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### Editorial.....

It is heartening to note that our journal is able to sustain the enthusiasm and covering various facets of knowledge. It is our hope that IJMER would continue to live up to its fullest expectations savoring the thoughts of the intellectuals associated with its functioning .Our progress is steady and we are in a position now to receive evaluate and publish as many articles as we can. The response from the academicians and scholars is excellent and we are proud to acknowledge this stimulating aspect.

The writers with their rich research experience in the academic fields are contributing excellently and making IJMER march to progress as envisaged. The interdisciplinary topics bring in a spirit of immense participation enabling us to understand the relations in the growing competitive world. Our endeavour will be to keep IJMER as a perfect tool in making all its participants to work to unity with their thoughts and action.

The Editor thanks one and all for their input towards the growth of the **Knowledge Based Society**. All of us together are making continues efforts to make our predictions true in making IJMER, a Journal of Repute

**Dr.K.Victor Babu**  
**Editor-in-Chief**

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**PARENTAL PERSPECTIVES ON EFFECTIVENESS OF INCLUSIVE EDUCATION  
FOR CHILDREN WITH INTELLECTUAL DISABILITIES IN MALAPPURAM  
DISTRICT, KERALA**

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**Abstract**

The current study explores the parental perspectives of youngsters with intellectual disabilities (ID) on the effectiveness of inclusive education in Schools of Malappuram district, Kerala. The participants were 51 parents, whose children had different degrees of Intellectual Disability and every one of them was attending mainstream schools at the time of the study. The parents completed a questionnaire examining their perspectives regarding (a) the foremost effective educational placement in mainstream schools (special class, mainstream class or co-teaching), (b) their satisfaction with the inclusive mainstream education, (c) their cooperation with the teachers, (d) the perceived benefits of their children's educational placement and (e) their suggestions regarding the development of the inclusive educational model. Results indicated that the majority of the parents of youngsters with ID would like their child to attend a mainstream class with a co-teaching arrangement. The perceived benefits are mostly related to the development of their children's social skills. Huge contemplations in regards to participation with the educators, absence of individualized data and direction, managerial and hierarchical issues were communicated.

**Keywords:** Parental Perspectives, Children with Intellectual Disabilities, Inclusive Education

**1.Introduction:**

The Education and equality of Persons with Intellectual disabled is determined by the myths, concerns and ignorance of parents, professionals, and the general public. Parents are the first persons in the family who care the children with disabilities or children with Intellectual disabled. Many parents are worried about the isolation with their children with Intellectual disabled will face as adults in terms of education, participation, responsibilities life experiences etc. Mentally Handicapped children and adults have a right to education in the field of their interest and requirement and it can be possible with the concept of inclusive education with keeping the view in sense that every individual have right of to live their life as others. In education of the mentally retarded individual levels must be gain importance for training. Parents face difficulty while discussing occurred matters with their children. There may be some another reason. The explanation must be adapted to their ability. Simple and user friendly material is needed for instruction and information. Much can be explained through role playing using everyday situations and language. The nature of training for the youngster with Intellectual crippled ought to be furnished with wide edge work. The way of thinking of comprehensive instruction which was the consequence of preceded with the examination of incorporation implies teaching youngsters with Intellectual handicapped in a normal instructive setting alongside 'non-crippled' peers. Instruction, regard, opportunity, investment, correspondence, and Parenthood are likely the most far from being an obviously true issue in standardization for Persons with Intellectual debilitated.



All parents show of three fundamental reactions towards their youngster. In the first place, the youngster is acknowledged for what he is and the guardians perceiving the kid confinements attempt as well as could be expected to give the most wholes one condition conceivable in which the kid can accomplish his most noteworthy conceivable level. Second there guardians either acknowledge or dismiss the youngster, which conceivable concealing of acknowledgment and dismissal response however chose to systematize him, third they dismiss the kid either part or in entirety (Ehlers Krishef & Prothern 1977).

Reponal (1955) seen that when the lack is evident during childbirth at when the acknowledgment gradually downs, the most major issues are stimulated by parental blame, at having created such a kid. It was discovered that very much different couples who love one another and are bound together by solid common compassion will in general become considerably filmier joined to frame a portion, protective triangles as moms, father, and flawed kid. Then again, if the groups between the couples are not solid has a shockingly dividing impact. Each strained to fault the other, progressively to discover deficiency are reprimands scatterings increments and may prompt partition or family separation. In by far most of cases, there are troublesome issues regularly to a great extent undiscovered.

The response of most guardians is a blend of the agreeable dismissing and over compensatory response. There have been efforts internationally to include children with disabilities in the educational mainstream. In order to achieve truly inclusive education, we need to think about and incorporate children with special needs into regular schools. Especially, because these kids face some sort of barriers to learning and participation in the classroom. As general education classrooms include more and more diverse students, teachers realize the value of accepting each student as unique. In effective inclusive programs, teachers adapt activities to include all students, even though their individual goals may be different. We have learned that inclusive education is a better way to help all students succeed. Researches show that most students learn and perform better when exposed to the richness of the general education curriculum. The growing body of research has shown that children do better academically when in inclusive settings and Inclusion provides opportunities to develop relationships. Some of the benefits include: friendships, social skills, personal principles, comfort level with people who have special needs, and caring classroom environments. The purpose of this study was to examine the parents' Perspectives towards inclusion of their children with disabilities in general education and to associate their perspectives with parent variables (e.g. education) and child variables (e.g. age, severity of disability) and to explore the perspectives of parents' effectiveness of developing the children through the inclusive education.

## 2. Review of Literature:

Review of pertinent literature is evident that training of parents, Peer or other family members / attendants of disabled child is very helpful not only in the understanding of the disability but also in handling the disability in an effective manner.

According to Winnick, 2000 A gradually increasing number of parents want their CWSN to attend a regular school, that is, the same neighbourhood school that siblings and children without disabilities attend. Such parents believe that their children receive education that is as near to normal as possible as they are prepared for adult life Hardman *et al.*, (1993) Chakuchichi *et al.* (2003). There are parents who also reiterate that inclusive education in physical education promotes assimilation, accommodation, adjustment and adaptation among learners in a free atmosphere Ballard, (1999); Hallahan and Kauffman, (1994); Musangeya *et al.*, (2000) Kanhukamwe and Madondo, (2003).

Numerous inclusive physical education models have been designed to help students with disabilities gain social competence and other skills to function fully and independently in regular physical education classes. Panda (1996) attempted to study the attitude of parents,



teachers and community members towards disability of different categories of children. Major findings are that the attitude varies with gender whether they are teachers, parents or community members. Females showed favorable attitude towards normal, hearing impaired, visually-impaired and severely mentally retarded children on the evaluative dimension. Males showed more favourable attitude towards the educable, mentally retarded and speech impaired. Female parents had significantly more favourable attitudes than the male parents. On the activity factor, sex had no differential effect on attitudes towards disability. On the potency dimension, the females were slightly more favourable towards EMR and hearing-impaired than the males.

Moreover, Leyser and Kirk (2004) surveyed parents of children with disabilities regarding their attitudes toward inclusion. The results of this study indicated that while some parents supported inclusion or mainstreaming for their children with disabilities, other parents feared possible isolation socially because their children are different from the general education students. On the other hand, several studies (e.g., Gallagher *et al.*, 2013, Hilbert, 2014) have indicated that there is a difference between parents of children with and without disabilities attitudes toward including their children into the general education classroom Hilbert (2014).

Although many researchers have reported that parents of children with disabilities hold positive attitudes toward inclusion, some researchers have reported that some parents had doubts about inclusion. For instance, the findings of Bennett and Gallagher's study (2013) on parents of students with disabilities are concerned with the availability of the qualified staff, services and resources. In addition, Gallagher (2013) the parents also worried that their children would not receive as much instruction in the general education classroom as they would with more individualized instruction in a special education classroom. All successful system of inclusion requires that the community belief in the competence of the education system to meet the needs of all the students. Parents especially should have confidence in the capacity of the school in education their children with special needs (Bollapalli VR, Prakash S, 2019). Through this literature review, the researcher understood many things and found the gap for the study that aims at examining parents' perspectives on effectiveness in inclusive education and its influence in the performance of special needs students in inclusive setup at Malappuram District in the State of Kerala, India.

### 3. Methodology

This study was designed to investigate the perspectives of parents in rural schools of Malappuram district, Kerala towards the inclusion of students with disabilities in the regular classrooms. After restating the research questions the researcher described the methodological approach and chooses to collect and analyze data. Following this the researcher describes the remote municipality in the rural department of Malappuram district, Kerala, in which he conducted this study. Then the researcher described the specific methods used, and discusses the ways in which he maintained confidentiality for participants and ensured the credibility of this research in order to compare its findings to those of published studies on parents' perspectives on effectiveness towards inclusion from around the world.

#### ***Tool for data collection and its Description:***

The present study attempts to find out the perspectives of parent's towards inclusion of their children with special needs in mainstream classrooms. In order to collect the data the investigator adapted the Parent's Attitudes to Inclusion (PATI) scale developed by Palmer, Borthwick-Duffy, and Widaman (1998). Palmer *et al.* (1998a) recognized and responded to the growing awareness of the multidimensional nature of widespread attitudes among parents of children with special needs by designing the *Parent Attitude to Inclusion (PATI)* specifically to survey and elicit parental attitudes. They conducted extensive field testing to gather and analyze the survey data (Palmer *et al.*, 1998b; Palmer *et al.*, 2001).

The PATI's construction deliberately incorporated the "multidimensional nature of parent perceptions regarding inclusive practices for children with significant cognitive



disabilities" (Palmer *et al.*, 1998b). In particular, they specified three dimensions: quality of educational services, mutual benefits for the included child and non-disabled peers, and socio-emotional issues of peer acceptance and self-feelings. Two of the factors, labelled *Quality of educational services* (Items 5, 6, 9 and 10) and *Child acceptance and treatment* (Items 2 & 3), focused on the benefits of inclusion for these students. The third factor, labelled *Mutual benefits of inclusion* (Items 1, 4, 7, 8 and 11), focused on relations with other students.

#### **Research design**

This Study was conducted by using quantitative research methods. Quantitative research is collection and analysis of numerical data to describe, explain, predict, or control phenomena (Gay, Mills, & Airasian, 2009). This can be considered the best approach to collect information regarding parents' perspectives on effectiveness toward inclusion of the children with disabilities in general education classrooms.

The researcher discussed with the school authority about the purpose of the study and the procedures to be adopted. At a subsequent meeting, 51 parents' with Intellectual Disabled children who attended regular schools were invited to participate in the study. The researcher distributed an introductory letter to the parents. Each parent signed a consent form and provided background information of their child. The researcher gave a copy of the PATI scale to each parent, and asked to read the instructions and to rate the level of agreement for each item.

The Parental perspectives were analyzed descriptively. The primary outcomes analyzed for the study of differences and similarities in perspectives of the parents. All analyses were completed using IBM SPSS version 20.0. Differences in the outcomes between the parents were compared using independent samples parents' t- tests when data were normally distributed. Non-parametric tests (Mann-Whitney U test) were applied for scores that were not normally distributed. The outcomes will be reported as percentage correct for the parents' perspectives on effectiveness of inclusion of children with disabilities in inclusive setup.

Statistical significance was accepted at the 5% level and all P values are two-tailed. Ninety-five per cent confidence intervals (95% CI) were also calculated where appropriate. Spearman correlations were conducted to examine the relationship between them and outcomes will be used for data analysis & interpretation.

#### **4. Results and Discussion**

Total 51 Parents of Children with CWSN Participated shown in Figure-1

The table-1 shows the responses made by the parents of CWSN towards the PATI items based on this the overall opinion of the respondents responded on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The same Likert scale was adhered to in this study. For the ease of making sense of the data when comparing across contexts, the scores in this study will be reversed such that a higher score will reflect a more positive attitude as the authors of the original PATI have done. But reverse scoring was used in the present study to ensure that the lowest score invariably reflects the most positive perception. Choices of agreement as 1, strongly disagree to 6, and strongly agree.

Table- 2 represents the parents of CWSN responses with reference to the PATI items from the findings presented above, is as follows:

- (1) **Statement -1:** 31% of the respondents were Strongly Agreed, 65% of the respondents Agreed and 4% of the respondents slightly agreed. This indicates that the most of the respondents agreed to the statement.
- (2) **Statement -2:** 57% of the respondents were disagreed, 33% of the respondents slightly disagreed, and 8% of the respondents were slightly agreed and 2% of the respondents Agreed. This indicates that the Most of the respondents i.e., 80% of the respondents disagreed to the statement whereas only 20% of the respondents were agreed.



(3) **Statement -3:** 18% of the respondents were strongly disagreed, 59% of the respondents disagreed, 23% of the respondents were slightly disagreed and none of the respondents Agreed. This indicates that the Most of the respondents disagreed to the statement.

(4) **Statement -4:** 26% of the respondents were strongly agreed, 43% of the respondents agreed and 31% of the respondents were slightly agreed and none of the respondents Disagreed. This indicates that the Most of the respondents agreed to the statement.

(5) **Statement -5:** 31% of the respondents were strongly agreed, 69% of the respondents agreed and none of the respondents Disagreed. This indicates that the Most of the respondents agreed to the statement.

(6) **Statement -6:** 43% of the respondents were slightly disagreed, 47% of the respondents were slightly agreed and 10% of the respondents were agreed. This indicates that the 57% of the respondents agreed to the statement.

(7) **Statement -7:** 8% of the respondents were strongly disagreed, 21% of the respondents disagreed, 57% of the respondents were slightly disagreed and 14% of the respondents slightly agreed. This indicates that the Most of the respondents i.e., 86% of the respondents disagreed to the statement.

(8) **Statement -8:** 29% of the respondents were strongly agreed, 61% of the respondents agreed, 10% of the respondents were slightly agreed and none of the respondents disagreed. This indicates that the all most all of the respondents agreed to the statement.

(9) **Statement -9:** 61% of the respondents were agreed, 39% of the respondents slightly agreed, and none of the respondents disagreed. This indicates that the Most of the respondents agreed to the statement.

(10) **Statement -10:** 51% of the respondents were strongly agreed, 37% of the respondents agreed, 12% of the respondents were slightly agreed and none of the respondents disagreed. This indicates that the almost all of the respondents agreed to the statement.

(11) **Statement -11:** 65% of the respondents were strongly agreed, 35% of the respondents agreed, and none of the respondents disagreed. This indicates that the almost all of the respondents agreed to the statement.

These findings indicated that the respondents hold some concerns regarding the impact of inclusion on their children academic achievement.

The findings from the Table-2 revealed that the percentage of the respondents agreed with the items from 1 to 11 in PATI Scale with participants responded on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). But reverse scoring was used in the present study to ensure that the lowest score invariably reflects the most positive perception. Choices of agreement as 1, strongly disagree to 6, and strongly agree. Descriptive Statistics for Eleven Items have been notified in Table-3.

Descriptive Statistics for Eleven Items Used to Measure Attitudes (N = 51) represented in Table-3.

From the table -3, Z- Scores represents as a numerical measurement used in statistics of a value's relationship to the mean of a group of values, measured in terms of standard deviation (SD) from the mean. If Z-score is 0, it indicates that the data point's score is identical to the mean score. This measures of an observation's variability. The three items in Table with the lowest scores (with which the respondents agreed most strongly) were:

- (1) **Item-3:** "the more time my child spends in a regular classroom, the more likely it is that he/she would end up feeling lonely or left out around the regular education students." ( $M=3.00$ );
- (2) **Item-2:** "The more time my child spends in a regular classroom, the more likely it is that he/she will be mistreated by other nondisabled students in that room." ( $M=3.48$ ); and
- (3) **Item-7:** "If my child were to spend much of his/her day in a regular classroom, he/she would end up becoming friends with nondisabled students in that room." ( $M = 3.69$ ); The three

items with the highest scores in Table (with which the respondents not agreed Most strongly) were

- (4) **Item-11:** “The more time my child spends in a regular classroom, the more likely it is that he/ she will be treated kindly by the nondisabled students in that room.” ( $M = 6.52$ );
- (5) **Item-10:** “A regular education classroom provides more meaningful opportunities for my child to learn than does a special education classroom.” ( $M=6.26$ ); and **Item-5:** “It is impossible to modify most lessons and materials in a regular classroom to truly meet the needs of my child. ( $M = 6.19$ ).

The responses of parents Group Statistics for Eleven Items Used to Measure Attitudes ( $N = 51$ ; Males (A) =20; Females (B) =31) are notified in Table-4.

The three items from the Table-4 with the lowest scores (with which the respondents agreed most strongly) were:

- (1) **Item-3:** “the more time my child spends in a regular classroom, the more likely it is that he/ she would end up feeling lonely or left out around the regular education students.” (*Mean of A=2.20 & B= 1.97*);
- (2) **Item-2:** “The more time my child spends in a regular classroom, the more likely it is that he/ she will be mistreated by other nondisabled students in that room.” (*Mean of A=2.90 & B= 2.32*); and
- (3) **Item-7:** “If my child were to spend much of his/her day in a regular classroom, he/she would end up becoming friends with nondisabled students in that room.” (*Mean of A=2.40 & B= 3.00*);

The three items with the highest scores in Table (with which the respondents not agreed most strongly) were:

- (1) **Item-11:** “The more time my child spends in a regular classroom, the more likely it is that he/ she will be treated kindly by the nondisabled students in that room.” (*Mean of A=5.50 & B=5.74*);
- (2) **Item-10:** “A regular education classroom provides more meaningful opportunities for my child to learn than does a special education classroom.” (*Mean of A=5.30 & B=5.45*); and
- (3) **Item-8:** “The quality of a regular education student's education is enriched when a student with severe disabilities participates in his/her class.” (*Mean of A=5.30 & B=5.13*).

The responses of parents from Independent samples Test by Levene's Test for Equality of Variances for Eleven Items Used to Measure Attitudes ( $N = 51$ ; Males (A) =20; Females (B) =31) are notified in Table-5.

The table-5 represents the attitudes of parents' of CWSN with reference to the PATI items with Equal variances assumed from the findings presented above, is as follows:

(1) **For Statement -1:** The mean score for Attitudes for the statement-1 indicates that there was no significant difference ( $p=0.795$ ;  $t=0.269$ ) between the attitudes of the Male parents ( $M=5.25$ ) and Female parents with disabled children ( $M=5.29$ ). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(2) **For Statement -2:** The mean score for Attitudes for the statement-2 indicates that there was a significant difference ( $p=0.005$ ;  $t=0.969$ ) between the attitudes of the Male parents ( $M=2.90$ ) and Female parents with disabled children ( $M=2.32$ ). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(3) **For Statement -3:** The mean score for Attitudes for the statement-3 indicates that there was no significant difference ( $p=0.213$ ;  $t=0.602$ ) between the attitudes of the Male parents ( $M=2.20$ ) and Female parents with disabled children ( $M=1.97$ ). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(4) **For Statement -4:** The mean score for Attitudes for the statement-4 indicates that there was no significant difference ( $p=0.496$ ;  $t=0.290$ ) between the attitudes of the Male parents ( $M=$



4.85) and Female parents with disabled children (M=5.00). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(5) **For Statement -5:** The mean score for Attitudes for the statement-5 indicates that there was no significant difference ( $p=0.296$ ;  $t=0.412$ ) between the attitudes of the Male parents (M=5.40) and Female parents with disabled children (M=5.26). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(6) **For Statement -6:** The mean score for Attitudes for the statement-6 indicates that there was no significant difference ( $p=0.564$ ;  $t=0.269$ ) between the attitudes of the Male parents (M=3.60) and Female parents with disabled children (M=3.71). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(7) **For Statement -7:** The mean score for Attitudes for the statement-7 indicates that there was no significant difference ( $p=0.007$ ;  $t=-0.174$ ) between the attitudes of the Male parents (M=2.40) and Female parents with disabled children (M=3.00). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(8) **For Statement -8:** The mean score for Attitudes for the statement-8 indicates that there was no significant difference ( $p=0.326$ ;  $t=0.517$ ) between the attitudes of the Male parents (M=5.30) and Female parents with disabled children (M=5.13). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(9) **For Statement -9:** The mean score for Attitudes for the statement-9 indicates that there was no significant difference ( $p=0.213$ ;  $t=0.105$ ) between the attitudes of the Male parents (M=4.50) and Female parents with disabled children (M=4.68). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(10) **For Statement -10:** The mean score for Attitudes for the statement-10 indicates that there was no significant difference ( $p=0.453$ ;  $t=0.251$ ) between the attitudes of the Male parents (M=5.30) and Female parents with disabled children (M=5.45). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

(11) **For Statement -11:** The mean score for Attitudes for the statement-11 indicates that there was no significant difference ( $p=0.080$ ;  $t=0.030$ ) between the attitudes of the Male parents (M=5.50) and Female parents with disabled children (M=5.74). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion.

These findings indicated that the mean score for Attitudes for the **statement-2** i.e., 'The more time my child spends in a regular classroom, the more likely it is that he/ she will be mistreated by other nondisabled students in that room.' Only indicates that there was a significant difference ( $p=0.005$ ;  $t=0.969$ ) between the attitudes of the Male parents (M=2.90) and Female parents with disabled children (M=2.32). This indicates that the parents tended to be more cautious in their agreement with positive statements about inclusion. And all the other statements has no significant difference between the attitudes of the both the parents' of children with disabilities. This indicates that the respondents hold some concerns regarding the *Child acceptance and treatment* (Items 2 & 3), focused on the benefits of inclusion for these students impact of inclusion on their children academic achievement.

## 5. Conclusions

Researcher observes that Intellectual Disabled children parents more than 60% parents have positive attitude about the effectiveness of inclusive education with normal children they feel that Intellectual Disabled children can benefit in education equal opportunity in regular class they feel that non-government organization play an important role in education & Intellectual Disabled children shows better performance in academic skills in inclusive education.

Researcher observed that 40% Intellectual Disabled children parents' perspectives are not important in inclusion and inclusion is not more effective & cannot provide appropriate instructions, cannot affect the educational back ground age difference of husband & wife on the



development of Intellectual Disabled Children but have positive attitude about effect of social economic student son the development of Intellectual disabled Children. This implies that the socio-economic status plays an important role in effectiveness of inclusive education & provides appropriate instruction use in inclusive education school.

Researcher concluded that more than 60% of the parents believe that Intellectual Disability is a disease and teacher attitude is important for implementation for inclusive education. Intellectual Disabled Children need individual support, so regular teacher need appropriate training because they believe that special methods & studies play. Main role in educating these children that way regular teacher can give special attention to these students and can provide appropriate teaching learning material to them which can receive required support for learning.

Whereas 40% of the parents believe that it is not a disease and not required individual support regular teacher can teach non-disable children in regular class room. Regular teacher will not needs to special training to teach Intellectual Disabled children. It will not stream fully manage and has less effectiveness for the Intellectual Disabled children with normal children in inclusive education setup. Regular teacher can give individual attention in inclusive education & can provide appropriate teaching learning material & plan inclusive education programme appropriately. Children with special needs will not require support for learning they only was not mental support or their teacher and class mates.

#### **6. Justification for the Research:**

The study aims at examining parents' perspectives on effectiveness of inclusive education and its influence in the performance of special needs students in inclusive setup at Malappuram District in the State of Kerala, India. Children with disabilities demonstrate high level of social interaction with non- disabled peer in inclusive setting when compared with segregated setting.

Social competence and communication skills of children with diverse abilities are improved in inclusive setting and closely associated with social interaction with non-disabled peer Children with disabilities in inclusive setting often have more rigorous educational program, resulting in improved skills acquisition and academic gains.

Social acceptance of children with diverse abilities is enhanced by frequent small group work nature of their instruction in inclusive classroom. Children get to see beyond the disability when working with small group and begin to realize that they have much in common with children with disabilities and friendship more commonly developed children with disabilities and those without disabilities in inclusive setting.

#### **7. Limitations of the study:**

This study was conducted in Malappuram district of Kerala; it cannot be a representative sample of the whole population of India and this study is limited to 51 parents from 5 schools only as the inclusive setup government schools are less in number. So the findings may not be generalized to study. Further studies with an enlarged sample drawn from all the provinces of India are needed.

#### **8. Suggestions/Recommendations:**

Inclusive education should start by conducting both specialized programmes for disabled children and regular programmes for normal children under the same roof. The school programmed should be designed in such a way that all activities like cultural games, art and craft etc. remain common for both normal and disabled children. The design of the plan should include faculty from education as well as from other disciplines such a psychology, sociology, etc.

A committee may be burned with special general education, teacher, parents and the principal to explore research on incisive programs, report finding and recommendations to the faculty, solicit input and develop and implement the plan.



Regular and continuous communications and planning must take place among faculty members both before and after during the implementation process. Emphasis should be laid on the promotion of behavior and emotional development of children. Proper arrangement should be made for social support such as friends group. Parents of disabled children should come forward to receive advice and information about their children additional support needs. Students should be prepared for the inclusion of special education students through discussions of acceptance, respect, maintaining and assisting. Regulate interaction between the teachers and parents should be arranged to discuss the progress of children. Parents of all children (both normal and disabled) should be taken to confidence, so that their children are given proper individual attentions in inclusive settings. An effective approach to develop communities of belief about inclusion should be put into place by creating many opportunities for all community members to think carefully and discuss practical action.

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Table 1.Responses of the parents’ towards PATI Scale

S.No	Gender	PATI Items										
		1	2	3	4	5	6	7	8	9	10	11
1	M	5	2	3	4	5	3	1	5	4	5	5
2	M	6	3	3	5	5	4	2	5	4	5	6
3	M	5	4	3	4	5	4	2	6	5	6	6
4	M	5	3	3	4	5	4	1	5	4	5	5
5	M	6	2	2	4	6	4	1	6	4	6	6
6	M	5	3	2	6	5	3	3	5	5	6	6
7	M	6	4	2	5	6	4	3	5	4	5	5
8	F	6	2	2	4	5	4	3	5	4	5	6
9	M	6	5	1	5	5	3	2	5	4	6	5
10	M	5	2	3	6	6	5	4	6	5	4	6
11	M	4	3	2	5	6	3	3	6	4	6	5
12	M	5	4	3	6	5	4	2	5	5	5	6
13	M	5	3	2	4	5	4	2	5	4	5	6
14	M	5	2	2	5	5	3	3	4	5	6	6
15	F	5	3	1	5	5	4	3	5	4	6	6
16	M	6	2	1	4	6	3	4	6	5	5	5
17	M	5	2	3	4	6	4	2	6	5	6	6
18	F	5	3	2	6	5	3	3	5	5	6	6
19	M	5	3	3	5	5	4	4	5	4	4	5
20	M	6	2	2	5	6	4	3	6	5	5	6
21	M	6	2	2	5	5	3	2	5	4	6	5
22	M	4	3	1	5	6	3	1	5	5	5	5
23	M	5	4	1	6	5	3	3	5	5	5	5
24	F	5	2	2	4	5	3	3	6	5	6	5
25	F	5	2	3	6	6	5	4	6	5	4	6
26	F	6	2	2	5	6	4	2	5	5	5	5
27	F	5	2	2	5	5	3	3	4	5	6	6
28	F	6	2	2	4	5	4	3	5	4	5	6
29	F	5	3	1	5	5	4	3	5	4	6	6
30	F	5	3	2	6	5	3	3	5	5	6	6
31	F	5	2	2	4	5	3	3	6	5	6	5
32	F	5	2	3	6	6	5	4	6	5	4	6



33	F	6	2	2	5	6	4	2	5	5	5	5
34	F	5	2	2	5	5	3	3	4	5	6	6
35	F	6	2	2	4	5	4	3	5	4	5	6
36	F	5	3	1	5	5	4	3	5	4	6	6
37	F	5	3	2	6	5	3	3	5	5	6	6
38	F	5	2	2	4	5	3	3	6	5	6	5
39	F	5	2	3	6	6	5	4	6	5	4	6
40	F	6	2	2	5	6	4	2	5	5	5	5
41	F	5	2	2	5	5	3	3	4	5	6	6
42	F	6	2	2	4	5	4	3	5	4	5	6
43	F	5	3	1	5	5	4	3	5	4	6	6
44	F	5	3	2	6	5	3	3	5	5	6	6
45	F	5	2	2	4	5	3	3	6	5	6	5
46	F	5	2	3	6	6	5	4	6	5	4	6
47	F	6	2	2	5	6	4	2	5	5	5	5
48	F	5	2	2	5	5	3	3	4	5	6	6
49	F	6	2	2	4	5	4	3	5	4	5	6
50	F	5	3	1	5	5	4	3	5	4	6	6
51	F	5	3	2	6	5	3	3	5	5	6	6

Table 2. Percentage of parents of CWSN responded for each question in PATI items

Item	Statement	1 Strongly Disagree	2 Disagree	3 Slightly disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	N
01	The more time my child spends in a regular classroom; the more likely it is that the quality of his/her education will improve.	0%	0%	0%	4%	65%	31%	51
02	The more time my child spends in a regular classroom, the more likely it is that he/ she	0%	57%	33%	8%	2%	0%	51



	will be mistreated by other nondisabled students in that room.							
03	The more time my child spends in a regular classroom, the more likely it is that he/ she would end up feeling lonely or left out around the regular education students.	18%	59%	23%	0%	0%	0%	51
04	When a student with severe disabilities is enrolled in a regular education classroom, the positive benefits to the regular education students outweigh any possible problems that this practice may present.	0%	0%	0%	31%	43%	26%	51
05	It is impossible to modify most lessons and materials in a regular classroom to truly meet the needs of my child.	0%	0%	0%	0%	69%	31%	51
06	If my child were to spend a lot of time in a regular classroom, he/she would end up not getting the	0%	0%	43%	47%	10%	0%	51



	extra help he/she needs.							
07	If my child were to spend much of his/her day in a regular classroom, he/she would end up becoming friends with nondisabled students in that room.	8%	21%	57%	14%	0%	0%	51
08	The quality of a regular education student's education is enriched when a student with severe disabilities participates in his/her class.	0%	0%	0%	10%	61%	29%	51
09	If my child were to spend much of the day in a regular classroom, he/she would end up not getting all the necessary special services that would be provided in a special education classroom.	0%	0%	0%	39%	61%	0%	51
10	A regular education classroom provides more meaningful opportunities for my child to learn than does a special education classroom.	0%	0%	0%	12%	37%	51%	51



11	The more time my child spends in a regular classroom, the more likely it is that he/ she will be treated kindly by the nondisabled students in that room.	0%	0%	0%	0%	35%	65%	51
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Table 3.Descriptive Statistics for Eleven Items Used to Measure Attitudes of Parents’ of CWSN

Item	Statement	Mean	SD	Z-Score
01	The more time my child spends in a regular classroom; the more likely it is that the quality of his/her education will improve.	6.15	0.532	-0.515
02	The more time my child spends in a regular classroom, the more likely it is that he/ she will be mistreated by other nondisabled students in that room.	3.48	0.729	-6.153
03	The more time my child spends in a regular classroom, the more likely it is that he/ she would end up feeling lonely or left out around the regular education students.	3.00	0.645	-4.274
04	When a student with severe disabilities is enrolled in a regular education classroom, the positive benefits to the regular education students outweigh any possible problems that this practice may present.	5.82	0.759	-2.395
05	It is impossible to modify most lessons and materials in a regular classroom to truly meet the needs of my child.	6.19	0.468	-0.515
06	If my child were to spend a lot of time in a regular classroom, he/she would end up not getting the extra help he/she needs.	4.57	0.653	-4.274
07	If my child were to spend much of his/her day in a regular classroom, he/she would end up becoming friends with nondisabled students in that room.	3.69	0.789	-8.033
08	The quality of a regular education student's education is enriched when a student with severe disabilities participates in his/her class.	6.07	0.603	-0.515
09	If my child were to spend much of the day in a regular classroom, he/she would end up not getting all the necessary special services that would be provided in a special education classroom.	5.50	0.493	-2.395
10	A regular education classroom provides more meaningful opportunities for my child to learn than does a special education classroom.	6.26	0.695	-0.515
11	The more time my child spends in a regular classroom, the more likely it is that he/ she will be treated kindly by the nondisabled students in that room.	6.52	0.482	-0.515



Table 4.Group Statistics

Parents' of CWSN& PATI items	GENDER	N	Mean	Std. Deviation	Std. Error Mean
W1	A	20	5.25	.639	.143
	B	31	5.29	.461	.083
W2	A	20	2.90	.912	.204
	B	31	2.32	.475	.085
W3	A	20	2.20	.768	.172
	B	31	1.97	.547	.098
W4	A	20	4.85	.745	.167
	B	31	5.00	.775	.139
W5	A	20	5.40	.503	.112
	B	31	5.26	.445	.080
W6	A	20	3.60	.598	.134
	B	31	3.71	.693	.124
W7	A	20	2.40	.995	.222
	B	31	3.00	.516	.093
W8	A	20	5.30	.571	.128
	B	31	5.13	.619	.111
W9	A	20	4.50	.513	.115
	B	31	4.68	.475	.085
W10	A	20	5.30	.657	.147
	B	31	5.45	.723	.130
W11	A	20	5.50	.513	.115
	B	31	5.74	.445	.080

Table 5. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
W1	Equal variances assumed	2.260	.139	-.262	49	.795	-.040	.154	-.350	.269
	Equal variances not assumed			-.244	31.676	.809	-.040	.165	-.377	.296
W2	Equal variances assumed	7.588	.008	2.966	49	.005	.577	.195	.186	.969
	Equal variances not assumed			2.612	25.740	.015	.577	.221	.123	1.032

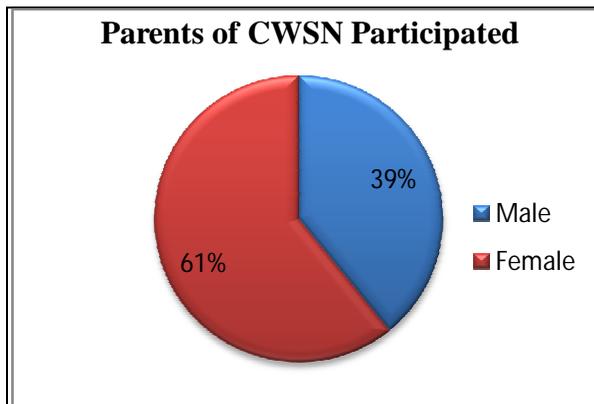


W3	Equal variances assumed	7.149	.010	1.262	49	.213	.232	.184	-.138	.602
	Equal variances not assumed			1.174	31.341	.249	.232	.198	-.171	.635
W4	Equal variances assumed	.011	.916	-.685	49	.496	-.150	.219	-.590	.290
	Equal variances not assumed			-.691	41.845	.493	-.150	.217	-.588	.288
W5	Equal variances assumed	3.548	.066	1.057	49	.296	.142	.134	-.128	.412
	Equal variances not assumed			1.029	37.059	.310	.142	.138	-.137	.421
W6	Equal variances assumed	.415	.522	-.582	49	.564	-.110	.189	-.489	.269
	Equal variances not assumed			-.600	44.831	.551	-.110	.183	-.478	.258
W7	Equal variances assumed	18.989	.000	-2.829	49	.007	-.600	.212	-1.026	-.174
	Equal variances not assumed			-2.490	25.690	.020	-.600	.241	-1.096	-.104
W8	Equal variances assumed	.147	.703	.992	49	.326	.171	.172	-.175	.517
	Equal variances not assumed			1.010	43.032	.318	.171	.169	-.170	.512
W9	Equal variances assumed	2.768	.103	-1.262	49	.213	-.177	.141	-.460	.105
	Equal variances not assumed			-1.241	38.405	.222	-.177	.143	-.467	.112



W10	Equal variances assumed	.699	.407	-.757	49	.453	-.152	.200	-.554	.251
	Equal variances not assumed			-.773	43.477	.444	-.152	.196	-.547	.244
W11	Equal variances assumed	5.874	.019	-1.786	49	.080	-.242	.135	-.514	.030
	Equal variances not assumed			-1.731	36.468	.092	-.242	.140	-.525	.041

Figure 1. Gender wise Percentage of parents of CWSN responded for each question in PATI items





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## FOREIGN DIRECT INVESTMENT INFLOWS IN RETAIL SECTOR

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### Abstract:

Foreign direct investment (FDI) has played an important role in the process of globalization during the past two decades. The rapid expansion in FDI by multinational enterprises since the mid-eighties may be attributed to significant changes in technologies, greater liberalization of trade and investment regimes, and deregulation and privatization of markets in many countries including developing countries like India. Indian retail industry has emerged as one of the most dynamic and fast –paced industries due to the entry of several new players. Total consumption expenditure is expected to reach nearly US \$ 3600 billion by 2020 from US \$ 1824 billion in 2017. The data collected from the study were publications from Reserve Bank of India. The period for the study from 2008-2018. The tools used for the analysis is Growth rate, Anova & Regression. This paper mainly focuses on foreign direct Investment in retail sector.

**Keywords:**Retail Sector, Foreign direct Investment, and Multi National Enterprises.

### 1.1 INTRODUCTION:

Indian retail industry has emerged as one of the most dynamic and fast-paced industries due to the entry of several new players. Total consumption expenditure is expected to reach nearly US\$ 3,600 billion by 2020 from US\$ 1,824 billion in 2017. It accounts for over 10 per cent of the country's gross domestic product (GDP) and around eight per cent of the employment. India is the world's fifth-largest global destination in the retail space. India ranked 73 in the United Nations Conference on Trade and Development's Business-to-Consumer (B2C) E-commerce Index 2019. India is the world's fifth largest global destination in the retail space and ranked 63 in World Bank's Doing Business 2019. India is the world's fifth largest global destination in the retail space. In FDI Confidence Index, India ranked 16 (after US, Canada, Germany, United Kingdom, China, Japan, France, Australia, Switzerland, and Italy).

The Indian retail trading has received Foreign Direct Investment (FDI) equity inflow totaling US\$ 2.12 billion during April 2000–March 2020 according to Department for Promotion of Industry and Internal Trade (DPIIT). With the rising need for consumer goods in different sectors including consumer electronics and home appliances, many companies have invested in the Indian retail space in the past few months. India's retail sector attracted US\$ 970 million from various private equity funds in 2019. Walmart Investments Cooperative U.A invested Rs 2.75 billion (US\$ 37.68 million) in Wal-Mart India Pvt Ltd.

### 1.2 REVIEW OF LITERATURE:

Singh Kr. Arun and Agarwal P.K., (2012)<sup>1</sup> in their article has explained the various concepts like organized and Un-organized retailing, single and multi-brand retailing. He



states that the opening up of retail to FDI should be designed in a such as way that many sectors - including agriculture, food processing, manufacturing, packaging and logistics must reap benefits. By looking at FDI investments in other countries they state that inflation will be definitely reduced and scale of operation and technology will help organized retailers to provide products at low cost.

**Dr. Mamata Jain and Mrs. Meenal Lodhana Sukhlecha, (2012)<sup>2</sup>**, studies about the retail sector in general and what is the need of FDI in retailing by means of various arguments for and against the same. A comparison with China is also made with respect to retail sector.

**Dr. Ghousia Khatoon (2016)<sup>3</sup>**, in their study examined “A study on Growth of Foreign Direct Investment in different sectors of Indian Economy – A descriptive and Analytical study”, the main objectives of the study is to analyze the country wise inflows of FDI in India. The researcher concluded that FDI is of vital importance to an Indian economy as it leads to not only capital formation but also increased employment opportunities, transfer of technology, higher standard of living, access to global managerial skills, optimum utilization of human capabilities and natural resources, access to international quality of goods etc.

### **1.3 NEED FOR THE STUDY:**

The most important one in the foreign direct Investment is will lead to increased and improvement in technology and infrastructure increased productivity and it also increased employment opportunities. In the year 2011-12 India is 11<sup>th</sup> position of Foreign direct Investment. But now, in the year 2019 India is Jumped into the 9<sup>th</sup> position of FDI. There is tremendous growth of foreign direct investment in India and it also increased the productivity and employment opportunities. In this context, it is essentially becoming significant for the host country government to study and ascertain the impact these investments would make in their local economies in the short, medium and long term. This is critical for the host country government to assess the impact on their economy so as to enable them to formulate, modify and re-work their strategies of encouraging the foreign direct investment to their countries. Hence, this study would become a vital portion of information, based on which governments can adopt suitable policies in welcoming foreign direct investments particularly retail sector.

### **1.4 OBJECTIVE OF THE STUDY:**

The main objective of the study is to know the foreign direct investment inflow in retail sector.

### **1.5 Retail sector- An overview:**

The Retail Sector is one of the biggest contributors to India’s GDP. It also has a high rate of employment. A retail store is the final frontier of the manufacturing to consumer chain. It sells products to the customers for final consumption. Derived from a French word, it means “to cut again”. Simply put a retailer cuts off small portions of a big production for sale and consumption by the customer. The shop at the corner, a multi-brand store or a single brand store is all retail shops. With the internet taking over the world online retail stores are now popular too. Retailing can be multi-brand or single-brand. A store or showroom that gives consumers many options under one roof is a multi-brand retail. An exclusive store or a store that houses products pertaining to a single brand is a single-brand store. Currently, the Indian Government has allowed up to



51% FDI in multi-brand retail and up to 100% FDI in single-brand retail after years of contemplating on the possibilities and disadvantages. These investments are subject to permissions from the Government Authorities. The demand for FDI was long being pushed by the major players wanting to encash the phenomenon of globalization. But the government had its own share of apprehensions. Slowly it did open up the avenues with certain terms and conditions.

1.6 Government Initiatives:

- In May 2020, Government increased FDI in Defence manufacturing under the automatic route from 49 per cent to 74 per cent.
• In April 2020, Government amended existing consolidated FDI policy for restricting opportunistic takeovers or acquisition of Indian companies from neighboring nations.
• In March 2020, Government permitted non-resident Indians (NRIs) to acquire up to 100 per cent stake in Air India.
• In December 2019, Government permitted 26 per cent FDI in digital sectors.
• In August 2019, Government permitted 100 per cent FDI under the automatic route in coal mining for open sale (as well as in developing allied infrastructure like washeries).
• In Union Budget 2019-20, the Government of India proposed opening FDI in aviation, media (animation, AVGC) and insurance sectors in consultation with all stakeholders.
• As of February 2019, the Government of India has been working on a road map to achieve its goal of US\$ 100 billion worth of FDI inflow.

1.7 Data Analysis & Interpretation:

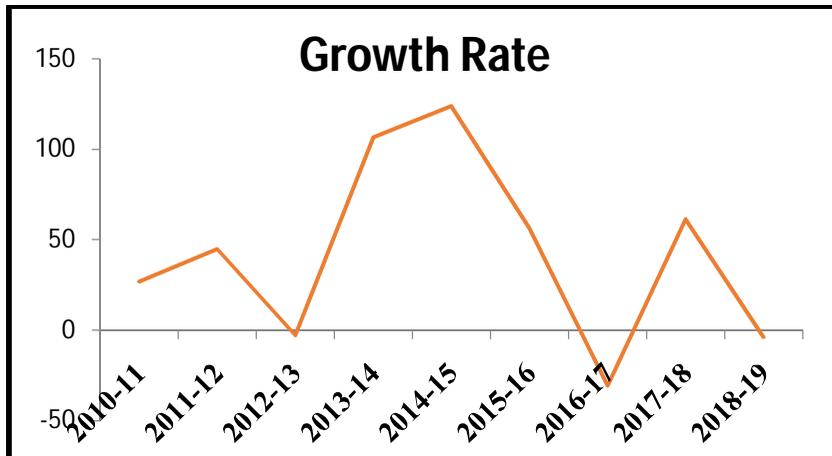
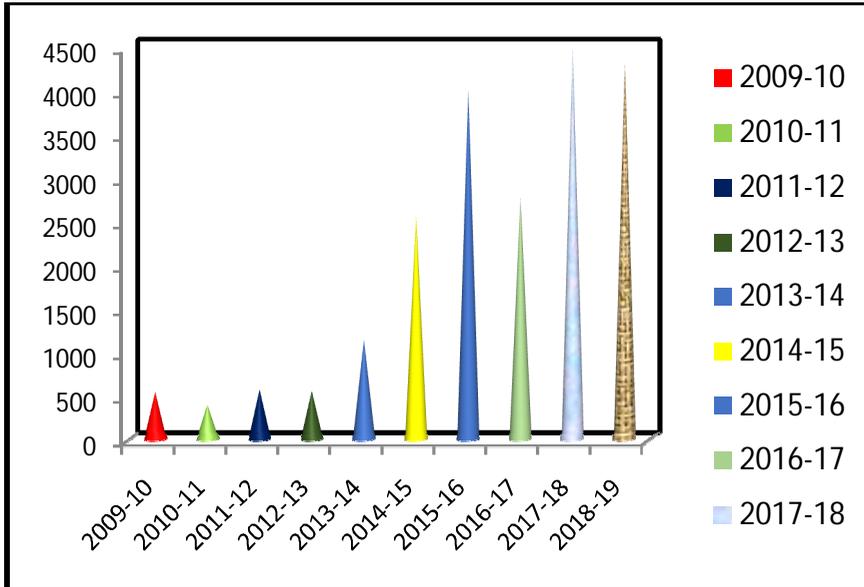
Retailing in India is one of the pillars of the pillars of its economy and accounts for 14 to 15% of its GDP. The Indian retail market is estimated to be US\$ 450 billion and one of the top five retail markets in the world by economic value. India is one of the fastest growing retail markets in the world, 1.2 billion people. The Indian retail industry has emerged as one of the most dynamic and fast-paced industries due to the entry of several new players. Total consumption expenditure is expected to reach nearly USD \$3,600 bn by 2020 from USD \$1,824 bn in 2017. India's e-commerce market has witnessed a phenomenal growth in the past recent years and is still flourishing. Foreign Direct Investment in E-Commerce in India can lead to an influx of capital, further enhancing its growth potential.

Table 1.1 Sector Wise Inflows in Retail Sector

Table with 4 columns: Year, Sector Wise Inflows, Growth Rate, and FDI IN RETAIL SECTOR (row header). Rows include years from 2009-10 to 2018-19 with corresponding inflow and growth rate values.

Source: Reserve Bank of India (Publications)

**Figure 1.1**  
**Sector Wise Inflows In Retail Sector**



In the **Table 1.1** is portrayed with results of trend and growth analysis for Foreign Direct Investment in India. In **2010-11**, retail sector in sector wise inflows US \$ 391, and positively trend growth in 2017-18 US \$ 4478. But in **2018-19** there is decreases in sector wise inflows US \$ 4311. The growth rate in the year **2010-2011**, 27.05% and Positive trend growth rate 61.6% and simultaneously there is negatively growth rate in -3.72.



### 1.8 Findings of the Study:

- It is observed that in **2010-11**, retail sector in sector wise inflows US \$ 391, and positively trend growth in 2017-18 US \$ 4478. But in **2018-19** there is decreases in sector wise inflows US \$ 4311.
- It is found that **2010-2011**, 27.05% and Positive trend growth rate 61.6% and simultaneously there is negatively growth rate in -3.72.

### 1.9 Suggestions :

The Government may support the retail sector by providing financial support to investors still there is growth in retail sector.

### 1.10 Conclusion:

The Retail Industry in India is expected to grow at a rate of 14% by 2013. According to Investment Commission of India, the retail sector is expected to grow almost three times its current levels of \$ 660 billion by 2015. In India, the retail sector is the second largest employer after agriculture. Retailing in India is one of the pillars of its economy and accounts for 14% to 15% of its GDP. India will allow FDI of upto 51% in multi brand sector. The Indian retail business is highly fragmented and is almost run by traditional families. In India, lot of departmental stores, Super markets and highly organized malls are emerging into this retail sector. The researcher concluded that retail sector there is tremendous growth rate in the year 2017-18.

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**PREDICTING DEPRESSION AMONG IT SECTOR EMPLOYEES IN INDIA DURING COVID-19 PANDEMIC USING DEEP NEURAL NETWORK AND SUPERVISED MACHINE LEARNING CLASSIFIERS: A SURVEY APPROACH**

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**Abstract**

COVID-19, the biggest outbreak of pandemic in this century, has caused an unprecedented impact on the psychological, physical, emotional, and social health of mankind. The dynamic IT sector workers are experiencing high mental stress, on both physical and professional fronts. This paper presents the results of a survey-based study carried out for predicting depression among IT sector workers in India using Deep Neural Network and Supervised Machine Learning Classifiers. We have compared the performance of both types of classifiers and identified the best method amongst them for detecting the onset of depression based on evaluation metrics applied to the test dataset obtained from the survey. It has been successful in the correct identification of the onset of depression, specifically exacerbated during the current period of pandemic. Through this, a generalized system for early detection of depression in all individuals can be developed. We have also identified some important coexisting factors that influence depression and analyzed them to identify and study the groups that are at high risk of developing depression.

**Keywords:** COVID-19, Depression Prediction, DNN Classifier, Machine Learning Classifier, IT Sector

**1. Introduction**

COVID-19 has caused unimaginable trauma and stress all over the world. On 30th January 2020, after all the regions of China were detected to be prone to novel coronavirus infection cases and the total number of cases had crossed the total case count of SARS (2003), the outbreak was declared as a pandemic, a public health emergency of international concern by the World Health Organization (WHO) [1]. Traumas like pandemics lead to feelings of uncertainty about life that ultimately cause stress, frustration, fear, anxiety, panic, depression, and sleep problems [2]. It can be seen that this pandemic has led to direct and indirect psychological and social effects which are pervasive and are affecting mental health now and might continue in the future too [3]. Isolation strategy with quarantine has turned out to be an effective model in controlling transmission and rapid spread of the virus [4]. There is a definite possibility for this because over 10 million total cases all over the world have been registered by



the end of June 2020 [5] and have reached almost 10.5 million by July mid. As per a research, in India, under normal circumstances, around 10–12% of people are affected by a mental disorder either due to stress, depression, anxiety, or any other cause [6]. It can be assumed that the level of mental issues could have increased manifolds by now, under the current circumstances. According to a survey conducted in China during the initial outbreak of COVID-19, 53.8% of respondents rated the psychological impact of the outbreak as moderate or severe; 16.5% reported moderate to severe depressive symptoms; 28.8% reported moderate to severe anxiety symptoms, and 8.1% reported moderate to severe stress levels [7]. We can assume that the levels of psychological impacts of coronavirus outbreak must be even greater in fields like defense, healthcare, retail, travel and tourism, and the Information Technology (IT) sector. We know that the IT sector is infamous for its VUCA (volatility, uncertainty, complexity, ambiguity) properties of the work environment [8]. The advent of globalization and privatization has brought a new culture in terms of work relationships, job insecurity, uncertainty in career planning, which is further exacerbated due to rapid technological development [9], and now it has turned worse due to the current pandemic. As seen previously, among the prevalent mental health disorders; depression, anxiety, and stress constitute a large proportion [6]. The general population survey, done by Ipsos MORI revealed that the possibility of becoming physically unwell due to COVID-19 ranked lower than the issues related to the social and psychological response to the pandemic [3]. In another study, we found that in general, stress is one of the major factors that affect the decision-making capabilities of technical background employees [8]. Like stress, depression is one of the most common mental disorders, causing enormous personal and economic burden [10]. India has shown a 1-year prevalence rate of depression from 5.8 to 9.5 [11]. There are very few models found on depression detection among IT Sector Workers in the literature. In this study, we have analyzed the mental state of IT Sector Workers in India to detect any symptoms that may reflect the prevalence of any stage of depression during the COVID-19 period by comparing five different predictive models using machine learning methodologies. We have also identified the common factors that contribute to causing depression in IT sector employees. Depression among IT Sector workers remains undiagnosed due to negligence and simple standard instruments like the Impact of Event Scale-Revised (IES-R) [6]. So if there is a model that can predict an individual with depression automatically depending upon socio-demographic and few important morbidity features then it will be helpful in the detection of depression in the nascent stages. In this paper, we will show a comparative analysis between the classifiers used based on their prediction results on the test set. We have also identified some important factors that influence depression and analyzed the groups that are at high risk of developing depression, on the basis of the responses of employees collected in the survey.

The organization of this document is as follows. In Section 2, we have discussed how COVID-19 Pandemic has affected the lives of people especially the lives of hardworking IT Sector Workers, and few existing architectures to predict depression. Section 3, describes the participants who took part in our survey, the methods and techniques implemented. Section 4, describes the confusion matrix and the predictions made with the test dataset using all the five machine learning classifiers used in our



proposed method. Section 5, presents the deep neural network trained with the DNN classifier that is also used for our study, its model description and the predictions made with the test dataset. Section 6, shows the comparative analysis between all the six classifiers with the test dataset, the success method plot which shows the best method amongst all the six classifiers used, predictions made by the best method and identification of some coexisting factors responsible for the development of depression based on the responses of the individuals collected in our survey, and lastly Section 7 concludes our paper by specifying all the research findings of our model.

## 2. Related Work

A number of surveys have been conducted in order to detect the prevalence of depression, specifically in the IT sector [12]. These surveys clearly show that various factors like layoffs, work pressure, job evaluation and appraisals, competition, et cetera cause depression in employees at varying levels and stages. Countries like Singapore use the Impact of Event Scale-Revised (IES-R), which is a standard instrument used by healthcare workers, for depression detection [1]. Another survey [6], was carried out in 2015, in industrial workers of Bangalore, India where the researchers used a Depression Anxiety Stress Scale (DASS)-21, as the mental health screening tool, that has been discussed below [6]. One of the approaches to determine the depression among firm employees was proposed by Rao et al.,[6] where they made use of the Depression Anxiety Stress Scale (DASS-21) [15]. Logistic Regression [16] was used to test the relationship between the DASS-21 scores and the variables like age, the number of years in a firm, leaves, and sick leaves. Another methodology was proposed by Dietrich et al.,[10], in which they performed a literature search on well-known databases 'PubMed'[17] and 'EbscoHost'[18] for collecting the articles that were relevant to depression study. They found 9173 articles in total and only one article among 9173 was relevant for them. In this selected article the depression detection task was performed for workplace employees. In the age group of 18-24 years, women were prone to unipolar depression and mostly the age group of 35-44 years was more prone to depression [10]. In a study by Bhakta et al., [19] socio-demographic factors like earning status, age, and the like may contribute to depression in senior citizens. For determining the depression in senior citizens [19], they used Weka Tool [20] using the machine learning classifiers.

In our study, we have used Supervised Machine Learning Classifiers[14] for predicting depression in IT sector employees. Machine learning [13] is the study of algorithms used in a computer that learns through experience. Supervised Learning [14] uses labeled data for training purposes and makes predictions for the unlabeled data on the basis of the dataset used for training. It learns a relationship between the target variable and the input features in an efficient way, and this is the reason why we preferred a supervised machine learning approach for the task of depression detection.

## 3. Methodology

The following three subsections provide information about the participants, the procedures implemented to gather the data samples and the methods implemented to clean the dataset:



### 3.1. Participants

The web-based survey has been conducted on the IT Sector workers, employed in distinctive organizations all over India, independent of their location, age, gender, position, background, etc, in the form of questionnaires. The questionnaire that was distributed between the dates 9th and 17th June 2020 was in the form of Google Forms that was totally random and was filled only with the consent of the interested participants. The questionnaire consists of 117 participants who enthusiastically took part in our survey who are associated with different work backgrounds like technical and non-technical. We used the “Snowball sampling” technique to collect the sample dataset in which the existing or current participant shares or recruit future participants among their friends or acquaintances. The collected sample contains data of 117 adults out of which 42 are Females, 74 are Males and 1 is from Others category. The sample of each participant includes information regarding their age, gender, work background.

### 3.2. Procedure

The dataset consists of questions that would help us in performing a survey and study related to the well-being and health issues of the IT Sector workers in India during the pandemic phase. The questionnaire was filled by 117 IT Sector Employees. After collecting the raw data samples which consist of both nominal and numeric data, we pre-processed and cleaned them in order to prepare the dataset to be worked upon. Further, we generated a covariance matrix to validate the dataset and also to measure the correlation between multiple feature columns present in the dataset. After validating the dataset we splitted the dataset into train and test sets with 7:3 ratio and fed the dataset into five machine learning classifiers and one deep neural network classifier for the training purpose and also for the dichotomous classification of the individuals into depressed and not-depressed categories. After training the model and getting evaluation results, we predicted whether an employee is depressed or not by using the best method amongst all the six classifiers used.

### 3.3. Data Pre-Processing and Covariance Matrix

As we know that the raw data is never clean, especially if it is obtained through a survey approach. Hence, data cleaning is one of the most important tasks that have to be performed in order to prepare the data to be worked upon. In order to pre-process the data, we converted all the responses obtained by the participants into lower cases, cleaned the raw data sample by filling the missing values, and finally rechecked if there is any missing data. We performed data encoding to ensure that there are no data redundancies, which helped to save the memory space since encoded data are smaller in size. We sampled the dataset by dropping all the irrelevant attributes which are not necessary for the task of analysis. The covariance matrix helps us to validate the dataset and to measure the correlation between multiple features, up to what extent a feature closely covaries with other features, or deviates with the other features. It can be clearly seen in Fig. 1, that the attribute ‘stress\_or\_not’ tends to covary very positively with the attributes ‘during\_covid\_issues’ and ‘depressed\_due\_to\_covid’. The attribute ‘Age’

covaries closely with the attributes ‘emotion\_before\_pandemic\_negative’, ‘social\_isolation\_due\_to\_COVID’ and ‘age\_range’ and so on. Based upon the close correlation between some of the relevant attributes, we will select the final feature columns to feed them into the training model, to get the optimum result.

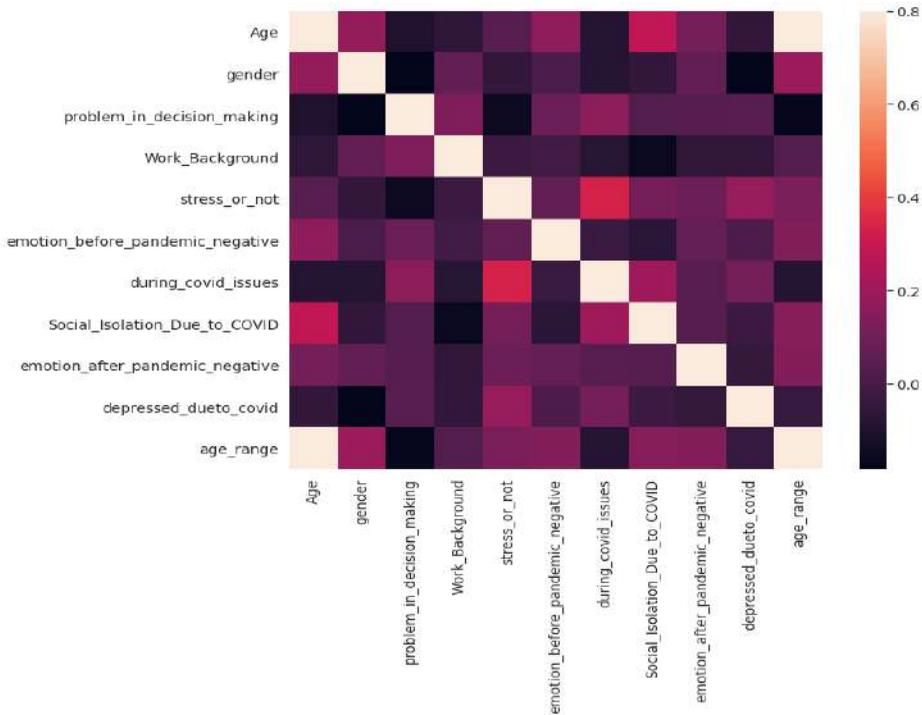


Figure 1. Covariance Matrix (Variability comparison between the attributes)

#### 4. Predicting with Supervised Machine Learning Classifiers

Machine Learning provides numerous classifiers that can be used to train the model and predict outcomes. Supervised Learning [14] is best for our method because it learns a relationship between the target variable and the input features in an efficient way, and our problem is a classification problem where we have to determine whether an employee is ‘depressed’ or ‘not depressed’. For the task of predicting depression, we have used five supervised machine learning classifiers which are, Logistic Regression, K Nearest Neighbors, Random Forest, Decision Tree and Bagging by using sklearn python library. The following five subsections describes the confusion matrices generated by all the five classifiers with our test dataset in detail:

##### 4.1 Logistic Regression

Logistic Regression is a mathematical model that is used in machine learning as a classification algorithm which estimates the probability of an event occurring, on given previous data [16]. While predicting whether an employee is depressed or not, we will

represent depressed employees as ‘1’ and not depressed as ‘0’. After the performance on the Test Dataset has been evaluated using the Logistic Regression Classifier in our model, we got the following statistics- Classification Accuracy:1.0, Classification Loss: 0.0, Precision:1.0, AUC Score:1.0 and ROC Area Score:1.00. We generated a confusion matrix for illustrating the prediction result using the Logistic Regression Classifier on the test set which is shown in Fig. 2. Since we had split the whole dataset into train and test with a ratio of 7:3, the test dataset consists of 36 data samples. In fig. 2 we can see that the x-axis indicates the predicted value of our model, and the y-axis indicates the actual prediction, which is represented by labels “0” and “1” where “1” represents the “Depressed” class and “0” represents the “Not Depressed” class. The “True Positive” region where both the Actual and Predicted value is “1”, consists of 6 data points, which tells us that 6 individuals were actually detected as depressed. Our model also predicted 6 individuals as depressed. There are no “False Positive” and “False Negative” outcomes of our model, which tells us that Logistic Regression has efficiently predicted the correct output.

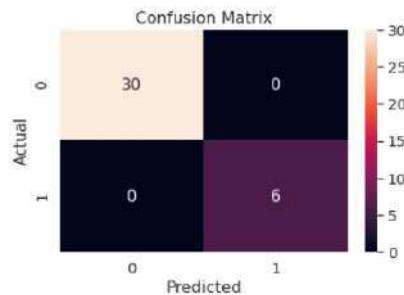


Figure 2. Logistic Regression Confusion Matrix with our Test Dataset

#### 4.2 K Nearest Neighbors

K-Nearest Neighbors (KNN) is a supervised learning algorithm that stores all the available cases, classifies the new data based on a similarity measure and determines the closest classes. In our model, KNN is also used to predict the values of the data points based on the similarity measures[22]. After the performance on the Test Dataset has been evaluated with K-Nearest Neighbors Classifier in our model, we got the following statistics- Classification Accuracy:0.88, Classification Loss: 0.11, Precision:1.0, AUC Score:0.66 and ROC Area Score:0.88. We generated a confusion matrix for illustrating the prediction result using K-Nearest Neighbors on the test set which is shown in Fig. 3. In the figure, we can see that the “True Positive” consists of 2 data points, which tells us that only 2 individuals out of 6 depressed individuals were correctly classified as “Depressed” by the KNN Classifier. There are no “False Positive” outcomes of our model but the “False Negative” region consists of 4 data points, which tells us that 4 individuals out of 6 depressed individuals were wrongly classified as “Not Depressed”. This shows that KNN Classifier is not very much efficient in this task in comparison to the Logistic Regression.

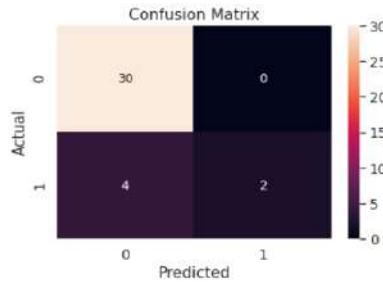


Figure 3. K-Nearest Neighbors Confusion Matrix with our Test Dataset

### 4.3 Random Forest

Random Forests are a kind of ensemble classifiers that use decision tree algorithms in a randomized fashion [23]. After the performance on the Test Dataset has been evaluated with Random Forest Classifier in our model, we got the following statistics-Classification Accuracy:0.97, Classification Loss: 0.02, Precision:1.0, AUC Score:0.91 and ROC Area Score:0.98. We generated a confusion matrix for illustrating the prediction result using Random Forest on the test set which is shown in Fig. 4. In the figure, we can see that the “True Positive” consists of 5 data points, which tells us that 5 individuals out of 6 depressed individuals were correctly classified as “Depressed” by the Random Forest. There are no “False Positive” outcomes of our model but the “False Negative” region consists of 1 data point, which tells us that 1 out of 6 depressed individuals were wrongly classified as “Not Depressed”. This shows that the Random Forest Classifier is less efficient than the Logistic Regression but more efficient than the KNN Classifier.

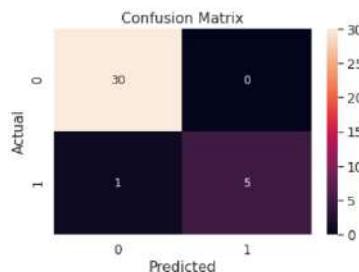


Figure 4. Random Forest Confusion Matrix with our Test Dataset

### 4.4 Decision Tree

A decision tree is a predictive model used in machine learning to solve classification problems. It is a supervised machine learning technique that splits the data continuously to build a tree-like structure based on a certain parameter or feature [24]. After the performance on the Test Dataset has been evaluated with the Decision Tree Classifier in

our model, we got the following statistics- Classification Accuracy:1.0, Classification Loss: 0.0, Precision:1.0, AUC Score:1.0 and ROC Area Score:1.00. We generated a confusion matrix for illustrating the prediction result using Decision Tree on the test set which is shown in Fig. 5. In the figure, we can see that the “True Positive” region where both the Actual and Predicted value is “1”, consists of 6 data points, which tells us that 6 individual which were actually detected as depressed has also been predicted as “Depressed” by the Decision Tree Classifier. There are no “False Positive” and “False Negative” outcomes of our model, which tells us that Decision Tree has efficiently predicted the correct output as likely as the Logistic Regression.

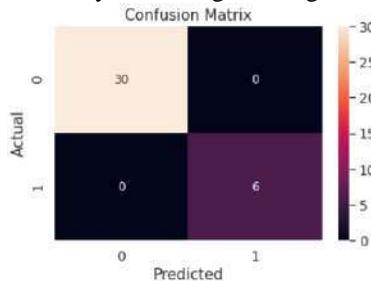


Figure 5. Decision Tree Confusion Matrix with our Test Dataset

#### 4.5 Bagging

There are two categories of Ensemble Machine Learning, that are, Bagging and Boosting. Bagging is also known as Bootstrap Aggregation. It is an ensemble method that returns an output with respect to the training dataset irrespective of the problem type, that is, “classification” or “regression”. After applying Bagging in the Test Set of our model, we got a Classification Accuracy of 1.0, Classification Loss of 0.0, Precision of 1.0, AUC Score of 1.0, and ROC Area Score of 1.00. We generated a confusion matrix for illustrating the prediction result using Bagging on the test set which is shown in Fig. 6. In the figure, we can see that the “True Positive” region where both the Actual and Predicted value is “1”, consists of 6 data points, which tells us that 6 individual which were actually detected as depressed has also been predicted as “Depressed” by the Decision Tree Classifier. There are no “False Positive” and “False Negative” outcomes of our model, which tells us that Bagging has efficiently predicted the correct output as likely as the Logistic Regression and Decision Tree.

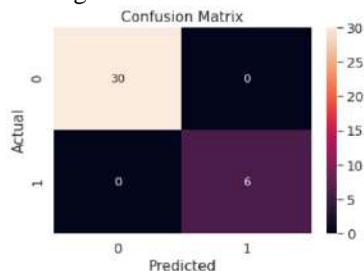


Figure 6. Bagging Confusion Matrix with our Test Dataset



## 5. Predicting with Deep Neural Network Classifiers

When many layers are added between input and output layers in an Artificial Neural Network (ANN), it becomes a Deep Neural Network (DNN) [30]. DNN is a feed-forward neural network because without using looping back, it processes data from the input layer to the output layer [25]. When an input is converted into output, the DNN has to find correct mathematical manipulation of the relationship between features [26]. In our work, we have trained Deep Neural Network with DNN Classifier on the test dataset which will go over the given dataset and calculate the probability of whether an employee belongs to a 'depressed' class or 'not depressed' class. Our model reviews the outcomes and the probabilities which are beyond a certain threshold, shown by the neural network and labels that are proposed by the model which are described in the following two subsections:

### 5.1 Training the Deep Neural Network

In order to train a neural network, we need to feed the network with appropriate input functions so that it can be properly evaluated and can predict accurate results. To create input functions we need to define the feature column which is a list of all the important features we want our model to use. We extracted a total of 6 important feature columns on the basis of a close correlation between feature columns as shown in the covariance matrix in Fig. 1. of Section 3.3. The feature columns which we have on the basis of their importance are "depressed\_dueto\_covid", "durin g\_covid\_issues", "em otion\_after\_p andemic\_negative", "problem\_in\_decision\_making", "Social\_Isolati on\_Due\_to\_C OVID" and "stress\_or\_not" as shown in Fig. 7. These features were fed into the neural network as the input feature columns. We separated the dataset into Train and Test with a ratio of 7:3 where 70% data will be used as train dataset and 30% data will be kept as test dataset. After the separation of the dataset, we fed the network with the shuffled train dataset as an input. Since the task of depression detection is a classification problem, we want to predict whether a person is depressed or not. After the model got prepared with two hidden layers and six nodes in each hidden layer, we trained the neural network for 1000 epochs with a batch size of 100.

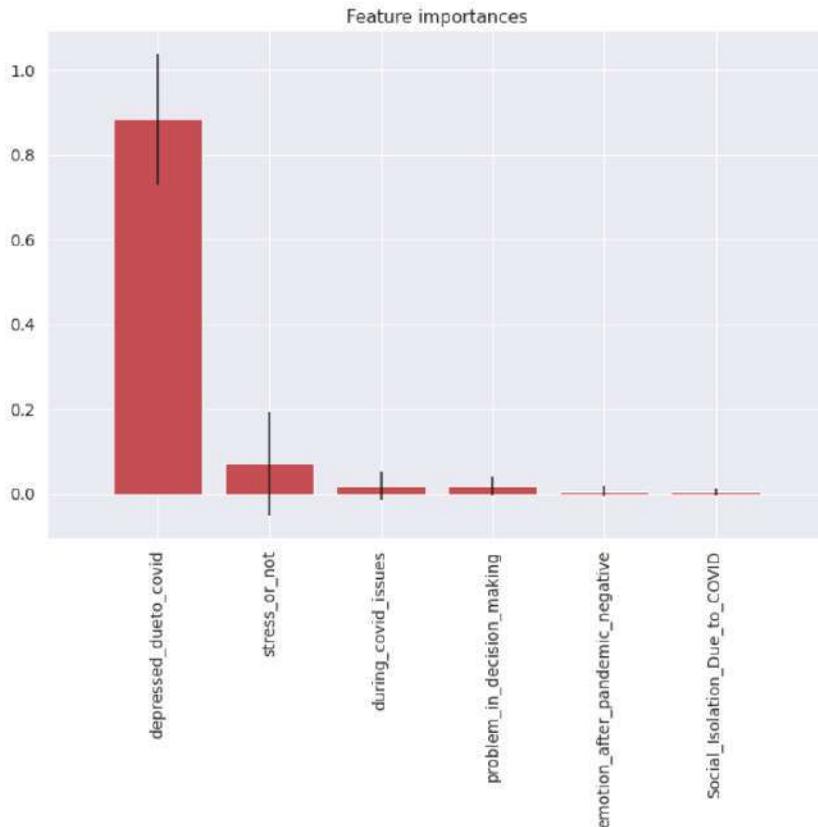


Figure 7. Feature Selection Based on The Covariance Matrix

## 5.2 Evaluation and Prediction with the Trained Deep Neural Network

After the model has been trained with a DNN Classifier by making use of the sklearn python library, we evaluated the model using metrics like- accuracy, AUC score, loss, precision, recall, and the like. The evaluation metrics like Accuracy, Precision and AUC Scores should be closer to “1” and the metrics like Loss should be closer to “0”. According to the predicted results of our trained neural network that is shown in Table 1, we achieved an accuracy of 0.972, loss of 0.135, precision of 1.0, and AUC Score of 0.975, which tells us that our trained deep neural network is highly efficient in predicting whether an individual is depressed or not. After training the model and getting good evaluation results, we used the trained model to predict whether an employee is depressed or not. To show the accuracy of the prediction, we created three columns namely- index, prediction and expected as depicted in Fig. 7. The index column will show the ID from the shuffled test dataset, the prediction column will show the predictions made by the model and the last column, that is the expected column will show the actual prediction.

**Table 1. Evaluation Metrics Chart of the Trained Deep Neural Network**

METRICS	SCORE
ACCURACY	0.972
BASELINE ACCURACY	0.833
AUC SCORE	0.975
AUC PRECISION RECALL	0.925
LOSS	0.135
PRECISION	1.0
RECALL	0.833
GLOBAL STEP	1000
LABEL/MEAN	0.166

In Fig. 8, we have shown an instance of the result predicted by the neural network along with the actual result, where the output representation “1” indicates that the individual has depression and the binary representation “0” indicates that the individual is not depressed. We can see that both the columns i.e “prediction” and “expected” are similar to each other and match well with each other, that tells us that our model is highly efficient in determining whether an individual is depressed or not.

index	prediction	expected
0	68	0
1	45	0
2	89	0
3	102	0
4	85	1

**Figure 8. An instance of the result predicted by the Neural Network showing the expected and predicted output**

## 6. Experimental Results

### 6.1 Evaluation Metrics Based Comparative Analysis Between All The Six Classifiers With The Test Dataset



We evaluated the performance of all the six classifiers used in our study with the test dataset and compared them on the basis of five metrics that are, Accuracy, Loss, Precision, AUC Score and ROC Area Score which is shown in Table 2. For an efficient predictive model, the Accuracy, AUC Score, Precision and ROC Area should be closer to one, and the Loss value should be closer to zero. From Table 2 it is clear that Bagging Classifier, Logistic Regression and Decision Tree gives the highest accuracy with and accuracy score of 1.0, DNN Classifier and Random Forest gives the accuracy of 0.97, while KNN gives the lowest accuracy with score 0.833, which tells us that if the dataset of the model for depression detection is trained with Bagging Classifier, Logistic Regression and Decision Tree then, it will give a very efficient result.

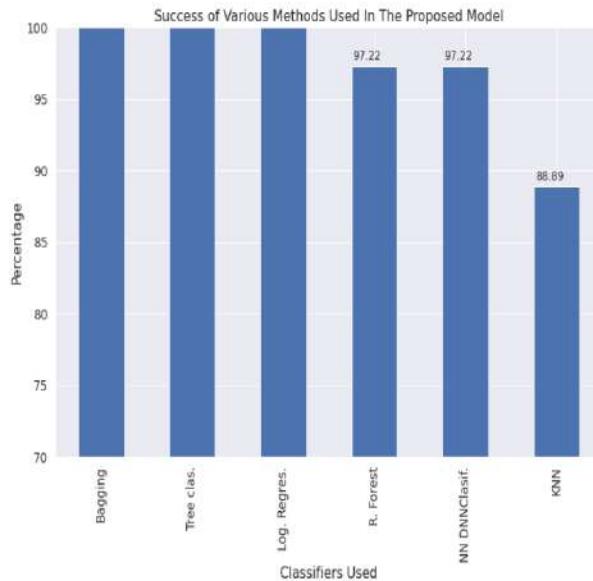
**Table 2. Evaluation Metrics Chart of all Six Classifiers with Test Dataset**

CLASSIFIERS	EVALUATION METRICS				
	ACCURACY	LOSS	PRECISION	AUC SCORE	ROC AREA
LOGISTIC REGRESSION	1.0	0.0	1.0	1.0	1.00
K NEAREST NEIGHBORS	0.88	0.11	1.0	0.66	0.88
RANDOM FOREST	0.97	0.02	1.0	0.91	0.98
DECISION TREE	1.0	0.0	1.0	1.0	1.00
BAGGING	1.0	0.0	1.0	1.0	1.00
DNN CLASSIFIER	0.97	0.13	1.0	0.97	0.98

### 6.2 Success Method Plot

We made a comparative analysis on the evaluation of five Machine Learning classifiers, that are, Logistic Regression, KNN, Decision Tree, Random Forest and Bagging, and one deep neural network classifier, that is, DNN Classifier, and plotted a comparison chart on the basis of their performance that is shown in Fig. 9. The success method plot tells us about the most successful and efficient classifiers among all the six classifiers used in our study of prediction depression among the IT Sector Employees in India. It shows that the Bagging Classifier is the most successful method for our model with an accuracy score of 100%, the second most efficient classifier is Decision Tree

with an accuracy score of **100%**, the third accurate classifier is Logistic Regression with an accuracy score of **100%**, while Random Forest is the fourth accurate method with **97.22%** accuracy score for our model. DNN Classifier and K Nearest Neighbors are the least successful classifiers for our model with an accuracy of **97.22%** and **83.33%** respectively.



**Figure 9. Success Method Plot Showing the Best out of all the Six Classifiers used**

### **6.3 Final Classifications with the Test Dataset using the Best Successful Classifier**

According to the success method plot and the evaluation metrics chart of all the six classifiers used in our study, which is shown in Fig. 9 and Table 2 respectively, the classifier Bagging turned out to be the most successful method for the task of classifying individuals into two categories- “depressed” and “not depressed”. The final classification result on the test dataset after applying the best classifier for our study is shown in Fig. 10. Since the collected dataset consists of 117 data samples and we splitted the dataset into train and test with a ratio of 7:3, we got a list of 36 predictions as the final test set. The final predicted classification result consists of two columns- “Index” and “Depression”, where the “Index” column shows the ID from the shuffled test dataset and the “Depression” column shows the predicted output as “0” or “1”, where “1” indicates that the individual is Depressed and “0” indicates that the individual is Not Depressed. According to the final prediction result on our test dataset 6 individuals are classified as “depressed” and 31 individuals are classified as “not depressed”.

Index	Depression	16	93	1	
0	10	0	17	74	0
1	59	0	18	61	0
2	95	0	19	73	0
3	91	0	20	16	0
4	7	0	21	108	1
5	86	1	22	13	0
6	26	0	23	43	0
7	112	0	24	105	0
8	22	0	25	33	0
9	94	0	26	30	0
10	101	0	27	56	0
11	2	1	28	48	0
12	50	0	29	8	0
13	24	0	30	97	0
14	116	0	31	66	0
15	62	0	32	109	0
			33	3	1
			34	63	0
			35	6	1

Figure 10. Final Classifications on the Test Dataset with the Best Successful Method

Total Number of Participants = 117					
Total Number of Frustrated and Depressed Participants = 9					
Total Number of Socially Isolated and Depressed Participants = 8					
Total Number of Indecisive and Depressed Participants = 11					
Total Number of Depressed Participants = 20 (17%)					
Domain		Coexisting Factors	Anger or Frustration	Social Isolation	Indecisiveness
		Employee Strength	Below 100000 : 8/9 (88.8%) Above 200000 : 1/9 (11.1%)	Below 100000 : 6/8 (75%) Above 200000 : 2/8 (25%)	Below 100000 : 7/11 (63.6%) Above 200000 : 4/11 (36.3%)
Depression	Gender	Female : 3/9 (33.3%) Male : 6/9 (66.6%) Prefer Not to Say : 0/9 (0%)	Female : 4/8 (50%) Male : 4/8 (50%) Prefer Not to Say : 0/8 (0%)	Female : 7/11 (63.6%) Male : 4/11 (36.3%) Prefer Not to Say : 0/11 (0%)	
	Work Background	Technical : 6/9 (66.6%) Non-Technical : 3/9 (33.3%)	Technical : 5/8 (62.5%) Non-Technical : 3/8 (37.5%)	Technical : 8/11 (72.7%) Non-Technical : 3/11 (27.2%)	
	Work Stress during COVID-19 Pandemic	Stress : 9/9 (100%) No Stress : 0/9 (0%)	Stress : 6/8 (75%) No Stress : 2/8 (25%)	Stress : 8/11 (72.7%) No Stress : 3/11 (27.2%)	

6.4: Identification of Some Coexisting Factors Responsible For The Development of Depression among the IT Sector Employees in India



After collecting the Data Sample and a Deep Study on each of the input features, we found some associativity between Depression and few Coexisting Factors that directly or indirectly affects the development of Depression among the employees. The Coexisting Factors which we have identified and with which we will correlate Depression are “Social Isolation”, “Anger or Frustration” and “Indecisiveness” in an individual. We have selected Social Isolation as a coexisting factor to relate with Depression because it is a situation which many of us have experienced in our lives at some point. According to Cacioppo et al., [27] and Nicholson [28] Social Isolation has been recognized as an important factor that affects the mental well-being of a human being especially the elderly people. According to a research by Busch [29], uncontrolled anger or rage, can accompany itself with depression and self-criticism. If an individual is a part of an organization especially in the IT sector where the employee has to deal with different types of people, deadlines, frustrations, et cetera on a daily basis, then it will not only affect the individual’s relationship with others but also their performance at the workplace and this is the reason why we chose anger or frustration as one of the coexisting factors. We chose Indecisiveness as one of the Coexisting Factors because it is very important for any IT Sector Employee working in a stressful environment in order to fight the competitive environment and be quick and efficient in decision making in various difficult situations. The aim of this section is to investigate the associativity of social isolation, Anger or Frustration and Indecisiveness with Depression, with respect to domains like Work Background, Employee Strength, Stress and Gender. We have shown a quantitative analysis of these relationships in table 3, which consists of all the necessary details like- Total Number of Participants in our survey, Total Number of Participants who are “depressed as well as Frustrated or Angry”, Total Number of Participants who are “Socially Isolated and Depressed as well”, Number of Participants who are “Indecisive and Depressed” both.

**Table 3. Associativity Between Depression and some Coexisting Factors**

According to table 4, we can state that “the risk of Depression accompanied by Indecisiveness is higher in Females as compared to Males, is very low in individuals who are Not Stressed due to the pandemic, is higher in employees with Technical Background as compared to the employees with Non-Technical Background, and higher when there are less number of co-workers”, “the risk of Depression accompanied by Social Isolation is very high in individuals who are Stressed due to the pandemic, is higher in employees with Technical Background as compared to the employees with Non-Technical Background, and higher when there are less number of co-workers”, and “the risk of Depression accompanied by Anger or Frustration is higher in Males as compared to Females, is not going to occur at all with individuals who are Not Stressed due to the pandemic, is higher in employees with Technical Background as compared to the employees with Non-Technical Background, and higher when there are less number of co-workers”.

**7. Conclusion and Future Scope**

Depression can challenge the vitality of all people in the active workforce of an organisation both physically and mentally. It is also a very alarming situation for the IT



Sector Workers in COVID-19 Pandemic phase. The task of predicting depression is still mostly done by a GDS scale. An automated depression prediction model can make the identification of the affected individual on early onset and can save precious time to help the treatment procedure. In this paper, we have developed a generalised methodology that could help in early detection of the onset of depression in the employees of the IT Sector in India as well as in the individuals of all kinds of professions using five supervised machine learning classifiers and one deep neural network classifier. Our study shows that Bagging, Logistic Regression and Decision Tree got the highest accuracy with a score of 1.0, DNN Classifier and Random Forest gave the accuracy of 0.97, while KNN gave the lowest accuracy with 0.833. Hence, the classification model for depression detection trained with Bagging, Logistic Regression and Decision Tree is expected to be the most efficient. We have also done a Quantitative Analysis on the associativity between Depression and various Coexisting Factors, according to which we can state that “the risk of Depression accompanied by Indecisiveness is higher in Females, in Employees with Technical Background, in individuals who are Stressed and when there are less number of co-workers”, “the risk of Depression due to Social Isolation is higher in employees with Technical Background, in individuals who are Stressed and when there are less number of co-workers” and “the risk of Depression accompanied by Anger or Frustration is higher in Males, in Employees with Technical Background, when there are less number of co-workers and Not Going to Occur in individuals who are Not-Stressed”.

Many different types of surveys can be conducted to collect the dataset on a large scale for a particular region or organization which will generalize the model in an efficient manner. Many deep learning methods like XLNET [31] or BERT [32] which are the pre-trained models of deep learning can be used for further modifications. Our methodology can be standardised and applied to other strenuous professions too, in any kind of situation, not just restricted to the current pandemic.

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## BYOD A MANTRA FOR HIGHER EDUCATIONAL INSTITUTIONS

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### **Abstract:**

India traditionally and historically was the center of education for the scholars from the worldwide as there was Gurukul system in which education was open and accessible to all but later it was linked to Varna system based on occupation as Kshatriya to learn warfare, Brahmins to learn scripture, Vaishyas commerce and so on others. The Nalanda and the Takshila, Vallabhi and Vikramshila were important centers of higher learning. The focus of the education was Vedas, spiritual knowledge, metrics, grammar, phonetics, astronomy, logic and reasoning, history, arithmetic, military science, law, performing arts, art, architecture, dance, music, agriculture, medical science etc. With the advent of Islam the makhtabs and madrasas were also started. But it was the British rule that modern and western education system was introduced in India with the establishment of some Colleges and Universities superseding the traditional system of values based education. Now almost the same system is continuing with some reforms but with growing population and changing technology digital divide has become a new problem for the youngsters. To tackle this problem BYOD initiative can be a remedy for the problem to ensure equity and access. The current study aims to redress the issue of digital divide in the higher education system. The objectives are to know the digital divide problem and finding out the ways out. The study is based on the NSS data and Google class room an online and digital initiative for the E-teaching and learning. Taking the total enrolment offline and online enrolment data for five colleges of UT of J and K representing from both rural and urban areas. The methodology is NSS data and survey forms for feedback from the colleges collected by Higher Education Department, J and K. The paper is divided into four sections with introduction, current status, data trends and analysis and finally conclusions and findings.

**Key words:** Higher Education, Google Class Enrolment, Digital Divide, Bring Your Own Device (BYOD), NAAC.

### **Introduction:**

The Higher Education in India is regulated by UGC, AICTE and other Councils as Medical Council of India, Bar Council of India etc under Ministry of HRD (Human Resources Development). The UGC has overriding powers. Two accreditation institutions are National Accreditation Board (NAB) set up by AICTE and National Assessment and Accreditation Council (NAAC) set up by UGC.

HEIs under UGC have to work under seven NAAC criterion as curriculum reforms, teaching learning, research and extension, infra support, student support services,



governance and leadership ,institutional values and best practices .For ensuring NAAC ,the HEIs need to have IQAC(Internal Quality Assurance Cell) at the institution level to ensure that the quality parameters are improved,enhaced and implemented. Theconvener of IQAC with members and the Head of the institution with all faculties have to ensure that all seven criterions are working as per quality standards. However among all criterions, teaching learning criterion carries huge weightage and needs more focus. The current teaching learning process is a blend of offline and online strategy and Covid-19 threat has globally shifted the strategy more towards the online and digital modes .But can it be possible if the learners don't have the access to the smart devices and thus the problem of digital divide.

**Current Status:**

Since independence in 1947 till present we have almost 40000 HEIs(Higher Education Institutions) catering to sciences, arts, fine arts, engineering, computer science, management etc. comprising of 799 Universities and 39071 Colleges including IITs,IIMs ,NITs etc. Of the 40000 HEIs only 8504 ( that is 363 Universities and 8141 Colleges) are NAAC accredited as of date as per NAAC website.

There is a huge gap between the facility provisioned and what the learners demand. For instance it is difficult to provide to library facility at a time to 400 plus students in all HEIs, same is the case with class room facility, laboratory and other facilities.

Internet accessibility and access to the learning device is the serious concern because all learners cannot afford the same .Attentionneeds here because this facility can help the learners 24/7 and engage the teacher and taught at any time anywhere.

Data Trends and Analysis: As per NSS data for 2017-18 , clearly indicates digital divide, as only 24% of households (HHs) in India have internet connections and going further only 15% HHs in rural area and 42% in urban areas have connections. Further only 8% HHs between ages 5 to 24yrs have computer with internet connection, just 24% HHs own smart devices and 11% own computer. Also electricity cuts further add to the problem. Taking the figures of offline and online classes enrolment data for 5 colleges of UT of J and K as a sample, digital divide can be observed .

Table: Enrolment Figures for 5 HEIs in UT of J and K (May 2020, HeD Data)

Name of the College	Enrolment Offline	Online Enrolment	Difference
GDC Ananantnag	5563	3200	2300
GDC Budgam	2623	600	2023
GDC Kupwara	4400	1274	3126
GDC Bhaderwah	1645	1150	495
GDC Dodo	1306	946	360
GDC Gandhi Nagar Jammu	5800	4300	1500



The data trends from the rural colleges show huge variations as compared to the city colleges as GDC Gandhi Nagar. It reflects that smart devices are not available with the learners in rural area due to poor socio-economic background, even though network problem cannot be ignored in some tough and hilly terrains. If one goes further deep it seems that of the online enrolled students in rural areas just 5-10% are active as just in a feedback collected for the GDC Bhaderwah for response to open the college, just 140 students responded of 1645, less than 1% in three days 5<sup>th</sup> to 7<sup>th</sup> June 2020, that is further a serious concern which may reflect that some students have managed to just register with from some borrowed devices or their may be single device in the family or no device at all. And even if the device is their then net packs may be some time not affordable for day bread earners. The above data is just an estimate to get idea of the real problem. This is how the equity and access cannot be ensure what RUSA aims without giving a serious thought.

### **Conclusion and Findings and suggestions:**

For teaching – learning the HEIs require adequate staff, adequate infrastructure, well equipped library, a developed ICT infrastructure, support staff etc. This needs a huge budgetary provision and doing all this takes a longer time. Till that learners can not wait. So simple mantra in future in tell the learners to BYOD (Bring Your Own Device). This will not only improve the teaching-learning practices but also improve NAAC grading of the HEIs. If not at one go but yes stepwise, this strategy has to be adopted sections of populations whose socio-economic status is not very good.

The devices issued to the students can be on loan basis for three years or the completion of his graduation, whatever the earlier and 2 or 3 years at post graduation level depending upon the duration of course. After the course is complete, the learning devices need to deposit with the libraries so that same can be issued to the freshers in next session and the process shall go likely.

Minimum budget for the device may start from Rs10000 per tab from a reputed brand per learner and for 500 learners entering in first year budget shall be Rs500000 per HEI and shall increase accordingly given the quality of the tabs and the number of the learners if rises.

Taking the case of the UT of J and K, Ladakh and other states college fraternity is using online resources and apps as Google class room, edmodo, Zoom etc to engage the students but the problem is specific to the learners who do not have access to smart phones and the such categories of students need to be taken care of.

Now the question is of security, misuse, eco friendly and cost effective devices etc, these issues can be resolved the proper records and ip addresses of the tablets and learners to whom tablets shall be issued from the library/other departments at the institutional level.



Technological intervention is required to bring eco friendly and cost effective smart devices.

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## PERCEPTION OF INVESTORS TOWARDS INVESTMENT BEHAVIOUR ON VARIOUS INVESTMENT AVENUES WITH REFERENCE TO VIJAYAWADA CITY

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### Abstract:

Equity markets are the meeting point for buyers and sellers of stocks. The securities traded in the equity market can be either be public stocks, which are those listed on the stock exchange, or privately traded stocks. The stock exchange is a mediator that allows buying/selling of shares. In India, the two primary stock exchanges are the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). ... Secondary markets allow investors to buy and sell shares issued during the initial public offering (IPO). The concept behind how the stock market works is simple. Think of an auction house where buyers and sellers negotiate prices and make trades. Now, substitute the auction house and items with equity market and shares. Companies list their shares on an exchange. Investors can buy shares in the primary market i.e. IPOs, and secondary market. The stock market is regulated by a financial watchdog. The equity market is maintained by stock exchanges, and various stakeholders like brokers, dealers, clearing corporations etc. It is an extended family of institutions and this is the true equity market meaning. Total sampling was obtained 300 from various parts and on geographic basis. Sampling was done on basis of stratified random sampling. The study only limited to Vijayawada city the outcomes and findings may differ from other parts of the nation due to various factors influencing.

### A. Introduction:

Customer satisfaction is related to the human activity directed at satisfying human wants through the exchange of goods and service. Satisfying the customers occupies a most important position in business management. Customer satisfaction plays a crucial and critical role as it deals with customers and their needs. The major task of organization is to satisfy customers by meeting their needs and wants. The essence of organization is the customer and not the product shall be the heart of the entire business system. It emphasizes on customer oriented business. Policies and programs, which are formulated to serve efficiently the customer demand. "Satisfaction of a customer is so basic that it cannot be considered as a separate function. It is the way whole business seen from the point of view of its final results i.e., from the customer's point of view". A consumer is the king and has the right to choose from a large variety of offering. He is the main person around which all business evolves. Today market is a more customer oriented in the sense all the business operations revolve around satisfying the customer by meeting their needs through effective service. Thus, business is often dynamic, challenging and



rewarding. It can also be frustrating and even disappointing but never dull. The topic “Customer satisfaction after Sales & Service” is chosen to study the service provided by Smp Bajaj who are the dealers of Bajaj Motors in the city of Vijayawada.

This project deals with how Smp Bajaj defines its consumer and uses its resources in the best way to attract and satisfy their needs and wants competitively and profitably. Here satisfying customers limited only till the service is provided after the sales, but they include all functions necessary to satisfy the customer such as financing, after sales services, etc.

### **B. Objectives:**

- To know the investors' objective of investing and Security Markets in and around Vijayawada District.
- To study Investment preferences of Customers and To evaluate the factors underlying consumer perception towards Securities Markets in and around Vijayawada District.
- To identify the gap between investor’s perceived benefits and actual benefits derived from Securities Markets in and around Vijayawada District.
- To study and suggest reasonable recommendations for enhancing the Securities Market in and around Vijayawada District.

### **C. Review of Literature:**

The researcher made an attempt to collect information from the prior researches and relevant studies conducted in the area of Securities Market and consumer behaviour so that the important variables for the study could be identified and analyzed. The review of literature has been presented in a summarized and precise manner and research gaps were identified. Singh Jagdeep (1988) have proposed a model of consumer complaining behaviour (CCB). It illustrated the variety of actions possible. Buyer may not complain to the seller but to formal third parties, bureau or a newspaper. They may engage in private CCB activities such as telling friends and relatives about the bad experiences and changing their own patronage behaviour. Kalwani et al. (1992) in their experimental study on consumer returns and promotion expectations investigated that in marketing, the study of the impact of Return expectations on consumer choice behaviour has begun to receive increasing attention in recent years. Hussels et al. (2005) has reviewed the efforts of researchers to explain consumer behaviour concerning the purchase or investment of Securities products for almost 50 years. The review of earlier studies concludes that bulk of the empirical studies undertaken finds a positive association between increase in savings behaviour, financial services industry and demand for Securities. Prof. Amita Fatterpekar (2007) in her article explained the three behavioural measures of loyalty as, customer’s recent purchase, frequency of customer’s purchases of different plan over a specified time interval and customer’s lifetime volume of purchases. Three attitudinal measures of loyalty measure are likelihood of continuing to do business, of repurchasing, willingness to recommend or serve as a reference. Arpita Khare., et.al., (2012) “Customer behaviour toward online insurance services in India”, in their research study examined the use of web-based



technologies as a service delivery medium has added new elements to service dissemination. Escalation in self-service technologies has provided customers with multiple choices for using services offered by an organization. The online service attributes of 'convenience' and 'ease of use' are being given priority by companies for designing web-based services. Kavita Mahajan, (2013) "Analysing Consumer Decision Making Process In Securities", in his research paper opined customer satisfaction is the perception of customers on the service whether that service has met their needs and expectations. The quality of service, personal demographic and psychological factors, perception of equity and fairness, price, product quality, situational factors, and attributions for service success or failure are the factors that influence the customer satisfaction. Zietz et al., (2003) has reviewed the efforts of researchers to explain consumer behaviour concerning the investment in Securities Market. The review of earlier studies concludes that bulk of the empirical studies undertaken finds a positive association between increase in savings behaviour, financial services industry and demand for Securities products.

#### **D. Research Methodology:**

Research has to proceed systematically in the already planned direction with the help of a number of steps in sequence. To make the research systematic the researcher has to adopt certain methods. The method adopted by the researcher for completing the project is called Research Methodology. A Research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. A Research is purely and simply the framework and plan for the study that guides the collection and analysis of data. It is a blue print that is followed in completing a study. Data refers to information or facts. It not only refers to numerical figures but also includes descriptive facts. The method of data collection includes two types of study, such as primary data and secondary data. It was collected directly from executives and customers. The information collected from executives through personal and direct interview to collect primary data, a detail and structured questionnaire was formed to suit the objectives of the study which contain definite and predetermined questions, containing information relating to sales and service and its products. The Primary data are collected with specific set of objective to assess the current status of any variable studied. Primary data is useful only for particular period. The questionnaire is filled by the respondents. A sample is a portion of the whole on which the study is based. Here a sample size of 300 respondents were chosen from different areas of Vijayawada District, There are basically two types of sampling methods are: 1. Probability sampling methods. 2. Non-Probability sampling methods. In this study area sampling method was adopted (Probability Sampling) the required number of customers were not selected according to area sampling procedure but the required number of sample (sample size) 300 were selected.

#### **E. Limitations:**

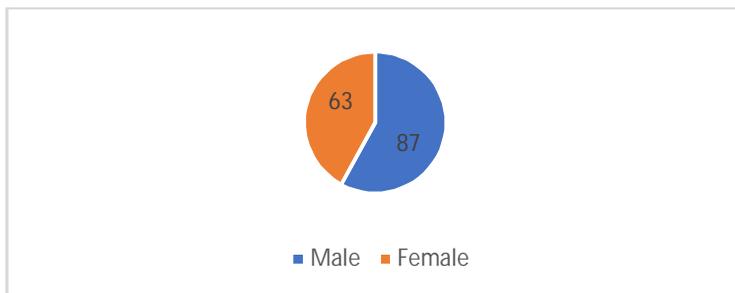
The limitations of the study may briefly be stated as follows:



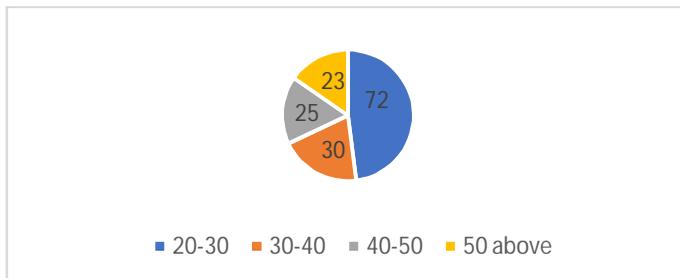
1. During the collection of information, it was found that executives were rather hesitant and ambivalent in providing the required information and sometimes they were reluctant to discuss.
2. The conclusions of the Research need not necessarily apply to other organizations of similar nature. While this does constitute a limitation of the study.
3. Keeping in view the vast recorded material available with the organization, the researcher took pains to arrange the data according to the different aspects of the present study.
4. Executives and Customers were hard pressed for time, The researcher had to persuade them for sparing time for responding to the Schedule and interviews. Establishing rapport with the respondents posed a problem initially.

**F. Data analysis:**

Gender

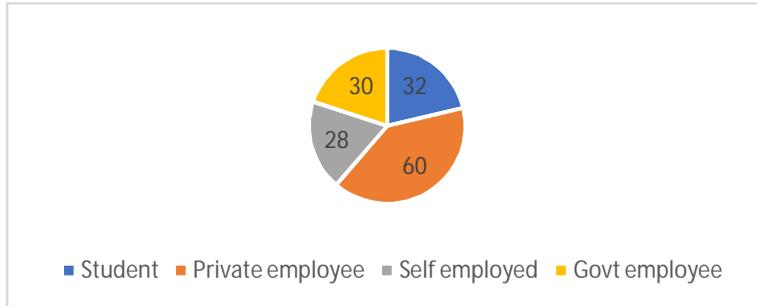


Age of the Respondents:

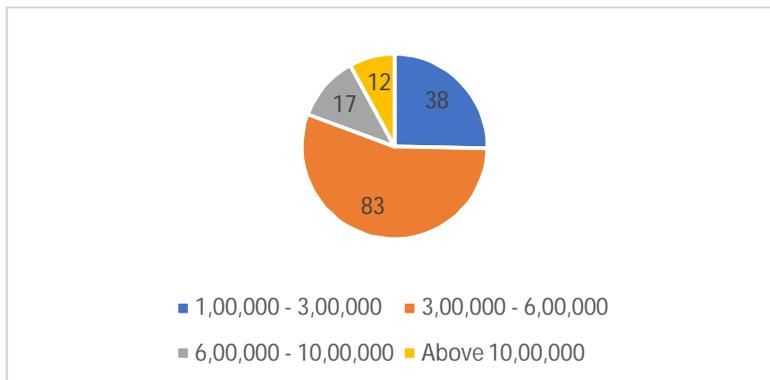




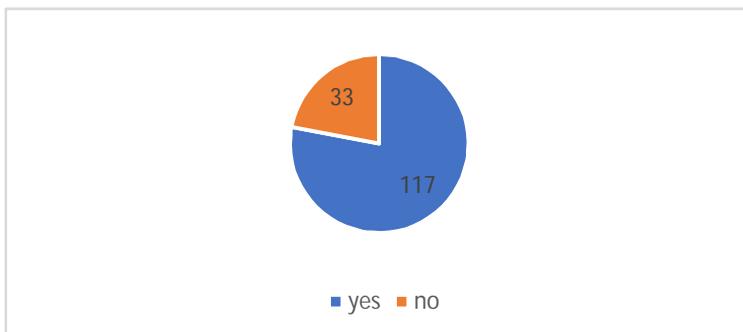
Occupation.



Income level:

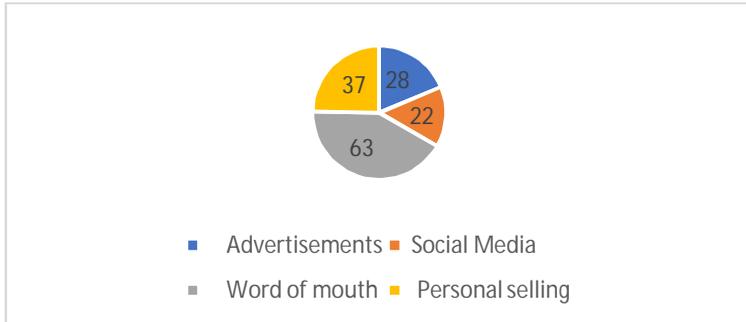


Have you ever invested in securities?

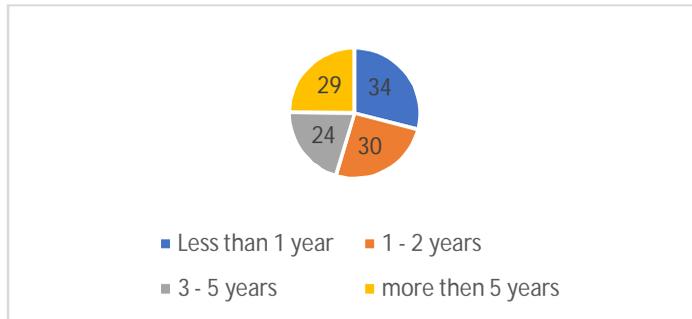




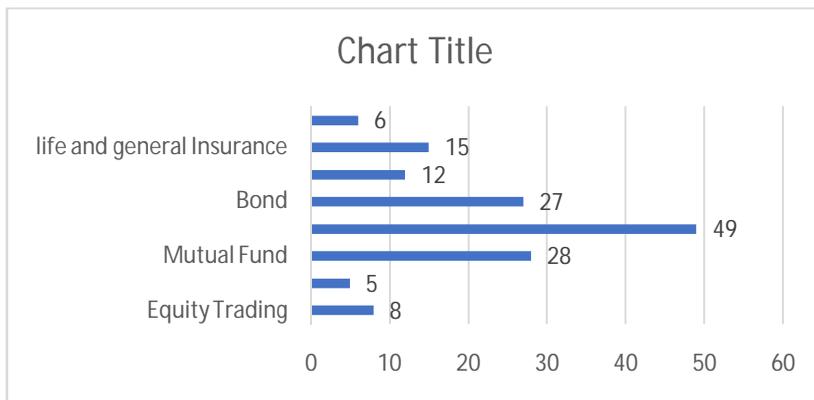
How did you know about securities Market?



How long have you been a customer of securities?

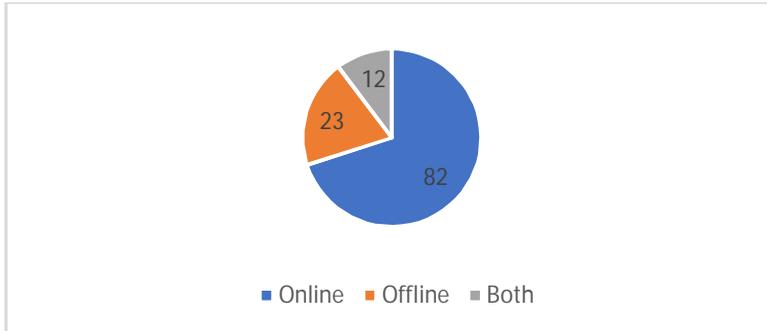


Among these products offered by securities Market, choose the product(s) you are aware of.

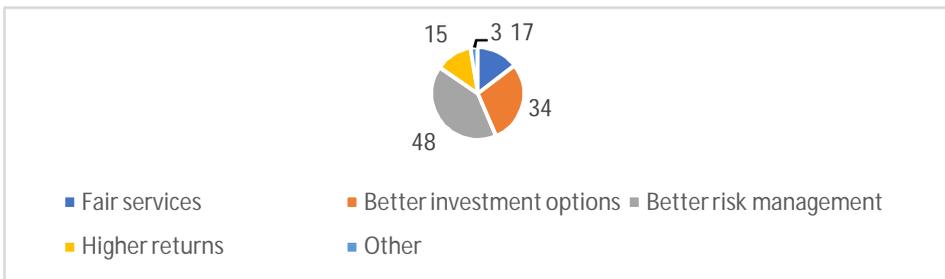




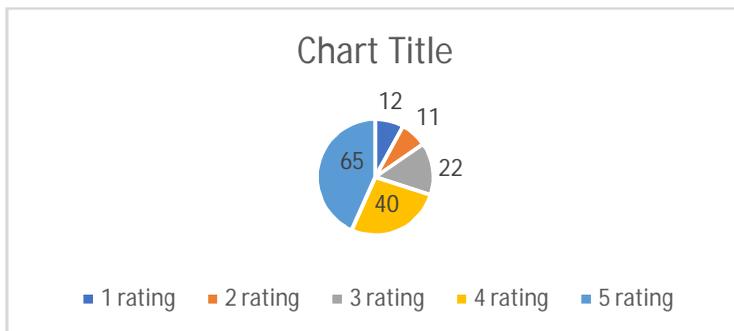
Which is your preferred purchase option of securities products?



Reason for choosing securities Products?



Overall satisfaction level or benefits sought from Securities Market





### G. Major Findings:

- Most of the people show more interest in investing in Securities product like Fixed Deposits and Mutual Funds has their can get fixed and periodical returns.
- Most of the people still do not have a clear picture about the Securities market and its investments.
- Students are showing more interest in investing in to stock broking which is a positive result for the future of Indian Economy in to a positive graph.
- But the investments are much lesser when compared to ones earnings and investment compared; people don't invest 30% of their earnings as they have diversified the occurrence of risk as many are dependent on salaries.
- Most of the people are satisfied by the services by the Securities provided by various banks in the market.
- Sometimes people are not aware about the stock and invest in them and incur loss because of lack of knowledge.

### H. Suggestions:

- Most of the people don't know about the all products provided by the Securities Market.
- Some people are saying that no beat return investments compare to the other companies so we should create some awareness about the management and how they are managing the funds and all to the people.
- People are much unaware of trading and its benefits of investing.
- If any sorts of awareness programs held for this as a campaign huge investments can be pumped in to our economy which basically leads to healthy growth of to our economy.
- Due to lack of knowledge people are investing in few which doesn't give them good results or yield comparative to stock market.
- People are not showing much interest in other trading equity type of funds.

### I. Conclusion:

Securities Market is a technology-based firm offering a wide range of financial services including investment banking, institutional broking, retail broking, private wealth management, and financial product distribution. According to the present scenario needs and priorities will change and evolve as well. Keeping this in mind, they bring to you select services, which are geared up to help people to secure their financial future and maximize their wealth, by adopting a scientific approach and providing customized offerings in most of our services. The services help them to plan and achieve future goals, plan to maintain desired lifestyle post-retirement, prepare themselves for any contingencies, build an equity portfolio with expert advice, take steps to maximize returns from their portfolio based on an in-depth analysis report and draft a Will to transfer their estate smoothly to the desired beneficiaries post their lifetime.



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## COMPARATIVE STUDY OF CONVENTIONAL DRYING AND UV PRINTING IN NEWSPAPER INDUSTRIES

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### ABSTRACT:

Ink drying while printing in newspaper industry is one of the crucial task to be made effectively to increase production speed, maintaining print quality, minimize wastage and on-time delivery of newspaper to readers. So it became evitable to make suitable choice of ink drying systems for the attainment of required print quality. Technically, a dryer can increase the gamut of colors, but it is a challenge to upgrade an existing machine with a dryer. Dryer Technology is a main feature while printing on numerous substrates like SNP, GNP, LWC and Art paper, matt coated paper, metalized paper, films, foils. The objective of present study to highlight the pros and cons of UV Printing over Conventional Offset ink drying systems.

**Keywords:** UV Printing, Heat set offset printing, Cold set offset printing, Newspaper industry, Ink drying.

### INTRODUCTION

Various types of drying systems are available now a days for newspaper industry in order to offer numerous pros and cons. Different drying system includes Cold Set Offset, Heat Set Offset and UV Printing.

The Cold set offset printing of is a method through which the ink gradually dries through evaporation and paper absorption. Cold set printing like newsprint is most frequently used on uncoated paper stocks. Because the ink isn't laid right away, there's always a little residue left on the paper. Cold set is one of the most cost-effective types of printing that enables various webs to run simultaneously, using less costly uncoated paper.

Heat set offset printing is the method of drying ink by running the printed paper through an oven (hot air circulation system) immediately after the printing units applies ink. The oil-based solvents in the drying zone achieve a "flash point" or evaporation point as the printed web moves through it. Waxes, resins and pigments remains there. Then this printed web moves through chilling rollers where waxes and resins are either cooled down/solidified or laid. This printing method results in a more upscale printed product being cleaner. Coated (glossy) paper like the paper used in journals and catalogs must always go through a method of heat set because it does not absorb ink.



UV Printing is a type of printing process that utilizes ultra-violet lights to dry or cure ink which is the most popular method of printing on vast variety of substrate using UV light. It is the fastest growing in the field of digital and offset printing. UV Printing is the hot trend in the newspaper sector also replacing the need of conventional methods. The main difference between UV and conventional method is the drying process. In UV process, the ink is cured by using photomechanical process while in conventional it is done by absorption and evaporation. UV printing provides a clean and safe environment due to no emission of harmful solvents. The process is same as conventional with difference of drying technology, Ink and rollers to get superior quality products. After applying ink on a substrate surface, specially constructed UV lights follow closely behind, immediately curing or drying the ink.

UV technology quickly accepted by the industrial and commercial marketplace to achieve premium quality. Because the UV lights instantly cure any printed ink, the moist ink dots are unable to spread once printed, leading in much finer details. Additionally, weather-resistant UV cured inks give that enhanced fading resistance. This method of curing is more environmentally friendly because it generates almost no VOCs, odors and heat.

**UV System Components:** Every UV System comprises of numerous components which are enlisted as below:-

1. Lamp head with interchangeable cassette
2. Lamp Control
3. Touch Screen HMI
4. Fan
5. Flexible ducting
6. Rigid ducting

#### **UV Unit**

**UV Lamps:** UV lamp comprises of a mercury-containing closed quartz tube. Technically, UV radiation is produced by electrical mercury stimulation in the quartz tube, whereby the gas filling determines the spectral light distribution of a UV lamp. Normally a mercury vapor lamp also emits visible light and IR radiation.

**Reflector:** Reflector is the second significant element of a UV-unit. In all directions, the UV lamp emits radiation. To make use of the radiation generated in the lamp housing, special reflectors are implemented. A nice and effective reflector allows about 55 percent of the radiation reaching the substrate to consist of reflected radiation.

**Comparative study between UV Printing and Conventional Offset printing drying system**  
**Conventional offset printing inks:** Solvent inks are used in conventional process. Solvent inks are not the choice of today's era because they evaporate into the atmosphere and release VOCs. Some spray powder is required to cure inks completely. Colours become fade and less bright because of the absorption of solvent into the paper. Drying can add days to each work depending on the personality and weight of the

documents. Conventional process is suitable for printing on materials such as plastic, foil or acrylic.

In UV printing photomechanical method is used for ink curing. As they are printed, the inks are exposed to ultraviolet lights, turning immediately from a liquid to a solid with almost no solvent evaporation and no ink absorption into the substrate. So when using UV inks facilitates to print on wide varieties of substrates.

Perspectives	Heat set Dryer	UV – Dryer technology
<b>Technical Aspects</b>	<ul style="list-style-type: none"> <li>● Hot-air drying System</li> </ul>	UV technique: - <ul style="list-style-type: none"> <li>● Air curing with UV-radiation only</li> <li>● Inert curing, UV-radiation in a nitrogen environment</li> </ul>
<b>General Aspects</b>	<ul style="list-style-type: none"> <li>● High investment cost</li> <li>● Deals with wet ink</li> <li>● Large space required</li> </ul>	<ul style="list-style-type: none"> <li>● Lower Investment</li> <li>● Implement on existing machine</li> <li>● Specific Ink and solvents are required</li> <li>● Expensive ink costs, delivered by limited number of suppliers, but high densities and longer mileage (because of less solvent) per kg</li> </ul>
<b>Best Practice :</b> Might be best for	<ul style="list-style-type: none"> <li>● High-volume printing</li> <li>● Long working hours</li> <li>● Continuous use of dryer</li> <li>● few number of editions</li> </ul>	<ul style="list-style-type: none"> <li>● Average amount of printing</li> <li>● Normal working hours</li> <li>● Number of editions</li> </ul>

Table 1:Heat set-Dryer vs. UV-Curing

### UV Rollers

UV printing is done with the help of special rollers. Generally EPDM or combi rollers are used for UV printing. Rollers must be cleaned before printing. Roller temperature should be less than 30 Degree. Roller pressure setting should be kept soft because extra pressure will result in uneven distribution of ink and put extra pressure on shaft also. All the instructions should be followed carefully before printing.

### UV Safety and Handling

In order to handle UV System safely and effectively, various precautions need to be followed for avoiding any hazards.

Do's	Don'ts
These are : - 1. Wash skin with soap 2. Wear gloves 3. Keep UV filter safety glasses 4. Change clothes if contaminated 5. Leave work shoes at shop 6. Clean lamps, reflectors and shields weekly 7. Always use clean knives, sponges and rags	These are : - 1. Wash skin with press wash 2. Use bare hands to clean up UV ink and coating 3. Look at UV light without protection 4. Wear clothes and shoes contaminate with UV ink or coating home

Table 2: Do's and Don'ts while using UV Systems

### Precautions while Storage

During storage various precautions to be followed are enlisted as below: -

1. All UV curable products must be stored under safe condition to avoid excessive heat and direct sunlight.
2. All UV material should be kept closed.
3. 20 Degree – 24 Degree Centigrade is the recommended temperature for UV Products.
4. All UV inks should be labelled clearly.
5. Never mix UV ink with conventional inks and solvents.

### Role of UV Printing in Newspaper Sector

UV printing is known for offering many advantages in terms of print quality in newspaper sector due to the numerous reasons: -

- Ease of integration with existing system
- Low operational and maintenance cost
- Evenly curing of ink on numerous substrates
- Various choices of substrate
- Value addition to existing print quality
- Improved rub resistance resulting enhanced print quality
- Eliminating setoff
- Immediate and fast drying
- Offers ecofriendly benefits by proving VOC free system
- Elimination of Chilling system

### Result and Discussion

This study emphasized on comparative study of conventional drying and UV printing in newspaper industries. By using UV technology, the products can be printed to high-quality appearance, and can also avoid the use of costly infrastructure to



produce quality newspapers. This gives an option to the customer to go for variety of substrates and follow environmental regulations also. During the study it was observed that in heat set system, dryer takes 15 feet space but in UV system it takes 3 feet space. UV ink cures instantly evenly at high speed without any changes in substrate appearance and it is 80% more compact than Heat set oven. UV printing can be done on traditional coldest press by adding UV curing unit at the end of printing tower which in turn eliminates the need of chill stand, afterburners and silicone applicators. UV cold set has Low maintenance and operational cost as compares to heat set. UV cold set improve rub and mark resistance and no set off while using this system. All units of 4-Hi can print numerous paper substrates which include GNP, LWC, Art paper, but on the other hand Heat set which gives only one web per machine.

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## MAGIC TOUCH ‘NANO SKIN’ IN HEALING BURNS AND WOUNDS: A REVOLUTION IN THERAPEUTICS

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### Abstract:

The revolution of Nanotechnology in the various fields of science and technology is taking a huge heap of success and setting up milestones to much incredible advancement, more so in India, and elsewhere. The NANOSKIN is emerging as ‘The Ultimate Wound Management Device’ which is product of long years of research of Bio-Nano-Technology. The NANOSKIN is a fiber scaffold of nanoparticles, with enhanced physical and chemical properties to accelerate the healing of wounds and burns. The time to heal such would ranges from 10 to 20 times / days. The NANOSKIN is highly hydrated film made up of ribbon shaped random bundles of Nano fibrils of size less than 100 nm. It works in systematic way by isolating the nerve terminals, promoting new tissue growth, orientation and preventing infections. It is 100% natural, biocompatible method and provides perfect occlusions to the wounded area. NANOSKIN dressing is believed to reduce the cost and time of healing the burns and chronic wounds and is mainly used in: Drug delivery, Ophthalmologic prosthesis, and Stent covering and osteoporosis treatment. It is expected to be a new biodegradable binanopolymer. NANOSKIN technology is benchmark revolution in skin therapeutics and advancing more and reaching wide number of population in world. This paper highlights the framework, model and usability of NANO Skin and how even developing country like India, can be benefited in Health care sector. This technology has huge health care service opportunity and can generate huge employment for Biotech engineers in developing the drug, per se.

**Keywords:** Nanoskin, Nano fibrils, Occlusions, Binanopolymer.

**Abbreviations:** ECR (Extra Cellular Matrix), TGF –  $\beta$  - Transforming Growth Factor Beta, BC- Bionanocomposites, SEM- Scanning electron microscopy, TEM- Transmission electron microscopy.

### Introduction

The new advancements in the field of Nanobiotechnology and growing number of discoveries of new natural polymers have paved a major path in the field of prosthetic medications. The advancements in designing these new nanobiocellulase based materials have led to the novel concrete elevation in novel medical sciences and devices. Natural polymers like bacterial cellulose are preferred in medical, odontology application and tissue engineering and grafting (Maitz, 2015). The treatment of chronic wounds is of utmost priority and also a typical challenge that has to be faced by the cosmetologists. The reason is, it takes a lot of time and careful observation of wounds and burns without leading it to further complications and avoid it to be infection prone



as the epidermal layer of skin and underlying tissues will be exposed and damaged exposing the nerves sometimes based on the extent of damage ("Chronic Wounds", 2019).

The treatment of such chronic cases needs advanced therapy techniques and immense knowledge on physiology of wounds and the physio – biological pathways the tissues undertake to heal and the effect of drugs on them. The rate of healing of wounded cells is believed to be dependent on the factor called ECR (Extra Cellular Matrix) more prominently in static case. Hence, designing a natural ECR is very advantageous over synthetic ECR as the natural ECR consists of all natural constituents a new tissue requires to regenerate it. The productive recurring of new cells can be performed such natural ECR and using the regenerative aspects using stem cell targeting techniques. This helps in tissue hybridization and differentiation in a short period of time (Huber & Kaigala, 2018).

The time required by the tissues to regenerate is a main key factor and scientists are successful in reducing it to up to 10 times less than the original time required by the tissues to get healed. This is done by the help of this ECR bio – scaffoldings which is believed to have lot of cell signals that accounts for cell adhesion, and other molecular processes like cellular components migration and cell proliferation. The new regenerative medicine techniques involve mainly the use of Nanoskin®, derived mainly from bacterial cellulose derivatives which have the property of self-agglomerating the cellulose scaffoldings on the given base medium. These cellulose scaffoldings and bunch of fibrils produced mimics the natural condition of protein called Collagen which is the main component of tissue matrix holding all cells rigidly in position and protecting it from mechanical shocks and stresses. This artificially synthesized ECM cellulose scaffoldings not only re- establish the lost and damaged part of the tissue, but also initiates the body to produce more of collagen by initiating the biochemical pathway for the production of collagen for binding the newly forming cells and regenerate a new tissue. This in turn generates the closure mechanism which will be initiated by the factor called TGF –  $\beta$  which stands for Transforming Growth Factor Beta which is a precursor for the production of fibroblasts in the tissues. Due to the increased production of newly formed fibroblast fibers the coronation and fabrication of new epithelial cells will get a head start along with the formulation of growth factors and various precursors for the initiation of production of glycosaminoglycans. These factors directly will be responsible for the increase of volume of dermis tissues of skin and speeding up the process of healing due to the activation factor Keratinocyte.

The Nanoskin® is the newly emerged technology, more predominantly known as 'The Ultimate Wound Management Device' which is mainly a cluster scaffold of nanoparticles, with enhanced physical and chemical properties to enhance the rate of healing of chronic burns and reduce the time required for our body to produce new set of tissues by providing required supplements and co-factors. Usually the time taken for a burn to heal will vary from 2 weeks to several months based on the intensity of the tissue damage. While, the time taken by the Nanoskin® will be just 15 to 45 days on an



approximately based on the extent of wound. The Nanoskin® composes of thin fiber like structures that are piled up to form bundles in a random fashion usually of the ribbon shape. They are highly hydrated sheath media that is nearly less than 100 nm in size (El-Hoseny, et al., 2015).

The way it performs its actions are very systematic and step –wise:

- First, the exposed and damaged nerve terminals are isolated by forming a sheath of film, mainly to stop the blood flow and to avoid contamination to the nerve cells and to the blood stream.
- Second, it promotes new tissue growth and proliferation as the method discussed above.
- Finally, it promotes the proper orientation of the newly formed cells and tissues and preventing the infection due to exposure.

This product The Nanoskin® is preferred more and gaining its own socio-economic importance and position in the field and market of, medicine and regenerative medicine, is mainly due to the several outstanding advantages it has over other products in the market. Some of the most important advantages are:

- It is 100% natural, as it is completely made up of materials derived from natural source.
- It is widely biocompatible with our skin and also with the environment and does not cause any kind of pollution or hazard to the environment.
- It provides perfect barricade and flexible occlusions in and around the wound.
- This product is believed to reduce the cost of treatment.
- It comparatively takes less duration of time by speeding up the process of tissue repair.
- It is more efficient than the normal methods and it is more specific in regenerating the wounded tissue by drug delivery systems and targeted drug therapy.
- It is porous in nature and hence can hold more drug content in them.
- Persons with diabetics can also be helped to cure the burns and wounds fast.

They are mainly used in the field of Drug Delivery, Stent covering in treating Myocardial Infarction, Open heart surgeries, By-Pass surgeries, Osteoporosis treatment, Ophthalmological prosthesis, Cosmetic reconstruction, Tissue regeneration etc.

The Nanoskin® product is playing a very important field in the business and entrepreneurship, where even normal person is able to access it due to the less and reliable cost, no side effects and it solves almost about 80 % of the scars and marks caused by burns. It is already introduced in the market in many countries and especially in developing country like India its influence will be tremendous as the Health Care Sectors will be benefitted a lot by the new product in the market. The main business aspects and market strategies of the Nanoskin® are:

- It is all together a new invention and thus the product have lot of value in the market due to its outstanding performance.
  - High quality of product is assured as it uses nanoparticles and hence quality healing and recovery is expected.
-



- The Nanoskin® Pvt. Ltd is the only company that is producing this product and there are no competitors in the market to hinder their business.
- The cost of the product is affordable by a common man, because it just uses natural products that are required for its production.
- This sector will create a great revolution as this will increase the employment opportunities in India.
- The upcoming generation can opt their studies in this field of health sectors where new programs regarding this can be introduced in universities.
- Provides huge health care service opportunity as many medical processes that were complex are made very simple by the use of this product.

## Materials and Methods

### *Synthesis of Bacterial Cellulose:*

The production of Bacterial Cellulose by synthetic or artificial method is by the process of fermentation using glucose as the base source. In the normal reaction, the results obtained after the fermentation will be an acetic acid and a mass of Nano-sized bio cellulose. This process can be altered to get the product of our own desire by adding hyaluronic acid, chondroitin sulfate and beta-glucan before the inoculation of bacterium to the media in the ferment vessel. A bacterial strain called *Gluconacetobacter xylinus* produces the Bacterial Cellulose (BC) naturally in nature. This bacterium produces BC in its purest form of 3-D structure, in the fermenter when cultured in a medium. This form of three dimensional structures of BC produced is a network consisting of ultra-fine cellulose Nano fibers, which will have enormous mechanical tensile strength and complete biocompatibility and high cellulose crystallinity.

### *Bionanocomposites Characterization:*

The characterization of bio nanocomposites are very important as they will possess the features of nanoparticles and behave like them. The term characterization includes processes to analyze the physical properties like, size, structure, shape, surface topology etc. Detailed clear study should be made to analyze the physical and chemical aspects of bio nanocomposites to understand its working and to predict the results it would produce.

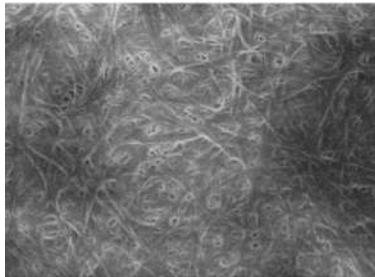
The characterization is carried out with the aid of electron microscopy techniques like SEM (Scanning Electron Microscope), TEM (Transmission Electron Microscope), and sometimes also with the help of methods and processes of Microfluidics. The BC sample produced should be coated with a conducting material for it to be used under SEM or TEM. The produced BC sample will be analyzed using these aids and pictures will be recorded and analysed (El-Hoseny, et al., 2015).

## Results and Discussion

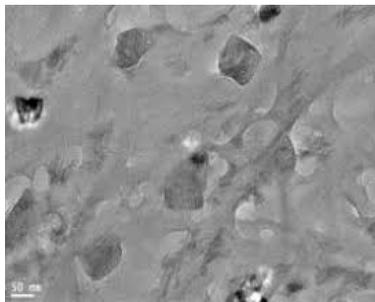
### *SEM And TEM Observations:*

The Nanaoskin® which is basically bacterial cellulose scaffoldings are characterized by SEM and TEM and its surface topology is analyzed.

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(a)



(b)

**Fig. 1.** The Nanaoskin® fibril scaffoldings as observed under A) SEM and B) TEM (Pyun&Kayumov, 2012).

### *The Nanoskin® In Medical Applications:*

As discussed due to increased efficiency The Nanaoskin® heals the chronic damage caused by wounds and burns in a shorter period of time decreasing the pain and is of a great advancement from business point of view. It creates a lot of advancement in the employment and critical increase in market strategy of medical science in India.



**Fig. 2.**Wound healing revolution by using The Nanaoskin® technology from the material bacterial cellulose (Basmaji, Olyveira, Costa, Francozo, & Oliveira, 2015).



A. Business Perspective:

- The main advantage of this new innovational product Nanaoskin® is that, it reduces the cost of the treatment and span of time.
- The initial investments to be made are also comparatively feasible.
- As the treatment time is reduced, the cost will be cut down tremendously.
- The processing and the maintenance cost is also very less as the formulation is simple yet effective.
- The target customers for this products are mainly:
  - Hospitals
  - Cosmetic surgery centers
  - Laboratories
  - Pharmacy
  - Army: Many soldiers who are wounded by fire and have restricted medical facility can use this.

Hence, this product is a definite revolutionary ideology to treat various degree burns faster, efficiently and with low cost as possible compared to other expensive methods like surgery etc.

### Conclusion

On a whole the revolution that is created by The Nanaoskin® in various fields of science and technology especially medicine is tremendous. It overcomes almost all the disadvantages of other methods of healing chronic wounds and burns and increases the rate of healing and formation of new tissues in short period of time with very less pain and minimal side effects.

It also creates many employment opportunities and helps in the development of socio-economic condition of our country as it has lot of scope and business opportunities.

### Future Scope

The Nanaoskin® technology will have a wide range of future scope. This technology using nano materials is much advanced and revolutionary as compared to conventional wound healing. Conventional wound-healing treatment is focused on dressing. Standard dressings are meant to provide cover for bite, bleeding capture, adsorption of fluids, moistening or / and drying, defense from infection and elimination of dead tissue. The Nanaoskin® is creating a wide variety of wound-healing items because of their special properties. The Nanaoskin® can alter every phase of wound healing because they possess antibacterial and anti-inflammatory properties, proangiogenic and proliferative. NMs are capable of correcting the degree of expression of certain essential proteins and signaling molecules to enhance wound healing. Thus, developing modern biocompatible and biodegradable nanomaterial technologies like Nanaoskin® that can reverse all steps of wound healing should be a potential priority for researchers working in this area(Kalashnikova, Das, & Seal, 2015).

**Conflict of Interest:** No Conflict of Interest



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## AIR POLLUTION AND HUMAN HEALTH DEGRADATION: A MICRO LEVEL STUDY ON AMTA (CENSUS TOWN), HAORA, WEST BENGAL

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### **Abstract:**

Transportation is presently played a dichotomous role in between development approach and notorious hazards impact in nature. No doubt transportation is a boon for human being but some time it has been proves as a ban. From one side, transportation activities support increasing mobility demands for passengers and freight, while on the other, transport activities are associated with growing levels of environmental externalities. Transportation is an integral part of development but at the same time vehicle removes excessive pollutants in air like,  $PM_{10}$ ,  $SO_2$ , and  $NO_2$  degraded the ambient air quality. In this paper by the using of Exceedance Factor (EF) method the ambient air quality of Amta station has been analysed. Apart from that some perception study has been done which added a new farther to know what kind of health related problem public being faced. At the end of the whole discursion some humble suggestion has been drawn to check air pollution due to vehicle emission and to get rid from this problem.

**Key words:** Air pollution, Air Quality Index Exceedance Factor, Environment, Vehicles

### **1.0 Introduction:**

Human does not survive without air for a few minutes. So, air is very crucial to all types of life, which are exists in biosphere. Basically air depicts a mixture of several gases (viz. Nitrogen, Oxygen, Argon, Carbon dioxide, Helium, Hydrogen, Ozone etc.) with different proportion. It is must be say that air is not pure. There the reason is such pollutants like Sulphur dioxide, Carbon monoxide, Hydrogen, Pollens etc. are always present in air.

Air pollution is defined as limited to situation in which the outdoor ambient atmosphere contains materials in concentration, which are harmful to man and his surrounding environment. (WHO).

The nature, dimension and magnitude of air pollution depend on a variety of factor in which vehicular emission is another one. If we take a short look over the source of air pollution, then it can be find out vehicular emission is an anthropogenic source.

Due to vehicular emission lot of pollutant are being released in air regularly like,  $CO_2$ ,  $SO_2$ ,  $NO$ , Hydrocarbons,  $H_2S$ ,  $NH_3$ ,  $HCL$ ,  $SPM$ ,  $RPM$  etc. In Amta (CT) due



to poor traffic management in different traffic intersecting point, lacking of public consciousness, lacking of Govt. initiatives huge quantity air pollutant are released in air. Among them PM10, SO<sub>2</sub>, NO<sub>2</sub> are present in a measurable quantity and as a result the air quality of Amta(CT) and its surrounding deteriorating day to day.

### 1.1 Objectives:

*Some objectives have been formulated in this research paper:*

- (1) To identify, with the help of WBPCB (West Bengal Pollution Control Board) annual report, the responsible particle and gases which make air pollution and support the local air quality being cheap.
- (2) To find out the quality of air in Amta according to, AQI (Air Quality Index).
- (3) To explore what kind of problem local public face for air pollution.
- (4) To suggest some remedial measures for the adverse effect of air pollution in Amta (Census town).

### 1.2 Literature Review:

(1) West Bengal National University of Juridical Sciences (2008) in their manual on 'Environmental Protection' have pointed out the different legislative provisions with respect to motor vehicles in the city of Kolkata. In this report three legislative provision has been pointed out regarding the control of emission level for two, three and four wheelers and even light and heavy duty diesel and gasoline engine vehicles. West Bengal Motor Vehicle act, 1988 with special reference to powers of the Central and State Governments, offences and penalties, central motor vehicles rules 1989 and West Bengal Motor Vehicles rules 1989 has also been incorporated to describe the different legislative provision. (2) Mahesh Kashyap (2011) in his report, which is entitled on 'Air pollution from Transportation Sources in Bangalore' has mark out the different way to reduce the vehicular emission load in Bangalore city and find out various control measures. Some other aspect has also been studied down viz. testing of emissions from vehicles, including heavy duty vehicles, implementation of four stroke engine vehicles, including motorcycles, measurement of fugitive dust from paved and unpaved roads and introduction of other general measures such as a spot check, preventing adulteration of fuels, proper scientific construction of speed breakers, and other type of traffic management measures etc. (3) Indrajit Roy Chowdhury (2015) in his paper entitled on "Scenario of Vehicular Emissions and its Effect on Human Health in Kolkata City" has marked out that increasing Vehicular Pollution level in the city of Kolkata along the increasing number of vehicles. In Kolkata city mainly automobile pollution are creating by the high emission from two and three wheelers. Behind the causes of high emission is- ill maintenance of vehicles, erratic traffic behaviour, using of adulterer fuel, and congestion at selected traffic intersection points, road encroachment by pavement dwellers, street hawkers and illegal car parking etc. (4) Md. Senaul Haque and R. B. Singh (2017) in their article which is entitled on "Air Pollution and Human Health in Kolkata, India: A Case Study" analysed the ambient air quality in Kolkata by the applying on Exceedence Factor (EF) method, where the presence of listed pollutants annual average concentration are classified into four categories. Out of a total of 17 ambient air quality

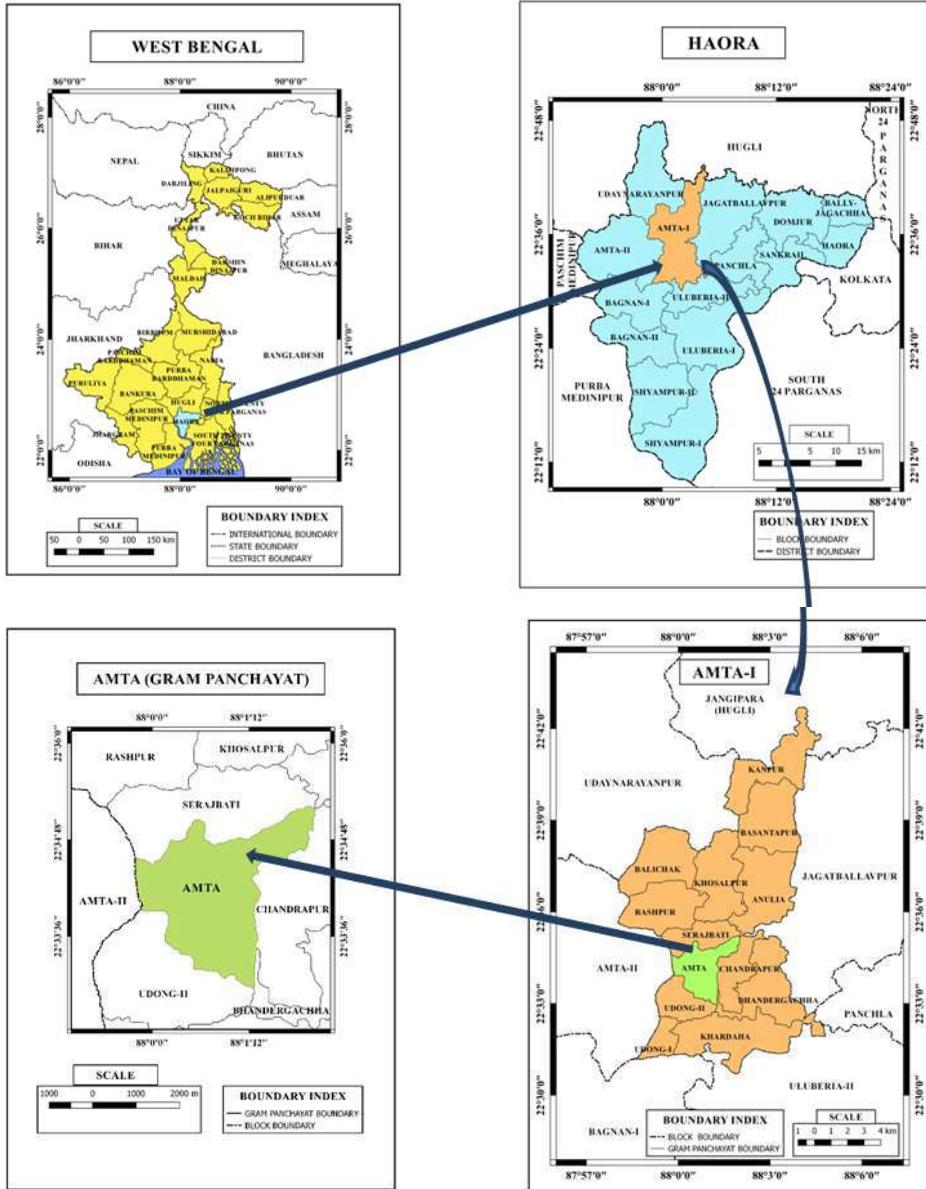


monitoring stations operating in Kolkata, five fall under the critical category, and the remaining 12 locations fall under the high category of NO<sub>2</sub> concentration, while for RPM four recorded critical, and 13 come under the high pollution category. They also took under consideration a health assessment which was undertaken with a structured questionnaire at some nearby dispensaries which fall under area with different ambient air pollution levels. (5) West Bengal pollution Control Board in their “Annual Report (2016-2017)” and “Annual Report (2018-2019)” in “Chapter 5” reveals about auto emission testing centres in West Bengal, while the Chapter 6” deals with Air Quality in various air quality station of various district and compare the situation of air pollutant with National Ambient Air Quality Standards. At the end of the whole study about air pollutant, there only PM<sub>10</sub>, PM<sub>2.5</sub>, and NO<sub>2</sub> during winter months were found to cross the National Daily Standard (NAAQS). However, over a period of 8 months in a year the air quality parameters remain within the national Standard. (6) Talal M. AL Momani, Barakat AL Bataina and Sameer Hamadneh (2017) in their paper which is named as “Levels of Pollutant Gases Emitted into the Atmosphere of Irbid city Jordan from Vehicles that use 90-octane and 95-octane gasoline” mark out that, air pollution is becoming increasingly more global and this problem was noticed and raised in the late 1960s when the issue of acidification was brought. The average emission rates of gaseous pollutant from vehicle engine that use two grades of unleaded gasoline namely octane 90 and octane 95 were investigated in area at Irbid-Jordan. Two gases analyser were used to measure the average concentration of oxygen (O<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and hydrocarbons in the emission gases. There five hundred gasoline vehicles were tested for different emissions. End of the study the result showed that new vehicle has better results in pass/failed test than old ones.(7)*Dorina Pojani and Dominic Stead (2015)* in their article which is entitled on “Sustainable Urban Transport in the developing World” they argue that a focus on small and medium-sized cities is crucial to achieving substantial progress towards more sustainable urban development, not only because they are home to at least a quarter of the world’s population but because they also offer great potential for sustainable transformation. In principle, their size allows for flexibility in terms of urban expansion, the adoption of “green” travel modes, and environmental protection.

### 1.3 Brief Details about Study Area along with Transport System:

This block is an administrative unit of Uluberia subdivision of Haora. Jaypur and Amta police stations serve this block, which is a part of the lower Damodar river basin. Near Jamalpur the river bifurcates into the Kanki-Mundeswari River and the main Damodar-Amta Channel. This is a remote rural area of the district. This block has a natural boundary. Amta is a census town in Howrah District (according to 2011 census) with an extension of 126.09 sq. km. which is located at Amta-I. Amta –I, lies between 22°30’34” N and 22°43’17” N latitudes & between 87°57’55” E and 88°4’32” E longitudes. Amta-1 C.D.Block is bounded by Udaynarayanpur, Amta-2 in the West with Damodar River; Jagatballavpur and Panchla block in the East; Bagnan-1, Uluberia-2 in the South and Hugli district in the northern part.

Location Map of the Study Area



Base Map Source: Internet, Haora Census Handbook 2011, B. D. Office (Amta-I) and Map Prepared by the Authors.

Map No.: 1.



#### 1.4 Data base:

Primary and secondary both type of data has been included to prepare this paper:

**1.4.1 Primary Data Source:** Primary data has been collected on the basis of observation method which has been introduced to identify the intensity of air pollution in the study area and on the basis of perception study based on questionnaire survey.

**1.4.2 Secondary Data Source:** For secondary data collection various types journal, official websites and annual reports of central and state government, district census handbook, maps have been taken into consideration.

#### 1.5 Methodology:

**1.5.1 Pre-Field:** In this phase a pilot survey has been carried out for collecting some general information about the transport system study area and some important map has been gathered from B.D.O Office and with the help of some website. Some previous year data about air quality of Amta census town has been collected from WBPCB official website. Then a structured questionnaire has been prepared for surveying the respondents (passengers, civic voluntaries).

**1.5.2 Field:** During field it has been followed the stratified sampling method and select random basis respondents from different age strata and it have been completed a perception study over respondents in different four intersecting point at Amta census town. Some snap was taken during field survey to describe the actual scenario of study area.

**1.5.3 Post-Field:** In post field method it has been first make master table on the basis of collecting data, which have been gathered during field work. With the help of master table, it has been formulated some diagrams and maps (using QGIS) by the application cartography techniques. On the basis of secondary data an Exceedance Factor (EF) has been calculated to determine the level of air pollution in Amta census town.

#### 1.6 Limitation:

*This research work has some limitation,*

- a) The time was too short to complete the task with a satisfied limit, which was creates a big interruption in the way of research.
- b) Since the study area are consisting in a very small place, that's why the lacking of secondary data is a big limitation.
- c) During field survey all respondents are not responding in a same manner.

#### 1.7 Air Quality Index:

In present day context air quality is considered as a severe pollution which rapidly degraded the ambient air quality and now it has been a serious matter of environmental and health hazard. To feel the cogitation of the air pollution in 2015 the, Government of India together with IIT Kanpur launched the National Air Quality Index and it was launched by Sukhjinder Sharma of Haryana. There are eight pollutants has been taken into consideration (PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, NH<sub>3</sub> and Pb) to determine the National Ambient Air Quality Standards.



**Table No. 1: Breakpoints for AQI Scale 0-500**

AQI Category (Range)	PM <sub>10</sub> 24-hr (µg/m <sup>3</sup> )	PM <sub>2.5</sub> 24-hr (µg/m <sup>3</sup> )	NO <sub>2</sub> 24-hr (µg/m <sup>3</sup> )	O <sub>3</sub> 8-hr (µg/m <sup>3</sup> )	CO 8-hr (mg/m <sup>3</sup> )	SO <sub>2</sub> 24-hr (µg/m <sup>3</sup> )	NH <sub>3</sub> 24-hr (µg/m <sup>3</sup> )	Pb 24-hr (µg/m <sup>3</sup> )
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.6-1.0
Moderate (101-200)	101-250	61-90	81-180	101-168	2.1-10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10.1-17	381-800	801-1200	2.1-3.0
Very Poor (301-400)	351-430	121-250	281-400	209-748*	17.1-34	801-1600	1201-1800	3.1-3.5
Severe (401-500)	430+	250+	400+	748+*	34+	1600+	1800+	3.5+

\*One hourly monitoring (for mathematical calculation only)

Data Source: Official website of CPCB (Central Pollution Control Board).

**Table No. 2: Health Statements for AQI Categories**

AQI	Associated Health Impacts
Good (0-50)	Minimal Impact
Satisfactory (51-100)	May cause minor breathing discomfort to sensitive people
Moderate (101-200)	May cause breathing discomfort to the people with the lung disease such as asthma and discomfort to people with heart disease, children and older adults



Poor (201-300)	May cause breathing discomfort to the people on prolonged exposure and discomfort to people with heart disease with short exposure
Very Poor (301-400)	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart disease
Severe (401-500)	May cause respiratory effect even on healthy people and serious health impact on people with lung/heart disease. The health impacts may be experienced even during light physical activity

Data Source: Official website of CPCB (Central Pollution Control Board).

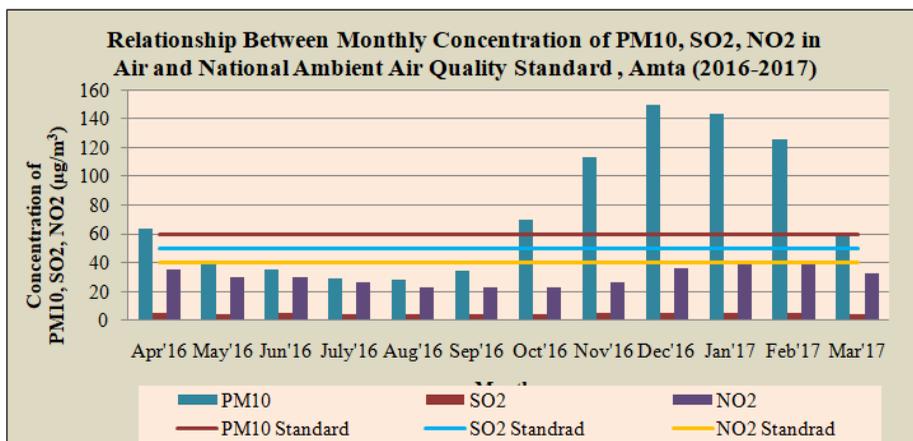
### 1.8 Air Pollution Status of Amta:

In Haora district the ambient air quality measurement station Amta severally effected by air pollution and this place mainly disturbed by low air quality during winter season. It may be happening due to high air pressure on ground surface level which get stopped the vertical air movement and stop the process of air mixing. The WBPCB identify three air pollutants (PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>2</sub>) which might be the reason for cheap air quality of Amta station. During perception lots of local people opined their experience about health hazard due to air pollution and they mainly accused the vehicular emission for air quality degradation. Because in and around Amta census town there is no industry, which could be responsible for air pollution and on the other hand the residential areas are little bit away from the main transport route.

Table No. 3: Monthly Air Pollutant Concentration of Amta Station, 2016-17

Amta (2016-17)			
Months	Air Pollutant Concentration		
	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
Apr'16	64	5.4	35.2
May'16	40	4.4	30.2
Jun'16	35	4.9	29.6
July'16	29	4.2	26.4
Aug'16	28	4.2	23.2
Sep'16	34	4.5	22.7
Oct'16	70	4.5	23.1
Nov'16	113	4.9	26.8
Dec'16	150	5.1	36.4
Jan'17	143	5.4	41
Feb'17	126	5.2	39
Mar'17	60	4.2	32.3

Data Source: Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.



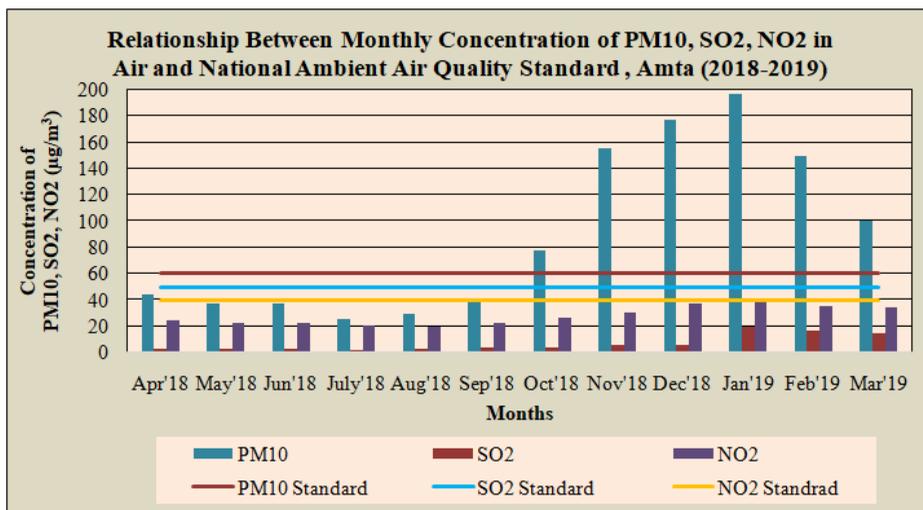
Data Source: Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.

Fig No.: 1.

Table No. 4: Monthly Air Pollutant Concentration of Ama Station, 2018-19

Ama (2018-19)			
Months	Air Pollutant Concentration		
	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
Apr'16	44.22	2.88	24.92
May'16	37.41	2.94	22.75
Jun'16	37.58	2.8	22.92
July'16	25.67	2.32	20.43
Aug'16	29.52	2.93	19.46
Sep'16	38.88	3.66	22.74
Oct'16	77.81	4.06	26.42
Nov'16	155.59	5.89	30.61
Dec'16	176.63	5.72	36.95
Jan'17	196.83	19.72	39.13
Feb'17	148.88	16.63	35.78
Mar'17	100.47	14.94	34.29

Data Source: Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.



Data Source: Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.

Fig No.: 2.

From the above figure no.:1 & 2 It can be concluded that mainly three pollutants viz., PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub> monthly average concentration revealed the air pollution variation for the whole year for Amta census town. The data of the concentrated air polluted particle has been gathered here with the help of WBPCB (West Bengal Pollution Control Board) Annual Report 2016-17 & 2018-19. The analysis of the data has expressed that mainly during the winter season, November and December in 2016 & 2018 and January and February in 2017 & 2019, the value of PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>2</sub> is very high in air. The value of PM<sub>10</sub> in the month of December has been recorded to be the highest which is 150 µg/m<sup>3</sup>, while the highest value for SO<sub>2</sub>, and NO<sub>2</sub> which is 5.4µg/m<sup>3</sup> and 41µg/m<sup>3</sup> has been recorded in the month of January for the year 2016-17. On the other hand, for the year 2018-19 the value of all pollutants PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>2</sub> in the month of January has been recorded to be the highest which is 196.83 µg/m<sup>3</sup>, 19.72µg/m<sup>3</sup> and 39.13µg/m<sup>3</sup>. And it should be noticed that above mentioned all value are being crossed the National Ambient Air Quality Standard which is enough to degraded the air quality and to become the causes of some disease. On the contrary in rainy season the value of air pollutant has been lowest observed.

In winter (November- February) the land surface of India face severe cold seasonal effect which might be the causes of high pressure in ground level the vertical upward movement of wind get stopped and as a result the pollutants remain concentrated at the ground level for a longer period. As opposed to during rainy season mainly in the month of July and August the value of PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>2</sub> in air less respectively because in that time the Indian climate has been driven by the monsoon mechanism.

### 1.9 Air Quality Assessment for Amta Station:

With the help of recorded data (from Annual Report of WBPCB, 2016-17 and 2018-19) for station Amta, the assessment of the monthly average concentration of ambient air pollution has been calculated and the data for station Amta has also been comparing with the average value, which is given by NAAQS (National Ambient Air Quality Standard). To check the level of air pollution there the Exceedance Factor (EF) method (after CPCB) has been introduced. The EF is calculated as follows:

$$\text{Exceedance Factor (EF)} = \frac{\text{Observed annual mean concentration of criteria pollutant}}{\text{Annual standard for the respective pollutant and area class}}$$

**Table No. 5: Relative scale for Exceedance Factor (EF) values**

Categories	Exceedance Factor values
<0.5	Low Pollution
0.5-1.0	Moderate Pollution
1.0-1.5	High Pollution
>1.5	Critical Pollution

Data Source: Official website of CPCB (Central Pollution Control Board) and computed by the authors.

**Table No. 6: Calculated Exceedance Factor (EF) values after Amta Station (2016-17)**

Various Air Pollutant	Observed annual mean concentration of criteria pollutants	NAAQS annual range for the respective pollutant for Industrial, Residential, Rural and Other Areas	Calculated Exceedance Factor (EF) values
Particulate Matter (PM <sub>10</sub> ) µg/m <sup>3</sup>	74.33	60	1.24
Sulphur Dioxide (SO <sub>2</sub> ) µg/m <sup>3</sup>	4.74	50	0.09
Nitrogen Dioxide (NO <sub>2</sub> ) µg/m <sup>3</sup>	30.49	40	0.76

Data Source: Official website of CPCB (Central Pollution Control Board), Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.



From the above table no. 5 it could be concluded that for the air pollutant  $PM_{10}$  the Exceedance Factor (EF) value is 1.24 which indicate the Amta station is highly polluted by the air pollutant  $PM_{10}$  while the EF value for  $SO_2$  is 0.09 which literally depict  $SO_2$  level is low in the air of study area. For a change when  $NO_2$  value has been checked out according to EF value range then the value 0.76 is expressed it is moderately responsible for cheap air quality.

**Table No. 7: Calculated Exceedance Factor (EF) values after Amta Station (2018-19)**

Various Air Pollutant	Observed annual mean concentration of criteria pollutants	NAAQS annual range for the respective pollutant for Industrial, Residential, Rural and Other Areas	Calculated Exceedance Factor (EF) values
Particulate Matter ( $PM_{10}$ ) $\mu g/m^3$	89.12	60	1.49
Sulphur Dioxide ( $SO_2$ ) $\mu g/m^3$	7.04	50	0.14
Nitrogen Dioxide ( $NO_2$ ) $\mu g/m^3$	28.03	40	0.70

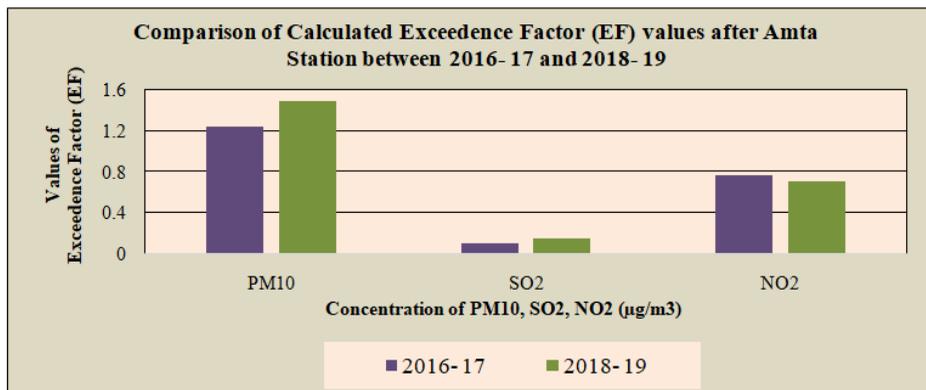
*Data Source: Official website of CPCB (Central Pollution Control Board), Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.*

From the above table no. 6 it could be concluded that Exceedance Factor (EF) value for the air pollutant  $PM_{10}$  the is 1.49 which indicate the Amta station is highly polluted by the air pollutant  $PM_{10}$ . For a change when  $SO_2$  value has been checked out according to EF value range then the value 0.14 is expressed it is less responsible for cheap air quality. On the other hand, the EF value for  $NO_2$  is 0.70 which literally depict  $NO_2$  level is moderate in the air of study area.

**Table No. 8: Comparison of Calculated Exceedance Factor (EF) values after Amta Station between 2016- 17 and 2018- 19**

Year		2016-17	2018-19
Values of Calculated Exceedance Factor (EF) various Air Pollutant	Particulate Matter (PM <sub>10</sub> )	1.24	1.49
	Sulphur Dioxide (SO <sub>2</sub> )	0.09	0.14
	Nitrogen Dioxide (NO <sub>2</sub> )	0.76	0.70

Data Source: Official website of CPCB (Central Pollution Control Board), Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.



Data Source: Official website of CPCB (Central Pollution Control Board), Official website of WBPCB (West Bengal Pollution Control Board) and computed by the authors.

Fig No.: 3.

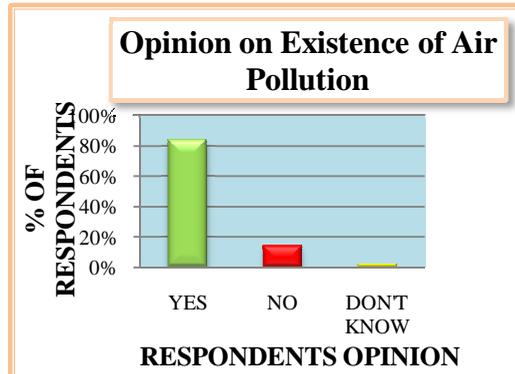
From the above figure no.:3 it could be concluded that Exceedance Factor (EF) value of PM<sub>10</sub> rapidly increases from 2016-17 (EF value of PM<sub>10</sub>- 1.24) to 2018-19 (EF value of PM<sub>10</sub>- 1.49) which can cause a variety of health disasters. If it is penetrating deep into lungs, then it may cause for asthma and even cancer. Similarly, if we keep an eye on SO<sub>2</sub> we will see that its amount has similarly increased in the air from 2016-17 (EF value of SO<sub>2</sub> – 0.09) to 2018-19 (EF value of SO<sub>2</sub> – 0.14). In the same way it could be causes for irritation of nose, throat and it also could be causes for coughing, sneezing, shortness of breath or a tight feeling around the chest. For a change,

if we consider NO<sub>2</sub> then in that case only a little less can be noticed on 2018-19 (EF value of NO<sub>2</sub> – 0.70) than 2016-17 (EF value of NO<sub>2</sub> – 0.14).

### 1.10 RESPONDENTS OPINION ABOUT AIR POLLUTION IN VARIOUS SURVEY POINT:

#### 1.10.1 Opinion on Existence of Air Pollution:

The perception study report has revealed the fact that, 84% people said yes as their opinion on the question on existence of air pollution in study area and they know the fact very well because they face the problem of air pollution in a regular basis, basically in the winter season whereas 14% people say no and 2% people says they have no idea whether air pollution are being

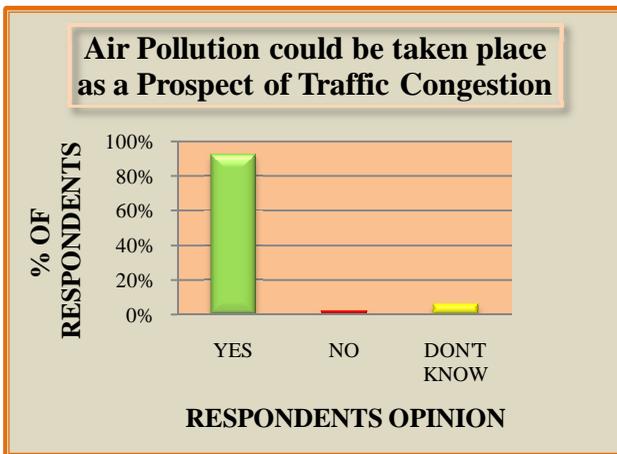


exists in study area or not and it could be for they don't know the actual concept of air pollution very well.

Fig No.: 4 Data Source: Field Survey, 2019.

#### 1.10.2 Air Pollution can be taken place as a Prospect of Traffic Congestion:

During field survey 92% respondents gave their answer in the favour of air pollution



could be taken place as a prospect of traffic congestion and they also projected it in their mind on the basis of rapidly growing population rate in the study area and also very fast rate of number of vehicle increment in study area, while 2% respondents say no because they think that in near future Government surely taken some step towards to check the air pollution level and 6% people express their

answer as don't know because they are absolutely confused about the upcoming role of Government and local peoples.

Fig No.: 5 Data Source: Field Survey, 2019.

### 1.10.3 Major Sources of Air Pollution:

From the perception study, it is being accounted that 70% respondents informed that vehicular emission is the major source of air pollution in and around study area on the other hand, while 4% people claim that industry is the major responsible factor to create air pollution in study area. Apart from these opinion 14% respondents considered road side shop as major source of air pollution, while 14% people define the other sources like open smoking, flying dust particle etc. And basically it is truth that transport has been played a crucial role to contribute air pollution while road side shop mainly small restaurant, industry contribute to create air pollutant a very little bit.

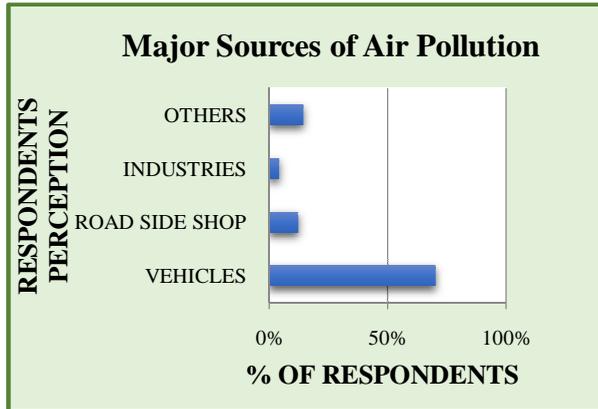


Fig No.: 6 Data Source: Field Survey, 2019.

### 1.10.4 Opinion on Major Air Pollution Creating Vehicles:

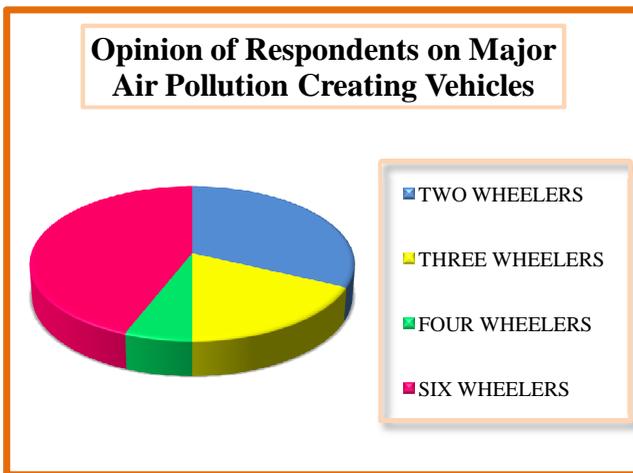


Fig No.:7 Data Source: Field Survey, 2019.

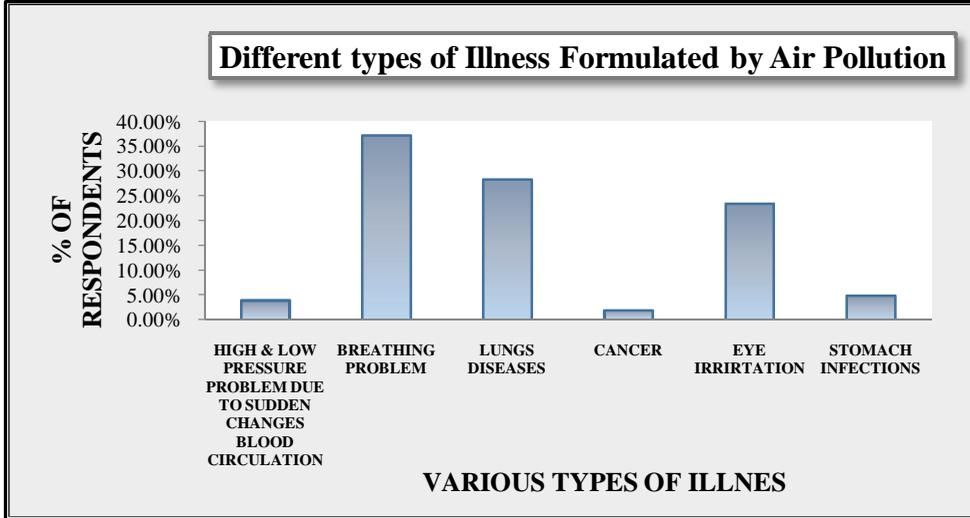
According to the perception study among respondents 44% people said six wheelers is the major air pollution creating vehicles in study area because they noticed during a single day maximum time of the road are occupied by the six wheelers mainly by the bus, on the other hand 32% people markedly observed two wheelers is mainly responsible for air pollution and they mainly noticed the highest frequency among

the vehicle is bike over road, while 18% people opined that three wheelers is more accountable behind air pollution, and at the same time 6% people is said that four wheelers is more amenable to it.

1.10.5 Different Types of Air Pollution Formulated Illness:

During field survey for the formulated illness by air pollution, 37.25% people express them

Fig No.: 9 Data Source: Field Survey, 2019.

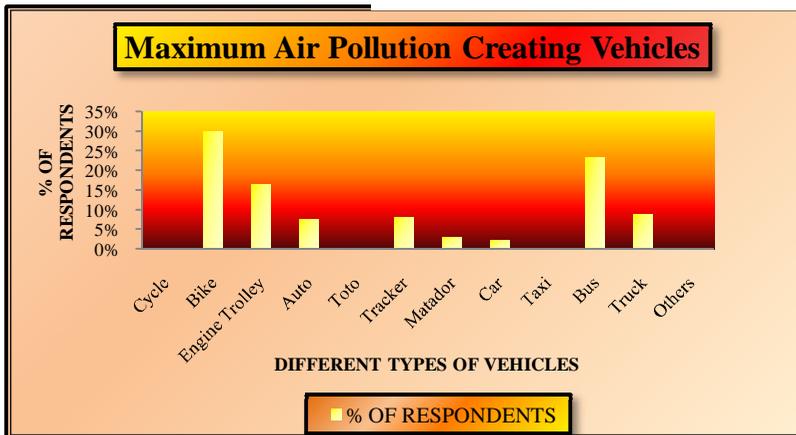


answers for breathing problem, while 28.43% people said for lungs diseases, on the contrary 23.53% respondents feel they have some problem related to eye irritation for air pollution, when 4.91% people informed for stomach infections. At the same time 3.92% respondents opined for high and low pressure problem due to sudden changes blood circulation and 1.96% people said about cancer as air pollution formulated illness which occurs due to some very effective air pollutants.

1.10.6 Maximum Air Pollution

Creating Vehicles:

Fig No.: 8 Data Source: Field Survey, 2019.



The work has The work has The work has reflected the idea that 30.08% people identifying bike as maximum air pollution creating vehicles, when 23.31% people commented on bus, 16.54% people feel about engine trolley, 9.02% people go for with truck. Some nominal 8.26% of respondents said about tracker as very much air pollution creating vehicles. On the other hand, 7.52% respondents in study area define auto, 3.01% considered matador and 2.26% people express them idea about car as a maximum air polluting vehicles. There the fact is lot of people support the Toto as an eco-friendly vehicle and they opined battery driven vehicle should be more increased to reduce the air pollution.

#### 1.10.7 Rating of Study Area as per Air Pollution Due to the Vehicular Activity:

During survey respondents also rate the study area on the basis of air pollution. Among the respondents 54% people rating the study area moderately because they always not feel the problem of air pollution but they feel also air pollution for some specific time like in the morning and in the time of evening when the temperature gets less respectively, for a change 22% respondents said for low because they not face the air pollution problem and related any kind of health hazard, while 12% respondents go for very low as well as high. Nobody rate the study area as per above mentioned norms.

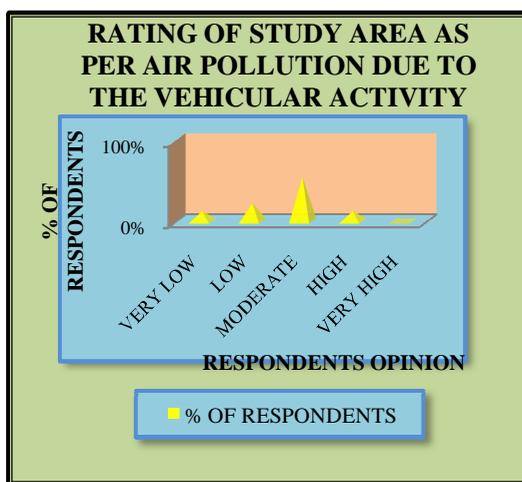


Fig No.: 10

Data Source: Field Survey, 2019.

#### 1.11 Major Findings:

Several findings have been mark out while study has been conducted:

1.11.1 In Amta mainly three air pollutants  $PM_{10}$ ,  $SO_2$ , and  $NO_2$  are being found after WBPCB 2016-17 and 2018-19 Annual Report, which has crossed the National Ambient Air Quality Standard. And this might be enhanced day to day due to the increasing number of vehicle, in a leaps and bounce manner.

1.11.2 According to Air Quality Index the study area Amta census town fall under moderate category which might be causes for breathing discomfort to the people with the lung disease such as asthma and discomfort to people with heart disease, children and older adults. And there the coincidence is that, this fact is being supporting by the field survey. And poor ambient air is very much related to health hazard.



1.11.3 Mainly during the whole winter season the level of air pollution touch the peak level in study area, because of ground level high pressure system and minimum rate of air circulation which get stopped the air mixing.

1.11.4 To check the level of air pollution there the Exceedance Factor (EF) method (after CPCB) has been introduced. And the analysed value of EF expressed that, the concentration of PM<sub>10</sub> major pollutant which creates high pollution while the level of NO<sub>2</sub> in study is lies in the class of moderate pollution and SO<sub>2</sub> is responsible for low pollution.

1.11.5 The survey reveals that maximum air polluting vehicles are bus, bike and engine trolley. Among them bus and bike are very frequent vehicle in and around study area and the engine trolley has been not so frequent but it contributes in air pollution with higher proportion because of its poor engine quality.

#### **1.12 Problem:**

*Several problems have been identified which might be the reason of air pollution in this region....*

- The rate of air pollution though moderate but it has been very much responsible for health hazard. Breathing problem, lung disease, problem of eye irritation is some of the common problem that the local people in the study area are commonly faced.
- Field survey reveals that, road width in the study is very narrow compare to that of vehicle pressure and it is single lane. Along with them the haphazard flow of vehicle is very accountable to enhanced the traffic congestion, as a consequence the vehicle emission rate often very high which may highly contribute to happen air pollution.
- Lacking of local people's awareness is a major factor to the problem of air pollution because lots of people don't know what is being happened due to the air pollution.

#### **1.13 Suggestion:**

Several suggestions have been formulated to overcome the problems in this study area-

- Government should be increased the road width with a right proportion to the number of vehicle enhancement or it could be more appreciate if the road become double lane because it reduced the rate of traffic congestion and adjacent vehicular emission.
- More number of trees should be planted in the study area which retain the local environment cool and calm and simultaneously reduced the level of ambient air pollutant.
- Local people and Government jointly taken some effective initiative like, social as well as human awareness related programmed to check the degraded ambient air quality. For instance, procession, laws regarding to the negative impact of air pollution and how it is created health hazard, might be the very good alternatives.

#### **1.14 Conclusion:**

At the end of the discussion, it has been concluded that the study area Amta census town is very much predominant with air pollution which is occurs due to main vehicular emission and the local people have been badly suffering with some health related diseases during mainly winter season. Even some time in the very early a winter



morning smog have been developing which might be support to enhanced respiratory disease and leads to a health hazard. So proper sustainable programme should be incorporated for this area which would a big and better step toward prevent air pollution.

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## IMPORTANCE OF URBAN FORESTRY IN CYCLONIC RISK MITIGATION THROUGH GIS AND REMOTE SENSING: A CASE STUDY OF THE SEVERE CYCLONIC STORM AMPHAN IN WEST BENGAL

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### **Abstract**

Severe cyclonic storm “Amphan” originated in the Bay of Bengal lashed the West-Bengal-Bangladesh coastline on 20th May 2020, extending its devastation trail far inland into the state of West Bengal. Although a prior alert and rapid evacuation saved lives of almost 3 lakh coastal residents, the category 4 cyclone rendered the coast and the districts, which fell under the predicted cyclonic pathway, in complete ruins. UNESCO World Heritage site “Sundarban National Park” suffered the most critical hit that has led to the destruction of 28% of its total area. The strong winds accompanied by heavy downpour uprooted at least 15,000 trees within the city of Kolkata that had never faced such an apocalyptic storm in 100 years. Substandard urban forestry practice was the primary reason for such devastation within the city that will inevitably lead to a massive surge in pollution due to the loss of a substantial amount of green cover. For the revival of green cover and execution of effective disaster management practices, GIS integrated with remote sensing technology can provide valuable assistance to the decision-makers of concerned authorities. The paper discusses the possibility of restraining future cyclonic devastation by the implementation of a “Storm Surge model” which helps generate hazard maps for different return periods, that indicate in advance the level of vulnerability and risk of the study area to future cyclones. The threat of declining green cover in Kolkata and feasible strategies for its prevention and recovery has also been elaborately discussed in the paper.

**Keywords:** Amphan, Cyclone, GIS, Remote Sensing, Risk Assessment, Urban Forestry

### **1. Introduction**

Tropical cyclones pose a significant threat to coastal life and property in various parts of the world. The cyclonic hotbed, Bay of Bengal has given rise to some of the most powerful tropical cyclones. (A. K. Nayak, 2014; N. Sen, 2018) On 20 May 2020, cyclone, “Amphan” which originated in the Bay of Bengal made its landfall across the West Bengal-Bangladesh and Orissa coastline leaving behind lakhs of people homeless, and devastation beyond immediate restoration. (Team Poshan, 2020) This catastrophic storm was the first super cyclone to originate in the Bay of Bengal, since, 1999. (Nandi & Thakur, 2020) Though its intensity had weakened by the time of the landfall, it was still positioned under “Category 4” of the Saffir-Simpson Hurricane Wind Scale. (Henson, 2020) Hours ahead of cyclonic landfall. Indian Meteorological Department (IMD) announced a cyclone alert for the Indian seacoast of Bay of Bengal.



(Express Web Desk, 2020)National Disaster Response Force (NDRF) executed rapid evacuation of almost 3 lakh residents from the coastal areas, which effectively prevented the rise in the death toll.(M. Nayak, 2020)In West Bengal, the districts of Howrah, Hooghly, North and South 24 Parganas, Kolkata, East, and West Midnapore, Nadia, and East Burdwan were severely affected due to the cyclone.

UNESCO World Heritage Site, “Sundarban National Park” suffered the most critical hit. The massive surge in seawater breached the embankments and inundated the farmlands and villages.(Team Poshan, 2020) Amphan, which was more powerful than previous cyclones faced by the region such as Aila (2009), Fani (2019), and Bulbul (2019) created widespread wreckage that has rendered the Sundarbans completely unrecognizable; and its residents unprotected and helpless. (Bhattacharyya, 2020; G. Singh, 2020)Kolkata, home to almost 15 million people have been left completely devastated by the worst cyclone it has experienced in 100 years. The strong winds along with heavy rainfall brought in by the cyclone, uprooted over 15,000 trees as well as blew away shanties, mud houses, several lampposts, telecom towers, electricity wires, and traffic signals in the metropolitan alone. (PTI, 2020a)The loss of a considerable proportion of green cover over Kolkata and other affected districts will inevitably lead to a massive surge in pollution levels beyond the permissible limit of the World Health Organization (WHO). (PTI, 2020b)Substandard urban forestry planning is one of the leading causes of such widespread havoc in the city.(A. Mukherjee, 2015)A study carried out by (Mondal, 2013) on the urban green cover of Kolkata indicated a statistically significant decreasing trend. In recent years uncontrolled urbanization and poor compensatory plantation have imposed a significant burden on the citizens of Kolkata and its adjoining districts. Before the Amphan tragedy, the green cover of Kolkata stood at 5%, which was already much below the required 15% for the Indian Metro cities. (Mondal, 2013; Mukherjee, 2015) Environmentalists expect that the scenario after Amphan will be even more alarming.

Vanishing green cover of the city along with unplanned plantations lead to a gradual rise in pollution rates over the last decade, making it extremely unhealthy for the population. (G. Singh, 2020)To prevent and protect the city and the coastal areas from future cyclonic disasters, GIS and remote sensing (RS) technologies can be used as an efficient tool in disaster management by the decision-makers to offer prior awareness to local communities. (Dhruvesh, Praful, & Aditya, 2016) Remotely sensed data can be effectively utilized to prepare severity and vulnerability assessment maps that indicate the risk of cyclone impact and other natural disasters in the target area. GIS assists in the interpretation of information by the development of satellite-based thematic maps that display the spatial dimension of the affected areas. (Nayak, 2014) Tidal surge during a cyclone is considered the most devastating occurrence for coastal regions. A storm surge model developed by (Rana, Gunasekara, Hazarika, Samarakoon, & Siddiquee, 2010) provides an effective measure for disaster planning and management. This model was developed by combining the Digital Elevation Model (DEM) with historical cyclone data of the study area, which generated the cyclone hazard maps for different return periods. This paper considers the possibility of implementing the storm surge



model on the coastline of West Bengal and its adjoining low-lying areas which are vulnerable to catastrophic action of cyclones for effective cyclonic risk management. The present, post-Amphan scenario, and effect on urban forestry in Kolkata, and other affected districts, and possible prevention and recovery strategies have also been elaborately discussed in the paper.

## **2. Effects of Amphan**

### **2.1 Kolkata**

Amphan lashed the coastal areas with ferocious winds that blew at a rate of almost 185km/hr. along with extremely heavy rainfall.(Bhattacharyya, 2020) After landfall, the storm started weakening as it moved along its predicted north-east pathway. Although rapid evacuation was conducted before cyclonic landfall, the super cyclone killed at least 86 people across India and Bangladesh. (PTI, 2020a; G. Singh, 2020)

The eastern city of Kolkata was left completely devastated by the monstrous storm. The maximum recorded wind speed in the city was 145km/hr. In a matter of a few hours the cyclone uprooted thousands of trees, knocked down electricity and telecom towers, and several houses were destroyed. Soon after the rage of the storm receded, the ripped electrical wires and broken water pipes led to power cuts and water shortages in several localities and wards across the state capital of Kolkata. The fallen trees blocked the road affecting the transportation services within the city. A private aircraft which was parked in a hangar and two hangars were destroyed in the city airport which was completely flooded with rainwater.(G. Singh, 2020)

### **2.2 Sundarbans and other districts**

The impact of cyclone Amphan was even more critical in the villages of Sundarbans, along the coastline of Bay of Bengal and in the adjoining districts of Kolkata. Turbulent downpour along with violent wind exceeding 180km/hr. was recorded during the time of cyclonic landfall. Excepting human and livestock casualties, the cyclone also caused severe losses to farmers by ruining their standing crops of paddy, mangoes, lychee during their peak harvest time. The largest paddy growing district of West Bengal, Burdwan (East) suffered a substantial loss estimated around Rs.3 billion. The unfavorable climatic conditions since the beginning of the year along with economic crisis due to ongoing national lockdown had already affected almost 70% of the agricultural output. The cyclone snatched away the bare remainders of the seasonal harvest from these farmers.(G. Singh, 2020) State agriculture minister of West Bengal, Ashish Banerjee stated that the Cyclone Amphan impacted the farming sector in at least 14 of the 23 districts in West Bengal and the loss incurred may create an all-time record. Sundarbans biosphere reserve was the worst affected, leaving thousands of houses shattered, mangroves uprooted and the acres of land submerged underwater. Even the mud dykes and embankments that protected the low-lying farmlands during the floods were destroyed, severely affecting the livelihood and property of the local inhabitants. (G. Singh, 2020; Team Poshan, 2020)The mangrove ecosystem is responsible for not



only acts as a windbreaker, but it also effectively breaks the sea waves during a storm surge caused by a cyclone. (Goswami, 2020; S. S. Singh, 2020a) According to the government report, 28% that is 1,200 sq km of the mangrove forest was destroyed due to the cyclone and the rest of the trees within the reserve are currently facing acute survival concerns due to an increase in salinity of the soil. The diversity of local indigenous fauna species of crabs, turtles are also expected to have been severely affected. (K. Mukherjee, 2020; S. S. Singh, 2020a)

### 3. Mitigation strategies

#### 3.1 Development of a storm surge model

For accurate prediction of cyclonic hazards, especially in low lying coastal areas, Rana et.al compiled historical data of storm surge height, cyclonic wind speed, inundation levels, land use data and other meteorological and topographical data of the region. The Storm surge model developed by taking into consideration the previously mentioned primary data. Wind speed frequency was analyzed and taking into consideration the bay characteristics, tidal amplitude and bathymetry the coastal area was divided into various zones. Relationship between wind speed and surge height was established using Regression analysis. ILWIS Program (Integrated Land and Water Information system) was used to develop the storm surge model. Surge Decay Coefficient (SDC) which is considered as a function of the friction caused by surface forms was calculated for each surge height.

SDC is calculated as follows:

Surge height - Average elevation at end of surge

Total inundation width - Width of constant surge

From historical records it is evident that low lying areas with no embankments along the coast, will have a constant surge depth, after which it will decrease until a certain distance inland. A similar surge model was also suggested by (Hoque, Phinn, Roelfsema, & Childs, 2017) as basic input in the risk modelling procedure due to its lucidity and speedy derivation of required information for preparedness phase of cyclone disaster management.

#### 3.2 Development of return period maps

The development of different return period hazard map of surge water depth requires two models:

(i) Surge model constructed from the historical records of cyclone flooding in the focus area

(ii) Digital Elevation Model (DEM) of the focus area

Integrating these two models and processing the same in a GIS or remote sensing software, can generate various return period maps such as:

1. Hazard map of 100-year return period
2. Vulnerability map of 100-year return period
3. Casualty map of 100 years return period



#### 4. Risk assessment map of 100-year return period

Return period maps of coastal areas are important for the development of effective and holistic disaster management techniques. It also aids in sustainable infrastructural and agricultural development that might boost the economy in the region.

Flood depth and inundated area, land use, and population density, and road networks are the most important parameters in the development of flood risk evaluation. Remotely sensed spatial imagery can provide accurate information to the decision-makers for planning an effective risk mitigation strategy in vulnerable areas. (Sahoo & Sreeja, 2017)

#### 3.3 Development of Urban Forestry and Replantation Program

Post-Amphan 500 fallen trees were identified among a thousand others, which could be re-fixed. With the help of state pollution control board, state biodiversity board, Botanical Survey of India, and several NGOs more than 50 trees have been successfully re-fixed to date.(Thakur, 2020) The West Bengal State government announced a plantation drive where at least 50,000 saplings will be planted throughout the city in the coming weeks. (S. S. Singh, 2020a)For the prevention of such disasters in the future accurate planning, monitoring, training, and pruning should be regularly performed by the concerned authorities.(Kundu, 2020; PTI, 2020a; S. Sen, 2020) Indian road congress has set up specific guidelines for selection of different plant types and planting management in roadside areas of urban India, such guidelines must be followed in urban plantation programs with regular care and as avenue trees play a major role in urban environmental planning along with urban infrastructural development. (Mandal & Mukherjee, 2019)

The Sundarbans and affected village areas need increased attention from all levels of the government as well as worldwide. Although the restoration process has been initiated by the state government, a large proportion of affected areas remain unattended.(S. S. Singh, 2020b)The policies for redevelopment should be precisely aligned towards the larger objective of reducing external strain on the ecosystem, as the infrastructure is remodeled. An appropriate greenbelt, shelterbelt, and homestead plantation system must be established and practiced to avoid loss of house and property. Due to the sensitivity of the mangrove ecosystem of Sundarbans, priority should be given for its sustainable conservation while the reconstruction of the same. (Islam & Rahman, 2015)Before initiation of any conservation or replantation program in the region, and environmental impact assessment should be performed to identify the potential threats to the existing environment and also to identify the measures to eliminate these threats while the environment is given its due time to recover.(SICOM & MoEFCC, 2019)

#### 4. Risks in implementation

Deforestation is easier in an urban area than to forest it. There are several problems in the way of sustainable urban forestry planning and development in Kolkata; some of the major problems as stated by (Mukherjee, 2015) are listed below:

1. Lack of adequate funding for systematic development that includes regular pruning and pest maintenance.



2. Due to limited knowledge of economic, social, and biological benefits of trees effective urban forestry planning is not given primary priority during urbanization. Forestry planning is considered as a supplementary optional construction in developmental projects.
3. People are unaware of the importance of green cover due to which they are hesitant to sacrifice one inch of land for plantation purposes. Urban trees in the current scenario grow only in a stressful environment where only limited resources are available.
4. Efficient urban forest management includes year-long planning, various levels of professional coordination as well as local community participation.

In the city outskirts, other adjoining districts, and in the rural areas there exists several local challenges such as widespread poverty that accounts for almost 34 percent of the population with extremely low human development measures and 47 percent live with some food scarcity.(Modak, 2020)

In recent years increased dependence on forest resources and uncontrollable illegal extraction of other biotic components has caused further disbalance in the ecosystem affecting the resilience capacity of the mangrove forest. (IUCN, 2017)

Lack of proper education and awareness also compute to the risks of implementation of disaster management strategies in the rural areas, which should be the primary goal of central and as well as state governments.

## 6. Conclusion

The changing climatic conditions have undoubtedly affected the weather patterns, making the cyclones more frequent and intense. The low-lying delta region of Sundarbans is also threatened by the rising seawater level. (Ghosh et al., 2018) Assuming the sea level rise predictions and local conditions do, a 28 cm sea-level rise is likely to occur in the next 50-90 years which will destroy the largest mangrove ecosystem in the world. (Loucks, Barber-Meyer, Hossain, Barlow, & Chowdhury, 2009) The surging seas have already rendered the fertile agricultural lands and groundwater in the region, increasingly saline, that has affected the agricultural produce of the local farmers. Recurrent extreme weather conditions demand up-gradation in the existing rural infrastructure. (Dhara, 2019)The government could reduce the damage and save the lives of these coastal inhabitants by building disaster-resilient infrastructure. (PTI, 2020a)Housing schemes in the coastal belt should incorporate designs that are resistant to cyclones. For disaster prevention, the government should focus on creating a fast and accurate warning and forecasting mechanism. Disaster Management strategies consist of activities related to various phases such as preparedness, prediction, damage assessment, and rehabilitation. (Sibandze, 2013)

The Storm surge model based on remote sensing and GIS technology that has been proven to be quite effective in the preparedness and prediction phase for the identification of disaster-prone areas, zoning them according to risk magnitudes and simulating damage scenarios. Accurate application of this technique during damage assessment and rehabilitation phase can provide immediate access to the information required to make appropriate decisions that help in reducing panic, confusion, and mental stress during an unpleasant situation.



In the metropolitan cities, urban sprawl and unplanned development pose a significant threat to the environment. (K. Mukherjee & Niyogi, 2020) The trees and vegetative elements act as a carbon sink that absorbs the urban heat and pollution. Lack of practical data and scientific awareness amongst citizens has resulted in a devaluation of the green cover. (Imam & Banerjee, 2016) Forestry planning should be considered as a major priority.

Environmentalists are concerned about the sharp increase in pollution levels in the post-Amphan scenario which will eventually lead to an increase in pulmonary disease within the population. (G. Singh, 2020) The primary objective of developmental authorities in urban as well as in rural areas should be the construction of infrastructure required for underground communication network and transmission of electricity, which will solve the problem of contact and power shortage in the event of a disruption due to weather-related calamity. (PTI, 2020a) Apart from the above-mentioned tasks, the municipal authorities should also simultaneously perform the following duties to prevent such catastrophic destruction in the future:

1. Organize awareness campaigns to spread the importance of effective urban forestry
2. Encroach lands for plantation of trees
3. Spread the knowledge and the advantages of rooftop gardening.
4. Financial benefits for tree plantation within premises.
5. Organize frequent seminars, workshops, and training programs towards the importance of forestry and tools required for the efficient management of the same. (A. Mukherjee, 2015)

Amphan might have caused widespread devastation across the state of West Bengal, but it also pointed out the drawbacks of our existing urban forestry and disaster management system. Forestry, environment sustainability, and environmental disaster governance should not be compromised with the general governance of the state or nation at any cost. If these projects are not given due attention the state might have to face an even greater environmental crisis soon which will ultimately lead to the collapse of the entire economic, social and cultural framework of our country.

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## SARS COV-2- A REVIEW

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### ABSTRACT

The world rejoinder to incorporate and control the pestilence, the huge vehemence used to be sighted on producing lookup talent to cue evidence-based responses to enclose the virus, which title such as extreme acute respiratory syndrome coronavirus two (SARS-CoV-2), owing to the genetic analogous with the SARS Cov two This overview recapitulates the ensuing testimony which can assist to tips the public fitness riposte, particularly in India. the pivotal location has been identified in which lookup wishes to be administered to generate vast Genius for prevention and manipulate struggles. The emergence of SARS-CoV-2 has as soon as once more uncovered the weaknesses of international fitness structures preparedness, the capability to reply to an infectious threat, the rapidity of transmission of infections throughout global borders, and the ineffectiveness of kneejerk coverage responses to emerging/re-emerging infectious sickness threats. The evaluation concludes with the key mastering factors from the ongoing efforts to stop and include COVID-19 and identifies the want to make investments in fitness systems, community-led response mechanisms, and the want for preparedness and international fitness security.

### INTRODUCTION

The coronavirus disorder 2019 (COVID-19) outbreak, which originated from Wuhan, Hubei Province, China, has unfolded to all of the provinces of China and 28 different countries. As of 23 February 2020, extra than 77,000 instances of SARS-CoV-2 contamination have been validated in China and 60% of these have been said in Wuhan. Its causative pathogen is a phylogenetic sister to the extreme acute respiratory syndrome coronavirus (SARS-CoV) and has been exactly as SARS-CoV-2 (ref. 2). However, though SARS-CoV-2 shares 79.6% sequence identification and the equal Mobilephone receptor with SARS-CoV3,4, the scientific result of SARS-CoV-2 now not solely consists of SARS-like viral pneumonia 5 however additionally covers milder illness, even asymptomatic infection6,7. Analysis by way of the China CDC indicated that 80.9% of verified COVID-19 instances have been characterized as slight or reasonable types—that is, except respiration situation and hypoxia7. Wuhan is the biggest town in central China, with a resident populace of over fourteen million.

The speedy amplify in mentioned instances suggests that neighbourhood transmission of SARS-CoV-2 had mounted in the metropolis of Wuhan and close by areas no later than the cease of January eight As the speedy molecular diagnostic assay was once no longer handy in early January and huge use used to be hard earlier than 23 January 2020, it used to be challenging to screen the transmission of SARS-CoV-2 amongst the community. To higher apprehend the modern epidemic in Wuhan, mainly the reputation of instances of milder illness, we retrospectively investigated the presence of SARS-CoV-2 amongst nearby sufferers with influenzalike sickness (ILI), which have been described as outpatients with unexpected onset of a fever of >38 °C and a cough or sore throat. Sustained sentinel surveillance for ILI instances and their etiology has been applied in Wuhan because 2005, based totally on the National Influenza Surveillance Network of China9. Two consultant referral hospitals had been chosen as sentinel



hospitals to replicate the tendencies in ILI in the neighborhood populace (Supplementary Fig. 1): the Children's Hospital of Wuhan, which is the greatest pediatric core in the province, and Wuhan No. 1 Hospital, a primary commonplace health center with over two million outpatient visits per year. The variety of ILI instances and whole outpatient numbers have been mentioned weekly through the sentinel hospitals, and medical samples have been additionally accrued from ILI patients. In this study, 640 throat swabs amassed from ILI sufferers in the sixteen weeks between 6 October 2019 (week (W) forty of 2019; 2019W40 hereafter) and 21 January 2020 (2020W03) have been re-analyzed. The duration in challenge coincided with the iciness height of influenza and different respiratory illnesses. The range of ILI instances in all age companies extended dramatically beginning in early December and reached a height via the New Year (Fig. 1a). In particular, the 5–14-year team extended over 24-fold for the duration of this duration (2019W40–W47, seventy-five instances per week; 2019W52, 1,916 cases). The proportion of ILI sufferers in all outpatients skilled a comparable rise: the common share was once 1.07% in the course of 2019W40–W47 and soared up to 9.44% in 2020W01. Besides, ILI statistics for the 2019–2020 iciness was once notably greater in contrast to preceding years (Fig. 1b,c, and Source Data Fig. 1), suggesting the necessity to distinguish between influenza-infected and suspected COVID-19 patients. The sufferers with ILI taking part in this learn about comprised 315 adult males and 325 females, ranging in age from 9 months to 87 12 months (median age, eight yr; imply age, 22.7 yr). SARS-CoV-2 RNA used to be detected in 9 affected person specimens (Table 1 and Extended Data Fig. 1), all of which have been accumulated in January 2020 (2020W01–W03) when seasonal influenza (mainly A/H3 and B/Victoria) remained active; however, no coinfection was once detected.

The primary demographic records and sickness timeline of the 9 sufferers contaminated with SARS-CoV-2 are listed in Extended Data Fig. two The gender ratio used to be 1.25 (five adult males versus 4 females), and they have been all adults (age range: 35–71 yr). These demographic points are constant with different reachable reviews involving sufferers with COVID-19 (refs. 5,7,10). The onset date of the earliest case was once four January 2020, one week after the outbreak was once suggested by means of hospitals<sup>11</sup>. The common hole between onset and looking for clinical assist used to be 1.7 d, which is shorter than a preceding document on early identified instances that generally have pneumonia<sup>5,11</sup>. Although the weekly pattern dimension was once small, it appears that COVID-19 was once steadily increasing amongst the ILI instances for the duration of January. In the remaining week of observation, the frequency of SARS-CoV-2-positive instances had handed that of the influenza virus amongst the team of sufferers older than 30 years (Table 1). This discovery is regular with the latest epidemiological estimations about the early transmission dynamics of SARS-CoV-2 (refs. 11,12). Interestingly, the 9 sufferers with COVID-19 got here from six one-of-a-kind districts of the Wuhan metropolitan and surrounding areas (Supplementary Fig. 1), which furnished extra proof for neighborhood transmission in this region. SARS-CoV-2 detection in sufferers with influenza-like illness, surveillance facts from two sentinel hospitals in Wuhan. a Number of ILI instances and proportion of outpatients with ILI between 6 October 2019 and 21 January 2020 (2019W40 to 2020W03). The vertical columns scaled on the left y-axis file the weekly ILI case numbers and the color blocks in the columns characterize the exceptional age organizations of the sufferers with ILI.

The dashed line suggests the share of outpatients with ILI and is scaled on the proper y-axis. b, Number of ILI instances that befell in the course of the iciness influenza season of the previous three years. Percentage of ILI at some stage in the wintry weather influenza season of the previous three years. The solely two human-pathogenic CoVs recognized earlier than the SARS epidemics had been HCoV-229E and HCoV-OC43, which normally purpose self-limiting higher respiratory tract infections<sup>2</sup>. Therefore, researchers and lookup facilities, particularly these concerned in



antiviral development, had been underprepared when SARS-CoV all at once emerged in 2003. Subsequently, three frequent strategies have been used to find out workable anti-CoV remedy selections for human-pathogenic CoVs — specially SARS-CoV and the rising MERS-CoV — that are related to greater extreme disorder than the different HCoVs are<sup>9,114,115</sup>. The first method to drug discovery is to check present broad-spectrum antiviral capsules that have been used to deal with different viral infections by means of the use of preferred assays that measure the results of these pills on the cytopathic, virus yield and plaque formation of stay and/or pseudotyped CoVs. Examples of pills recognized the usage of this method encompass interferon alfa, interferon-beta, interferon-gamma, ribavirin, and inhibitors of cyclophilin<sup>8,74,116–122</sup>. These capsules have the apparent gain of being quite simply handy with recognized pharmacokinetic and pharmacodynamic properties, aspect results, and dosing regimens. However, they do now not have precise anti-CoV consequences and may additionally be related to extremely negative effects. The 2nd anti-CoV drug discovery method entails the screening of chemical libraries comprising giant numbers of current compounds or databases that incorporate facts on transcriptional signatures in distinctive mobile lines<sup>122–127</sup>. This strategy affords rapid, high-throughput screening of many effortlessly accessible compounds that can then be in addition evaluated by means of antiviral assays. Various instructions of capsules have been recognized in these drug repurposing programs, which includes many that have essential physiological and/or immunological consequences such as these that have an effect on neurotransmitter regulation, the estrogen receptor, kinase signaling, lipid or sterol metabolism, protein processing, and DNA synthesis or repair<sup>122–127</sup>. The essential drawback of this method is that even though many of the recognized pills showcase anti-CoV things to do in vitro, most are no longer clinically beneficial due to the fact they are both related with immunosuppressive consequences or they have anti-CoV half-maximal fantastic awareness (EC<sub>50</sub>) values that markedly exceed the height serum attention (C<sub>max</sub>) stages that achieve capable at therapeutic dosages. An awesome exception, which used to be discovered to be tremendous in a non-human primate mannequin and in non-randomized scientific trials, is the anti-HIV protease inhibitor lopinavir–ritonavir<sup>76,77,128</sup> (TABLE 1). The 1/3 strategy for anti-CoV drug discovery includes the de novo improvement of the novel, particular retailers based totally on the genomic and biophysical appreciation of the person CoVs. Examples encompass siRNA molecules or inhibitors that goal unique viral enzymes worried in the viral replication cycle, mAbs that goal the host receptor, inhibitors of host cell proteases, inhibitors of virus endocytosis through the host cell, human or humanized mAbs that goal the S1 subunit RBD and antiviral peptides that goal the S2 subunit (FIG. 2).

Although most of these pills have amazing in vitro and/or in vivo anti-CoV activity, their pharmacokinetic and pharmacodynamic residences and side-effect profiles have but to be evaluated in animal and human trials. Furthermore, the improvement of these candidate pills into clinically beneficial therapeutic selections with dependable transport modes for sufferers typically takes years. Overall, these three drug discovery processes are regularly used collectively all through rising CoV outbreaks to perceive candidate drug compounds that can be generally categorized into virus-based and host-based cure options. Vaccine The WHO R&D blueprint and its Working Group conveyed a casual session on prioritization of vaccine candidates towards SARS-CoV-2 in Geneva on January 30, 2020<sup>87,88</sup>, and recognized at least 5 main candidate vaccines for SARS-CoV-2<sup>89</sup>.

As on February 13, 2020, the WHO professional team did no longer launch a prioritization list, nor did the US Clinical Trials registry exhibit any registered medical trials on vaccines towards SARS-COV-2. Among the one-of-a-kind candidates in the pipeline, nucleic acids and viral vectored vaccines are being tried. INO-4800 is one of the main candidates developed by way of



Inovio Pharmaceuticals and Beijing Advaccine Biotechnology based totally on a DNA plasmid vaccine Electroporation device. Inovio pursuits to commence section I scientific trial in the US concurrently with Beijing Advaccine in China<sup>90</sup>. Clover Biopharmaceuticals is creating a recombinant subunit vaccine based totally on the trimeric S protein (S-Trimer)<sup>91</sup>. All the vaccine research is presented in the preclinical phase.

## METHODS

No statistical techniques had been used to predetermine pattern size. Metagenomic evaluation and viral genome meeting We gathered viromic, metagenomic and transcriptomic statistics of specific mammals and birds in public databases—including NCBI Sequence Read Archive (SRA) and European Nucleotide Archive (ENA)—for looking manageable coronavirus sequences. The uncooked reads from the public databases and some in-house metagenomic datasets have been trimmed the use of fast (v.0.19.7)<sup>19</sup> to dispose of adaptor and low-quality sequences. The easy reads have been mapped to the SARS-CoV-2 reference sequence (MN908947) the use of BWA-MEM (v.0.7.17)<sup>20</sup> with >30% matches. The mapped reads had been gathered for downstream analyses. Contigs had been de novo-assembled the usage of Megahit (v.1.0.3)<sup>21</sup> and recognized as associated with SARS-CoV-2 the usage of BLASTn with E-values <  $1 \times 10^{-5}$  and sequence identification >90%.

Virus isolation and RT-PCR evaluation Lung tissue extract from pangolins were once inoculated into Vero E6 cells for virus isolation. The cellphone line used to be examined free of mycoplasma infection the usage of LookOut Mycoplasma PCR Detection Kit (SIGMA), and used to be authenticated by using microscopic morphologic evaluation. Cultured phone monolayers have been maintained in Dulbecco's Modified Eagle Medium (DMEM) and Ham's F-12. The inoculum used to be organized with the aid of grinding the lung tissue in liquid nitrogen, diluting it 1:2 with DMEM, filtering it thru a 0.45- $\mu$ m filter (Merck Millipore), and treating it with sixteen  $\mu$ g/ml trypsin solution. After incubation at 37 °C for 1 h, the inoculum was once eliminated from the way of life and changed with a clean subculture medium.

The cells had been incubated at 37 °C and discovered every day for cytopathic effects. Viral RNA was once extracted from the lung tissue the use of the QIAamp Viral RNA Mini package (Qiagen) following the manufacturer-recommended procedures, and examined for coronavirus by using RT-PCR the use of a pair of primers (F: 5'-TGGCWTATAGGTTAATGGYATTGGAG-3', R: 5'- CCGTCGATTGTGTGWATTTGSACAT-3') designed to expand the S gene of betacoronavirus. Transmission electron microscopy Cell cultures that confirmed cytopathic outcomes have been examined for the viral particles the usage of transmission electron microscopy. Cells had been amassed from the subculture by means of centrifugation at 1,000g for 10 min, and constant originally with 2.5% glutaraldehyde answer at 4 °C for four h, and once more with 1% osmium tetroxide. They have been dehydrated with graded ethanol and embedded with PON812 resin. Sections (80 nm in thickness) had been reducing from the resin block and stained with uranyl acetate and lead citrate sequentially. The terribly stained grids and ultrathin sections have been found below an HT7800 transmission electron microscope (Hitachi).

Serological take a look at Plasma samples from eight Malayan pangolins had been examined for anti-SARS-CoV-2 antibodies the usage of a double-antigen ELISA package for the detection of antibodies towards SARS-CoV-2 via Hotgen, following manufacturer-recommended procedures. The assay was once designed for the detection of each IgG and IgM antibodies towards SARS-CoV-2 in people and animals and marketed as a supplementary diagnostic device for COVID-19. It makes use of the seize of antibodies towards SARS-CoV-2 through the S1 antigen pre-coated



on ELISA plates and the detection of the antibodies via the use of horseradish peroxidase-conjugated RBD. Both the S1 antigen and RBD fragment have been expressed in eukaryotic cells. Data generated by means of the take a look at developers has proven a 95% detection fee in the evaluation of sera from over 200 sufferers with COVID-19s.

The assay has an inter-test variant of  $\leq 15\%$ , and no cross-reactivities with sera or plasma from sufferers advantageous for SARS-CoV, frequent and avian influenza viruses, mycoplasma and chlamydia. Fifty microlitres of plasma used to be analyzed in duplicate, collectively with two terrible controls and one advantageous control. The response was once examined on a Synergy HTX Multi-Mode Microplate Reader (BioTek) at 450/630 nm, with optical density (OD) values being calculated. The cut-off OD price for positivity was once 0.105 + suggest OD from the terrible controls, and the cut-off fee for OD for the advantageous manage used to be set at  $\geq 0.5$ . Positive samples had been examined once more with serial-diluted plasma. Metagenomic sequencing The lung tissue used to be homogenized via vortex with silica beads in 1 ml of phosphate-buffered saline. The homogenate used to be centrifuged at 10,000g for 5 min, with the supernatant being filtered via a 0.45- $\mu\text{m}$  filter (Merck Millipore) to get rid of massive particles. The filtrate or virus tradition supernatant was once used in RNA extraction with the QIAamp Viral RNA Mini Kit. cDNA used to be synthesized from the extracted RNA the usage of PrimeScriptScript II reverse transcriptase (Takara) and random primers, and amplified the use of Klenow Fragment (New England Biolabs). Sequencing libraries had been organized with NEBNext Ultra DNA Library Prep Kit for Illumina (New England Biolabs), and sequenced paired-end (150-bp) on an Illumina NovaSeq 6000. Specific PCR assays had been used to fill genome sequence gaps, the usage of primers designed primarily based on sequences flanking the gap.

Molecular simulation of interactions between RBD and ACE2 The interplay between the RBD of the S protein of SARS-related coronavirus and the ACE2 of humans, civets, and pangolins were once examined the usage of molecular dynamic simulation. The crystal shape of the SARS-CoV RBD area binding to human ACE2 protein complicated used to be downloaded from Protein Data Bank (PDB code 2AJF27). The buildings of the complexes shaped by way of ACE2 of civets or pangolins and the RBD of SARS-CoV-2, RaTG13, and pangolin-CoV have been made the usage of the MODELLER program<sup>28</sup> and superimposed with the template (PDB code 2AJF).

## CLINICAL MANIFESTATIONS

The most frequent signs and symptoms at sickness onset are fever (99%), fatigue (70%), dry cough (60%), myalgia (44%), and dyspnoea<sup>26,27,46</sup>. Less frequent signs are headache, dizziness, diarrhea, nausea, and vomiting<sup>47</sup>. Symptoms such as pharyngeal pain, dyspnoea, dizziness, stomach ache, and anorexia are greater probable to be current in sufferers with extreme illnesses<sup>27</sup>. In addition, sufferers who are elderly, have underlying co-morbidities which include hypertension, diabetes, cardiovascular sickness, and cerebrovascular sickness are greater in all likelihood to have negative outcomes. The most frequent laboratory abnormalities amongst sufferers hospitalized with COVID-19 are marked lymphopenia, extended prothrombin time, multiplied lactate dehydrogenase, and accelerated D-dimer.

These laboratory abnormalities are comparable to the ones viewed in SARS-CoV and MERS-CoV infections. Bilateral patchy shadows and ground-glass opacities are viewed on chest imaging. The most frequent problems of COVID-19 are acute respiratory misery syndrome, arrhythmias, acute cardiac injury, shock, and acute kidney injury<sup>47-49</sup>. The in-hospital transmission of the virus is very excessive with fees as excessive as forty percent. Of the hospitalized patients, the mortality



price is around 4-5 per cent<sup>47-49</sup>. There is ample descriptive proof in the posted literature to improve a whole scientific image of the disease. However, there is a want for deliberate constructions for offering multidisciplinary care in an integrated, single-service area. Further, designing and constructing these isolation wards, the usage of humane and beneficial esthetics, is additionally an integral step in empowering fitness structures to mount an ample response to the surge in cases.

Diagnosis Patients who fulfill scientific case definition and are epidemiologically linked to a history of the tour from the town of Wuhan in the remaining 14 days, or have come in contact with reverse transcription (RT)-PCR proven case or with an affected person who is underneath investigation for SARS-COV-2 inside the equal period, are regarded to be struggling from COVID-19<sup>50</sup>. As the asymptomatic transmission of the virus has been established<sup>51,52</sup>, men and women with epidemiological danger publicity have to exercise strict adherence to preferred precautions and manipulate of contact-based transmission. Preferred scientific samples for setting up the laboratory affirmation of a suspected case consist of nasopharyngeal and oropharyngeal swabs gathered the use of Dacron swabs, expectorated sputum, BAL fluid, endotracheal aspirate, and tissue. The medical pattern is to be accumulated in a sterile container with everyday saline which covers the sample; serum samples are gathered in pairs in pink cap vials (plain vials) with clot activators throughout each the acute segment and the convalescent segment of the illness<sup>53</sup>. For the transportation of samples to the laboratory, the swabs have to be positioned in a commercially handy viral transport medium. The recommendations propose the triple packaging of the sample<sup>54</sup>.

Appropriately filling the laboratory request shape is fundamental as soon as a medical pattern is gathered from a suspected patient. Information involving the patient's demographic details, date, time, and anatomical web page of the pattern collection, checks required and the medical history, symptoms, and danger elements want to be stated to mitigate dangers of transmission if the pattern turns out to be positive. The pattern bundle ought to be labeled with UN3373 for Category B Biological Substances<sup>55</sup>. The receiving facility ought to be knowledgeable formerly about the case and the transport of the sample.

The WHO recommends that the way of life of the virus ought to be performed in a BSL-3 laboratory and the RT-PCR be accomplished in a BSL-2 laboratory<sup>53,56</sup>. While dealing with specimens of SARS-COV-2, one needs to make certain that neither the sample nor the HCW is contaminated to reduce any dangers and to make certain accuracy of diagnosis. Isolation of SARS-COV-2 can be finished in cell traces and the analysis has to be proven via RT-PCR. Charité Berlin, from Germany, was once the first to boost the assay and standardize the protocol for actual time RT-PCR<sup>57</sup>. The take a look at detects the presence of three genes- E, RdRp, and N. This is performed in a step-wise process, with the three genes examined in sequence solely if the one earlier than is positive. In laboratory-confirmed case of COVID-19, two samples gathered from anatomically awesome web sites or two samples accumulated from the equal web site all through two extraordinary days of illness, are fantastic in two exclusive assays or on repeat PCR<sup>58</sup>. The seroconversion of the disorder is viewed via the detection of antibodies in convalescent section serum after terrible end results in acute section serum pattern or a four-fold upward thrust in antibody titers between the acute and convalescent phases. Seroconversion can be proven by means of ELISA or oblique fluorescent antibody check (IFA)<sup>59</sup>.



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## Prevention of Transmission SARS-Cov-2

SARS-CoV-2 spreads by means of respiratory droplets and bodily contact. It is quintessential to exercise precautionary measures to forestall transmission. Standard precautions consist of hand hygiene, use of private protecting gear (PPE), and respiratory and cough etiquettes. Hand hygiene needs to be completed with alcohol-based hand rubs (ABHRs) containing 60-80 percent ethanol. Hand washing following the right steps with cleaning soap and water must suffice. Cloth towels must be averted for drying fingers and disposable tissue papers must be preferred. PPE consists of the clinical masks or particulate respirators, face shields or goggles, gowns, gloves, and shoe covers<sup>60,61</sup>. For droplet and contact-based transmission, clinical masks or process masks with head straps ought to suffice. This ought to be worn earlier than coming into the affected person's vicinity and have to be taken off solely after leaving the same. It is obligatory for folks in the neighborhood settings who are symptomatic, the sufferers who are in domestic care setups and suspected instances of COVID-19 with slight respiratory signs and symptoms and healthcare employees (due to their multiplied chance of exposure) want to put on scientific masks at all instances observed by using hand hygiene and right disposal<sup>61</sup>.

Particulate respirators (NIOSH-certified N95, EU popular FFP2, or equivalent) need to be used with the aid of HCWs worried in aerosol-generating techniques (AGPs). Face shields/goggles are to be used by using all HCWs whilst performing AGPs. Long-sleeved, sterile, water-resistant gowns, made of non-absorbable substances are to be worn. When robes are no longer available, water-resistant aprons have to be used. Powder-free, latex gloves need to be worn while coping with contaminated patient's material. This must now not be viewed as a substitute for hand hygiene. Shoe covers need to additionally be used in healthcare settings to stop the infection of clothes. Respiratory and cough etiquettes have to be adhered to masking the nostril and mouth whilst sneezing and coughing, the use of disposable tissue paper as a substitute for cotton cloth, and if nothing else is available, the use of the flexed elbow, accompanied by using excellent hand hygiene. Symptomatic sufferers in the neighborhood settings have to be discouraged from congregating in public or crowded areas. Information, schooling and verbal exchange (IEC) messages have to motivate self-deferral and self-containment for sufferers who are symptomatic. For domestic care, sufferers must be positioned in a well-ventilated room. In healthcare settings, the affected person has to be positioned in a poor stress room.

## Approaches to Anti-Cov Drug Screening.

Coronavirus replication and pathogenesis ACE2, determined in the decrease respiratory tract of humans, is recognized as a mobile receptor for SARS-CoV [27] and regulates each of the cross-species and human-to-human transmission [28]. Isolated from the bronchoalveolar lavage fluid (BALF) of a COVID-19 patient, Zhou et al. [8] have demonstrated that the SARS-CoV-2 makes use of the identical mobile entry receptor, ACE2, as SARS-CoV. The virion S-glycoprotein on the floor of coronavirus can connect to the receptor, ACE2 on the floor of human cells [29]. S glycoprotein consists of two subunits, S1 and S2 [30]. S1 determines the virus-host vary and cell tropism with the key characteristic area – RBD, whilst S2 mediates virus-cell membrane fusion by way of two tandem domains, heptad repeats 1 (HR1) [31] and HR2 [32]. After membrane fusion, the viral genome RNA is launched into the cytoplasm, and the uncoated RNA interprets two polyproteins, pp1a and pp1ab [33], which encode non-structural proteins, and structure replication-transcription complicated (RTC) in double-membrane vesicle [34]. Continuously RTC replicates and synthesizes a nested set of subgenomic RNAs [35], which encode accent proteins and structural proteins. Mediating endoplasmic reticulum (ER) and Golgi [36], newly fashioned



genomic RNA, nucleocapsid proteins and envelope glycoproteins gather and structure Viral particle buds. the virion-containing vesicles fuse with the plasma membrane to launch the virus. Because the binding of SARS-CoV-2 Spike (S) glycoprotein and ACE2 receptor is a crucial step for virus entry, virus-receptor binding affinity is below intensive find out about via exclusive approaches. Systematic detection of  $\beta$ -CoV receptors confirmed that human cells expressing ACE2, however now not human Dipeptidyl peptidase-4 (DPP4) or APN (Aminopeptidase N), had been the superior entry of SARS-CoV-2 [37].

While, some others find out about confirmed that S protein and ACE2 binding effectivity is 10- to 20- fold greater than that of SARS-CoV, evidenced by using Cryo-EM Structure of the SARS-CoV-2 Spike in the prefusion conformation [38]. For SARS-CoV, the cleavage of trimer S protein is brought about by using the phone surface-associated transmembrane protease serine two (TMPRSS2) [39] and cathepsin [40], whilst the viable molecules facilitated membrane invagination for SARS-CoV-2 endocytosis are nonetheless unclear. Up to the date this evaluate paper was once prepared, reviews confirmed that the SARS-CoV-2 may additionally easily transmit, whilst reason much less serious human contamination instead than human SARS-CoV. Based on the modern-day WHO report, the variety of contaminated humans (over 80,000 globally, up to date on 1 March 2020). The international outbreak may additionally due to the following factors: firstly, unknown pneumonia outbreak at the time of China Spring Festival, when the mass populace flowing. Secondly, greater specific molecular mechanisms of viral binding and entry manners anticipate to be elucidated, which may additionally abate the improvement of centered therapy. Thirdly, reachable facts cautioned that the SARS-CoV-2 may additionally be much less virulent than the SARS-CoV and MERS-CoV, with the presently analyzed mortality of COVID-19 is 3.4%, decrease than the loss of life charge of SARS (9.6%) and MERS (around 35%), respectively [19]. Thus, the plausible mechanisms for human-to-human transmission and pathogenic mechanisms of the SARS-CoV-2 are underneath significantly studied.

**Diagnostic standards** The viral lookup organization in China has carried out preliminary identification of the SARS-CoV-2 thru the classical Koch's postulates and gazing its morphology via electron microscopy [49]. So far, the golden medical analysis approach of COVID-19 is nucleic acid detection in the nasal and throat swab sampling or different respiratory tract samplings by way of real-time PCR and similarly demonstrated by means of next-generation sequencing.

### **Results Expression of SARS-Cov-2 S Protein.**

To decorate expression of the S protein of SARS-CoV-2 in mammalian cells, a codon-optimized cDNA encoding the S protein and 3xFLAG tag was once synthesized, and to facilitate incorporation of S protein into lentiviral pseudovirions, the remaining 19 amino acids containing an endoplasmic reticulum (ER)-retention sign from the cytoplasmic tail of the S protein used to be eliminated (Fig. 1a). The assemble was once named SARS-CoV-2 S. HEK293T cells have been transfected with SARS-CoV-2 S plasmid and expression of SARS-CoV-2 S protein was once decided via western blot. There had been two main bands, 180kDa, and 90kDa, detected by way of mouse anti-FLAG M2 antibody (Fig. 1b, lane 2), reflecting the full-length and cleaved S proteins, respectively. The band above 250kDa probably consequences from dimeric or trimeric S proteins. Consistent with our preceding report<sup>29</sup>, MERS-CoV S protein used to be detected by way of polyclonal goat anti-MHV S antibodies AO4 (Fig. 1c). AO4 additionally detected SARS-CoV-2 and SARS-CoV S proteins, suggesting the presence of a conserved immunogenic epitope amongst all 4 special CoVs. This most likely linear epitope is in all likelihood in S229. S1



subunits of SARS-CoV-2 and SARS-CoV share nearly 64% in amino acid identities. Nevertheless, SARS-CoV-2 S protein used to be barely detected by way of rabbit polyclonal anti-SARS S1 antibodies T62 (Fig. 1d), suggesting that the principal epitope(s) for T62 antibodies consist of nonconserved areas of S1. The SARS-CoV-2 S protein was once now not detected by way of both a monoclonal anti-SARS S1 antibody (Fig. 1e) or anti-MERS S2 antibody (Fig. 1f). Pseudovirion incorporation of SARS-CoV-2 S protein. The efficiency of SARS-CoV-2 S protein incorporation into pseudovirions was once evaluated the use of monoclonal mouse anti-FLAG M2 antibody and polyclonal goat anti-MHV S antibody AO4. While the majority of SARS-CoV S proteins integrated into pseudovirions have been full-length, at 180kDa (Fig. 1h, i), most of SARS-CoV-2 S proteins on lentiviral pseudovirions had been cleaved, about 90kDa (Fig. 1g, h), in all likelihood reflecting presence of more furin web site (R682R683-A684-R685, Fig. 1a) between S1 and S2 in SARS-CoV-2 S protein. Consistent with the effects in telephone lysate (Fig. 1d), SARS-CoV S protein, however now not SARS-CoV-2 S protein, in pseudovirions used to be with no trouble detected through the usage of polyclonal rabbit anti-SARS S1 antibodies T62.

## CONCLUSIONS

The outbreak of COVID-19 swept throughout China swiftly and has unfolded to eighty-five countries/territories/areas outdoor of China as of 5 March 2020 [2]. Scientists have made growth in the characterization of the novel coronavirus and are working notably on the remedies and vaccines in opposition to the virus. We have summarized the contemporary understanding of SARS-CoV-2 as follows: Firstly, rising pneumonia, COVID-19, brought about by way of SARS-CoV-2, famous robust infectivity however much less virulence, in contrast to SARS and MERS, in phrases of morbidity and mortality. Nowadays corona infection goes to increase. On the immunity bases who have diseases like diabetes, blood pressure so they having weak immunity, and covid caught very fast by those peoples. SARS is not yet to be in control form and no vaccine is there for SARS.

## DISCUSSION

About 70% of the rising pathogens infecting people originate from animals, and CoVs are amongst the forefronts of these pathogens<sup>45</sup>. The newly emerged SARS-CoV-2 infects human and reasons extreme pneumonia, and as of 10 February 2020, the present-day outbreak has unfolded to 25 nations with over 40,000 confirmed cases and 900 deaths<sup>46</sup>. However, little is acknowledged about its biology. Since the viruses classified as a biosafety degree three (BSL3) agent, in accordance with WHO guidelines, we developed a pseudotype gadget with S protein of SARS-CoV-2 to learn about virus entry in BSL2 settings. Understanding how SARS-CoV-2 enters the phone will supply treasured records for virus pathogenesis, vaccine design, and drug target. Now ICMR and Bharat Biotech working on vaccine for SARS CoV virus, the clinical trial is going on by both this organization. If it will successfully worked then it will launch soon. Hope it will become soon and will work for covid disease.

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## A STUDY OF THE HISTORY OF INDIA AS PART OF THE HISTORY OF THE WORLD

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### Abstract

The model of periodization that is nowadays hegemonic in Indian history, squarely based on the colonial model first articulated by James Mill, is both heuristically unsatisfactory and politically dangerous. From a heuristic viewpoint, it refers only to the 'religious' composition of the 'ruling class' (and, by the way, not even the whole of the ruling class). From a political viewpoint, it stresses the divisive elements present in the Indian historical tradition, by implicitly equating 'Hindu' with 'Indian' and 'Muslim' with 'invader/foreigner'. The present article aims at sketching out a scientifically more inclusive and politically less dangerous new model by building on the assumption that Indian history is part of world history and, consequently, that the main socio-economic developments in the Indian subcontinent are part and parcel of the most relevant socio-economic developments world-wide. The resulting model de-emphasizes the divisive elements of the Indian experience, represented by the separate religious strands historically present within the Indian society, and, by focusing on socio-economic evolution, makes obvious both the fundamental unity of Indian history and its relationship with the history of the remainder of the world.

**Keywords:** Periodization, Indian History, World History, Grand Narratives.

### INTRODUCTION

In the past decades the possibility of 'grand narratives', aimed at explaining history in its totality, has been put in doubt. Personally, I think that 'grand narratives' are what gives history its meaning and make history a worthwhile enterprise. In turn, grand narratives need appropriate categories. Most particularly, the general history of a people, which is a 'grand narrative' par excellence, needs a proper periodization. But, in striving to delineate a proper periodization, we must be aware of two problems. The first is that the categories that we employ must be powerful enough to organize in a meaningful way, if not all, at least as many significant phenomena as possible. The second problem is that any category we make use of and, therefore, any periodization carries with itself its own hidden or not so hidden agenda.

If we keep these caveats in mind, it becomes immediately clear that the periodization model now hegemonic in Indian history, squarely based on colonialist categories, is both heuristically unsatisfactory and characterized by a (not so) hidden agenda that is politically dangerous. An effort must be made at building a new model, which might be both sounder from the scientific viewpoint and less dangerous from the political



standpoint. It is my contention that this is a result that can be reached by relating Indian history to world history, and viewing the history of India as part of the history of the world. Accordingly, in the remainder of this article, I will start by dwelling both on the colonialist roots of the periodization nowadays prevailing, and on the reasons why such a periodization should be discarded. From there I will move on to discuss the relationship between world history and Indian history. In so doing, I will sketch out a new model of periodization, with the explicit aim to make it scientifically more inclusive and politically less dangerous than the old model.

## **THE WORLD HISTORY**

### **The Ancient Era**

The ancient era can be seen as included between the ninth millennium BC and the late fifth or early sixth century CE. It begins with the agricultural revolution, which made possible the development of the first civilizations created by settled populations. Between the late sixth millennium BC and the middle of the first millennium BC all the major civilizations Western, Middle Eastern, Indian, Chinese took shape. Following Mc Neill, I will call the sum of the civilizations created by settled populations 'Ecumene'.

Since the rise of the first civilizations and up to the eighteenth century CE, a main dynamic of world history was represented by the interaction between the Ecumene and the nomadic or semi-nomadic peoples that lived either outside or in the interstices of the world inhabited by settled peoples.

During the Ancient Period, world civilizations were characterized by the fact that, although based on agrarian economies, the locus of power was represented by the cities. The cities were the loci where the agriculturally produced economic surplus was concentrated and put to use in order to support the political, intellectual, administrative and military élites and their dependents. In other words, the cities were not only the centres of political and military power, but also the residence of literate classes, which means that the cities were the centres of elaboration of high culture. Moreover cities were important economic centres, as it was in the cities that part of the agriculturally produced surplus was transformed into manufactured goods. These were partly consumed by the urban population, particularly the élites, and partly channeled into long-distance trade. Of course, this was made possible by the existence of intermediate social strata of merchants, financiers and artisans, and presupposed a flourishing monetary economy.

In sum, during the Ancient Era, in the Ecumene namely in the geographical spaces inhabited by settled populations' cities dominated the countryside economically and politically and were the mainstays of the existing kingdoms and empires.

The World System created in the period beginning with the first century reached its apex during the first two centuries of the Christian era. Then, beginning with the third century, a process of decline began in different parts of the civilized world. The reasons for this phenomenon are not completely clear, but plague and attacks from nomadic peoples loom large among the possible explanations. Moreover, in a world where long-distance trade played an important economic role, it makes sense to assume that the economic collapse of certain parts of the Ecumene must have had a negative impact on the remainder of it.

### **The Medieval Era**



The downward trend that set in during the third century CE manifested itself through the interlinked and intertwined processes of de-urbanization, decline and collapse of long-distance trade, and shrinking and quasi-disappearance of the monetary economy. By the late fifth and the early sixth centuries, this process became so pronounced that it is safe to claim that those decades marked the end of the Ancient Era. A new era did start, which was bound to last up to a period encompassing the fifteenth and sixteenth centuries (the exact moment is different in the various parts of the Ecumene). This period which, following the prevalent Western periodization, may be called the Medieval Era, was characterized by the localization in the countryside of both political power and economic activities. As long-distance trade dramatically shrunk and, in some parts of the Ecumene, almost disappeared, the surviving civilizations lost most of those economic and cultural connections that had previously united them. Of course, it is true that, in some parts of the world, big cities and long-distance trade did not disappear completely. However, these cases were indeed exceptions, which cannot change the general picture in any significant way.

After a first phase, the Medieval Era saw the emergence of a countertendency to the prevailing process of localization of both the political power and the economy. This counter-tendency started to manifest itself in the seventh century, with the rise of an Islamic world system centred in the Middle East but stretching to North Africa and Spain in the West, and Central Asia and the Indus Valley in the East. Among the characteristics of this Islamic world systems were: the growth of new cities, the concentration of political and economic power in these cities, the flourishing of long-distance trade and the rise of a new monetary economy.

All the above amounted to a process that saw the shifting of the locus of the political and economic power from the countryside back to the cities, most particularly those that became the capitals either of centralizing kingdoms or new small but wealthy states where as in Italy and in the Low Countries the political power was in the hands of a rising merchant class. However, beginning with the 1320s, this process was brought to a sudden halt by a pandemic plague and a series of agrarian crises that hit some of the historically most productive agricultural areas of the Ecumene. As a consequence, this period the central part of the Middle Age reached its end. The final part of the Middle Age set during the second half of the fourteenth century and was characterized by the loss of political and economic power of the cities and the shift back to the countryside of much of it. In other words, the closing of the Middle Age saw the reassertion of many of the social and economic features that had characterized its beginning.

## THE EARLY MODERN AGE

In the early fifteenth century, the consequences of the plague and the agrarian crises were on wane. Once again economic and demographic growth reasserted themselves. The clearest symptom of the turning of the tide is represented by the launching of two ambitious programmes of geographical reconnaissance at the two extremes of the Ecumene, in Portugal and China.<sup>16</sup> The Chinese effort was abandoned soon enough, but



the Portuguese endeavour continued for the whole century and beyond. It was causal in spawning first the Spanish discovery of the Americas and, as a consequence, the Dutch, English and French enterprises both in the Atlantic and the Indian Ocean. The result of all this was both the opening of the new high-sea routes and, eventually, the European conquest and colonization of the American continent. For a variety of reasons economic, political, cultural this last development was a very significant one, both for Europe and the world at large. Accordingly, Columbus's arrival in the New Continent in 1492 can be maintained as a highly symbolic dividing point between the Middle Age and the Early Modern Age.

As summed by John Richards, the characteristics of the Early Modern Age are as follows:-

1. The continuous growth of the world population (in spite of the demographic catastrophe in the Americas, directly or indirectly caused by the European conquest);
2. The recreation in the fifteenth century of a world system that, in the sixteenth, grew to include the Americas;
3. The development of new military technologies, based on the utilization of increasingly efficient firearms; and, as a consequence of the spreading of efficient firearms,
4. The rolling back of external and internal frontiers, and, last but certainly not the least,
5. a new and this time unstoppable process of centralization of the state power.

According to many, the period starting with the European discoveries is characterized by the worldwide rise of European hegemony. In my opinion, however, Andre Gunder Frank and Robert Marks, among others, have challenged this assumption in a very effective way, showing that China and India had economies that were more advanced than the contemporary European economies.<sup>18</sup> In fact, till the eve of the first Opium war, the standard of living of the average Chinese was well superior to the standard of living of the average European. Moreover, few doubts are possible about the fact that the Chinese polity, in the eighteenth century, was more efficient than anything existing in Europe, which significantly enough was clearly understood by most of the main representatives of the European Enlightenment. Summing up, once all the above is taken into account, it is difficult to accept the idea that the sixteenth century was the starting point of a worldwide European hegemony. As it shall be argued in the following section, European hegemony on the rest of the world and, most particularly, on Asia came to be established only in the period encompassing the closing decades of the eighteenth century (the retreat of the Ottoman Empire in the face of the Russian onslaught, sanctioned by the treaty of Kucuk Kaynarca in 1774) and the fifth decade of the nineteenth century (the first Opium War, 1839-42).

### **THE LATE MODERN AGE**

What we can define as the Late Modern Age and is usually categorized as the modern age tout court is habitually seen as starting with both or either of the following developments:



1. The fulfillment of the Industrial Revolution in England, in the second half of the eighteenth century;
2. The French Revolution (late eighteenth century) and his Napoleonic sequel (early nineteenth century).

Whereas I am fully aware of the pivotal importance of both developments, I think that they must be put in a wider perspective. This wider perspective is given by the fact that the European states did begin to impose their hegemony on Asia before either developments, and independently from them. In fact, some of the European states that were starting to extend their political and economic hegemony on parts of Asia or the European parts of a non-European power as the Ottoman Empire not only did that before either the fulfillment of the Industrial Revolution or the playing out of the French revolution, but also were never on the forefront of the developments started by either revolutions. This is certainly the case with both Russia which conquered a huge part of Asia and overawed both the Ottoman and Iranian empires as well as Austria, which occupied a considerable swath of the European part of the Ottoman Empire.

Taking all the above into account, my contention is that the Late Modern Age started with the imposition of the political and military hegemony of the West on the remainder of the World. Accordingly, we could legitimately define it as the age of Western hegemony. In turn, the rise of Western hegemony is a process that began in the period encompassing the late eighteenth and the early nineteenth centuries, with the rolling back of the Ottoman Empire in Europe, the temporary French conquest of Egypt, and the imposition of British hegemony in the Indian subcontinent (with the third Mysorean war, 1799 and the second Maratha war, 1803–06).

It is worth stressing that the rise of Western hegemony was not the by-product of any superiority acquired by the Europeans, thanks to the results of either the Industrial or the French revolutions, but the consequence of the new way of war, which, in turn, was not the result of superior weaponry but of superior organization. As shown by O'Connell, this was based on a methodical and brutal form of training, which transformed individual soldiers into human automata, who would fight according to a pre-established sequence of movements in all circumstances and on any terrain. Originally conceived in the late sixteenth century by Maurice of Nassau, Prince of Orange and Stand holder of Holland, during the eighteenth century this new system was adopted by all the main European armies, becoming even more lethal with the introduction of the bayonet, and the subsequent removal of the need to integrate detachments of pike-men and halberdiers into infantry formations with the function of protecting the fusiliers from assaults made from close quarters. In this way European infantry troops acquired such a flexibility of man oeuvre and such an ability to maintain a constant volume of fire that they became practically invincible in head-on clashes with armies such as the Asian ones, which lacked the same type of organization. It was at that point that the rolling back of the Turkish Empire in Europe and the European conquest of India began in earnest.



During the nineteenth century, Western hegemony, primarily grounded in the previous century in this superior military organization (an organization which, anyway, was not impossible to replicate) was to be made seemingly unbreakable by the advantages that the Industrial and French revolutions gave to the Westerners.

Western hegemony brought about, for the first time in history, the creation of a world system that was distinctly different from all the previous world systems. In fact the new world system that came into being at the turning of the eighteenth century was characterized by two novelties:

1. It coincided with the world;
2. It was hierarchically organized around a dominant centre.

Bearing all this in mind, we can subdivide the Late Modern Age or the age of Western dominance in phases that are characterized by the fact that the locus of power, although residing in the West, shifted in time from one area to another within it.

**Accordingly we can divide the period in three phases:**

1. The one from the second half of the eighteenth century up to the Second World War included, characterized by world hegemony exercised by a few European powers, to which, in the late nineteenth century and early twentieth century, first the USA and later Japan went on to add themselves;
2. The one from the end of the Second World War up to the dissolution of the Soviet Union in 1991, characterized by the world hegemony exercised by the USA and the USSR;
3. The one characterized by the world hegemony exercised by the USA, namely a situation still prevailing at the moment when these lines are written, but which, increasingly, seems to be destined to draw to its end in a not too distant future.

**THE RELEVANCE OF THE PERIODIZATION OF WORLD HISTORY FOR INDIAN HISTORY**

If Indian history is part of the world history, then the same trends that were and are apparent worldwide which have been sketched above should be present and relevant in the Indian subcontinent, more or less at the same time of their appearance in Europe or in other parts of the Ecumene. This is what I shall try to prove in the following sections.

**THE ANCIENT ERA**

In the period from the agricultural revolution up to the turning of the fifth century CE the socio-economic features that characterize the history of the subcontinent are much the same as those sketched in the previous part of this article. In fact, from the rise of the Indus Valley Civilization around 2600 BC, Indian history can be seen as characterized by the growth of an ever-expanding urban civilization. Thanks to archaeology, we do know now that urban civilization in India did not disappear with the collapse of the Indus Civilization around 1500 BC. Other urban civilizations were contemporaneous to or followed the Indus Civilization, so that the latter collapse



although important can be considered as a temporary setback in the development of the urban world in India. By Maurya time (circa 317-185 BC), Indian cities although technically less advanced than the Indus Civilization cities were bigger and present on a much wider part of the Indian subcontinent.

Archaeology has also shown that during the period of the Indus Valley Civilization the subcontinent was already tied to the Middle East by trade. During the Maurya time the interconnections between India and the outside world did intensify, while in India there was the building of a complex network of new roads. The development of the urban world and the construction of an ever-expanding road system did continue after the disappearance of the Maurya Empire. During the first century BC the Silk Road in Central Asia was opened and the Indian subcontinent became related to it. During the first century CE, high sea voyages both between the Red Sea and the West Coast of India and between the East Coast of India and the Malacca straits became common.

### THE MEDIEVAL ERA

With the sixth century the downward trend that had already become apparent during the Gupta 'Golden Age' reached its lowest point. At the time the localization in the countryside of both the economy and the political power became the dominant feature of the age. By that time, most of the cities had disappeared in much of the subcontinent and those still surviving were either religious centres or military headquarters. As in the case of the abbeys in Europe, temples become the main centre of political and economic power. Monetary circulation almost disappeared and, symptomatically, most of the surviving coins, unearthed by archaeology, are high-value gold coins. Clearly, they were minted less for economic than for political reasons, namely to be given by the monarchs to the magnates of the age. Most trade was localized trade and barter had a main role in making it possible.

In India as in the remainder of the Ecumene, in due time a counter-tendency to the situation of localization in the countryside of both the political power and the economy asserted itself. Indeed, the new phase became apparent with the rise and consolidation of the Delhi sultanate in the thirteenth century. The mainstays of the sultanate were a number of new cities, which were the residence of the new Islamic ruling class, their servants and the service categories that catered to their needs.<sup>31</sup> A massive trade with the Middle East became an important feature of the economy of the Sultanate. In a region like the Indian subcontinent, where for climatic reasons it was not easy to breed vigorous horses, this trade was started and carried out in order to get the warhorses necessary to cope with the Mongol invasions.<sup>32</sup> An economy characterized by the expansion and importance of the urban sector and the existence of significant currents of long-distance trade made possible the shifting back of political power from the countryside to the main cities. From Balban (1246–1287) to Ala-ud-din Khalji (1296–1316) to Muhammad bin Tughlak (1325–1351), the story of the Delhi Sultanate can be seen as a continuous attempt at political centralization.



As a result of the failure of Muhammad bin Tughlak's policies, after his death a reaction set in and expressed itself in the decision by his successor, Firuz Shah (1351-1388) to give up the centralizing policy pursued by his predecessors. Accordingly, in what remained the most extensive Indian state of the age, the same socio-economic characteristics that had prevailed at the beginning of the Middle Age started to reassert themselves. Moreover, it can be argued that the change of policy implemented by Firuz Shah played a crucial role in weakening the Sultanate both politically and militarily. After Firuz's death, it resulted in the Sultanate's inability to cope with Timur's invasion, which brought about the sack of Delhi and the virtual destruction of the city (1398), as well as the de facto collapse of the Sultanate. Whatever power was still in the hands of the Delhi Sultans on the eve of Timur's invasion disappeared, leaving a situation in which the political and economic power had largely gone back to the localities. This situation did not change as the century progressed. Indeed, while during the fifteenth century the reborn Delhi Sultanate gradually re-brought under its over lordship most of the Indo-Gangetic Valley, it was unable to exert any kind of close-knit central control on the great nobles who continued to act as little kings in their own fiefdoms, which, in turn, included most of the geographical area encompassed by the Sultanate. Accordingly, the new Delhi Sultanate, although extensive, remained a decentralized feudal structure. Moreover, Ibrahim Lodi (r. 1517–26), the last Delhi Sultan, was forced to give up the extraction of the land revenue in cash and go back to the payments in kind.

For a long time, historians have depicted what was the other main Indian state in the fourteenth fifteenth centuries, namely the Vijayanagara Empire, as a centralized military monarchy. In the late 1980s, however, Burton Stein generally considered the foremost authority on the subject conclusively showed that even Vijayanagara was a largely decentralized political structure, whose maharadirajas were nothing more than feudal kings presiding over a set of powerful feudal lords.

### **The Early Modern Era**

During Akbar's reign (1556–1605) the land tax came to be paid in silver once again. Likewise, long-distance trade became very important once again, as shown among other things by the fact that silver itself was transported to India through trade. A number of great cities became the mainstay of the Empire. Akbar centralized the power of the state, even if this centralization was not carried to its final consequences. It was only under Akbar's third successor, Aurangzeb (1658–1707), that territorial over-extension which began with the invasion of the Deccan in 1681 plus the fact that the process of centralization of state power had been left unfinished by Akbar and his successors were among the main causes that, in the following century, triggered the process that was to end up in the break up of the Mughal Empire. By the 1720s the Empire had become a kind of loose federation of de facto independent provinces, over which the imperial paramountcy was purely nominal.



Moreover, large swathes of the subcontinent had passed under the sway of the Marathas. Like the contemporary Mughal Empire, the Maratha dominions were not a unified imperial structure, but a loose confederation of de facto independent monarchies.

Up to a few decades ago, this and the fact that the various Indian states were continuously at war with one another resulted in the historians characterizing the eighteenth century as an age of 'decadence and depravity' or, to put it in less emotional terms, a dark period of political and military anarchy (providentially interrupted by the rise of the colonial power), plus economic collapse. However, recent scholarship has conclusively shown that the two main features of the century were: (a) that many of the Indian states emerging in the eighteenth century did have a degree of centralization well superior to the one that had characterized the Mughal Empire; (b) that, in spite of the fact that some parts of India, including the symbolically and politically important area of Delhi, were devastated by war, on the whole the economy of India showed itself to be extremely resilient. Even areas, for example in the Deccan, which had been devastated by war showed the capability to bounce back. Still on the eve of colonial conquest, most of India was characterized by a flourishing economy. Monetary circulation was increasing, rather than decreasing, and long-distance trade remained important. In the eighteenth century, India consolidated its position as the most important exporter worldwide of finished and semi-finished cotton and cotton-mixed-with-silk textiles. In turn this presupposed a complex economic and financial organization.

## THE LATE MODERN ERA

The beginning of the late Modern Era coincides with the establishing of the colonial hegemony, namely with the destruction first of Tipu Sultan (Anglo-Mysorean war of 1799) and, soon afterwards, of Maratha power (Anglo-Maratha war of 1803-1805).<sup>43</sup> We now know that colonial hegemony, far from being a blessing for India as claimed by colonial historians put an end to the political and economic developments of the eighteenth century and brought about a series of adverse economic developments: monetary circulation declined; economic depression set in; long-distance trade changed in nature and was politically manipulated in such a way to cause a net export of wealth from India to Great Britain. Summing up, differently from what was the case in the West, in India as in China the beginning of the Late Modern Era was characterized by a process of de-development. In turn, this process of development was the natural result of the kind of world system that had emerged at the turn from the early to the late modern era. This new system, as already recalled, was characterized by the fact that, for the first time in history, a well-defined geographical and geopolitical area was militarily and, therefore, politically and economically dominant on the remainder of the globe. This situation contributes to explain why, while the West grew, the Rest declined. Of course, as in history nothing is permanent, in India counter-tendencies had already started setting in at the end of the nineteenth century and became increasingly visible and relevant beginning with the First World War. But, in India (as in China), the turning point came only after the collapse of European power in Asia, following the Second World War, and the rise of the bipolar world. That was the time when India was finally able to get out of the situation of economic stagnation that had characterized the first



half of the twentieth century, embarking on a period of growth that, beginning with the early 1980s, became increasingly fast. In turn, it is this growth that together with that of China is prefiguring the coming into being of a new international order, where, as in the pre-colonial era, the most advanced countries in the world will be in Asia and, maybe more importantly, no single area of the globe will be in a position of hegemony vis-à-vis the rest. At that point, what we call the Modern Era will come to its end and historians and intellectuals will have to create a new terminology. Although that moment is not so far away, it is far away enough to allow us to close at this point our discussion on periodization in both world history and Indian history.

## CONCLUSION

The above-proposed periodization has, of course, its strength and its weakness. What, in my opinion, makes it much more satisfactory than the traditional periodization is the fact that it takes into account both the economic structure and the general political evolution, rather than focussing narrowly on the religious composition of the upper crust of the ruling class. In doing so, the proposed analytical model focuses both on the fundamental unity of Indian history and on the basic unity tying the Indian to the world experience. On the other hand, this model de-emphasizes the divisive elements of the Indian experience, represented by the separate religious strands historically present within the Indian society. Clearly, the not-so-hidden agenda behind this model is one that, on the one hand, emphasizes the basic unity of humankind and the equal worth and dignity of the several peoples in which it is structured, and, on the other hand, de-emphasizes the importance of religion as a divisive factor. Once this is said, the obvious objection that can be made to this model is that it has been built without any serious effort at integrating cultural and religious factors in it. Here the relevant questions become: Is there a cultural unity characterizing the various eras as they have been defined in the above model? And, if a cultural unity does not exist, is the proposed periodization acceptable? Shouldn't we strive to build a new periodization based not only on socio-economic and political factors but cultural and religious factors as well? All these are very important questions, which deserve proper answers. Personally, I am convinced that the above-proposed periodization can be refined and shown to be relevant at the religious and cultural levels as well. But, no doubt, additional research on this topic is needed, which will have to be carried out by scholars both in possession of the relevant analytical tools for an in-depth examination of the cultural history of India and with a wide enough vision to be able to compare and relate the cultural to the socio-economic and political history both of India and the world at large. And this is a task that the author of these lines willingly leaves to others.

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## DESIGN AND ANALYSIS OF VALVE USING BI METAL FOR OPEN AND CLOSED OPTIMAL CONDITIONS

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**Abstract**—The valves used in the IC engines are of three types: Poppet or mushroom valve or Sleeve valve or Rotary valve. Of these three types, Poppet valve is most commonly used. Since both the inlet and exhaust valves are subjected to high temperatures of 500°C to 1200°C during the power stroke, therefore, it is necessary that the materials of the valves should withstand these temperatures. The temperature at the inlet valve is less compared to exhaust valve. Thus the inlet valve is generally made of nickel chromium alloy steel and exhaust valve is made of si-chrome steel. Automobile engines are usually petrol, diesel or gasoline engines.

Petrol engines are Spark Ignition engines and diesel engines are Compression Ignition engines. Blended fuels are mixtures of traditional and alternative fuels in varying percentages. Here the effect of diesel blended fuels on valve is studied by mathematical correlations applying thermal loads produced during combustion. Blended fuels are usually bio fuels blended in different percentages. Percentages vary from 10%, 15%, and 25%. Internal combustion engines produce exhaust gases at extremely high temperatures and pressures.

As these hot gases pass through the exhaust valve, temperatures of the valve, valve seat, and stem increase. To avoid any damage to the exhaust valve assembly, heat is transferred from the exhaust valve through different parts, especially the valve seat insert during the opening and closing cycle as they come into contact with each other. In this thesis, a finite-element method is used for modeling the thermal analysis of an exhaust valve.

The temperature distribution and resultant thermal fluxes are evaluated. Detailed analyses are performed to estimate the boundary conditions of an internal combustion engine. In this thesis, Catia is employed for modeling and Ansys is used for analysis of the exhaust valve.

### 1. INTRODUCTION TO VALVES

#### 1.1 VALVE TESTING DISPLACEMENT

Displacement testing was designed to monitor the position and the extremes of engine valve movement. For these experiments, an LVDT was attached to the CLE piston. Output values from the LVDT in the form of voltages were monitored using an oscilloscope. The following results were based on monitoring the oscilloscope's output and determining the voltage for both the extreme open and extreme closed position of the engine valve. The voltages were then converted

into position measurements based on the voltage vs. displacement calibration curve. From this data, the distance the valve opened and the distance the valve remained open when it was to be closed was determined. Furthermore, the difference of the two positions equals the valve stroke.

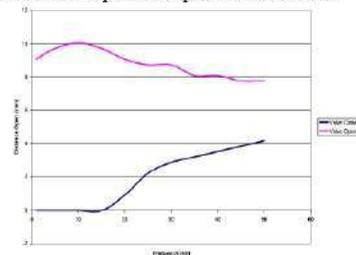


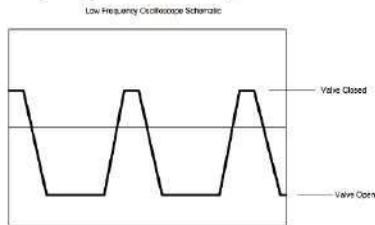
Fig.1 Valve Displacement vs. Input Frequency

The amount that the valve is open, when it is supposed to be open, decreases steadily with increasing frequencies above 14 Hz. The valve begins to remain open, when it is supposed to be shut, for frequencies above 15 Hz. The amount that the valve remains open also steadily increases with increasing frequency. The results of the changes in displacement for both the open and closed valve position. This shows that the valve stroke begins to decrease steadily for frequencies greater than 15 Hz. This experiment supports the calculated maximum frequency for maximum valve stroke. Furthermore, the valve stroke decreases at a nearly linear rate between 15 and 50 Hz. This is also in support of the calculations showing that the volumetric fluid flow  $Q_3$  remains constant, but as the number of strokes/sec increase (i.e. frequency), the compensation for limited flow is reduced valve displacement. It should be noted that all the previously discussed testing was done with a sinusoidal voltage input at  $\pm 10$  V DC with a 0 V DC offset. Other qualitative testing has demonstrated that changing from a sinusoidal wave to a square wave input dramatically affects the overall operation of the system.

#### 1.2 SPOOL VALVE CALIBRATION

After completing the flow rate and valve displacement tests outlined in the previous sections, it was observed that the spool valve position could be calibrated using the visual output from the LVDT signal. At low frequencies, when the valve remained fully open and closed for a short period of time, the time the valve was fully open could be compared to the time it was fully closed. From this observation, it was clear that the engine valve was remaining fully open much longer compared to the time

the valve was fully closed. A schematic of the oscilloscope output of the LVDT signal.

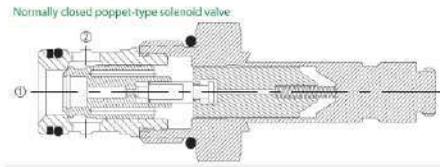


**Fig.2 Valve Closed Valve Open Low Frequency Oscilloscope Schematic** Oscilloscope Output from LVDT prior to Calibration 75 While monitoring the LVDT signal with the oscilloscope, the threaded rod controlling the position of the spool was manipulated. This process continued until the time fully closed and fully open became equal. The locknut was then tightened to secure the position of the spool. Immediately, the entire prototype showed considerable improvement. Flow testing was repeated for the output flow rate of the system.

These tests indicated a significant increase of volumetric flow rate. The output flow varied between 70 to 85 cm<sup>3</sup>/sec based on the operating temperature of the hydraulic fluid. At low operating temperatures, the displacement testing was repeated. This testing resulted in full valve displacement at 36 Hz using a sine wave input at  $\pm 10$  V DC. This value compares very favorably against the earlier results of 14 to 15 Hz. Furthermore, the values of 70 cm<sup>3</sup>/sec and 36 Hz continue to prove the relationship between output flow rate and theoretical maximum full displacement frequency. Based on the favorable results from the sine wave input, tests were repeated using a square wave input at  $\pm 10$  V DC. This voltage input results in full engine valve displacement through the entire 1 to 50 Hz operating range. It was also observed that at low frequencies, lower voltage inputs continued to produce full engine valve displacement. These recent findings indicate the system is operating at greater capacity and upholds the theory that custom voltage inputs may create even greater benefits.

### 1.3 NORMALLY- CLOSED

Normally-closed poppet valves block flow from 2 to 1 when de-energized. When the solenoid coil is energized, magnetic force lifts the small pilot dart from its seat, creating a pressure differential across the main poppet that provides the force to lift the main poppet off its seat. Models with free-reverse-flow also act as a low-pressure, free-flow check valve from 1 to 2 when energized; standard models provide an orifice-connection to 2 when pressure is applied at 1.

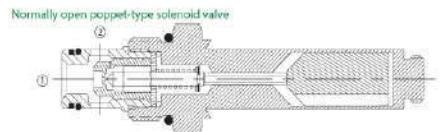


**Fig. 3 Poppet valve**

### 1.4 NORMALLY OPEN

Normally-open poppet valves provide free flow from 2 to 1 when de-energized. When the solenoid coil is energized, magnetic force seats the small pilot dart, creating a pressure differential that provides the force to seat the main poppet and block flow.

Models with free-reverse flow also act as a low-pressure, free-flow check valve from 1 to 2 when de-energized; standard models provide an orifice-connection to 2 when pressure is applied at 1.



**Fig. 4 Poppet valve**

## 2. PROPER DESIGN REQUIREMENTS KNOWLEDGE OF VALVE TYPES

Some pneumatic valves are depended upon for saving lives—so don't take chances when selecting the right one for your application.

Valves used in the medical device industry are designed with precise specifications so they are compatible with the requirements of the applications. Meanwhile, valves used in factory automation are designed to work within specific safety regulations. Every project has unique requirements and choosing the best pneumatic valve design for your application will provide optimum results.

While each design has its strengths and weakness to be considered, knowing your application's requirements is essential. For example, the media of the application varies between industries. Compressed air and other gases can be extremely powerful—even fatal—so understanding how the valve will be used is important. Certain valve designs are compatible but limited by specific media. Some other factors that dictate the required valve are the external variables such as temperature range of the application, and purity of the air or media (moisture,



contamination). Once you know the critical requirements for the application, the valve design can be chosen based on its specific features.

### 2.1 POPPET-DESIGN

Poppet-design valves use a rubber molded poppet wrapped around the stem that moves along the bore of the valve, creating a seal when the poppet is in its seat. One specific advantage to using a valve with this type of internal design is the compatibility with a variety of media other than compressed air. The unique feature that allows this compatibility is less lubrication sensitivity due to few sliding parts or (dynamic seals).

Valves with a basic poppet design feature few sliding seals, and are pressure unbalanced.

Another benefit to this poppet design is that the valves are more tolerant of minor air sediment or debris. They also have excellent exhaust capacity and are capable of high flow rates. The poppet design provides a faster response rate due to short stroke and can be mounted in several ways.

Poppet valves more readily lend themselves to 2-or 3-way configurations, although 4-way configurations can be achieved by using dual 3-way poppet sets in one valve body. Poppet valves are typically unbalanced designs, which use the air pressure as the primary force to return the valve to a given position. This concept provides assurances that the valve will return to the desired position, even if the return spring fails. Balanced poppet valves are used to reduce actuation force and achieve lower current consumption in solenoid valves. Balanced valves typically provide smaller overall physical size and produce greater flow capacity.

Applications in which this design are most commonly found are in the medical device and analytical instrumentation industries, where air purity is required (absence of dirty or wet media/air), the need for reliability is mandatory (could be saving lives), low leakage rate is critical, and gases other than compressed air will be used as a medium.

### 2.2 DIAPHRAGM-POPPET

Diaphragm-poppet design valves expand the poppet valves' design by the use of a diaphragm. Its outer webbing guides the poppet to its seat without using sliding seals. Diaphragm-poppet designs are usually unbalanced providing the same assurance of return to a given position as the poppet valve. The diaphragm

increases durability especially with different or non-lubricated media.

The diaphragm-poppet valve design has no sliding seals and is pressure unbalanced.

A variety of diameter and diaphragm compounds make it simple to modify a valve based on the environmental or application requirements for operation. Also, expect extremely low leak rates due to strong sealing control. Diaphragm-poppet valves make 2-way or 3-way configurations available, as well as the possibility of 4-way valves, by using dual 3-way diaphragm poppet sets in one valve body. This valve's durability and reliability make it a great candidate for applications such as critical life support devices (e.g. heart ventricular support assistance or pulmonary supply devices).

Its non-lubrication capability makes it appealing to be used with devices used for respiratory and anesthesia gases. Diaphragm-poppet designs are great solutions in leak testing devices, due to the very low leak rate. Lastly, these designs are suitable for critical or contaminated vacuum applications.

### 2.3 SPOPPET-DESIGN

Spoppet-design valves combine two designs to provide a blend of primary poppet sealing in conjunction with a minimal number of sliding seals, thus emulating characteristics of a poppet and spool valve design. Spoppet designs retain some unbalance characteristics but with some balance of pressure to reduce actuation forces. This design provides the benefits of the poppet valve with a reduced sensitivity to lubrication.

Spoppet-design valves combine spool and poppet concepts.

Only one sliding seal engaged at a time reduces the drag within the valve body. These designs can sometimes bridge the gaps or limitations of poppet and spool valves making them more useable in numerous critical applications. By blending the designs, spoppets provide more cost efficient 3-way and 4-way valves, and can be used in many different environments and applications.

### 2.4 SPOOL-DESIGN

Spool-design valves are available in two types: lapped/shear-design with no seals or dynamic seals/O-rings. Spool valves are designed to be more cost-effective when manufacturing for 4-way valves and are conversely less adaptable for 2-or 3-way configurations. Spool valves can

be either balanced or unbalanced, depending on desired position control required. Therefore, understanding this valves' function is critical to the application requirements. Lapped- or shear-design spool valves can operate without lubrication but are less tolerant of variations in lubrication or by-products of compressing the air at the air compressor. Hence, further conditioning of the compressed air is required prior to use.

Valves featuring the spool design with dynamic seals require lubrication in balanced or unbalanced configurations.

Dynamic seal spool valves generally require lubrication. Lapped spool valves have higher leak rates that may make them unacceptable for control of medias other than air, or limited media sources (air/gas tanks/bottles). Consequently, these valve designs are better suited to applications in factory automation where the leak rates are not critical. The requirement for conditioned media also limits their use for vacuum where contaminants are ingested into the vacuum lines and valves.

### 2.5 CUSTOM-DESIGNED

Custom-designed valves are becoming more common, using a combination of the fore-mentioned design technologies to provide solutions unique to the customers' challenges. In a perfect world, off-the-shelf components would meet every application's need. But that doesn't often happen, especially when faced with trade-offs such as space constraints versus performance. Sometimes a complex solution is needed, such as squeezing multiple components into a small space or incorporating multiple valve designs for a solution.

Custom valve designs combine technologies for unique solutions.

Custom designs using known and proven design technologies offer the potential of lower cost pneumatic systems. Once the specifications are agreed upon with the manufacturer's design engineers and the application's product engineers, a custom designed solution may be the best way to meet the applications' challenges if a specific design is close but not does not meet exact specifications.

Ultimately when it comes to valves, each design technology offers unique capabilities but not every design suits specific applications. No matter whether you are replacing a component or designing a pneumatic system, consult a valve manufacturer who has knowledge in many different design principles so that the best solution can be achieved.

### 3. THERMAL ANALYSIS VALVE USING THE MATERIAL SILICHROME STEEL FOR 10% BLENDED FUELS

File→Importing→IGES→ Browse →Select the .igs file →Open→Ok

#### Imported model

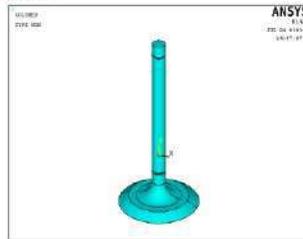


Fig.5 Imported model

Preferences →thermal→Ok

Preprocessor→element type→add/edit→add→ Select solid 20 Node 186 →Ok→close

Preprocessor→Material type→ Material models→ Isotropic→ conductivity as 0.0519, specific heat as 599 and density as 0.00000787→Ok

Preprocessor→Meshing→Mesh tool→ Select Area Set →Pick All →Enter the edge length→Ok

#### Meshed model

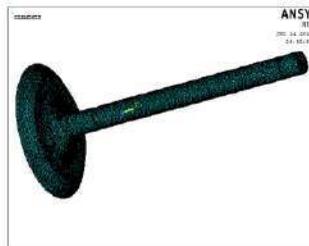


Fig.6 Meshed model

PREPROCESSOR→Physicsa→ Environment→ Write→ enter THERMAL→Ok

PREPROCESSOR→Physics→ Environment→ Clear

FINISH

PREFERENCES→ STRUCTURAL→ OK

PREPROCESSOR→Element→ Switch element type → Thermal to struct→ Ok

PREPROCESSOR→material properties→ Material models→ structural →Linear→ Isotropic→ Elastic, enter

Young's Modulus= 186000 N/mm<sup>2</sup>

Poisson's ratio= 0.29

Density=0.00000787

Cte= 14.8e-9

PREPROCESSOR→Physics→ Environment→ Write→ enter STUCT→Ok

PREPROCESSOR→Physics→ Environment→ Clear  
**FINISH**  
 PREPROCESSOR→Physics→ Environment→ Read→select  
 THERMAL→Ok  
**SOLUTION**  
 Solution→Analysis→ New analysis→ Steady State→Ok  
 Solution→Define Loads→Thermal→ Temperature→ On  
 Areas→ Select the Areas→ Ok→ enter the temperature value  
 as 800→Ok  
 Solution→Define Loads→Thermal →On Areas Select  
 Remaining areas other than the temperature applied areas→  
 enter film co efficient as 0.0035 and Bulk temp as 298→ Ok  
**Loads applied model**



Fig.7Loads applied

Post Processor→ Plot results→ Nodal solution→ DOF  
 solution→ Nodal Temperature→ Ok  
**NODAL TEMPERATURE**

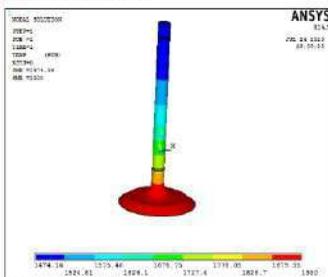


Fig.8 Nodal Temperature

Post Processor→ Plot results→ Nodal solution→ DOF  
 solution→Thermal Gradient→ TG vector sum→ Ok  
**THERMAL GRADIENT**

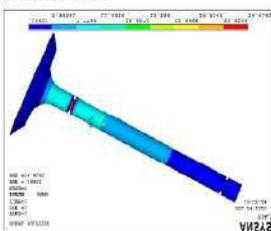


Fig.9 Thermal Gradient

Post Processor→ Plot results→ Nodal solution→ DOF  
 solution→Thermal Gradient→ TF vector sum→ Ok

**THERMAL FLUX**

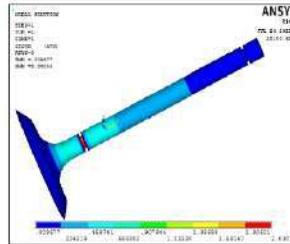


Fig.9 Thermal flux

**FINISH**

PREPROCESSOR→Physics→ Environment→  
 Read→Select →STUCT→Ok

**Solution** →Define  
 loads→apply→Structural→displacement→ On Areas →  
 Select the areas→Ok→All DOF→Ok

**Solution** →Define  
 Loads→Apply→Structural→ Temperature→From Thermal  
 Analysis→Browse→Select File.Rth(File Is The Name Of The  
 Job Defined)→ Ok→Ok

Solution→ Solve→ Current I.S→ Ok

Post processor→ Plot results→deformed shape  
 Contour Plot→ Nodal Solution →DOF solution

**DEFORMATION**



Fig.10 Deformation image

Post processor→ Plot results→Contour Plot→ Nodal  
 Solution →DOF solution→ Displacement Vector SUM→ Ok

**DISPLACEMENT VECTOR SUM**

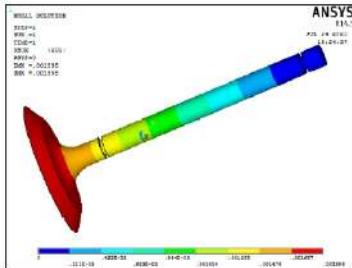


Fig.10 Displacement vector sum

**NODAL TEMPERATURE**

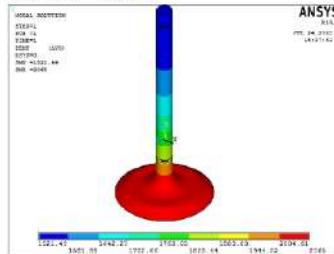


Fig.13 Nodal Temperature

Post processor → Plot results → Contour Plot → Nodal Solution → Stress → Von Mises stress → Ok

**VON MISES STRESS (THERMAL STRESSES)**

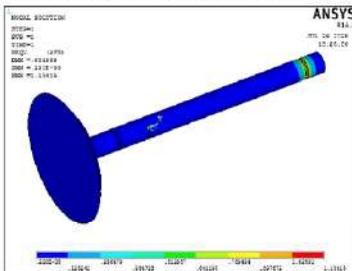


Fig.11 Von mises stresses

**THERMAL GRADIENT**

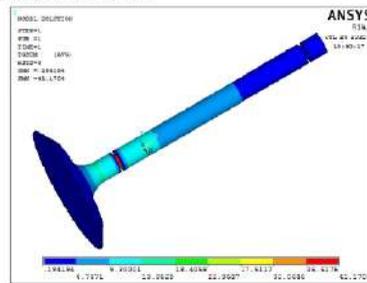


Fig.14 Thermal Gradient

**THERMAL FLUX**

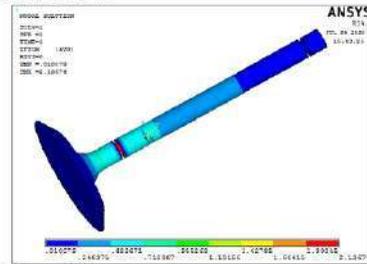


Fig.15 Thermal flux

**4. THERMAL ANALYSIS VALVE USING THE MATERIAL SILICHROME STEEL FOR 15% BLENDED FUELS**

**Material Properties**

Conductivity = 0.0519

Specific heat = 599

Density = 0.0000787

Young's Modulus = 186000

Poisson's Ratio = 0.29

Temperature 1930



Fig.12 Loads applied on model

**DEFORMATION**

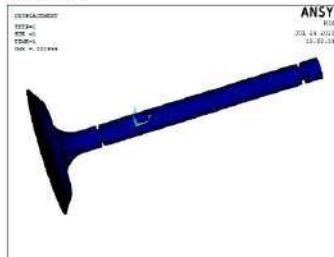


Fig.16 Deformation

DISPLACEMENT VECTOR SUM

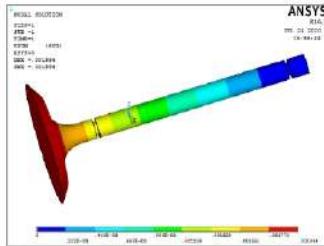


Fig.17 Displacement vector sum

NODAL TEMPERATURE

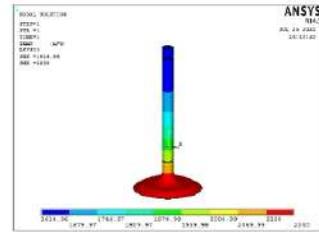


Fig.20 Nodal Temperature

VON MISES STRESS (THERMAL STRESSES)

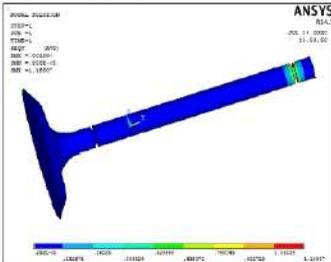


Fig.18 Von mises stress

THERMAL GRADIENT

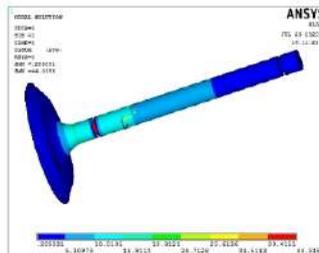


Fig.21 Thermal Gradient

### 5. THERMAL ANALYSIS VALVE USING THE MATERIAL SILICHROME STEEL FOR 25% BLENDED FUELS

#### Material Properties

Conductivity = 0.0519

Specific heat = 599

Density = 0.00000787

Young's Modulus = 186000

Poisson's Ratio = 0.29

Temperature 2200

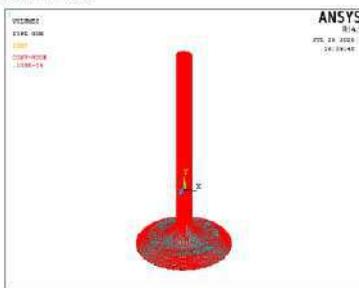


Fig.19 Loads applied on model

THERMAL FLUX

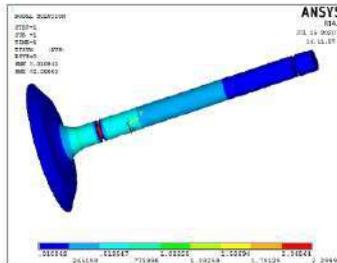


Fig.21 Thermal flux

DEFORMATION



Fig.21 Deformation image

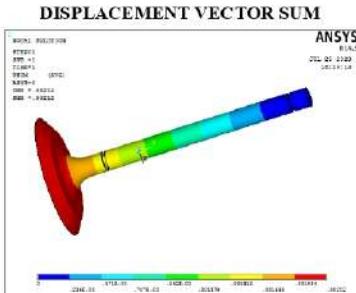


Fig.21 Displacement Vector sum

VON MISES STRESS (THERMAL STRESSES)

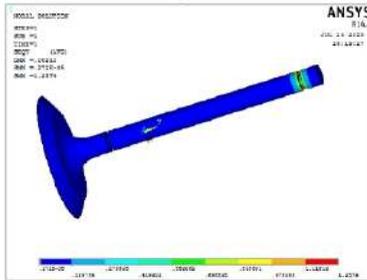
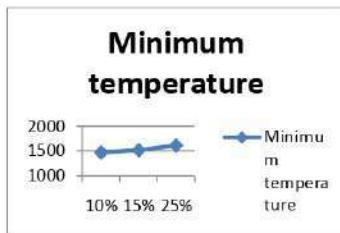


Fig.22 Von mises stresses

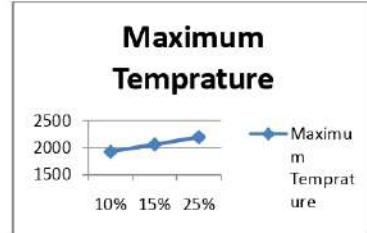
6. RESULTS COMPARISON TABLES

	Min Temp (K)	Max Temp (K)	Thermal Gradient		Thermal Flux		Deformation (mm)	Stress	
			Min(K)	Max(K)	Min (W/mm <sup>2</sup> )	Max (W/mm <sup>2</sup> )		Min (N/mm <sup>2</sup> )	Max (N/mm <sup>2</sup> )
10%	1474.16	1930	0.16002	34.43181	0.003677	2.99155	0.903898	2.205366	1.15415
15%	1521.48	2085	0.194194	41.1704	0.003079	2.13674	2.11674	2.518366	1.18507
25%	1614.96	2200	0.209621	44.3153	0.002849	2.29099	0.00282	2.725366	1.2579

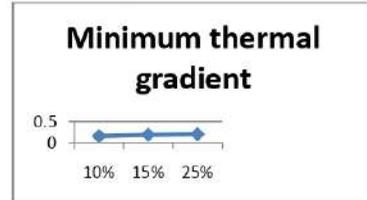
7. RESULTS COMPARISON GRAPHS



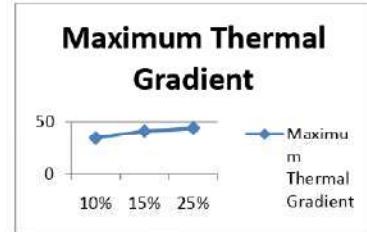
Graph 1 Minimum Temperature



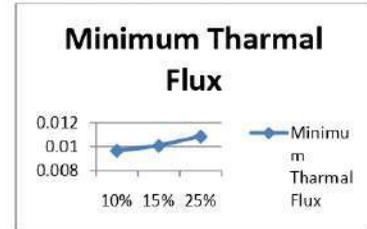
Graph 2 Maximum Temperature



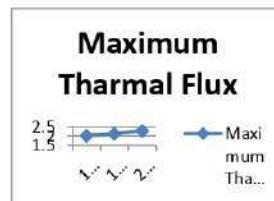
Graph 3 Minimum Thermal Gradient



Graph 4 Maximum Thermal Gradient

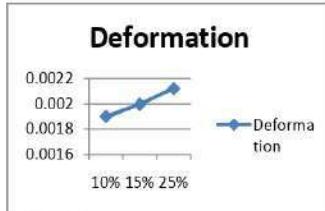


Graph 5 Minimum Thermal Gradient Max

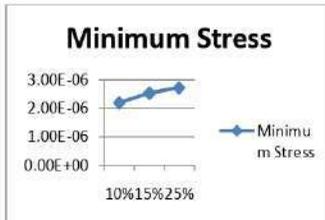


Graph 6 Max Thermal flux

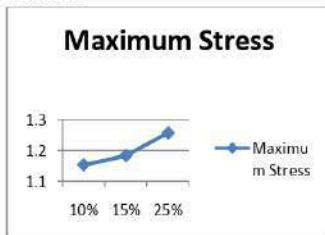
Def:



Graph 7 Deformation



Graph 8 Min Stress



Graph 9 Max Stress

### 8. CONCLUSION

In this thesis, a finite-element method is used for modeling the thermal analysis of an exhaust valve. The temperature distribution and resultant thermal stresses are evaluated. Detailed analyses are performed to estimate the boundary conditions of an internal combustion engine. In this thesis, Pro/Engineer is employed for modeling and Ansys is used for analysis of the exhaust valve.

Here the effect of petrol, diesel and blended fuels on valve is studied by mathematical correlations applying thermal loads produced during combustion. Blended fuels are usually Ethanol fuels blended in different percentages. Percentages vary from 10%, 15% and 25%.

As per the obtained results, we have compared in the results in the graph we can observe that the silichrome steel with 10% blended fuels is having low thermal gradient (3404161) and thermal flux (20.3.55) when compared with the silichrome steel with 15 % and 20% mixture of blended fuels. Even when considering with the deformation (0.001898) and stress values

(1.15415) the silichrome steel mixture with 10% blended fuels is having he less deformation and least stress values with other materials.

So as per the results observed we can conclude that the value with silichrome steel mixture with 10% blended fuels is the best material for the better life of the IC engine.

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## WELL-BEING AMONG SECONDARY SCHOOL TEACHERS WITH RESPECT TO AGE AND TEACHING EXPERIENCE

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### Abstract

Well-being is the extent to which an individual experiences happiness, feeling of comfort, satisfaction with one's life experiences and one's role in the world of work, belongingness, curiosity and ability to use abilities and talents to the maximum extent, and sense of achievement, and no distress, dissatisfaction, and worries. **Method:** The Survey method was adopted for this study. The present study consisted of 480, secondary school teachers of Nalgonda, Yadadri Bhongir, and Suryapeta Districts, Telangana during the academic year 2017-2018. The well-being tool developed by the investigator was used for the present study. For statistical analysis and hypothesis testing, Mean and F-test were applied. **Findings:** The findings revealed that age was directly proportional to well-being i.e., higher the age of teachers, better was the well-being among teachers. Teachers with 36 yrs to 40 yrs of age were definitely better than others. Senior-most teachers were definitely better than others with regard to well-being.

**Keywords:** Well-being, Age, Experience, Secondary School Teachers

Progress of any nation predominantly depends on the health, wellness, quality of life and life satisfaction of its citizens. A teacher plays major role in the progress of society. Students' character building; growth and success also largely depends on the role plays by the teacher. It is the teacher, who provides learning experiences and opportunities. Teachers also play a pivotal role in shaping an ideal and knowledgeable emerging society, their health, wellness, personality, character, qualities, attitude, aptitude and lifestyle are valuable and essential for moulding the good and ideal students and thereby contributing to creating a better nation. The National Commission on Teachers (1983-85) emphasized the important and crucial role of teachers in nation building. "The wellness of teachers is a matter of concern to all as teachers accomplish a significant role of preparing the students to be future citizens and to face the present and future challenges." (p.17) The Kothari Commission (1964-66) was rightly emphasized that "the destiny of India is now being shaped in her classrooms." (p.2)

Managing good health and well-being are prerequisites for the teaching-learning process. The success of an educational process is determined to a large extent by its teachers and the success of students also depends upon the teacher's mental health, well-being, guidance, and teaching. Teachers should be aware, how significance of health and well-being in the education system. In fact, most of the teachers know about the importance of health and well-being, but little efforts are made to implement this. Heavy workload, stress are the frequently reported by teachers, which are seem to be major contributors to illness as well as a cause for health problems. National



Curriculum Framework for Teacher Education (2009) emphasized that “it is the teacher in the classroom who inspires, cultivates, and motivates learning.” Undesirable pressure of competitiveness in today’s society, teachers are expected to be serve additional working hours daily to be effective and productive so that they could reach upto maximum extent and face challenging circumstances. The concept of well-being now has become increasingly prominent since the acknowledgment that there is more to health than the absence of disease. Well-being includes human strengths and positive psychological outcomes which enable human beings to maintain healthy relationships for the purpose of being happy, healthy, and harmonious.

Positive relationship and active engagement with family and society are an important part of well-being definition (Kahneman, Diener & Schwarz 1999; Seligman & Csikszentmihalyi, 2000). The history of well-being dates back to Aristotle's period when the term Eudaimonia (the Greek word for happiness) was coined and defined. Aristotle’s views on Eudaimonia was that ‘human flourishing associated with living a life of virtue, or happiness based on a lifelong pursuit of meaningful, developmental goals, was the key to a satisfied prosperous life.’ Bradburn (1969) emphasized how psychological well-being (translated to as happiness) was the factor that stands out as being generally transformed as well-being. Aristotle believed this “lifelong pursuit of happy and prosperous life is to be the universal goal of human actions” (Bradburn, 1969, p.9). Some efforts made by Ross (1967) and Copper (1997) to eliminate the discrepancy between the meaning of eudaimonia and happiness, and due to inadequate capture the meaning and translation of the Greek word Eudaimonia (happiness). They proposed two new terms; which are ‘well-being’ and ‘flourishing’ (Walker & John, 2012. p.22). An employee who is happier flourished would act more productive (Spector et al., 2004; Moorman, 1993). In this regard, well-being can be understood that, an individual experiences a feeling of comfort, happiness, contentment, and curiosity and is able to engage to the maximum extent with what is going on around him /her. Flourishing means functioning to the maximum extent in the world; experiences positive relationships have some control over life and have a sense of purpose. Human basic needs can be fulfilled by achieving good health, well-being and quality of life which has been a major concern in every society.

A principle of life as expounded in the Indian scriptures, especially the Bhagavad Gita is very much beneficial for the well-being (happiness) and personal growth. Well-being means individuals' ability to enjoy their life and efforts in order to achieve psychological resilience. Mahatma Gandhi acknowledged the Indian great scripture; Bhagavad Gita is a proven rich source of mental peace or well-being (Amareshwaran, 2018). The four purusharthas of human lives are like Maslow’s hierarchy needs. The four goals of every human life are Kama: pleasure, love associate with basic biological needs; Artha: Seeking meaning or purpose of life through economic prosperity resembles with belongingness needs; Dharma: righteous driven actions to fulfill self-esteem needs; Moksha: Spiritual liberation can be attained through self-actualization needs. Well-being is often referred to as “an integration of body, mind, and spirit in terms of health, prosperity, and self-actualization” by Maslow (1968) for whom the pursuit of optimum health was the universal human tendency to self-actualization.



In early days experts in the field of positive psychology agreed and supported the hedonic thought which believes that ‘subjective well-being and happiness both were used synonymously’. On the other hand, most of the other scholars’ perspectives were in coherence with Aristotle’s views on Eudaimonia; believed that well-being and happiness are not interchangeable with the meaning. In this context, eudaimonia is comprises of three main aspects; flourishing,(which also referred to as well-being) happiness, and meaning are given in the following formula,

Well-being = happiness + meaning.

### ***Teachers’ well-being***

Human life has become more challenging, complex and stressful due to many unavoidable rapid changes and advancements in every domain of his/her life. As a part of society, teachers are also vulnerable to issues like maladjustment, feeling of overburden and high stress. Physical as well as mental health is a matter of concern to all members of the society. In order to perform daily responsibilities affectively, teachers need to be in a state of fit, well and healthy. The teachers are expected to be adequately enthusiastic to face the rapid changes, societal pressures and difficulties. They also play a crucial role in nurture all the character and personality of students including attitudes, habits, values, manners etc. High student-centrism in instruction, societal demands, and high expectations, in addition to professional pressures may impact teaching. Teachers’ competency and effectiveness influenced by many factors related to their work and personal domains. These factors also influence the behavior and personality of the teacher.

Earlier studies found that; inequity among teachers leads to stress (Van Horn, Schaufeli & Enzmann, 1999; Kyriacou, 2001). Another interesting research finding revealed that higher level of expectations and limited resources at work place create stress. (Xanthopoulou et. al., 2007).

Furthermore, the little or lack of opportunities in career advancement, inadequate work pay, little chance of professional growth are commonly associated with dissatisfaction (Kyriacou, 2001). European Commission (2010) emphasized that, “due to economic and societal advancements have led to an increased set of duties and responsibilities for teachers” (p.10).

Dissatisfaction seems to be one of the hindrances for professional growth, which is undesirable in teaching profession. Teacher dissatisfaction with the job can affects overall performance and effectiveness.

Teaching is a noble profession that includes meaning and purpose, also helps in building the personality and all-round development of students. Teachers may get inspired experience of joy by watching their students’ success.

It is established fact that “an education system of any country built on the premises of quality and equity is central to sustainable success in the emerging knowledge economy”. (Some Inputs for draft NEP, 2016, p.5) Maintain standards of education; ensure quality education become major concern globally. The major contributing factor and principal source of nation’s development is its quality education which largely depends upon qualities of teacher. Quality of life and stature of any individual depends mainly upon the amount of quality education he/ she gets. Quality education is seemed to be the most effective instrument to meet present as well as the



future challenges. The purpose of ensuring quality education is not only in helping individual's physical as well as mental growth but also meet the societal needs and expectations.

Well-being can be defined as the extent to which an individual experiences happiness with satisfying basic needs, sense of meaning and purpose of life, satisfaction with life, social connectedness, feeling of belongingness; can also utilize his/her abilities and talents to the maximum extent.

There are multiple dimensions to well-being and in order to be 'well' each individual must actively strive to improve them within each dimension (Well-being in the Classroom: Education Conference Report 2012, p.7).

For the present study, well-being comprises of six dimensions. They were; (i) Physical well-being: expressed as being safe, sheltered, and in good health. (ii) Emotional well-being: expressed the ability to manage feelings, actions and related behaviors, cope effectively with stress, and ready to accept the change. (iii) Social well-being: expressed to connectedness and belongingness to the society, having healthy relationships with all, and having an interest in and concern for the needs of others and humankind. (iv) Spiritual well-being: can be viewed that beliefs and values of an individual and, sense meaning, purpose of life and peace. (v) Professional well-being: expressed as an ability to manage a perfect equilibrium between professional activities and leisure time, able address conflicts at work, stress, and building healthy relationships. (vi) Financial well-being: expressed as a state of being wherein an individual can meet to the maximum extent present and ongoing obligations, can feel satisfied, secure in his/her financial future, and is able to make relevant choices that allow them to lead an enjoyable and satisfying life.

#### **Need & Significance of the study**

Concerns have increased globally over the decades regarding maintain good standards in education to ensure quality education. In order to improve standards and quality in education, the personal factors like health, wellness of the teacher are the key indicators. Teacher plays significant role in providing quality education. Teacher competencies, efficiency and commitment are very much essential in the field of education. They considered as the role models to their students. It is also true that "no people can rise above the level of its teachers" (NEP1986, p.25). Teachers are very important assets and play a very crucial role in every society as they are the backbone for national development. The Report of Commonwealth Conference on Teacher Education (1974) has clearly stated that "the teachers have a major role in educational progress whether active or passive contribution towards work. Education development can be influenced by ignoring innovative practices or merely remaining quite in the face of a growing need for reform"(p.23).

Based on the above interesting issues and importance of teachers' well-being, an idea was conceptualized to study the status of well-being among teachers. Hence there are various issues that need to be addressed which are related to teachers' well-being. Education in itself is a promoter of a healthy and prosperous life and well-being among the students. So there is a need to investigate the teachers' well-being. Relative to working professionals in other sectors, teachers experience significantly more issues like stress and suffer more often from psychological problems. Except for periodical



types of research where the efforts have been directed to study the variables in different combinations of dimensions, most of these have been investigated to some extent and thus not adequate in giving a clear picture of the phenomenon of well-being. Moreover, there is a need for such research evidence referring to secondary school teachers of newly formed Telangana state. Considering the status of well-being among teachers from selected educational institutions of Telangana state, the present study intends to find out the well-being of teachers. The study findings would be useful to the educational planners and policymakers in recommend and providing strategies to the teachers so that they may be in a position to manage and improve their well-being and can give quality education to the system and nurture the best talent among students. Thus there is a need to study the well-being among school teachers. Hence it is worthwhile to undertake a research problem entitled “Well-being among Secondary School Teachers”.

**Literature Review:** Parveen Grover (2006) found that, senior and experienced secondary school teachers exhibit higher levels of physical, mental, social, emotional, spiritual and total well-being. Rajesh Kumar (2011) revealed that, the age was found positively significant correlated with the well-being, and with the home adjustment. Uppal (2011) concluded that a significant positive correlation was found between job satisfaction and teacher effectiveness. Sukhpal (2011) showed that teachers did not differ significantly in their well-being in terms of teaching experience, gender. Meena Devi (2012) explored the significant difference in the level of well-being with respect to marital status of high school female teachers. Mehdinezhad (2012) study revealed that there was no significant difference between the age of the teachers and their well-being. Paul Boreham, Jenny Povey and Wojtek Tomaszewski (2013) concluded that age has a significant negative relationship to well-being. Mahmud Moein Addin, Shahnaz Nayebzadeh & Zahra Bahonar (2013) have argued that the age, education, gender, and the school level taught by teachers found no relationship with the teachers’ financial well-being. Rajkumar G. Malakappgol (2015) found that females showed higher overall well-being. The higher age groups were found higher wellbeing than their counterparts. Age of the respondents was found to influence the dimensions like social, emotional and overall well-being.

### **Objectives**

1. To study the well-being among teachers with respect to age.
2. To study the well-being among teachers with respect to teaching experience.

### **Hypotheses**

Considering the review of literature done, the hypotheses for the present study:

1. There is a difference in well-being of teachers with respect to their age.
2. There is a difference in well-being of teachers with respect to their teaching experience.

### **Methodology**

According to the objectives, descriptive survey method was adopted for the study.

### **Sample**

Teachers teaching 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> classes were selected for the study. Random sampling technique was used for the selection of teachers. Total number of secondary school teachers in three districts was 12,710 (Educational Statistics, Telangana, 2014-



15). Out of 5785 teachers 240 teachers were selected from Nalgonda, out of 2940 teachers 96 teachers from Yadadri and out of 3985 teachers 144 teachers from Suryapet in the ratio of 5:2:3. Teacher sample was taken from 40 schools. From each school 12 teachers were selected randomly by lottery method. Therefore the total number of teachers selected for the study was 480.

**Variables:** In this study independent variables were age and teaching experience and dependent variable was well-being.

**Tools:** Two measures were used in this study.

**1. Personal data sheet:** Personal data sheet was constructed to obtain demographic data of the teachers. It consisted of the following items: Teacher Name, Age Gender, Category, Location of the school, Type of the school (management) Medium of Instruction, Educational Qualification, Teaching Experience, Teaching Subject, Monthly Income.

**2. Well-being Tool:** Teachers well-being tool was constructed by the investigator after referring to some of the available standardized tools on well-being. The motivation for developing a new tool is the experts' suggestions and the investigator's belief that the previous tools are inadequate for some reasons and not completely cover the dimensions under present study. The following tools were referred before designing well-being tool for teachers. Scales of psychological well-being by Carol Ryff (1989), WHO well-being scale by Heun et. al (1999), Well-being Scale by Jagsharanbir Singh and Asha Gupta (2001), General well-being measure prepared by Dr. Santosh K. Verma, and Ms. Amita Verma (2009), Well-being Scale by Kalia and Deshwal (2011), General Well-being Scale by V. L Chauhan and R.K. Didwania (2015), Teacher well-being Index 2018 (Julian Stanley),

**Reliability:** Well-being tool was developed by the investigator. Pilot study was conducted to finalize the items in the tools and establish validity & reliability. Pilot study was conducted in 2 Schools of Ranga Reddy district. From each school 15 teachers were selected. The well-being tool was distributed to 30 teachers in two schools. The tool was explained to the teachers and collected the data from the teachers. In the pilot study, the split half method was adopted. To find out internal consistency of the teacher well-being tool split half reliability was done. The reliability found to be for the well-being tool was 0.893(Cronbach's alpha). Thus the reliability of the tool was established.

**Procedure:** The investigator visited 40 schools for data collection. The investigator developed rapport with the teachers before commencing the data collection. The well-being tool was distributed to the teachers and instructions were readout. The investigator clarified the difficult statements to the teachers and remained with them till the completion of the questionnaire. The obtained scores were analyzed with Statistical Package for Social Sciences (SPSS-20). Descriptive statistics, one way ANOVA was applied. The obtained results were discussed in the following tables.

## Results

**Hypothesis -1.** "There is a difference in well-being of teachers with respect to their age".

To test the above hypothesis, the one-way ANOVA (Analysis of Variance) has been employed. Results of the statistical computations were presented in the below table 1.

**Table 1**  
*Showing well-being among teachers with respect to age*

	Age	N	Mean	S.D	F value	Sig	df
Well-being	25yrs - 30yrs	104	231.72	14.365	4.219	0.006	3, 476
	31yrs - 35yrs	98	236.17	14.974			
	36yrs - 40yrs	100	238.02	13.103			
	41yrs & above	178	237.13	14.189			
	Total	480	235.95	14.317			

\*p<.05.

**a. Predictor: Age**

**b. Dependent Variable: Well-being**

The one-way analysis of variance (ANOVA) has been employed to find out the difference between teachers age i.e., 25 to 30 yrs, 31 to 35 yrs, 36 to 40 yrs and above 41 yrs of age with respect to well-being. The results revealed that age was directly proportional to well-being. Teachers with 36 to 40 yrs of age were definitely better than others. i.e., higher the age of teachers, better was the well-being (p< .05).Therefore, hypothesis-1 “There is a difference in well-being of teachers with respect to their age”- was accepted. This finding is supported by the findings of *Rajkumar G.malakappagol (2015)*.

**Hypothesis-2.** “There is a difference in well-being of teachers with respect to their teaching experience.”

To test the above hypothesis, the-one way ANOVA was employed. Results of the statistical computations were presented in Table 2.

**a. Predictor: Teaching experience**

**b. Dependent variable: Well-being**

**Table 2**

*Showing well-being among teachers with respect to teaching experience*

	Experience	N	Mean	S.D	F value	Sig	df
Well-being	Upto 10 yrs	255	234.34	14.472	3.626	0.027	2, 477
	11yrs to 20 yrs	137	237.38	13.385			
	21yrs & above	88	238.40	14.835			
	Total	480	235.95	14.317			

Result of F test revealed that senior most (21 yrs & above teaching experience) teachers were definitely better than others in well-being (p< .05). Therefore it can be inferred that teaching experience was directly proportional to well-being i.e., higher the teaching experience better was the well-being of the teachers. This finding of the study was contradicted with the finding of *Sukhpal (2011)* revealed that no significant difference pointed out in the level of overall well-being among teachers with regard to



their age. Hence the hypothesis-2, "There is a difference in well-being of teachers with respect to their teaching experience." was accepted.

### **Discussion**

The research aimed to study well-being among secondary school teachers with respect to age and teaching experience. The teachers age was from 25yrs to above 41 yrs. The findings of the study indicated that the age of the teachers is directly proportional to well-being i.e., higher the age of teachers, better was the well-being among teachers. This finding was in coherence with the findings of *Parveen Grover (2006)*, *Rajkumar G. Malakappagol (2015)* and contradicting with the findings of *Paul Boreham, Jenny Povey and Wojtek Tomaszewski (2013)*. Senior most (more than 21yrs teaching experience) teachers were definitely better than others. This study was contradicted with the finding of *Sukhpal (2011)*.

H 1: There is a difference in well-being of teachers with respect to their age. Earlier studies pointed out that, there was no significant difference between the age of the teachers and their well-being. The age group is found significant with the well-being. Teachers with above 41 yrs of age appear to be comparatively better than others while the teachers with 36-40 yrs of age were definitely better than others in well-being i.e., higher the age of teachers, better was the well-being.

H 2: There is a difference in well-being of teachers with respect to their teaching experience. Studies revealed that teaching experience seems to directly relate to well-being of teachers. Induction programs have little affects on professional development. Senior teachers appear to be marginally better than others while the senior most teachers were certainly better than others in their well-being i.e., higher the teaching experience better was the well-being.

### **Conclusion**

The study shows that age is directly proportional to well-being. Teachers between 36-40 yrs of age were certainly better than others in well-being. i.e., higher the age of teachers, better was the well-being among teachers. There was also a significant difference between well-being of teachers with respect to teaching experience. Experienced (more than 21yrs of teaching experience) teachers certainly better than others in well-being. Teaching experience was directly proportional to well-being i.e., higher the teaching experience, better was the well-being of the teachers.

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### **Educational Implications**

Teacher training institutes, policy makers and Government need to develop and organize the programs to newly appointed and junior teachers about how to manage and improve their well-being.



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## A COMPARATIVE STUDY OF ATTITUDE OF GOVERNMENT AND PRIVATE SCHOOL TEACHERS TOWARDS CONTINUOUS AND COMPREHENSIVE EVALUATION

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### Abstract

In the present competitive situation each one wants to secure a high position in every part of existence. Recent thoughts and knowledge demands such evaluation system which enhance the capacity of students in regularly in all dimensions. Implementation of effective evaluation system mainly depends upon the attitude of teachers. The positive and favourable attitude of teachers builds the efficient and competent individual. In the present study 160 secondary school teachers, 80 from government school and 80 from private school were selected by random sampling method from Patna District. Teacher attitude scale towards Continuous and Comprehensive Evaluation developed by Dr. Vishal Sood & Dr. Aarti Anand was used for data collection. The statistical techniques such as Mean, Standard Deviation & 't' test were used for analysis of data. The results revealed that there was no significant difference between the attitude of government school teachers and private school teachers towards continuous and comprehensive evaluation. Also, there was no significant difference between the attitude of government school teachers and private school teachers towards continuous and comprehensive evaluation on the basis of gender. Both male and female possessed similar level of attitude. However, there was significant difference between attitudes of rural & urban area's school teachers of government as well as private school towards continuous and comprehensive evaluation. The urban area's school teachers possessed more positive and favourable attitude than the rural area's school teachers towards continuous and comprehensive evaluation.

**Key Words:** Continuous and Comprehensive Evaluation, Attitude, Government School, Private School Teachers

### Introduction

The fundamental purpose of education is to enable the children to get knowledge, enhance their understanding, acquire skills, build up positive attitudes, values and practices that are contributing to holistic development of their personality. Imparting cognitive knowledge without emotions makes individual as an empty shell. Therefore, required steps are taken to carry out changes in their individual, cognitive, affective and psychomotor attributes. For this, it is necessary that the improvement of both scholastic and co-scholastic areas of students to be examined and evaluated regularly with SWOT analysis.

Since, evaluation is an essential part of the entire teaching learning process, which not only shows the way to teachers but also helps the students to progress



efficiently. The report of NCF-2005 and RTE Act -2009 recommended that emphasis on external examination have been reduced and encourage the internal assessment, to follow the scheme of Continuous and Comprehensive Evaluation (CCE). Continuous and Comprehensive Evaluation has evolved as a progress to change the traditional system of evaluation. It has become the most effective approach to tackle the qualitative improvement of students in all dimensions of personality.

Vasava (2015) found that most of the teachers and principals feel SCE contributes towards all round development of students' personality but they had not sufficient time to organize all the activities properly in the classroom. Gupta and Jain (2017) observed that male and female teachers do not differ significantly in their attitude towards continuous and comprehensive evaluation. Also, teachers of secondary school having more positive attitude than primary school teachers towards continuous and comprehensive evaluation. The study of Singh (2017) revealed that most of the teachers agree that CCE has reduced stress among the students and it is helpful in holistic development of child. But majority of teachers were not in favor of its implementation in present Indian Education System.

Hnamte and Lalhruaitluangi (2018) found that parents, principals and teachers had unbiased attitude towards Continuous and Comprehensive Evaluation and they were not much sensitive to the concept of CCE. Lalnunfeli et. al. (2018) concluded that there was significant difference in teachers' attitude level with respect to gender, age, academic qualification and locality. Muthaiyan (2020) observed that the attitude of government school teachers, students and parents was average that shows moderate acceptability of continuous and comprehensive evaluation by the teachers. Government school teachers were not adequately prepared to execute CCE effectively.

#### **Justification of the Problem**

For the successful execution of evaluation it is required to know the attitude to teacher's towards continuous and comprehensive evaluation. This can present an insight to recognize the teacher's opinion and enable us to make necessary changes to accept the concept in right sense. The attitude of teachers decides the success of any process. Positive attitude offers the positive and victorious outcomes whereas; negative attitude hinders the success of any process. With this concern this study is taken up to analyze the teacher's attitude about continuous and comprehensive evaluation. Hence, the researcher performs the comparative study of attitude of government and private school teachers towards continuous and comprehensive evaluation in Patna District of Bihar.

#### **Statement of the Problem**

**“A Comparative Study of Attitude of Government and Private School Teachers towards Continuous and Comprehensive Evaluation”**

#### **Operational Definitions of the Terms Used**

- **Attitude:** The term 'attitude', researcher signify that mental preparation and beliefs which determine what each individual think and experience about Continuous and Comprehensive Evaluation system.
- **Continuous and Comprehensive Evaluation:** The term 'Continuous and Comprehensive Evaluation', researcher mean that a system of evaluation which regularly assess the growth and development of scholastic as well as co-scholastic aspects of students'.



- **Government School Teachers:** The term ‘Government School Teachers’, researcher mean that teachers who are teaching in school which is financed and regulated by government authorities.
- **Private School Teachers:** The term ‘Private School Teachers’, researcher mean that teachers who are teaching in school which is financed and regulated by Private authorities.

### Objectives

1. To compare the attitudes of Government and Private school teachers towards Continuous and Comprehensive Evaluation.
2. To compare the attitudes of Male and Female Government school teachers towards Continuous and Comprehensive Evaluation.
3. To compare the attitudes of Male and Female Private school teachers towards Continuous and Comprehensive Evaluation.
4. To compare the attitudes of Rural and Urban Government school teachers towards Continuous and Comprehensive Evaluation.
5. To compare the attitudes of Rural and Urban Private school teachers towards Continuous and Comprehensive Evaluation.

### Hypotheses

1. There is no significant difference between attitudes of Government and Private school teachers towards Continuous and Comprehensive Evaluation.
2. There is no significant difference between attitudes of Male and Female Government school teachers towards Continuous and Comprehensive Evaluation.
3. There is no significant difference between attitudes of Male and Female Private school teachers towards Continuous and Comprehensive Evaluation.
4. There is no significant difference between attitudes of Rural and Urban Government school teachers towards Continuous and Comprehensive Evaluation.
5. There is no significant difference between attitudes of Rural and Urban Private school teachers towards Continuous and Comprehensive Evaluation.

### Delimitations of the Study

1. The study was delimited as follows:
2. This study was limited to Patna District only.
3. Only secondary school teachers were taken as sample.
4. A sample of 160 teachers was selected for the study.
5. The study restricted to only one independent variable i.e., teachers’ attitude towards Continuous and Comprehensive Evaluation.

### Methodology

For attaining objectives of research, descriptive survey method was used for the present study.

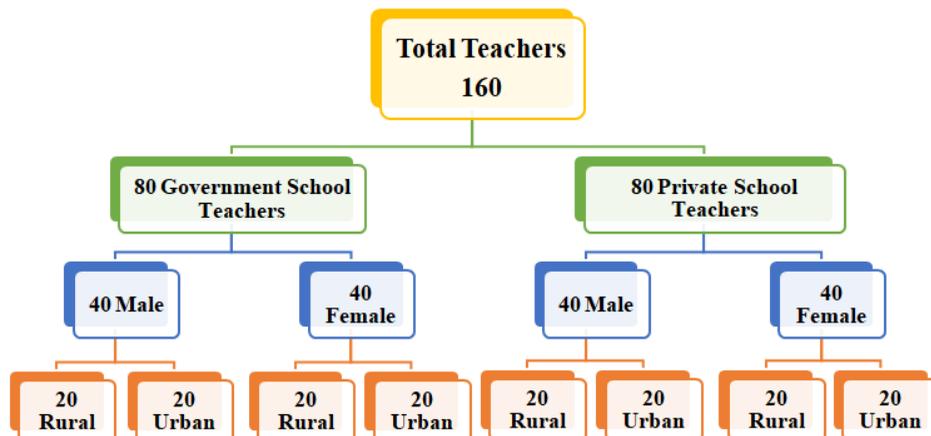
### Population

All the Government and Private secondary school teachers’ working in Patna District was comprise the population.

**Sample**

By the random sampling technique, 80 Government and 80 Private secondary school teachers was selected from Patna District as sample.

**Sample Design**



**Fig: 1 Showing the Sample Distribution**

**Tool Used**

Teacher attitude scale towards Continuous and Comprehensive Evaluation developed by Dr. Vishal Sood & Dr. Anand Aarti was used for the collection of research data. The tool is highly reliable and valid. This scale is a five point Likert type scale, which consist of 48 statements.

**Statistical Techniques**

The statistical techniques such as Mean, S.D. & 't' test technique was used in this study.

**Analysis and Interpretation of Data**

Analysis and Interpretation of data is necessary for giving the meaning to the obtained information and that leads to conclusions and findings of the study. In the present research, the data were classified, tabulated, analyzed and interpreted under different variables.

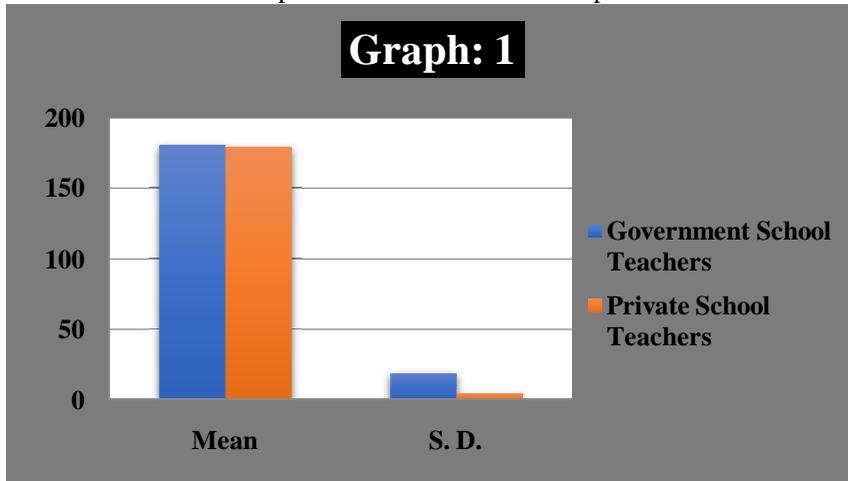
**Hypothesis: 1** There is no significant difference between attitudes of Government and Private school teachers towards Continuous and Comprehensive Evaluation.

**Table: 01**

**Mean, S.D. & 't' value of attitude of Government & Private School teachers Towards Continuous and Comprehensive Evaluation**

Variable	N	M	S.D.	DF	't' Value	Level of Significance
Government School Teachers	80	180.66	19.05	158	0.40	Not Significant At 0.05 level
Private School Teachers	80	179.49	17.48			

**Interpretation:** The mean & S.D. of attitude of government & private school teachers' towards continuous and comprehensive evaluation is 180.66, 179.49 and 19.05, 17.48 respectively. The calculated 't' value 0.40 is less than the table value shows that it is statistically not significant at 0.05 level of significance. Therefore, the hypothesis- there is no significant difference between attitudes of Government and Private school teachers towards Continuous and Comprehensive Evaluation is accepted.



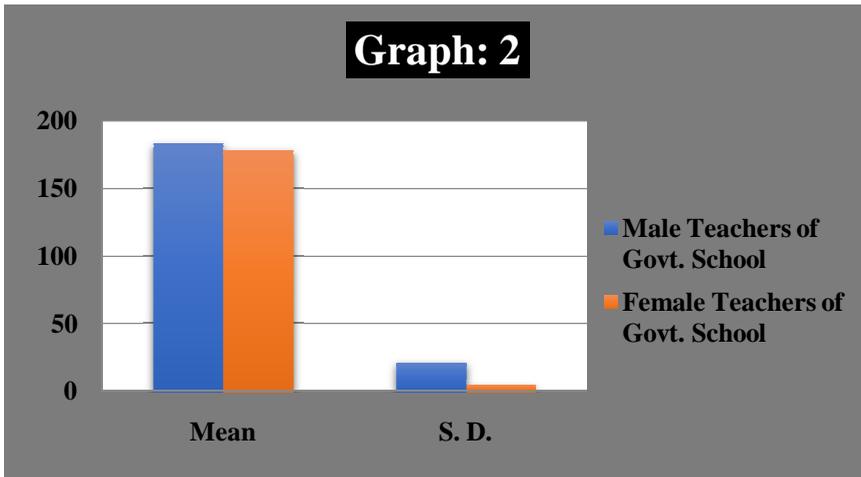
**Hypothesis: 2** There is no significant difference between attitudes of Male and Female Government school teachers towards Continuous and Comprehensive Evaluation.

**Table: 02**

Mean, S.D. & 't' value of attitude of Male & Female Government School teachers Towards Continuous and Comprehensive Evaluation

Variable	N	M	S.D.	DF	't' Value	Level of Significance
Male Teachers of Government School	40	183.25	21.19	78	1.22	Not Significant At 0.05 level
Female Teachers of Government School	40	178.08	16.49			

**Interpretation:** The mean & S.D. of attitude of male and female government school teachers' towards continuous and comprehensive evaluation is 183.25, 178.08 and 21.19, 16.49 respectively. The calculated 't' value 1.22 is less than the table value shows that it is statistically not significant at 0.05 level of significance. Therefore, the hypothesis- there is no significant difference between attitudes of Male and Female Government school teachers towards Continuous and Comprehensive Evaluation is accepted.

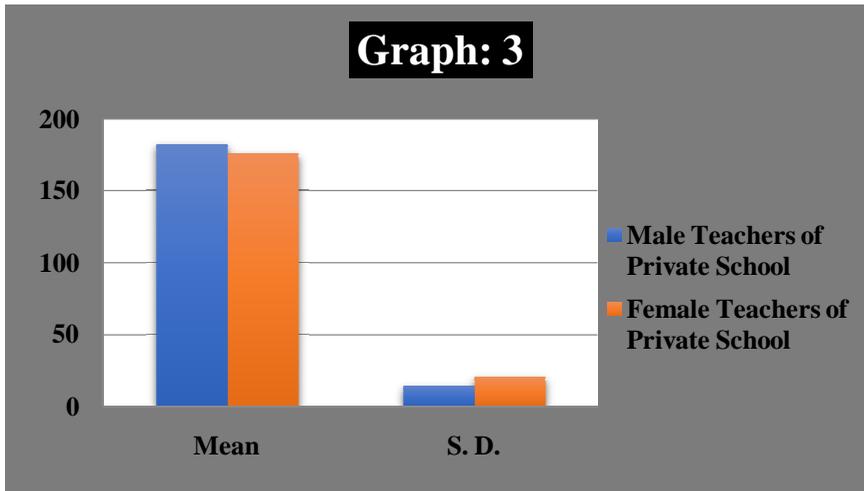


**Hypothesis: 3** There is no significant difference between attitudes of Male and Female Private school teachers towards Continuous and Comprehensive Evaluation.

**Table: 03**  
**Mean, S.D. & 't' value of attitude of Male & Female Private School teachers**  
**Towards Continuous and Comprehensive Evaluation**

Variable	N	M	S.D.	DF	't' Value	Level of Significance
Male Teachers of Private School	40	182.35	14.11	78	1.61	Not Significant At 0.05 level
Female Teachers of Private School	40	176.11	20.08			

**Interpretation:** The mean & S.D. of attitude of male & female private school teachers' towards continuous and comprehensive evaluation is 182.35, 176.11 and 14.11, 20.08 respectively. The calculated 't' value 1.61 is less than the table value shows that it is statistically not significant at 0.05 level of significance. Therefore, the hypothesis- there is no significant difference between attitudes of Male and Female Private School teachers towards Continuous and Comprehensive Evaluation is accepted.

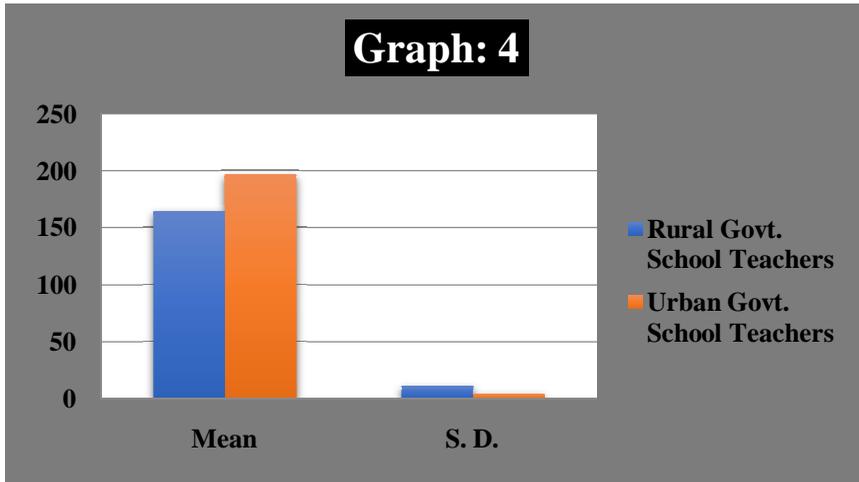


**Hypothesis: 4** There is no significant difference between attitudes of Rural and Urban Government school teachers towards Continuous and Comprehensive Evaluation.

**Table: 04**  
**Mean, S.D. & 't' value of attitude of Government & Private School teachers**  
**Towards Continuous and Comprehensive Evaluation**

Variable	N	M	S.D.	DF	't' Value	Level of Significance
Rural Government School Teachers	40	164.53	11.30	78	14.41	Significant At 0.05 level
Urban Government School Teachers	40	196.80	8.54			

**Interpretation:** The mean & S.D. of attitude of rural and urban government school teachers' towards continuous and comprehensive evaluation is 164.53, 196.08 and 11.30, 8.54 respectively. The calculated 't' value 14.41 is more than the table value shows that it is statistically significant at 0.05 level of significance. Therefore, the hypothesis- there is no significant difference between attitudes of Rural and Urban Government school teachers towards Continuous and Comprehensive Evaluation is rejected. The mean value of attitude of urban area's government school teachers is more than rural area's government school teachers. This indicates that the attitude of urban area's government school teachers towards continuous and comprehensive evaluation is more than attitude of rural area's government school teachers.

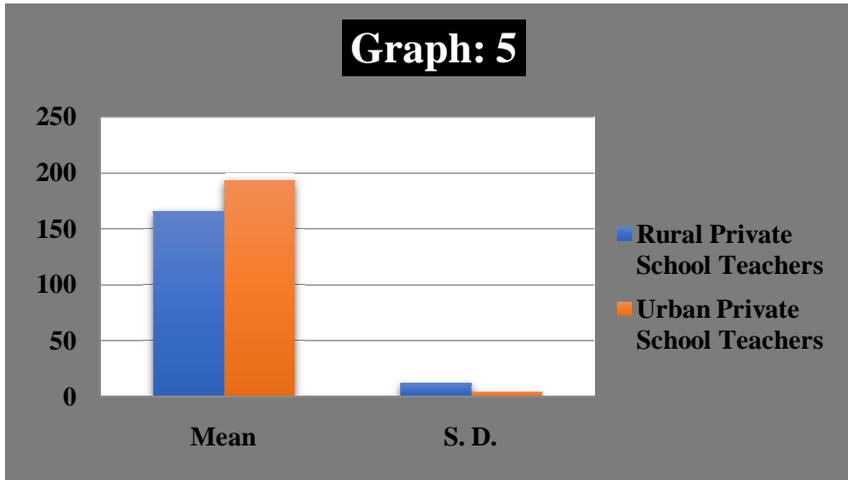


**Hypothesis: 5** There is no significant difference between attitudes of Rural and Urban Private school teachers towards Continuous and Comprehensive Evaluation.

**Table: 05**  
Mean, S.D. & 't' value of attitude of Government & Private School teachers  
Towards Continuous and Comprehensive Evaluation

Variable	N	M	S.D.	DF	't' Value	Level of Significance
Rural Private School Teachers	40	165.53	12.08	78	11.93	Significant At 0.05 level
Urban Private School Teachers	40	193.45	8.57			

**Interpretation:** The mean & S.D. of attitude of rural & urban private school teachers' towards continuous and comprehensive evaluation is 165.53, 193.45 and 12.08, 8.57 respectively. The calculated 't' value 11.93 is more than the table value shows that it is statistically significant at 0.05 level of significance. Therefore, the hypothesis- there is no significant difference between attitudes of Rural and Urban Private School teachers towards Continuous and Comprehensive Evaluation is rejected. The mean value of attitude of urban area's private school teachers is more than rural area's private school teachers. This indicates that the attitude of urban area's private school teachers towards continuous and comprehensive evaluation is more than attitude of rural area's private school teachers.



### Discussion and Findings

- The teachers of Government and Private schools do not significantly differ in their attitude towards continuous and comprehensive evaluation. They possessed similar level of attitude.
- There is a no any significant difference between the attitude of male and female teachers of Government Schools towards continuous and comprehensive evaluation. The mean value of attitudes of male government school teachers is more than female teachers; therefore the attitudes of male government school teachers are greater than female government teachers towards continuous and comprehensive evaluation.
- The male and female teachers of private schools do not differ significantly in their attitude towards continuous and comprehensive evaluation. The mean value of attitudes of male private school teachers is more than female private school teachers, therefore the attitudes of male teachers are greater than female private school teachers towards continuous and comprehensive evaluation.
- There is a significant difference between the attitude of rural and urban area's government school teachers towards continuous and comprehensive evaluation. The mean value of attitudes of urban area's government school teachers is more than rural area's government school teachers'. Hence, it can be interpreted that the urban area's government teachers' attitude is more positive in comparison to rural area's government school teachers towards continuous and comprehensive evaluation. The reason behind this might be that the urban government teachers' are more aware and they have better facilities in school for executing continuous and comprehensive evaluation.
- There is a significant difference between the attitude of rural and urban area's private school teachers towards continuous and comprehensive evaluation. The mean value of attitudes of urban area's private school teachers is more than rural area's private school teachers'. Hence, it can be interpreted that the urban



area's private school teachers' attitude is more positive in comparison to rural area's private teachers towards continuous and comprehensive evaluation. The reason behind this might be that the urban private teachers' are more aware and they have better facilities in school for executing continuous and comprehensive evaluation.

### **Conclusion**

The present study is very supportive in the field of education. The study provides the information about the attitude of government and private school teachers of Patna District towards continuous and comprehensive evaluation. It can be concluded that continuous and comprehensive evaluation is the need of the hour. It helps the students as well as teachers to know their strength and weaknesses, so that proper improvement has been employed to make the teaching learning point most effective. However, to make the continuous and comprehensive evaluation process efficient it is necessary for teachers, students, parents, society, administrators and government to put positive and favourable attitude. This present fruitful and successful outcome if implemented with some improvement. It becomes a decisive issue in the field of evaluation, which draws the entire concerned.

### **Educational Implications**

Attitude has an important role in the teaching learning process. If teachers possess positive attitude then it can improve the whole educational environment. The educational implications from the present study are as follows:

1. In this study the teachers of government along with private school both possessed similar level of attitude towards continuous and comprehensive evaluation. Hence, teacher should not be discriminated on the basis of types of school.
2. Similarly, male and female teachers do not differ in their attitude towards continuous and comprehensive evaluation. Therefore, they should not be differentiated on the basis of gender. All the training, facilities and policies should be provided to teachers without prejudice of gender or types of school.
3. Moreover, rural area's government as well as private school teachers towards continuous and comprehensive evaluation is less than the urban area's school teachers' because the teachers belongs to school of urban area are more aware and got more facilities to execute the evaluation system. The rural areas' school teachers' should be motivated to aware and they should given more facilities regarding continuous and comprehensive evaluation.

### **Suggestions for Further Research**

1. There was only one independent variable in the study. It may be conducted with more than one variable as well as with another variable.
2. Sample may be selected at college and university level also.
3. Similar research may be performed with more and different samples.
4. This research may be conducted in another district or state.



### Acknowledgements

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## EMERGING TRENDS IN MEDIATION AMIDST COVID 19 PANDEMIC: INDIAN PERSPECTIVE

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### **Abstract**

We live in bizarre occasions. Old assurances have offered approach to new vulnerabilities. Down the ages, Lady Justice, blade in one hand and eyes blindfolded, has been basically similar to the Rock of Gibraltar, guaranteeing solidness, yet in addition being impervious to change. One bug, dedicated COVID-19, goes along and the Lady is reeling. At the core of the antagonistic framework is backing acted in open setting, in full look of customers and individual legal counselors, and that has directed methods of thought and approach and conduct, all vital to the framework. Justice must appear to be done, however makes a decision about must likewise be seen while they are occupied with the undertaking of doing it. Be that as it may, nearness in numbers requires vicinity, and now closeness spells threat. Denied of their characteristic setting of the court, judges and legal advisors have fallen back to discuss virtual courts, with the goal that the minimum necessity is accomplished — the appointed authority having the option to hear the specific attorney. Every single other component of the court are shunned, and along these lines a basically open setting is changed over to a shut entryway one. It is, and will stay, unacceptable.

**Keywords:** Mediation, COVID 19, E-Mediation

### **Introduction**

Disputes are part and parcel of everybody's life. Disputes are inescapable and make certain to emerge in any close to home or business affiliation. Each question has three perspectives individuals, procedure and issue. There is nothing incorrectly in having a contest yet what is significant, how the parties handle that question. There could be two methods of tending to a dispute antagonistic like litigation and arbitration and non-ill-disposed like mediation and conciliation.

The antagonistic arrangement of dispute resolution is one in which the contending cases of parties are spoken to by lawful agents who have enthusiasm for the results of question, to a fair outsider, with capacity to force specialists. As against the antagonistic method of dispute resolution, non-ill-disposed ADR instruments like mediation is casual, individuals amicable, less entangled and permits the parties to speak with one another to the main driver of their contention, recognize their basic advantages and encourages them center around discovering the arrangement themselves. It helps in fortifying and remaking of the connections. Such non-antagonistic methods of dispute resolution help in setting aside time and cash of the parties.

The Indian lawful framework has end up being a wellspring of keeping up monetary security in our nation by rendering equity to individuals everywhere and has in this



manner become the foundation of democracy in India.<sup>1</sup> Despite the foundation of courts in our nation since quite a while today, the quantity of cases that have settled on casual dispute resolution, before the legitimate framework in India appeared is colossal.

A large number of these casual modes can be resounded with the contemporary "Mediation". It very well may be alluded to as a method of settling questions by not thumping at the entryways of the courts. It is settled by an impartial outsider wherein sufficient apparatuses are utilized to change an issue through a middle person so as to bring the in contrasts of the gatherings to an end. The choices of the middle person can't be persuasively forced on the gatherings, i.e., he isn't as such a choice maker.<sup>2</sup> In request to guarantee that more fragile gatherings can authorize their lawful and legally binding rights and don't get influenced unfavorably by the definitive legal assurance, wherein the coercive intensity of the State propels reluctant defendants to go to the negotiating table.<sup>3</sup>

Just because the idea of mediation got legislative recognition in India through the Industrial Disputes Act, 1947. The conciliators selected under Section 4 of the Act are "accused of the obligation of interceding in and advancing the settlement of Industrial disputes." Under the Act detailed methods were endorsed for appeasement procedures. Another rule to be acquainted with the Indian lawful framework to intercession was the Arbitration and Conciliation Act, 1996. The Indian Parliament in 1999 passed the Civil Procedure Code Amendment Act of 1999 embedding Sec.89 in the Code of Civil Procedure 1908, wherein it given to reference of cases pending in the Courts to Alternate Dispute Resolution which included intercession.<sup>4</sup>

### **Mediation**

Mediation has been defined in the Cambridge Dictionary as "*the process of talking to two separate people or groups involved in a disagreement to try to help them to agree or find a solution to their problems.*"<sup>5</sup>

Black's Law Dictionary has defined Mediation as "*A method of non-binding dispute resolution involving a neutral third party who tries to help the disputing parties to reach a mutually agreeable solution.*"<sup>6</sup>

It has been rightly said by Joseph Grynbaum "*An ounce of mediation is worth a pound of arbitration and a ton of litigation.*"<sup>7</sup>

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<sup>1</sup> Rashika Narain & Abhinav Sankaranarayanan, 'Formulating a Model Legislative Framework for Mediation in India' (2018) 11 NUJS L. Rev. 1

<sup>2</sup> LexQuest, 'Mediation in India: Practical Indepth' LexQuest (2014)

<sup>3</sup> Alan Uzelac, 'Goals of Civil Justice and Civil Procedure in the Contemporary Judicial Systems' (2013) Jus Gentium,

<sup>4</sup> Mediation and Conciliation Project Committee, 'Mediation Training Manual In India', Supreme Court

<sup>5</sup> <https://www.google.co.in/amp/s/dictionary.cambridge.org/amp/engligh/mediation> ( last visited on 23.7.2020) at 12:15p.m

<sup>6</sup> Black's Law Dictionary Eighth Edition, First South Asian Edition 2015

<sup>7</sup> <http://www.adrtoolbox.com/library/adr-quotes/> (last visited on 23.7.2020) at 12.20 P.m.



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It has been rightly quoted by Abraham Lincoln, *“Discourage litigation. Persuade your neighbors to compromise whenever you can. As a peacemaker the lawyer has superior opportunity of being a good man. There will still be business enough.”*<sup>8</sup>

### **Constitutional and Legislative provision**

The Constitution of India dependent on the idea of government assistance state. It is the obligation of the state to tie down access to equity to its residents by guaranteeing legal and non-legal parties of dispute resolution that gives opportune and powerful equity and requirement of their legitimate and essential rights. Numbness, destitution and other social illnesses ought not to become hindrances to making sure about justice.

It is settled since free legal aid must be given to the poverty stricken individual, who can't guard themselves in a courtroom because of the reason of cash and other and now it additionally compulsory under Article 39-A and Article 21 of the Indian Constitution.<sup>9</sup>

**“The jurisprudence of Access to justice as an integral part of social justice and examine the constitutionalism as a facet of human rights highlighted in our Nation’s Constitution. If the state itself should travesty this basic Principle, in the teeth of Articles 14 and 39-A, where an indigent widow is involved, a second look at its policy is overdue.”**<sup>10</sup>

The law needs to enable the helpless who to don't have intends to battle their causes. The Constitutional Mandate salvage activity started with equity V.R. Krishna Iyer and Justice P.N. Bhagwati's Committee Report, weak section therefore become empower to move toward law court's privilege from Munsif courts to the Supreme Court. CILAS (Committee for the execution of Legal Aid Services) additionally please the scene. In view of this state’s embraced (through state legitimate Aid and counsel Boards) Lok Adalat.<sup>11</sup>

### **Constitutional Provisions**

Our Constitution considers this urge in the Preamble itself, which talks about equity in the entirety of its structures: social, monetary and political. The Preamble makes sure about to all the residents of India – Justice-Social, financial, and political. The articulation Justice quickly its —the also, Legal Aid Camps, Family Courts, Village Courts, Mediation Centers, commercial arbitration, Women Centers Consumer Protection Forums, and so on which are nevertheless different aspects of compelling Alternative Dispute Resolution system.<sup>12</sup> Constitution of India<sup>13</sup> is the grund-norm of this nation; it contains arrangements which demonstrate advancement of equity agreeable compromise of individual lead with the general welfare of society. A

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<sup>8</sup> [https://www.brainyquote.com/quotes/abraham\\_lincoln\\_132544](https://www.brainyquote.com/quotes/abraham_lincoln_132544) (last visited on 23.7.2020) at 1225 P.m.

<sup>9</sup> Avtar Singh, “Law of Arbitration and Conciliation”l, 7<sup>th</sup> Edition, Eastern book Company, Lucknow, P 397-398

<sup>10</sup> State of Haryana Vs. Darshan Devi, AIR 1979 SC 855

<sup>11</sup> Dr. Anupam Kurlwal, An Introduction of Alternative Dispute Resolution System

<sup>12</sup> P.N. Bhagawati on the need to create adequate and effective delivery system of justice in Chapter VI of —Social Justice – Equal Justicel P.33

<sup>13</sup> Narendra Kumar – —Constitution of India PP.28, 250



demonstration or lead of an individual is supposed to be simply in the event that it advances the general prosperity of the community.

In this manner, the accomplishment of the benefit of all as recognized from the benefit of people is the embodiment of equity. Lawful equity is a piece of social equity. As at whatever point the legitimate equity is denied the general public gets upset. A legitimate framework is a piece of state which keeps up social congruity through dispute resolution. In a nation, which means to ensure the financial and social privileges of residents, it is critical to rapidly arrange the cases in India, as the Courts alone can't deal with the immense build-up of cases. This can be viably accomplished by applying the systems of Alternative Dispute Resolution.

#### **Article 21 of the Constitution**

Article 21 proclaims in an obligatory tone that no individual will be deprived of his life or his own personal liberty except according to procedure established by law.

**In Hussainara Khatoun I vs. Home Secretary, Bihar**<sup>14</sup> “it has been interpreted that right to speedy trial is also a part of the right to life and personal liberty. The Supreme court has allowed Article 21 to stretch aims as wide as legitimately can.”<sup>15</sup>

The explanation of this liberal translation was extremely basic that Article-21 is to review that psychological distress, costs and strain which an individual continued against in prosecution needs to experience and which, combined with delay, may bring about impeding the limit or capacity of the denounced to protect himself.

The equivalent has gotten acknowledgment from the lawmaking body just as introduction of Alternative Dispute Resolution and Alternative Dispute Resolution Mechanism through different enactment.

#### **Article 39-A Free Legal Aid**

Article 39-A commits the State of secure that —the activity of the legitimate framework which advances equity, on a premise of equivalent chance, and will, specifically, give free lawful guide, by appropriate enactment or plans or in some other manner, to guarantee that open doors for making sure about equity are not denied to any resident by reason of monetary or different inabilities.<sup>16</sup>

In this manner advancement of equity is most significant capacity of a state and ADR components helps in it. Henceforth much enactment like Arbitration and Conciliation Act 1996 ; Section 89 of Civil Procedure Code ; Legal Services Authority Act 1987 have been passed to advance equity.<sup>17</sup>

#### **Legislative Provisions**

As rightly said by Justice Krishna Iyer,” **The first Commandment to our legislative freedom fighters ought to be to bury these codes and the Evidence Act but re-**

<sup>14</sup> AIR 1979 SC 1360; Kadra Pahadiya V. State of Bihar, AIR 1982 SC 1167; Raghubir Sing V. State of Bihar, (1986) 4 SCC 481. See also Raj Deo Sharma V. State of Bihar, AIR 1998 SC 3281; Common Cause, Registered Society V. Union of India, AIR 1997 SC 1539; Kartar Sing V. State of Punjab, (1994) 3 SCC 569; Akhtari Bai V. State of M.P., AIR 2001 SC 1528 : In this case it is ruled that where matters are not disposed of within a period of say 5 years for no fault of the convict, they should be released on bail

<sup>15</sup> Article 21 is Fundamental right that can be directly enforced in the Supreme Court under Article 32 of the Constitution of India.

<sup>16</sup> This Directive Principle was inserted by the Constitution 42nd Amendment Act, 1976

<sup>17</sup> Dr. Anupam Kurlwal, An Introduction of Alternative Dispute Resolution System page 114



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create a simple, spacious, modern and business management oriented code with scope for judicial initiative in doing justice to the people.”

**1. Civil Procedure Code,1908**

**i. Section 89. Settlement of disputes outside the Court.**

- (1) Where it appears to the court that there exist elements of a settlement which may be acceptable to the parties, the court shall formulate the terms of settlement and give them to the parties for their observations and after receiving the observations of the parties, the court may reformulate the terms of a possible settlement and refer the same for –
- (a) Arbitration;
  - (b) Conciliation;
  - (c) Judicial settlement including settlement through Lok Adalat; or
  - (d) Mediation
- (2) Where a dispute has been referred –
- (a) For arbitration or conciliation, the provision of the Arbitration and Conciliation Act, 1996 (26 of 1996) shall apply as if the proceedings for arbitration or conciliation were referred for settlement under the provision of that Act;
  - (b) to Lok Adalat, the court shall refer the same to the Lok Adalat in accordance with the provisions of sub section (1) of section 20 of the legal Services Authority Act, 1987 (39 of 1987) and all other provisions of that Act shall apply in respect of the dispute to referred to the Lok Adalat;
  - (c) For judicial settlement, the court shall refer the same to a suitable institution or person and such institution or person shall be deemed to be a Lok Adalat and all the provisions of the Legal Services Authority Act, 1987 (39 of 1987) shall apply as if the dispute were referred to a Lok Adalat under the provision of the Act;
  - (d) For mediation, the court shall effect a compromise between the parties and shall follow such procedure as may be prescribed.

Section 89 lays down that whereby it appears to the court that there exists element of settlement, which may be acceptable to the parties, the Court shall formulate the terms of the settlement and give them to the parties for their comments. On receiving the response from the parties, the Court may formulate the possible settlement and refer it to either:- Arbitration, Conciliation ; judicial Settlement including settlement through Lok Adalats : or Mediation.<sup>18</sup> In **Salem Advocates Bar Association V. U.O.I**,<sup>19</sup> “the Supreme Court directed the constitution of an expert committee to formulate the manner in which section 89 and other provisions introduced in CPC have to be brought into operation. The Court also directed to devise a model case management formula as well as rules and regulations, which should be followed while taking recourse to ADR referred to in section 89 of CPC.”

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<sup>18</sup> Law & Practice of Alteration Dispute Resolution in India, a Detailed Analysis by Anirban Chakraborty  
Published by Lexis Nexis

<sup>19</sup> AIR 2003 SC 189



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**ii. Order X Examination of party by the Court**

Rule 1. Ascertainment whether allegations in pleadings are admitted or denied. At first hearing of the suit the Court shall ascertain from each party or his pleader whether he admits or denies such allegations of fact as are made in plaint or written statement (if any) of the opposite party, and as are not expressly or by the necessary implication admitted or denied by the party against whom they are made. The Court shall record such admissions and denials.

1A. Direction of the Court to opt for any one mode of alternative dispute resolution – After recording the admissions and denials, the Court shall direct the parties to the suit to opt either mode of the settlement outside the Court as specified in sub-section (1) of section 89. On the option of the parties, the Court shall fix the date of appearance before such forum or authority as may be opted by the parties.<sup>20</sup>

1B. Appearance before the conciliatory forum or authority. Where a suit is referred under rule 1A, the parties shall appear before such forum or authority for conciliation of the suit.<sup>21</sup>

1C. Appearance before the Court consequent to the failure of efforts of conciliation Where a suit is referred under rule 1A and the presiding officer of conciliation forum or authority is satisfied that it would not be proper in the interest of justice to proceed with the matter further, then it shall refer the matter again to the Court and direct the parties to appear before the Court on the date fixed by it.<sup>22</sup>

**iii. Order XXXII 32(A)**

Order 32(A) Lays down the provision relating to “suits relating to matter concerning the family.” It is commonly the generally acknowledged view that customary court method may not be undeniably fit to manage the sensitive area of individual connections. Prosecution including issues of the family appears to require exceptional methodology taking into account the genuine enthusiastic viewpoints included. Considering this target family guiding as a technique for accomplishing the object of safeguarding of family is fundamentally required to be energized in family and matrimonial disputes.

In this manner, Order 32 A looks to feature the requirement for receiving an alternate methodology where matters concerning the family are at issue, including the requirement for exertion to realize friendly settlement. The arrangements of this Order applies to all procedures identifying with family, similar to guardianship, care of minor, maintenance, wills progression, and so forth., Rule 3 forces an obligation on the Court to put forth an attempt of settlement by method of giving help where it is conceivable to do as such. The Court may likewise suspends the procedures in the event that it believes fir to empower endeavor to be made to impact a settlement where there is a sensible chance of settlement. In release of this obligation Court may take help of government assistance master who is occupied with advancing the government assistance of the family.

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<sup>20</sup> Inserted by Act 46 of 1999, sec. 20(w.e.f. 01-07-2002)

<sup>21</sup> ibid

<sup>22</sup> ibid



#### iv. Order 23 Rule 3 Compromise of suit

Here it is proved to the satisfaction of the Court that a suit has been adjusted wholly or in part by any lawful agreement or compromise [in writing and signed by the parties], or where the defendant satisfies the plaintiff in respect of the whole or any part of the subject matter of the suit, the Court shall order such agreement, compromise or satisfaction to be recorded, and shall pass a decree in accordance therewith [so far as it relates to the parties to the suit, whether or not the subject matter of the agreement, compromise or satisfaction is the same as the subject matter of the suit.

Order 23 Rule 3 also make a provision for making a decree on any lawful agreement or compromise between the parties during the pendency of the suit by which claim is satisfied or adjusted. The scheme of Rule 3 of Order 23 proves that if the court is satisfied that a suit has been adjusted wholly or partly by and lawful agreement or compromise, the court shall pass a decree in accordance to that. Order 23, Rule 3 gives mandate to the Court to record a lawful adjustment or compromise and pass a decree in term of such compromise or adjustment.

#### 2. Family Courts Act 1984

The family courts act, (Act No. 66 of 1984) is in act to accommodate the foundation of family courts so as to advance conciliation in, and secure quick settlement of dispute identifying with marriage and family undertakings and for issues associated in that.

#### Section 9 Duty of Family Court to make efforts for settlement.

- (1) In each suit or continuing, try will be made by Family Court in the primary occasion, where it is conceivable to do so steady with the nature and conditions of the case, to help and convince the gatherings in showing up at a settlement in regard of the topic of the suit or continuing and for this reason a Family Court may, subject to any standards made by the High Court, follow such technique as it might regard fit.
- (2) In the event that, in any suit or continuing, at any stage, it appears to the Family Court that there is a sensible chance of a settlement between the gatherings. the Family Court may defer the procedures for such period, as it believes fit to empower endeavors to be made to impact such a settlement.
- (3) The Power conferred by sub-section (2) will be notwithstanding, and not in discrediting of, some other intensity of the Family Court. to suspend the procedures.

It is the limited obligation of the family court for making an endeavor for conciliation before procedures with preliminary of the case. Section 9 of the demonstration sets out the obligation of the Family Court to help and convince the gatherings, from the outset case, in showing up at a settlement in regard of topic. The Family Court has additionally been met with the ability to dismiss the procedures for any treasonable period empower endeavors to be made to impact settlement if there is a sensible chance.



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### 3. Hindu Marriage Act, 1955

Hindu Marriage Act 1955 Casts Duty on the court that before allowing alleviation under this Act, the court will in the principal case make and try to realize compromise between the gatherings, where it is conceivable court ought to ideally endeavor to urge the gatherings to placate their disparities and disputes.<sup>23</sup> For this reason the rule engages the court of appropriate circumstance to defer the procedures for the sensible period and alluded the issue to individual assigned by court or gathering with the bearing to answer to the court concerning the consequence of the compromise.

### 4. Industrial Dispute Act, 1947

Conciliation has been statutorily recognized as an effective method of dispute resolution in relation to dispute between workers and the management. Industrial Dispute Act, 1947 provides both for conciliation and arbitration for the purpose of settlement of dispute.

The key object of the Industrial Dispute Act, is examination and settlement of mechanical debates with that thing in vision assorted specialists have been made by the Act the work committee, conciliation Officer, Board of Conciliation and Courts of Inquiry endeavor to determine the distinction before it might be settled upon by the Labor Court or the Industrial Tribunal. The all aim at neighborly settlement of the industrial dispute.<sup>24</sup>

#### Encouragement of Mediation in family Disputes

In B.S. Krishnamurthy v. B.S. Nagaraj (2010), the Supreme Court speaking through Justice Markandey Katju emphasized the need for lawyers to advise their clients to try mediation especially where family relationships are involved.

#### Process of Mediation

1. Introduction;
2. Understanding the Problem;
3. Deeper understanding of the interest and need of parties;
4. Defining the problem;
5. Creating options;
6. Evaluating options;
- 7 Settlement/Non settlement

#### Effective Implementation of Mediation in India

There is a pressing requirement for a uniform sculpture solely administering the intervention procedure in India. Intervention enactment exists in excess of 18 different wards, including Singapore, Malaysia, and Ireland (assumes administrative job). The Singapore International Arbitration Center (SIAC) and the Singapore International Mediation Center (SIMC) have surrounded SIAC-SIMC Arb-Med-Arb Protocol (AMA Protocol) to manage debates as per an "Arb-Med-Arb" provision for business contracts.

In India, parties mostly settle on court annexed intercession, for which the respective High Courts have their own arrangement of Rules. Private intercession is less favored because of absence of acknowledgment.

As the above provided enactments have been presented or are being presented in our nation, what we all the while need is a speedy advancement of the intercession

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<sup>23</sup> Chhotelal vs. Kamla 1967 pat. 269

<sup>24</sup> Dr. Anupam Kurlwal, An Introduction of Alternative Dispute Resolution System.



instrument. For this, the intervention procedure, be it private or court-attached would require reasonable acknowledgment by the legislature and the legal executive.

The legal executive for the most deal with matters that require arbitration, yet there are circumstances where intercession procedures would be progressively proper and gainful to the gatherings. In this manner, recognizable proof of such issues and circumstances by gatherings, legal advisors and judges turns out to be incredibly vital and significant in the advancement of component.

### **Building a New Trend**

- How should mediation attract litigants from a purely economic point of view?
- Who will serve as neutrals in mediation?
- How will mediation be initiated (for which cases) and concluded?
- Which attributes of mediation are most likely to be effective in different litigation contexts?
- How should the courts establish quality controls (including ethics and discipline) over the emerging practice of mediation?
- How should the courts build both internal and external capacity without incurring unaffordable costs?

Naturally, the foregoing sketch of issues is far from exhaustive. A number of implementation questions will be raised and addressed: **how to make mediation economically desirable, how to cultivate a larger number of mediators available to the courts, how to promote and improve educational exposure and training methodologies throughout the country, including those under the direction of the High Courts. These capacity-building issues also demand attention and intellectual investment.** Finite answers to these questions would be premature. Thus, it may be useful, however, to highlight a list of questions and make some preliminary observations.

### **Emerging Future in Mediation: Step Forward**

Mediation is at a beginning stage in our lawful framework. With the end goal for intervention to genuinely flourish, various advances must be taken. These are not just fundamental for a superior comprehension of intervention yet in addition to make an environment for intercession, in this way incorporating it into standard Indian lawful society. A portion of our suggestions are as per the following:-

- ✓ **Independent enactment for intervention:** After the 2002 revision to the CPC, there have not been considerable changes in the administrative system of the nation, which can bolster expanded foothold for intercession in India. The 2015 correction to the Arbitration and Conciliation Act, 1996 rolled out critical improvements to the manner in which intervention and assuagement was polished in the nation, nonetheless, the equivalent doesn't affect the intercession procedure.

There is a dire requirement for an all-encompassing intervention enactment that reliably administers a wide range of intercession in the nation. An independent enactment can address the enforceability of settlement understandings, accreditation and norms of training, secrecy, benefit, irreconcilable situation, willfulness, self-assurance, and other moral worries that would definitely emerge from intervention practice, accordingly conceding expanded authenticity to intercession. Such an enactment should be drafted



with most extreme concern and care, without influencing the inventiveness and adaptability of the procedure.

- ✓ **Training the Judges in intercession:** Mediation needs the support of the legal executive to be acknowledged by the network as a compelling debate goal system. Besides, thinking about the staggering overabundance of cases in the framework, it turns out to be progressively significant for judges to acclimate themselves with the procedure and allude gatherings to intervention. Gatherings alluded by an appointed authority are known to partake viably and effectively in intercession. It is in this manner basic for judges to be prepared to recognize fitting cases for intercession and effectively allude them to intervention. The gatherings can pick in the event that they might want to receive the court-attached or private intervention foundations for settlement.
- ✓ **Sustaining go betweens with enthusiasm and responsibility:** Mediation is an encounter driven procedure. The apparent achievement or disappointment of it, regardless of arriving at a settlement, is dictated by the way in which it is directed. For that very explanation, it becomes significant that go betweens are painstakingly supported so they are likely pioneers, brand diplomats, and sincere specialist co-ops. Go betweens must be given excellent intervention preparing and urged to routinely go to cutting edge preparing projects to continually sharpen and build up their abilities to give top notch intercession administrations.
- ✓ **Making a physical space that respects the training:** Mindsets are being changed about intervention. The space must be favorable for undivided attention, sharing secret data, and settling on choices in an agreeable and quiet condition. In court-annexed programs, satisfactory consideration must be paid to proper framework. This loans validity to intervention in the brains of the defendant, particularly when the appointed authority has squeezed them to take part.
- ✓ **Altering graduate school educational program to incorporate intercession studies and preparing:** In request for the procedure to get acknowledgment, intervention ought to be remembered for graduate school educational plan, so the rising age of legal advisors know about the procedure and in this manner utilize the procedure all the more every now and again and viably. At the ongoing Global Pound Conference, India that was held in Chandigarh in May 2017, nature with the debate goal process was recognized as the greatest influencer when legal counselors make proposals to parties about procedural alternatives for settling business disputes.<sup>25</sup> Training of law understudies and legal advisors is in this manner fundamental to manufacture required recognition and hence expanded utilization. In such manner, the Ministry of Law and Justice is finding a way to incorporate ADR practices and strategies in graduate school educational plan. As indicated by an authority in the service, 'Absence of mindfulness at the understudy level converts

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<sup>25</sup> Proceedings of the Global Pound Conference, Chandigarh held on 12 May 2017, available online at <http://globalpound.org/wp-content/uploads/2017/07/GPC-Series-Chandigarh-2017-Voting-Results.pdf> (last visited on 29.7.20) at 12.50 p.m



into absence of conviction in intercession as a promoter, which must be addressed.<sup>26</sup>

- ✓ **Building private foundations and intercession focuses that fill in as stages for middle people to practice in the nation:** In request for intervention to make the following stride in our nation, private intercession establishments are basic. Private intervention will: (a) permit access to intercession on a pre-suit premise, (b) permit gatherings to have a decision concerning their go between, bringing about improved nature of arbiters, (c) permit the advancement of intercession as a calling, and (d) give a superior motivating force to business customers to attempt intercession. Private intervention foundations are, lamentably, not many and battling. Intercession by the legislature and legal executive is expected to help these youngster organizations to support themselves in giving quality intervention administrations, particularly on a pre-litigation basis.
- ✓ **Making solid administration to elevate attention to intercession and deal with its development and improvement:** Another procedure is being created in our nation. Its development must be composed and arranged with the end goal for it to be a genuinely successful choice in our lawful framework. Intervention experiences numbness and misinterpretation. Mindfulness must be made at the business, individual, and network levels in an organized and sorted out way to help a flourishing society of intervention. Broad utilization of intervention can't occur without a central change in the impression of contest goal — such a change can be productively achieved through viable and moving authority.

### E- Mediation in the era of COVID -19

The flare-up of the corona virus (COVID-19) pandemic keeps on influencing the legitimate calling nearby other significant businesses in exceptional manners. Lock downs and social separating measures have upheld court terminations and, with more restricted virtual other options, this circumstance will build delays in managing overabundance. So as to manage this novel circumstance, the calling's reaction is to a great extent going to concentrate on utilizing tech-based answers for keep the wheels of equity moving. As of now, courts are utilizing video conferencing innovation to direct hearings. While noteworthy adaptability has been appeared by the two appointed authorities and prosecutors in partaking in video-hearings, more extreme movements are required to deal with the effect on both existing and pipeline cases. Moreover, gracefully chain issues, business questions and other business matters rising up out of the pandemic itself will additionally trouble the equity framework in the coming many months. It is accordingly unavoidable that the push towards expanding utilization of innovation arrangements will be joined by a move towards utilization of elective types of compromise which can convey results with deftness and at decreased expense.

E- Mediation will empower the middle person and the parties to collect together, each on their PC screens maybe several miles away. Conversation can be guided, allowing parties and legal advisors the chance to advance their perspectives. At the point when

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<sup>26</sup> Kanu Sarda. 2017. 'Mediation, Arbitration to Enter Law School Curriculum', *New Indian Express*, 19 August, available online at <http://www.newindianexpress.com/thesundaystandard/2017/aug/19/mediation-arbitration-to-enter-law-school-curriculum-1645476.html> (last visited on 29.7.2020) at 12.57p.m



separate parties are required, the go between can, at the snap of a catch, move the other party and its attorney to another virtual room. The incredible bit of leeway of online intercession is that it is helpful, practical and a productive utilization of time. Parties don't need to endure costs, don't need to travel, don't need to stand by extended periods, and don't need to experience deferments and numerous visits to the intervention place. Much should be possible by utilizing this medium to get quicker outcomes. What will be absent in this procedure is the quickness, unequivocal quality and complete contact that is conceivable just in up close and personal parties. Then again, it might likewise be that in an online procedure, we are giving the member a little case of security, when we make this grainy hindrance of two screens and a halfway universe of Internet and Wi Fi. It will absolutely be of advantage in situations where feelings run high and vis-à-vis encounter may build the contention. That happens regularly in marital cases, and in privately-owned company questions, where tempers and feelings emerging from frayed residential circumstances and settings can beat reasonable business rationale. Also, where gatherings are situated in various nations, we would have discarded challenges of separation when we embrace this mode. As the new careless of online courses shows, it is anything but difficult to get individuals from various areas on to one stage.

The accompanying direction can be utilized as a first-stage control for guides and middle people to deal with the virtual intercession process.

Choose the right video platform: This is the one of the crucial thing. Two fundamental concerns are usefulness and confidentiality. Most driving video meeting specialist organizations, for example, Microsoft Teams, Adobe Connect, Zoom and Skype for Business are outfitted with comparable usefulness. An intercession requires individual and entire meetings with parties so a private breakout room capacity or its comparable is vital. Regarding secretly and security, the most significant perspective to consider is starting to finish encryption of calls and information insurance strategies. Stages ought to be consistent with GDPR prerequisites and those planning the intercession ought to know about what information is gathered, for what reason and how it is put away. It is fitting that IT pros be counseled while checking stages from a security viewpoint. Stages ought to be thoroughly tried inside to guarantee video and sound capacity isn't undermined by various members and long term calls. This is significant given that interventions can last whole days or even a few days. While most stages are allowed to enroll and use for clients, guarantee that all necessary usefulness is remembered for the fundamental bundle. There may be a requirement for the host to buy an excellent membership. Equipment and hardware necessities additionally will in general contain some uniform highlights across most programming. Clients ought to guarantee that they have a solid, secure and private web association. The gadget (PC, pc) ought to likewise be outfitted with sound (speakers and amplifiers) and video abilities. On the off chance that such hardware isn't incorporated with the gadget the client may need to utilize outer assets like earphones and webcams.

This is significantly more significant in a virtual setting where all parties should be certain with the go between and the procedure as well as the innovation being utilized. So as to do this, it is best for the parties to encounter for themselves how intently an up close and personal collaboration can be accomplished utilizing the video meeting



programming, just as make sense of any specialized issues well ahead of time of the intercession. To accomplish this, it is generally best to make a concise programming client manage for members. On the rear of this guide, those sorting out the meeting should set up individual pre-mediation meetings with parties to exhibit the product just as break the ice.

The client guide ought to be an effectively available manual that acquaints parties with the product and how it very well may be utilized. It should utilize text, screen capture pictures and even screen throws or connections to recordings to exhibit how the innovation is introduced and utilized. The manual ought to be written in vernacular free language and walk parties through all in-consider usefulness that will be utilized, for example, breakout rooms, chat boxes and responses.

During the pre-intervention call consultants ought to guarantee that the gatherings have perused the client directs and acclimated themselves with the product. Setting up a reasonable clothing regulation ahead of time is significant in spite of the fact that what this will be will rely upon the intervention. Nonetheless, getting from a blocks and mortar intercession it might be proper to propose to members that the clothing regulation is formal if the intervention is a business matter. Members will likewise need to consider what their experience will be to make the correct tone for the event. While the individual stylistic theme of a member's lounge room ought not make any difference to the intervention this can be an interruption on the off chance that it isn't sensibly unbiased. The client guide ought to have an area on altered foundations (if the stage permits) and gatherings ought to be helped to remember this. Gatherings ought to be in a different private room during the intercession and make a dedication not to intrude on the meeting with outer calls and different interruptions. This is particularly applicable for parties working from their homes however will be testing while self-disengagement measures stay severe.

Parties may be anxious about the confidentiality and security of the procedures. Middle people and counselors ought to guarantee the parties that breakout rooms will be utilized to have private conversations all through the intervention and that the ordinary intercession rule of confidentiality applies.

In the pre-intercession stage, counselors ought to likewise consider who will go to the intervention itself. This is key for all intercessions however especially significant with regards to virtual interventions. All parties should be given access to the product and meeting. In light of a legitimate concern for staying away from any unexpected issues, numbers ought to be kept at the very least. All parties ought to have their key leaders either present or effectively accessible on the day by telephone or email, likewise with a conventional intercession. In the pre-intervention stage, go betweens and consultants ought to likewise consider whether the intercession agreement should be revised to incorporate programming related arrangements, for example, secrecy agreements precluding the sharing of the meeting ID, recording of meetings or taking of photographs or pictures.

When the fitting strides in the pre-intercession stage have been taken, the genuine intervention ought to be comprehensively like an up close and personal meeting. Utilizing video-conferencing programming the middle person can structure the virtual intervention similarly as they would one that is led face to face. Utilizing the breakout



rooms and different devices takes into account a similar degree of protection and adaptability as would somehow or another be accessible in a blocks and mortar setting. Nonetheless, those taking part ought to expect that the procedure will be more upsetting than a physical intercession. Drawing in with a screen for a few hours and utilizing what might be new innovation can be depleting and add to strains effectively inalienable in the intercession itself.

On the condition that a settlement is accomplished, the parties will need to utilize the pre-chosen technique to draft the agreement. Parties can utilize online arrangements like Docu Sign to consent to and formalize the arrangement continuously.

### **Conclusion**

E- Mediation has a large group of focal points, yet additionally bears some forewarning. Secrecy can be undermined since hearings could be recorded; specialist organizations must be watchful, and rules should punish members for break. Specialized glitches must be limited, and Internet administrations must apparatus okay with giving screen lucidity and continuous feed. In any case, most importantly, there is the misgiving that online correspondence will reject the oppressed; the individuals who can't manage the cost of access to Internet or don't have the limit or help to utilize it. Such rejection will be commensurate to refusal of access to equity. In the event that the State and its Courts will permit and urge online intercession to determine questions, more vulnerable gatherings must be helped and empowered to profit of this office.

As we wander in obscurity to discover what the new typical is going to comprise of, we may well find that a decent piece of the universe of dispute resolution has been flipped, and that COVID-19 is the harbinger of progress taking on the web consensual goal to a more significant level. Maybe, this cloud also has a silver coating.

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## EDUCATION IN INDIA POST COVID-19 OUTBREAK

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### Abstract

The sudden outbreak of COVID-19 pandemic and its repercussions upon the education scenario in India. More than 32 crore students in India are suffering severe disruption in their education as schools and colleges remain shut to maintain social distancing and prevent further spread of the disease. The education sector is facing unprecedented challenge and technology is the key factor now in providing educational resources to students staying at home and to keep them motivated for learning. But, not all the students in our country are capable of getting access to digital world with high speed internet and uninterrupted power supply or even having a Smartphone. Therefore, our government needs to develop creative strategies to enable access to learning to all the students, irrespective of school, college or university, even when we are facing the COVID-19 pandemic. This paper acknowledges the present status of education in India, the positive impact and the issues pertaining to execution of online education.

**Key Words:** COVID-19 Pandemic, Digital Learning, Blended Learning, Infrastructure

### Introduction

The outbreak of corona virus disease 2019 also known as COVID-19 has reminded the human population all over the world that change is inevitable. The global impact of COVID-19 is immense as educational institutions all over the world from Harvard to IITs are shut down; the whole world is extremely affected. There is panic all around, both educators and students are alike perplexed as immediate steps ahead and continuity with the educational objectives seems to be unstable. The future of majority of students hangs in limbo, no doubt, that the COVID-19 pandemic has unleashed the biggest calamity that humanity has ever faced in modern era. We all are going through perhaps the most trying circumstances of our lives.

According to UNESCO, over 157 crore enrolled students across the world, i.e. more than 91% of world's students were out of school, due to school closures in at least 191 countries during the months of March and April. Presently, in the month of July 2020, more than 60% of total enrolled learners from 106 countries are affected by this pandemic [1]. These students are heavily impacted by severe disruption in their education because of novel corona virus pandemic. In India, more than 32 crore students are facing interruption in their routine educational pursuits as schools and colleges are shut.



Prime Minister Narendra Modi announced a complete lockdown across India on March 24,2020,which affected the academic activities at various levels, including the postponement of board examinations, college and university level examinations of the year 2020 such as Joint Entrance Examination(JEE) for engineering and National Eligibility and Entrance Test(NEET) for medical, among others. Central Board of Secondary Education (CBSE) has postponed the Central Teachers Eligibility Test (CTET) July2020. Even, Union Public Service Commission(UPSC) also postponed the National Defense Academy (NDA) and Naval Academy (NA-1) Exam 2020 and Civil Services Personality Exams 2019. All these decisions have been taken in view of safety and security of candidates.

There are reports which proclaim that students from class 9 to 12 are the worst sufferer by this lockdown. More than 13 crore children falling in this category in India are the students who were writing or will write their board exams in very near future. The nationwide temporary closure of educational institutions was done as an attempt to contain the spread of COVID-19 pandemic. The education sector is coping with the unprecedented challenges and needs to adapt and find solutions to keep students motivated and involved in their learning path.

A research study done in Zambia, concluded that STEM subjects i.e. Science, Technology, Engineering and Mathematics, will be negatively affected in terms of learner performance in the national examinations and teachers expect a drop in the performance of Grade 12 students this academic year if the COVID-19 epidemic continues to cause an increase in the number of cases.[2]

In response to school closures, UNESCO has recommended the use of distance learning programs and open education applications and platforms that school and teachers can use to reach learners at remote places and limit the disruption of education. The Union Ministry of Human Resources and Development (MHRD) has made several arrangements, including online portals and educational channels through Direct to Home TV (DTH) for students to continue learning apart from online classes being held during this period. 'Bharat Net' is also connecting all the villages with high speed broadband network, to realize the vision of digital India.

It can be said that in the present situation, after the outbreak of COVID-19, online learning is the key word or new normal in education sector when we are still resisting the coronavirus pandemic. Although the future scenario of education in India shows great dependence on digital learning, the infrastructure required for open educational resources is actually not fully prepared, hence for the immediate future we will have to depend upon blended learning mode which permits the amalgamation of online learning and traditional methods of teaching-learning.

### **COVID-19 Outbreak**

The novel coronavirus is an unparalleled first-time danger to the human race all over the world. COVID-19 is an infectious disease caused by Severe Acute Respiratory



Syndrome (SARS) coronavirus 2. It was first identified in Wuhan, China in December 2019 and later on resulted in an ongoing pandemic. The virus is primarily spreading between people during close contact when the infected person coughs, sneezes or talks, small droplets carrying the coronavirus come out and infect the nearby persons.

We do not have any speculation that for how long it will spread but we have updated data everyday that it has already infected more than 17.2 million people around the world and still counting. Among the infected, more than 671,000 people have already died as on July 31, 2020 and the pandemic is also causing serious global economic damage. In our country, total number of confirmed cases have reached to 16,38,870 and number of deaths 35,747 as on July 31,2020 [3]. In order to limit damage, efforts are done to curb the spread of COVID-19 through non-pharmaceutical interventions and preventive measures such as use of mask and sanitizers, social distancing, self-isolation. Hence the recommendations for widespread closure of primary, secondary and tertiary level of educational institutions originated worldwide.

During the 1918-19 Influenza pandemic in United States, school closures and public gathering bans were associated with lower total morbidity rates. Also, during the 2009 H1N1 Flu pandemic, early school closures and other social distancing measures reduced influenza transmission rates in Mexico. The results suggested that similar measures could be useful for fighting future influenza pandemics.

### **Impact of COVID-19 on School Education**

For school going children, the lockdown represented sudden interruption in their routine course of learning journey. The COVID-19 pandemic is posing difficult time for everyone, but total shut down of schools; the places for real-life physical interaction, have been really tormenting for millions of students, who are forced to stay at home and study without direct physical presence of their teachers along with new way of online learning. Teachers and educators too are encountering the nuisances of teaching through digital platforms.

The Government of India has allocated only 4.6 percent of its GDP on education in the annual budget. The new challenge of e-learning demands expenditure on infrastructure, tools and technology at each level of education system as our country is still at a nascent stage of online system of education. This pandemic of coronavirus and the subsequent lockdown has intensified the obvious and deep- rooted social difference especially between private and public school systems. According to the LANCET, although the current school closures differ from summer holidays in that learning is expected to continue digitally, these closures are likely to widen the learning gap between children from lower-income and higher-income families. Children from low-income households live in conditions that make home schooling and digital learning much difficult[4].

According to research studies, enrolment in class 1 increased by astounding 30 percent after implementation of the Midday Meal Scheme, which simply implies that availability of food and not the access to education, is important and it is the key driving



force behind school enrolment. Therefore, one cannot imagine that these children will have any access to digital learning facilities at their home. It also means that their education is completely halted at present and it may lead to increase in dropout rate[5]. Although, government schools like Kasturba Gandhi Balika Vidyalaya, are also using social conferencing app like Zoom and social media platforms like WhatsApp for conveying of necessary learning instructions. In case of households not having Android phone, educational programs are run on Door darshan at specific hours.

On the other hand, the students belonging to urban private schools are having continued education through standard digital platforms where both teacher and students have the availability of technology. Many schools are using WhatsApp, Hangouts Meet, Zoom, You-tube live and Facebook live to connect with learners in real time. They are also using various other online apps like Kahoot, ed puzzle, Edusprint etc. to enable learners engage actively with the content, leading to active learning. Students are often assigned with individual and collaborative work also.

Nevertheless, most of the teachers need to upgrade their skills and aptitude for using technology and improve the access to various teaching resources. Parents in urban areas also remain fully involved just opposite to the normal schooling days as they help their children to set up e-learning stations at home, ensuring continuous internet facility, monitoring them frequently for any distractions and dealing with their stress and tantrums too. In case of very small children belonging to pre-primary and primary classes, where both parents are working from home or office, they really find it very difficult to juggle between their own work, household work and children's online education.

### **Impact of COVID-19 on Higher Education**

Universities and colleges are the center for higher education where students from different states and nations around the world live and study in close proximity to each other. But the foundations of this unique ecosystem have been impacted significantly by the recent rapid spread of the coronavirus outbreak, creating turmoil in the teaching learning environment. The most effective tool in keeping student retention and maintaining access to learning has been online courses during this pandemic outbreak. Earlier, in 2011, the Government of India launched 'Aakash' project, as a part of initiative to link 25,000 colleges and 400 universities in e-learning program. This project had aim of distributing 'Aakash' tablets to mostly rural, underprivileged students at subsidized rate to promote e-learning in villages which eventually became unsuccessful due to quality and procurement issues, but that scheme can be reformed and revived in present circumstances.

Universities across the United States have adjusted their programs in response to the spread of coronavirus, the professors are urged to take classes online. While the majority of colleges and universities around the world integrate some form of online education into their coursework, moving all programs online may prove challenging. Indian Institute of Technology, Bombay (IIT Bombay) has become the first major



institute to scrap face-to-face lectures this year, next semester will entirely be online. But most of the colleges in India, will take time to handle the change and be open to new methods of teaching through digital platforms. Here, the school teachers, students and parents are more comfortable with digital learning than the college teachers and students as lecture method is most popular method of teaching in colleges.

COVID-19 has caused snag in the career of students who were about to graduate or post graduate, they are caught in limbo and facing uncertainty to their future, particularly about employment issues or admission in further courses. There are also students who were one year away from school or college leaving exams. In fact, they have a big challenge of proving themselves for their next journey in education. These students meanwhile can focus on those areas which are aligned to their interests and strengths. They can involve themselves in some demonstrable projects which would showcase their skills in those areas and this can be marketed well in future for gaining affirmative position. SWAYAM courses, run by Government of India, which are initiated to provide best teaching learning resources to all, including the most disadvantaged class, now could be instrumental for gaining access to knowledge.

There are many international students studying in different universities of our country, who are affected by the coronavirus pandemic. They could not fly back to their countries and could not stay back in their own closed campus too. It became a great challenge for administrators to provide food, accommodation and safety measures to these foreign students. These international students are worried about not only their own living, health and further education, but also about the well-being of their family members. Further, these graduates are going to face the severe challenges of the global recession caused by the COVID-19 crisis[6].

### **Positive Impact of COVID-19 on Education System**

COVID-19 has redefined education system and the experts in education are compelled to rethink the conventional mode of education. It has brought the digital education to the forefront which appears as a solution to fill in the void for classroom education, while minimizing the chances of any infections to students and teachers until classes resume. It is very likely that remote learning through digital platforms will be aptly integrated into mainstream education in near future, which is the basic concept of blended or flipped learning.

Online teaching requires distinct skill sets that are not part of teacher's training curriculum specifically, but this emergency situation has now obligated the teaching fraternity to get acquainted and become capable of teaching online. Although, the draft of National Education Policy 2019, has made an attempt to bridge the gap between online and classroom education.

In India, online tutorials like BYJU's or Mindspark were gaining popularity before the COVID-19 pandemic struck. MHRD had already introduced various online learning platforms like e-Pathashala, e-PG Pathashala, Diksha, Swayam and Swayam Prabha.



However, most of the Boards, administration and teachers were reluctant to give prominence to it, nevertheless, the lockdown changed the perspective, as educational institutions are still closed since more than four months. Across the world, e-learning came to the foreground to keep the flow of education system running. Mindspark witnessed 10-fold rise in registration for trial or free coaching in the month of April.

The new era in education post COVID-19 will see a new methodology of blended learning where the educational institutions will try blending different teaching models, teachers will be trained accordingly and will become tech-savvy. This will be a set norm in most of the schools, colleges and universities. Hence, the current pandemic should be considered as an opportunity to introduce innovative teaching methods and facilitating e-learning platforms that can reach every child in the world. All these efforts finally make the education system of India more robust, flexible and comprehensive. As online practice is benefitting the students immensely, it should be continued after the lockdown [7].

COVID-19 pandemic has provided an opportunity for educators to propose new customized learning experiences for every student, which would be more interesting, individualized and enjoyable. They now have scope for getting access to world class education. There are massive open online courses [MOOC] available for students as well as teachers to upgrade one's knowledge and skills. Since our country has huge population, India is considered as biggest market for MOOCs after USA. One can have open access to these courses from all over the world via internet, thus it has brought revolution in the field of education.

In higher education, many universities and colleges are replacing traditional exams with online assessment tools. This is a new area for both teachers and students, hence, assessments may have larger measurement error than usual [8]. However, proctored way of conducting examinations is being introduced by the IT sector of the institutions, which can ensure fair procedures.

COVID-19 pandemic has significantly popularised the online teaching and learning scenario of our country. Among the teaching community also, the researchers, the educationists and the policy makers are actively interacting through the platform of webinar and workshops to share their knowledge.

### **Issues in Online Teaching Learning**

Online teaching has been appreciated in schools; and the students, teachers and parents are somewhat comfortable with this approach when compared to higher education sector. But after the outbreak of COVID-19, it has become necessity for the whole educational system in a very short period of time and various innovative learning contents and teaching methods are the need of the hour.

Digital or remote learning needs no physical boundaries, it is cost-effective and facilitates learning within the boundaries of home. Though, it has limitations and challenges too, because students living in urban area have the facilities to opt for digital



education, but, students in rural area or belonging to low income groups do not have the required infrastructure nor are they financially strong to avail the resources required for digital education [9]. Teachers also need training to use the online mode of teaching so that they are able to provide authentic, proper and unified learning experiences to students. However, online education system primarily depends upon smart classrooms or infrastructure that includes ample internet connectivity or high speed wi-fi, uninterrupted reliable power supply, LED screen and laptops. All students must have smartphone, tablets or laptops, which are still a dream for majority of students in India. The issue of language also poses a big challenge in case of online learning. Presently, adapting to online education or digital learning in English medium is much easier for students and teachers as the tools and contents are readily available in that, but the situation is totally opposite in vernacular languages that dominate the Indian education system in schools as well as colleges. Unless the gaps are bridged, the benefits of online education cannot reach a wider population.

### Conclusion

Until proper vaccine for the novel coronavirus is developed and implemented, we cannot imagine a normal social life with erstwhile system of education. Hence, we must remodel the tools and techniques of pedagogy and focus upon the functionality of online teaching learning, which has come as a rescue at the time of sudden outbreak of coronavirus pandemic and subsequent lockdown of the whole social structure worldwide. The concept of blended learning has appeared in this emergency time which encourages students and teachers to become more tech-savvy. But our country needs to expand its digital network and ensure maximum reach of online learning to every nook and corner of its cities and villages. It is need of the hour for every educational institution to strengthen the information and technology network so that all the teachers and students are connected digitally and contribute in the pursuit of gaining knowledge and skills.

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## A STUDY OF IMPACT OF OCCUPATIONAL STRESS ON FAMILY LIFE

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### Abstract

Stress is unavoidable in today's scenario. It is not restricted to one's who feel it, it rather has become a public issue and is seeking attention from people around. Each individual hold different view about stress as it can be experienced from variety of sources. But concern for stress has increased nowadays with increasing concern about work life balance and quality of life. Work and family are the two most important aspects in women's lives. There are many facets in working mother's lives that subject to stresses. They deal with multiple personal and professional issues as well as job stress on a daily basis. Imbalance between work and family life arises due to several factors. Various factors appear to strengthen the brunt of pressure on women.

**Keywords:** Stress, Occupational Stress, Work Life Balance, Family Life, Working Women

### Introduction

In today's world India is a superpower in the global economy because of the talented and educated Indian professionals. There is a drastic change in the role of men and women over the past 50 years. More women than ever before are now in the workforce reflecting, the rise in educational levels and changing societal attitudes. They undergo great amount of stress to balance their professional and personal life. Work Life Balance is the key issue bothering many corporate and employees in Information Technology (IT) sector. Professional and personal life are the two sides of the same coin, the imbalance between these two leads to factors like stress, fatigue, poor performance, deteriorating quality of health, time management issues, lack of proper social support, elderly and childcare issues.

Balancing work and family roles has become a key personal and family issue for many societies. Work and family are the two most important aspects in people's lives and, contrary to the initial belief that they are distinct parts of life; these domains are closely related (Ford et al., 2007).

Traditionally, the major responsibility of women has been perceived to be the maintenance of the family including home and childcare and breadwinning was the main responsibility of men. However, with more and more women entering the workforce and pursuing careers, these clearly defined gender roles were forced to change (Sevim, 2006). Most women do not have responsibility only in one domain anymore; they have to balance the competing demands of both work and family domains (Biçaksiz, 2009). Usually few years ago the scenario was that the mother was the homemaker and



was there to greet the children when they returned home from school each day. But there have been dramatic changes in the vision.

Gradually time has changed, and millions of families perceived that they need two wage-earners in order to fulfil the requirements including buy a home, pay the rent, afford vacations or simply to maintain the family budget. As a result, in most communities, two-working-parent families are no longer exceptional.

The proportion of working women with dependent children is increasing, especially among those with children under the age of five. Although the majority of women work part-time, increasing numbers are working full-time specially in IT companies where they have to work overtime and in shifts to meet the company and client expectations. Dramatic increases in women employment are seen as having important effects on family life. Some argue that it makes women think of themselves as self-sufficient individuals rather than as someone who only prioritises their home life and family relationships. Others see it as leading to more equitable relationships between both partners in a couple, and to parents devoting quality time to their children. Though occupational stress is another major area of concern. It is stress taken away to home from workplace. Occupational stress may have an impact on home and family environment

Today, maximum married couples are working to create a balance with occupational life as well as their personal life at home with their children. But it is not that easy for a woman as she has to take on multiple roles right from a cook, a tutor, a housemaid who take care of the home, a caretaker as well as cater to fulfil requirements at home. At this place, a working woman can be strained and restless; especially when family is not very cooperative. Working women, no matter whether they are single or married, face higher strain and contrary health effects. Working women most probably feel encumbered because of their diverse workload.

Stress among working women in IT sector for some people, a stressful job is no issue, but for others it can be draining and even become a health issue. And science backs this up; numerous studies have suggested that stress at work can shorten the life span and cause negative health problems. According to the American Psychological Association (APA), "Along with its emotional toll, prolonged job-related stress can drastically affect physical health. Constant preoccupation with job responsibilities often leads to erratic eating habits and not enough exercise, resulting in weight problems, high blood pressure and elevated cholesterol levels." The APA also cites a loss of mental energy in addition to the health problems that can stem from a negative working environment or a stressful job. It can also perpetuate a negative and cynical attitude, leading to problems with depression, which can ultimately reduce overall immunity. This research was an attempt to study the impact of job stress of these employments on home and family life of working women. Hence the investigation was carried out with following specific objectives:

- To study the multiple roles of women employees at personal and at professional level in IT sector which affect their psychological and physiological condition.



- To study the consequences of occupational stress among women employees working in IT sector.
- To study the perception of women employees on their occupational stress

### Review of Literature

(Allen, 2001; Dikkers et al., 2007; Thompson et al., 2004; Grandey et al., 2007; Lapierre et al., 2008) have indicated that employees working in an environment perceived as more family-friendly reported less work-family conflict. Study indicated those who employees working in the working in the family friendly and positive environment have less chances of dealing with occupational stress and work - life conflict.

(Ahmad and Omar, 2010) Occupational stress defined as the harmful physical and emotional responses that occur when the requirement of the job does not match the capabilities, resources or needs of the worker. Jobs these days are so demanding and employees expected to be provide the services 24\*7 whenever their company or client required irrespective of gender, which become quite stressful for women employees (who has to even manage a family responsibilities as well with their professional work) to fulfil the requirement of job which demand much time and work then their capabilities.

(Yahaya et al., 2009) Many job conditions caused stress among women. These job conditions include little control over work; role ambiguity and conflict; poor relationships with co-workers and supervisors; heavy workload demands; job insecurity and work that are narrow, repetitive and monotonous. Work and family balance issues also can be stressors for women in the workplace. On the other hand job stress has been linked with depression, musculoskeletal disorders, cardiovascular disease and burnout. Study shows that various factors of work stress lead to multiple health conditions and affect their mental peace.

(Abdullah et al., 2008) Because of difficult situation caused by occupational stress, there are many mothers that would like nothing more than to give up work and spend their time raising their family as best they can. However, financial problems can create areal obstacle here and many mothers find themselves having to go back to work in order to help maintain the family budget. For single mothers in particular, are turn to work after having a child is often a necessity. There are a number of problems that working mothers can face: Difficulties with finances, Getting to spend time with the kids, Keeping on top of the housework, Dealing with sickness, Quality time for yourself, Personal illness and stress.

Wei et al. (2009) examined 121 Chinese professional women on work-family conflict and their stressors. The result showed that professional women's self-role perceived and social-role perceived have conflicts; education, incoming ratio, professional experience can influence the stress; domesticity satisfaction, family activity, spouse stress, work devotion and work load are stressors of professional women's work-family conflict.

Abdullah et al. (2008) assessed occupational stress, social and family difficulties and job contentment of working women in Bangladesh. The study contained the information



and situation on working women, the hazards and occupational strains they face at work and in family life in many developed and developing countries including Bangladesh. Besides, this study has also tried to illustrate where the difficulties are and how far these for working women can be solved by giving them emotional sustenance, voicing against the long standing harassment of women and advocating equality for them.

**Gladies J. J. & Kennedy V.(2011)**- The author revealed a significant correlation between Organizational Climate and Job Stress among the women working in IT companies of India. According to him, learning how to manage stress is a very crucial issue that should be developed in IT companies so that they can reduce or eliminate the causes of stress and poor working environment.

**Khalid A. (2012)**- There is a direct relationship between stress and job performance in any organization. To improve the performance of an individual in an organization an employee should receive good support from their leaders. Hence, a supportive leader can improve the performance of an employee even at unfavourable situations.

**Kavitha(2012)**- The article focuses on the organizational role stress for the employees in the IT sector. It also highlights that women face more stress than men in the organization to be more septic married women faces more stress than the unmarried women.

**P.S. Swaminathan,& Rajkumar S. (2013)**- He conducted a study that focused on the levels of stress among the age group, profession, different varieties of jobs, hours of work and the impudence of work environment on the degree of stress faced by employees . Stress in an employee is very individual in nature. His study indicates about an optimum level in which every individual can perform with his full capacity. He has identified three conditions responsible for work stress they are a) Role overload b) Role self distance c) Role stagnation.

**Weiss M. (1983)**. -The Author investigated the sources of Job stress that is linked to Job dissatisfaction, Job related tension and anxiety and reduced productivity and effectiveness. He tried to reduce sources of stress so that he can prevent the deleterious health consequences. Through his study he determined the potential of social support that alleviate the deleterious consequences of stress.

**Amat Taap Manshor, Rodrigue Fontaine and Chong Siong Choy (2003)** in their study examined the sources of occupational stress and it was found that workloads, working conditions, and relationship at work were the main concern that lead to stress at the workplace. The results also indicate that certain demographic variables (age, income, and years of experience) do influence the level of stress.

**Ganster and Schaubroeck (1991)** point out that women experience the greater level of stress as they are more vulnerable to the demands of work to the extent that they often have more non-work demands than men.

While much research has been conducted on the occupational stress in men, little research has examined the occupational stress in working women and the effect of these stresses on their families. The current study mainly aims at demonstrating job situation for working women and, stresses and difficulties that women experience.



### Methodology

The present study was conducted in Pune city. In this study, the researcher adopted a random sampling method for selecting the sample. A representative sample of 100 women respondents from four IT companies namely TCS (Tata consultancy services), Infosys, Persistent, Cognizant was selected randomly. In all total 400 respondents were selected for the study. The questionnaire method was used for collection of data. Data for the study was collected through structured questionnaire method. The data collected was tabulated and suitable statistical tools such as frequency, percentages, mean score, chi square were used for analysis of data.

### Data and Analysis

**Table No. 1. Impact of stress on heal that individual level**

Company		Negative	Not Applicable	Total
TCS	N=	93	13	106
	%	88%	12%	100%
Infosys	N=	98	12	110
	%	89%	11%	100%
Persistent	N=	93	12	105
	%	89%	11%	100%
Cognizant	N=	68	11	79
	%	86%	14%	100%
Total	N=	352	48	400
	%	88%	12%	100%

Stress may do considerable damage to a person internally, but there are external manifestations too. The impact of ill health is always negative on every individual and it clearly impact individual's health and their work performance at their workplace because it is practical reality if anyone is physically ill it also somehow affects their mental functioning and it is very difficult to overcome this problem. The information related to impact of stress on health at individual level is collected and it is seen from the table above that about 88% of the respondent have reported that there is a negative impact of the stress on health. Perhaps unhealthiest is one of the major reason or cause for developing the stress. Particularly among the women when she is working at family level or at corporate level, she has to keep the balance between personal and professional life. Heavy workload, long hours of the work, timely completion of the task all these are the various factors that are creating negative impact on health and these factors creates the major problem on creation of stress among the respondents. In brief it is to state that almost all respondents are of the opinion that there is a negative impact of the stress on heal that individual level.

**Table No2. Factors occupied mind**

Company		Job/ Families	Finance	Health	Society	Relation with others
TCS	N=	89	60	51	33	31
	%	84%	57%	48%	31%	29%
Infosys	N=	94	69	47	33	31
	%	85%	63%	43%	30%	28%
Persistent	N=	89	75	53	37	31
	%	85%	71%	50%	35%	30%
Cognizant	N=	65	52	40	24	19
	%	82%	66%	51%	30%	24%
Total	N=	337	256	191	127	112
	%	84%	64%	48%	32%	28%

It is seen from the table above that about 84% of the respondents have reported that job and family are the first factors which keep their mind occupied for longer. Study was conducted on the employees of four companies who were randomly selected and they have shown no large variation in accepting the reality of job and family factor which keep their mind occupied for most of the time. However it is plainly ranges between 84% -82% in all the companies under study. Financial stability is another inevitable factor in an individual's life, for which people are working hard and also compromising their health by working more than their capacities,64% of the respondent have reported that they keep thinking about financial matter of the family or at individual level, 48% respondents have reported that health is other aspect which automatically drag their attention if they do not feel well or wont be able to concentrate on their work and perform well in their tasks. This clearly shows that there are several factors which keeps individual's mind occupied in some or other way.

**Table No3. Feeling of exhaustion at the end of the day**

Company		Sometimes	Often	Always	Total
TCS	N=	39	56	11	106
	%	37%	53%	10%	100%
Infosys	N=	36	58	16	110
	%	33%	53%	15%	100%
Persistent	N=	36	53	16	105
	%	34%	50%	15%	100%
Cognizant	N=	25	41	13	79
	%	32%	52%	16%	100%
Total	N=	136	208	56	400
	%	34%	52%	14%	100%



IT industry work environment is very tedious. An individual has to sit for longer hours at one place in front of the computer screen which not only strain their eyes but also increase the chances of musculoskeletal dangers like tension neck syndrome, Carpal Tunnel Syndrome and back problems. Though it seems like that while sitting no one get tired but this longer sitting hours make an individual really exhausted physically as well as mentally and they feel like they almost drain their energy at the end of the day. Sometime due to work they are so overly exhaust that it impact their work performance and they can't meet the clients expectation. This situation automatically creates the stress on the mind of employees. On this background the information related to the feeling of exhaustion at the end of the day at work or in between is collected from the respondent.

It is seen from the table above that 34% of the respondent have reported that sometimes they feel exhausted no large variations have been absurd between various companies however the trend remains same ranging from 32% to 37%. About 22% of the respondent has reported that they feel exhausted by monotonous work. In all the companies under study same trend have been absurd ranging from 50 to 53%. There are 14% of the respondent those who have reported they always feel exhausted and they mentioned several reasons for getting exhausted which is heavy workload, time bound programme to work monotonously. This situation creates the major tension and stress on the mind of the employees. The overall situation indicates that about 10% to 15% respondents from each company have reported the same response that they always feel exhausted. In brief it is to state that exhaustion is a natural phenomenon that is reported by most of the employees which is one of the main factors of stress creating element at workplace.

Table No.4. Impact of job expectation on family life

Company		Never	Hardly ever	Sometimes	Often	Always	Total
TCS	N=	1	19	60	25	1	106
	%	1%	18%	57%	24%	1%	100%
Infosys	N=	2	16	54	35	3	110
	%	2%	15%	49%	32%	3%	100%
Persistent	N=	4	15	53	31	2	105
	%	4%	14%	50%	30%	2%	100%
Cognizant	N=	1	14	40	22	2	79
	%	1%	18%	51%	28%	3%	100%
Total	N=	8	64	207	113	8	400
	%	2%	16%	52%	28%	2%	100%

It is seen from the table above that about 80% of the respondents have reported that there is a major impact job makes on the respondent's family life of the job. At work place the companies expecting the output from the employees which they may not be able to give it hence they faced a lot of problems at family level. They stated that sometimes or often they face lot of problems due to job commitment they can't give the time to their family and their children or sometime a urgent family requirement has



come and they won't be able to present at the time when their family needed most and due to this they develop the feeling of self-guilt of not being with their family at the time they needed them most. 18% of the respondent has reported that they hardly ever or never face this problem. Large variations have also been absurd between various companies regarding the numbers of respondents expectation of job impact their family life. The outcome from this data was that all respondents has who working in different companies and has different work environment from each other and not only this but in which project, position, shift she is working is also impact their job responsibilities and their workload.

Therefore it is very essential to know whether there is a interference of the office work in her personal life or not. Even though she decided not to interfere any office activities into the personal or family life it becomes very uneasy or impossible because the heavy job or the heavy workload given by the manager and she has to complete that job in a stipulated time in this condition naturally the office work gets interfered into the personal life or the family matter. And if it occurred quite frequently or regularly it becomes the major hurdle in the social relations of the family members.

### Conclusion

Stress at work, the stress of raising children, the stresses that come with aging parents any of these situations could provide a sort of high amount of stress. When women are faced with multiple roles, all of which carry heavy demands, they face levels of stress that are high enough to add to health problems, missed work, and a diminished capacity to take on more of stress.

Stress in the workplace is a commonality throughout the world in every business. Managing that stress becomes vital in order to keep up job performance as well as relationship with co-workers and family members. Changing the work environment relives work stress. Making the environment less competitive between employees decreases some amount of stress. Employees working in IT industry are prone to develop a lot of health problems due to continuous physical and mental stress of their work. Diseases are induced, sustained or exacerbated by stress. Thus, it is necessary that the management of IT organizations to take remedial measure to overcome the negative effect of stress on their employees.

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## IMPACT OF COVID 19 ON INDIAN EDUCATION

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### Abstract

COVID 19 epidemic has been called a global disease. It is becoming a world-destroyer if its treatment is not found at the right time. Different countries of the world are in the grip of it. Not only one country but the entire world economy, production, education, trade industry and human life many essential works are being stalled and badly affected.

Using a wide level online education system to maintain the progress of education in various countries previously from COVID 19. Education there will be less affected due to COVID 19 than in countries where the use of online updated education system is almost negligible. Those regions expected more likely to stop the education of students related to the rural environment and there is no promotion of education for a long time, the education of these places may also end.

We can say this in such a way that the level of education there can also go up to zero. Impact on education from COVID 19 can also affect the most terrible education of this century special efforts are being made for prevention in this direction like social-distancing, export & import of COVID 19 test kits, quarantine centers, and various information related to the prevention from COVID 19 is being disseminated through non-print media and print media. So that citizens can find their own way to rescue.

The students of primary, secondary and higher education are being influenced by COVID 19 at their own level. The efforts made by the Government of India to prevent COVID 19 are appreciable but they are proving to be inadequate. There are generally the problem of enhancing the level of education in primary education, the problem of 10 & 12 examinations in secondary education and research & practice work getting hampered on a wide ground in higher education.

**Keywords:** COVID 19, online education system, social-distancing, COVID 19 test kits, quarantine centers.

### Introduction

COVID 19 pandemic is deadly for the whole world, **India** including **China, America, Italy, and Britain, South Korea**, etc have the victims' countries. Due to COVID 19, the pace of trade has slowed down on a global scale. Most of the countries affected by COVID 19 are emphasizing their power first on the availability of health facilities. Along with this, they are also trying to ensure that the current pace of the economy is not reduced. Meanwhile, the government of India is importing and exporting various goods according to its capacity for better health facilities. So that efforts can be made to prevent COVID 19 in other countries as well. Whereas for the prevention of COVID 19 Government of India has ordered to follow the lockdown up to 4<sup>th</sup> stages and efforts to improve medical facilities in which attempts are being to make



the mask, sanitizer, and antibiotic. All zones of India are divided into three zones i.e. **red zone, orange zone & green zone**. All the people of the red zone are required to download the **Arogya Setu App** on mobile.

The survival of any country requires that its economy, health, and education have deep and strong roots. Economy, health, education, and infrastructure have undergone major changes with the increasing medical facility during COVID 19. The procrastination created in the economy can be accelerated through various techniques and technologies but eliminating the procrastination created in education is not a child's play, because during COVID 19 period the growth of children cannot be reversed again.

Globally, the level of education in other countries, teaching methods, and teaching techniques are already advanced than India. In these countries like Britain, America, Italy, and China, etc, various online programs at the national level were being organized since many years ago. In such a situation, COVID 19 cannot consider the wide impact on their education system as in India.

Before COVID 19 online teaching-learning program was being operated in India but it was very less than the required level. Students belonged from cities and directly affluent areas used to get the benefit of these online teaching-learning programs. Whereas the students from rural India are completely isolated from this stream of education. COVID 19 has affected Indian education very badly. Its effects are on various levels of education which are follows-

- Impact of COVID 19 on Primary Education & Upper-primary Education.
- Impact of COVID 19 on Secondary Education & Higher Secondary Education.
- Impact of COVID 19 on Higher Education.
- Impact of COVID 19 Primary Education & Upper-primary Education

Education in rural areas is given from the chalk and talk method mostly. In which the role of online study is very minimum or negligible. During COVID 19, many students from backward areas have postponed their education, and students who belong to the developed area are learning through online teaching. Due to which the gap between the educations of the students of the two localities can also take the form of a gap of knowledge and learning. COVID 19 has also victimized the education of students who learn in school every day. The wide impact of COVID 19 in the education-world can be seen in the education of children.

In this age, children interact with their classmates and friends to develop their social knowledge and interaction skills with their peers. The environment of the classroom and peer groups is essential for the all-round development of the children. Whereas the basic mantra of prevention from COVID 19 is social distancing. It is necessary to follow lockdown for social distancing. In such a situation, words **learning by doing, play-way method, and natural education** have no meaning because everybody has to stay at home following the lockdown. Thus, by staying in their homes and do not go to school, the social knowledge of students and their psychological trends is also rebuffed. Thus, the social and psychological gap of children in education is the issue of great concern.



- **Impact of COVID 19 on Secondary Education & Higher Secondary Education**

Secondary level students can be considered intelligent to the extent that they can gain the necessary knowledge possible by using the study material appropriately. The inspiration and interest of students play an important role in their education. If they wish, they may not do the same as classroom education, but they can still do the necessary learning by self-studying. The practical aspect of physics, chemistry, and botany, and other subjects, the students are getting less or no opportunities like experimenting in the laboratory of the university/college. The students can develop theoretical knowledge through self-study but the aspect of practical knowledge is left incomplete and is missed i.e. in secondary schools students can get theoretical knowledge to the best of their ability but the will to get achieve the most knowledge also contributes zero in gaining practical knowledge during lockdown to prevent **COVID 19**.

To maintain social distancing during COVID 19, the government passed all the students of this session 2020-21 without any examination. While High school (class 10) and Intermediate (class 12) examination were conducted. In such a situation, we can easily know the notorious effect of COVID 19. This is the first time in the history of Independent India that all students of the session 2020-21 are given a promotion in the next class without organizing the exam. So, that their learning level is not even evaluated. It was not checked whether the students were able to study in the next promoted class.

- **Impact of COVID 19 on Higher Education**

The COVID 19 epidemic harms Indian higher education. Students of B.A., B.Sc., M.A., M.Sc, and research scholars of Ph.D. courses studying in university and college are also affected by the lockdown during COVID 19. The experimental learning of B.Sc and M.Sc is severely affected if students are not able to contact their college at a broader level.

Research work in various fields is also being disrupted during the lockdown of COVID 19. Firstly, the dissertation work of M.A. and M.Ed students is breaking due to the closure of all schools, colleges, and universities, there are no students and teachers. The dissertation work is done in M.Ed & M.A. only after collecting the data received from the students and teacher, other staff members of schools, colleges, and universities. Research scholars belong to Ph.D. are getting hampered in data collection. They are unable to data collection in research. Which makes their work even more time taking. The research scholars are also having difficulty in getting tools of research work by NPC (National Psychological Corporation) and NLEPT.

It is now becoming clear that education is severely affected by COVID 19 at every level. Where the social, psychological, and play way aspects of LKG, UKG, Primary, and Upper-primary education are not able to develop the learning of students. The practical/experiments of secondary and senior secondary students are missing to the



science side. And at the level of higher education, the research work related to the M.Sc., Ph.D., and M.A., etc are being affected seriously.

The government of India made the objective of achieving an upgraded level of education. COVID 19 has tried to reduce the pace of education. In which it also has been successful to some extent. To reduce the impact of COVID 19 from the education sector the government of India and various educational institutions have taken a step towards each educational level like Primary, secondary and higher education. The online teaching-learning educational efforts made at various education level through online teaching-learning are as follows:

- Online teaching is being arranged through the DIKSHA APP (A free app for Android, by National Council for Teacher Education, NCTE) in Parshadiya primary and upper primary schools, etc. In which the student attendance is calculated and teaching is organized through this app with the help of the teacher.
- Various channels are already free of cost on Television. Through which various educational programs are broadcast according to the syllabus belong to secondary and senior secondary and other courses. The channels are presented as the practical and experimental procedures of science and other subjects.
- To avoid COVID 19 in higher education the online webinar, online workshops, online conference, etc. are being organized continuously by universities and other educational institution through the **ZOOM APP (Zoom app founded by Eric Yuan, A Cisco Webex executive engineer in 2011 and launching the software in 2013)**. In which the guests present their lecture. The articles and posters of the concerned topic of the program are presented by the participating students and research scholars. Online teaching-learning during COVID 19 is the most effective solution in which the Zoom app has proved very useful.

COVID 19 has provided a new opportunity to education, which is experiencing the need to find new teaching methods and technology with the condition of maintaining social distancing. All the above teaching-learning methods being used at present are expanding education easily. But the use of these methods increases the possibility of the following lacks in the educational perspectives:

- Through online teaching-learning, the aspects of social knowledge and personality development of students are unfulfilled because they are not contacting each other.
- By organizing learning webinars and workshops etc the students do not get the atmosphere of the classroom which can develop their expression skills.
- Psychologically, online teaching-learning can also be considered less effective than direct classroom-teaching. Because it has less opportunity for students to develop their abilities like debate, discussion, peer group interaction widely.
- Experimental knowledge and skills remain left and incomplete of students in online teaching-learning because they cannot learn by doing as the laboratory of universities and colleges.



## Conclusion

COVID 19 has seriously affected the education world. Its side-effects can be seen at each level of education. India is already backward from various countries in the field of education. In such a way for the uplifting and upgrading of education, the plans made by the government are also not fulfilling their objectives in this COVID 19 has become a huge obstacle. The role of the teacher in online teaching can be ensured, but he has no control over the role of students. The students do not get the opportunity for practical knowledge, games, debate, and discussion due to which they have created a lack of socialization, as well as their personality, developed less than expected.

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**INTELLECTUAL CAPITAL PERFORMANCE ON FIRM VALUE:  
A STUDY OF INDIAN CEMENT INDUSTRY**

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**ABSTRACT**

The purpose of this study examines the relationship between intellectual capital and firm value measures, i.e., profitability and market valuation of companies in the BSE Listed Indian cement industry. The modified value added intellectual coefficient model has been used to measure the intellectual capital efficiency of companies in this study. The results of the panel regression analysis that intellectual capital predicts the firm value of the company. The results found that human capital, physical capital and process capital plays significant role in intellectual capital but CCE and INCE has not plays significant role in intellectual capital.

The Findings also provides useful suggestions to the researchers, academicians, investors and government regarding importance of intellectual capital measurement and its relation with firm value.

**KEYWORDS:** Profitability, Market valuation, Indian Cement Industry.

**1. INTRODUCTION**

Traditionally, the organizations were used only tangible assets for evaluate the financial performance. Financial and Physical assets are economic factors traditionally used by organization to demonstrate their success, but the emerging economy places value on the role of Information and Knowledge as a sustainable resource to acquire and maintain competitive advantages. In the era of globalization, only physical assets are not enough to measure the efficiency of the firm. Intellectual Capital is more effective tool for the organization to compete the competition. In the early 1836, N. Senior wrote: "The Intellectual and Moral Capital of Great Britain far exceed all the Material Capital, not only in importance, but in productiveness." (Edvinsson, 1997) "IC can be defined as the intangible assets which are not listed explicitly on a firms' Balance sheet, but positively impact the performance of it, thereby revealing the relationship between employees, ideas, and information and measure which is not measured." Last two decades, Intellectual Capital has eye catching concept.

Intellectual capital (IC) is the term for discovery, concept, knowledge, design, Procedures, patents, intellectual property rights, computer programs and publications. The IC is possessing knowledge and experience, professional knowledge and skills, good relationships and technical competencies that give competitiveness when applied facilities in firms (CIMA, 2001). Non-physical or intangibles resources and a company's

resources, including its practices, patents and its underlying knowledge its members, partners, and contracting networks are referred to as ICs (Jacob Ben-Simchan, 2005).

The IC is defined differently by different authors as the consecutively force for business success (Palick, 2000), packaged useful knowledge (Stewart, 1997), knowledge which is evident Profit (Sullivan, 2000), Practical translation of knowledge combined with brands, Trademarks and processes (Russo et al, 1997), a firm's market and the gap between Compare book value (Edinson & Malone, 1997) and market value to book value (Coke, 2007).

The composition of this research work is as follows: the second section is for literature review which consist previous studies on intellectual capital and its impact on financial performance and market value in different countries of the world, as well as in India and research gap. The third section describes the research methodology used in the study. The fourth section discusses the results of the analysis and the fifth section presents the conclusions and policy implications of the study.

## 2. LITERATURE REVIEW

The following table 1 shows the previous studies on intellectual and firm value in various countries:

**Table 1 Previous studies on intellectual capital and firm value**

S.NO.	Author(s)	Sample/ Sector	Important Findings
1.	Hatane et.al (2019)	36 Indonesia listed Infrastructure and Transportation companies	All components from ICD have a negative influence on firm value during the pre-Jokowi's era. The RCD has negative effect of RCD on firm value without make different the presidential era. The interaction of ICD and the time period is increasing then the firm value has found negative relationship.
2.	Xu & Wang (2018)	390 manufacturing companies listed on Korean Stock Exchange	IC has positive impact on FP and companies' sustainable growth and also process capital, human capital and relation capital. Innovation capital positively associated with structural capital but negatively associated with performance of firms.
3.	Li & Zhao (2018)	1850 Chinese Listed Firms	There is no significant relationship between HC and FV whereas found positive relationship between organizational capital and firm value. So, more investing in organizational capital may give greater value for firms.
4.	Sardo et.al (2017)	Non-Financial listed firms of 8 European countries	VAIC components has positive impact on financial performance except SP while group2 indicates the VAIC components has negative impact on financial performance except SP. CEE has more impact on firms financial performance in both group of companies. Therefore, IC increases firms' FP in both groups of countries.
5.	Ozkan et.al (2017)	44 Turkey Banks	VAIC has not statistically significant effect on the financial performance of turkey banks but when VAIC is divided into its components, it can be find that CEE and HCE positively affect on the financial performance of turkey banks. In fact, CEE has more influence on financial performance of banks rather than HCE.



6.	Zenopoljac (2016)	Serbian ICT companies	CEE has significantly impact on financial measures of ICT companies and VAIC and its components have significant correlation with all selected dependent variables, physical and financial capital of the companies.
7.	khan (2016)	Indian IT industry	HC and PC both has influence the profitability and productivity of the firms. VAHC has a positive and significant relationship with all dependent variables. The components of VAIC shows that more impact on ROE while less impact on ATO but no impact on MB.
8.	Budiandriani & Mahfudnumajam-uddin (2014)	158 Indonesian companies	Physical and structural capital has a positive significant role on the financial performance of the firm whereas Human capital was positively insignificant role with financial performance and value of the firm.
9.	Deep & Narwal (2014)	100 Indian textile companies	The impact of IC was positively with the profitability while insignificant role of IC with productivity and market valuation of the companies. Physical capital (CE) had an important role on the profitability of the companies.
10.	Narwal & Ramandeep (2014)	100 Indian Pharmaceutical companies	IC has positively associated with financial performance (ATO, ROA, ROE and MB). Structural and physical capital has significant impact on the financial performance of the companies whereas Human capital has inversely significant role on the financial performance.
11.	Vishnu & Gupta (2014)	22 Indian pharmaceutical companies	IC and its components were significant related with performance i.e. ROA of the company while RC was not found any significant positive relationship with the performance variables.
12.	Fathi et al. (2013)	49 Iranian companies	SCE has positive impact with IC and three financial performance measures (ROE, ROA and GR) but the physical and human capital was having a positive impact only on between ROE and ROA.
13.	Mention & Bontis (2013)	200 Banks of Luxembourg and Belgium	Human capital has found positively impact on the business performance on the banking sector but Structural and relational capital were not positively related to business performance.
14.	Shaban & Kavida (2013)	22 Indian IT companies	The impact of IC and profitability was having a significant relationship whereas IC had insignificant relationship with productivity and market valuation. Physical capital found a significant relationship with productivity and market valuation.
15.	Mondal & Ghosh (2012)	65 Indian banks	The impact of IC was found significant in profitability and productivity of the banks. Human capital found greater influence in enhancing the returns of banks. Financial performance was least influencer by the structural capital of the banks.
16.	Pal & Soriya (2012)	105 Pharmaceutical and 102 textile companies of India	Intellectual capital was found to have a significant relationship with profitability, productivity and market valuation in both industries.



17.	Chu <i>et al.</i> (2011)	333 Chinese companies	Intellectual capital was significant associated with the profitability of the companies. Structural capital played a important role in enhancing the corporate profitability. IC components were strong predictors of financial performance such as return on equity and profitability.
18.	Clarke <i>et al.</i> (2011)	1676 Australian firms	Impact of IC on firm performance has found to be significant. Structural capital efficiency (SCE) showed no positive relation with firm performance. Human capital (HC) and capital employed (CE) was significantly positive related with firm performance measures.
19.	Pal & Soriya (2011)	IT companies	IC has a significant impact in increasing the profitability, but insignificant relationship was found between IC and productivity and market valuation of the companies.
20.	Phusavat <i>et al.</i> (2011)	Thailand	IC had significantly affected firm's performance measures (ROE, ROA) and revenue growth and employee productivity. Human capital depicted positive relation with the productivity of the firm.
21.	Amadiou & Viviani (2010)	207 French wine companies	Intangible proxies have an insignificant impact on the firms' economic performance measurements and a significant impact on commercial performance measurements (especially for cooperatives and wholesalers).
22.	Calisir <i>et al.</i> (2010)	14 ITC Turkey companies	Human capital efficiency (HCE) played an important influence of profitability of the company. Capital employed efficiency (CEE) was depicted to be the significant influence of both productivity and return on equity.
23.	Choudhary (2010)	466 Respondents from Indian IT sector	The impact of each component of intellectual capital was significantly positively relationship on increased organizational performance.
24.	Joshi <i>et al.</i> (2010)	11 Australian owned banks	Human capital (HC) had a significant effect on the efficiency of the banks in value creation. Structural capital (SC) and physical capital (CE) was having insignificant effect on overall efficiency of the banks and their value creation.
25.	Murale <i>et al.</i> (2010)	13 Indian companies	There was a significant relationship between IC and market to book value of the company. HC was having a significant impact on financial performance and value creation efficiency.
26.	Salamudin <i>et al.</i> (2010)	2121 Firm-year (2001 to 2006) of companies Malaysian	The book value of the assets played a dominant role in Malaysian corporate valuation. The positive trend was found in intangible assets development. Intangible assets showed a positive relationship with the financial performance of the company.
27.	Santidrian <i>et al.</i> (2010)	157 Spanish firms	Human and structural capital was having insignificant association with profitability and productivity. The association of HC and SC with value creation calculated by sales growth was significant.



28.	Abdulai <i>et al.</i> (2009)	83 West African software companies	The study depicted a considerable relationship between intellectual capital components and competitive capabilities of firms and between competitive capabilities and firm performance.
29.	Chan (2009 a & b)	All companies in Hand Sang index of China	IC and its major component (structural capital) were positively relationship with ROA and ROE, whereas negative relationship was found with MB and ATO at non-significant level. HCE had insignificant relationship with financial performance measures.
30.	Ghosh & Mondal (2009)	80 Indian pharmaceutical and software companies	The impact of IC and profitability was found to be significant. IC performance and productivity and market to book value ratio had insignificant relationship. Profitability and market to book value ratio found a positive significant relationship.
31.	Moeller (2009)	109 Questionnaire from German companies	Survey showed that the factors responsible for the interrelation between intangible and financial performance were strategic relevance and participation. The other variable Trust was not found to have any significant impact on the performance of the company.
32.	Ting & Lean (2009)	20 Malaysian financial institutions	Significant relationship between intellectual capital performance and profitability of the companies was found. Human and physical capital efficiency was significantly related with the profitability.
33.	Tovstiga & Tulugurova (2007)	20 Small and medium enterprises from St Petersburg	Intellectual capital, particularly structural and human capital was a main important variable of enterprise performance.
34.	Chen <i>et al.</i> (2005)	4254 Firm-year Taiwan companies	Intellectual capital has a significantly relationship with financial performance and market valuation of the companies. Investors laid different values on value creation efficiency components (physical capital, human capital and structural capital).
35.	Mavridis (2005)	17 Greek banks	Positive association between Physical and human capital and value added (VA) of the banks was found. The impact of HC and CE was insignificant relationship with output, input, gross profit, net profit, branches, employees and equity.
36.	Firer & Williams (2003)	75 South African companies	Significantly relationship was found between Structural capital (SC) and profitability. Human capital (HC) has a negative relationship with productivity and market valuation of the firms.
37.	Riahi-Belkaoui (2003)	81 US firms	Intellectual capital significantly affected the future financial performance of the firms as calculated by a net value added measure in support of both resource-based and stakeholder views.
38.	Bontis <i>et al.</i> (2000)	107 MBA respondents of Malaysia	Positive association between human capital and relational capital was found. Structural capital (SC) had a positive association with the business performance for both service and non-service industries.

Source: literature review by authors



**2.1 RESEARCH GAP IDENTIFIED**

As there are many studies on intellectual capital in various countries. But only a few studies have been carried out in India. After studying the related reviews on the role of intellectual capital on firm value it is found that not much attempt has been made to carry out research about the manufacturing industries and also found that even not only knowledge based industries like services sector contribute in intellectual capital rather than manufacturing sector have more impact of Intellectual Capital on Firm value because these sector also spend the money on R&D expenditures.. So, this gap requires further research on these aspects.

**RESEARCH METHODOLOGY**

**RESEARCH OBJECTIVES**

- a) To analyze the impact of intellectual capital coefficient on financial performance of cement industry.
- b) To gauge the impact of intellectual capital coefficient on market value of cement industry.

**3.2 Value Added Intellectual Coefficient (VAIC):** VAIC measures the efficiency of intellectual capital of the organizations. VAIC includes 3 components Structural Capital, Human Capital and Relational Capital but Leif Edvinsson Model explains the Extended VAIC Model. Under this, 2 more capitals are introduced i.e. innovation capital, customer capital and process capital. VAIC can be calculated as:

$$VAIC^{TM} = CEE + HCE + SCE$$

Where,

VAIC = VA Intellectual Coefficient

CEE = VA/CE (VA capital utilized coefficient for organization)

HCE = VA/HC (Human Capital coefficient for organization)

According to the taxonomy of this study, structural capital is composed of organizational capital (OC) and customer capital (CC). Organizational capital is composed of process capital (PC) and innovation capital (InC).

Therefore: SC= CC+ InC + PC

SCE = SC/VA (Structural Capital VA for organization) and also structural capital efficiency is the sum of efficiencies of customer capital plus innovation capital plus process capital.

SCE= CCE + InCE+ PCE

CCE=  $\frac{\text{Marketing Costs}}{VA}$

Research and development expenditure (R & D) has been used extensively in the literature as a proxy for innovation capacity (Bosworth and Rogers, 2001). The efficiency of innovation is calculated the following manner:

$$InCE = \frac{R\&D}{VA}$$

Process capital efficiency would simply equal to structural capital efficiency minus customer capital efficiency minus innovation capital efficiency.



Therefore,

$$PCE = SCE - InCE - CCE$$

$$VA = I + DP + D + T + M + R$$

VA is the mix of interest costs (I), depreciation costs (DP), profits (D), corporate assessments (T), value of minority investors in net wage of subsidiaries (M), benefits held for the year (R).

CE = Book estimation of the net resources for organization.

HC = Total venture compensation and wages for organization.

SC = VA – HC, Structural capital for organization.

**COLLECTION OF DATA:** In this study, data will be collected from CMIE (centre for monitoring Indian economy) PROWESS database OF BSE LISTED CEMENT FIRMS.

### 3.4 HYPOTHESES:

The impact of intellectual capital coefficient on Firm Value is measured by the use of VAIC model which is given by Ante Pulic so the followings hypothesis formulated:

H01a HCE is not associated with ROA.

H01b HCE is not associated with ROE.

H01c HCE is not associated with MBV.

H01d HCE is not associated with TOBIN'SQ.

H11a HCE is associated with ROA.

H11b HCE is associated with ROE.

H11c HCE is associated with MBV.

H11d HCE is associated with TOBIN'SQ.

H02a CCE is not associated with ROA.

H02b CCE is not associated with ROE.

H02c CCE is not associated with MBV.

H02d CCE is not associated with TOBIN'SQ.

H12a CCE is associated with ROA.

H12b CCE is associated with ROE.

H12c CCE is associated with MBV.

H12d CCE is associated with TOBIN'SQ.

H03a INCE is not associated with ROA.

H03b INCE is not associated with ROE.

H03c INCE is not associated with MBV.

H03d INCE is not associated with TOBIN'SQ.

H13a INCE is associated with ROA.

H13b INCE is associated with ROE.

H13c INCE is associated with MBV.

H13d INCE is associated with TOBIN'SQ.

H04a PCE is not associated with ROA.

H04b PCE is not associated with ROE.

H04c PCE is not associated with MBV.

H04d PCE is not associated with TOBIN'SQ.

H14a PCE is associated with ROA.

- H14bPCE is associated with ROE.
- H14c PCE is associated with MBV.
- H14d PCE is associated with TOBIN'SQ.
- H05a CEE is not associated with ROA.
- H05bCEE is not associated with ROE.
- H05c CEE is not associated with MBV.
- H05d CEE is not associated with TOBIN'SQ.
- H15a CEE is associated with ROA.
- H15bCEE is associated with ROE.
- H15c CEE is associated with MBV.
- H15d CEE is associated with TOBIN'SQ.

**3.5 DEPENDENT VARIABLES:** ROA, ROE, Tobin's Q and Market to book Value Ratio.

- **Return on Assets (ROA):** ROA is a monetary proportion which expresses that the level of benefit a firm procures in connection to its general assets. It can be ascertained as net income isolated by the total assets.
- **Return on Equity:** ROE is a financial ratio which shows that how much an organization earns profit in relation to invested money by equity shareholders. It can be calculated as net income divided by equity
- **Market to Book value:** The price an asset would fetch in the market.
- **Tobin's Q:** It is the proportion of the market value of an organization's benefits partitioned by the replacement cost of the organization's advantages (company's assets).

**CONTROL VARIABLES:** LEVERAGE, SIZE, MC.

- **Size:** Net asset value or no. of employees.
- **Leverage:** It may be defined as the amount of debt used to finance assets.
- **Market Cap:** MC shows the total value of organizations' all outstanding shares.

**3.6 OLS REGRESSION MODELS**

The following are the regression models developed for the study. The regression model has ROA, ROE, MBV and TOBIN'S Q as its dependent variables. ROA and ROE depicts the profitability of the cement firms and MBV or TBIN'S Q depicts the market value of the firms.

$$ROA_{it} = \alpha_{it} + \beta_1 HCE_{it} + \beta_2 CCE_{it} + \beta_3 INCE_{it} + \beta_4 PCE_{it} + \beta_5 CEE_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 MCAP_{it} + \epsilon_{it} \dots \dots \dots (1)$$

$$ROE_{it} = \alpha_{it} + \beta_1 HCE_{it} + \beta_2 CCE_{it} + \beta_3 INCE_{it} + \beta_4 PCE_{it} + \beta_5 CEE_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 MCAP_{it} + \epsilon_{it} \dots \dots \dots (2)$$

$$MBV_{it} =$$

$$\alpha_{it} + \beta_1 HCE_{it} + \beta_2 CCE_{it} + \beta_3 INCE_{it} + \beta_4 PCE_{it} + \beta_5 CEE_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 MCAP_{it} + \epsilon_{it} \dots \dots \dots (3)$$

TOBIN'S Q<sub>it</sub>=

$$\alpha_{it} + \beta_1 HCE_{it} + \beta_2 CCE_{it} + \beta_3 INCE_{it} + \beta_4 PCE_{it} + \beta_5 CEE_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 MCAP_{it} + \epsilon_{it} \dots \dots \dots (4)$$

#### 4 RESULTS AND ANALYSIS

##### 4.1 DESCRIPTIVE STATISTICS

Table 2 represents the descriptive statistics by providing mean, standard deviation, median, minimum and maximum values of all the variables. The mean value of M-VAICTM is 8.623038 which represent that Cement companies studied in this paper created 8.62 rupees value for every rupee employed. The average value of MBV is 4.423, shows that investors valued the selected companies in excess of the book value of total assets while Tobin q mean value 3.57 indicating that replacement value is more reported in the financial statements of the companies. From the table, it is understandable that companies generated more VA from HCE = 7.34 than CEE = 049. This finding is consistent with the prior researches, which found that much wealth is created by intellectual resources in comparison to physical and financial resources.

TABLE 2 Descriptive Statistics of Cement Firms

	HCE	CEE	CCE	INCE	PCE	M-VAIC	ROA	ROE	MBV	TOBINQ
<b>Mean</b>	7.349591	0.493296	0.057575	0.01825	0.704326	8.623038	0.09817	0.199619	4.423729	3.57148
<b>Median</b>	6.55558	0.355652	0.012795	0.002352	0.787056	7.828465	0.06855	0.170327	2.975	1.510278
<b>Maximum</b>	50.18672	3.13749	0.632794	0.724644	1.405159	51.81738	0.378305	1.426783	50.71	72.205
<b>Minimum</b>	-2.47911	-0.02474	-0.00179	0	-1.10976	-1.10048	-0.13861	-1.32706	0.26	0.049083
<b>Std. Dev.</b>	5.52232	0.406491	0.096063	0.061112	0.241838	5.66803	0.100131	0.255836	5.458684	6.945178
<b>Skewness</b>	2.840841	2.645804	2.519895	6.940816	-2.25141	2.701078	0.718859	0.082975	4.173704	5.299959
<b>Observations</b>	362	362	362	362	362	362	362	362	362	362

Source: Author own calculation

##### 4.2 UNIT ROOT TEST AND MULTICOLLINEARITY

To analyze the relationship of VAIC components (HCE, SCE and CEE) with certain variables, the Pearson correlation analysis technique was used. Table 3 presents the results of the correlation matrix which shows that human capital and structural capital (CEE and PCE), which are important components of intellectual capital, show a positive relationship with return on equity, return on assets, TOBINQ at the 1% level. The market value (MBV), MCAP, leverage effect (LEV) of companies is negatively correlated with HCE and while positively associated with CEE except leverage effect at a significant level. The Size variable is positively related with HCE but negatively related with CEE and CCE.

TABLE 3 CORRELATION MATRIXES OF VARIALES

	HCE	CEE	INCE	PCE	CCE
ROA	0.154558*	0.79048	-0.12753	0.057554	-0.27692
ROE	0.204381	0.764432	-0.12964	0.263211	-0.31972
MBV	-0.01462	0.777317	0.040904	-0.01384	-0.00815
TOBINQ	0.052402	0.21738	-0.04131	0.054118	-0.0167
MCAP	-0.05034	0.35868	0.031524	-0.07926	-0.23156
SIZE	0.048765	-0.10859	-0.0468	0.162483	-0.15897
LEV	-0.05003	-0.16468	-0.03099	-0.09879	0.215874

SOURCE: AUTHOR' S OWN CALCULATION

Stationary of the data is checked by applying the root unit test of Levin, Lin and Zhou (Levin) Et al., 2002) before running the regression model. This test is for pooled and panel

Analyze data from the root unit. The test results reject the unit root hypothesis test. The model applies ordinary least squares (OLS) and a fixed and random effect results. To get a specification that the estimate will give better results The Hausman specification test was applied. Before running multicollinearity regression is checked with the correlation matrix. multicollinearity problem exists when independent. Kennedy (1985) recommended that if the relationship between them explanatory variables exceeds 0.8 then will have multiple linear problems. The table shows value -0.1 to 0.7

#### 4.3 RESULTS OF REGRESSION

In order to have an in-depth view of the relationship between IC components and financial performance measures, the OLS regression was applied. Since the data are panel data, both the fixed effect and the random effects model were used in this study. The Hausman specification test was used to see which model should be applied for analysis. If the result of the Hausman X2 test is considered significant, the fixed-effect model is used and in the case where the Hausman X2 result is considered insignificant, the random-effect model is used for the analysis.

Table 4 reports the results of regression where ROA is the dependent variable. The results indicates that  $R^2$  in fixed effect at 90% and random effect at 56%.  $R^2$  indicates the explanatory power of the model. It is highest in fixed effect implying that fixed effect model have the highest explanatory power for the model. Hausman test value  $X^2$  (8) 51.83 which is significant indicates that fixed effect is more appropriate in comparison with random effect in estimating ROA.  $R^2$  for fixed effect, i.e., 90% significant at 1% level implies that the model does have satisfactory explanatory power. The results indicates that two major factors HCE and CEE is positively associated with ROA at 1% level of significance which implies that physical capital and human capital have significant contribution in increasing the ROA. The results lead to reject the null hypothesis (H01a and H05a) which indicates that HCE and CEE is not associated with ROA. PCE is positively significant at 1% level which indicates that process capital plays significant role in the ROA. It stands to reject the null hypothesis (H04a) that process capital efficiency is not associated with ROA. Two

major factors CCE and INCE are not significantly explaining the ROA. Thus, hypothesis H12a and H13a are accepted. Overall, not all the components of intellectual capital are making significant contribution in increasing ROA. Basuki and Sianipar (2012) in Indonesia banking and insurance sector found a limited association between values added efficiency with ROA, ROE and capital gain and Kamath (2008) in Indian drug and pharmaceutical companies found a human capital and structural capital had a significant effect on profitability while sc had no effect on company financial performance.

TABLE 4 FIXED AND RANDOM EFFECTS OF MODEL 1 FOR PROFITABILITY (ROA)

VARIABLES	FIXED EFFECT		RANDOM EFFECT	
	COEFFICIENT	STANDARD ERROR	COEFFICIENT	STANDARD ERROR
C	-0.05348** (-2.58035)	0.020726	-0.01064 (-0.53834)	0.019772
HCE	0.006817* (11.77056)	0.000579	0.005782* (10.54052)	0.000549
CEE	0.088268* (6.800087)	0.01298	0.128787* (12.65294)	0.010178
CCE	-0.02289 (-0.50027)	0.045753	-0.11251* (-2.7353)	0.041133
INCE	0.060638 (0.864338)	0.070156	-0.05621 (-0.88341)	0.063628
PCE	0.074875* (2.793827)	0.0268	0.004352 (0.185694)	0.023438
SIZE	1.03E-10 (0.042992)	2.39E-09	-4.41E-09** (-2.09965)	2.10E-09
LEV	-0.00119*** (-1.88055)	0.000631	-0.00139** (-2.23336)	0.000623
MCAP	9.48E-09**	3.76E-09	1.61E-08*	3.37E-09



	(2.52099)			(4.781891)	
R <sup>2</sup>		0.9019 24			0.563596
ADJUSTED R <sup>2</sup>		0.8897 03			0.553706
F-STAT		73.799 6*			56.98543*
HAUSMAN TEST		X <sup>2</sup> (8)	51.8326 7*		

Notes: \*, \*\*, \*\*\* AT 1 %, 5% AND 10% LEVEL OF SIGNIFICANCE  
Value of t shows in parenthesis

Table 5 shows the results of the model where ROE is the dependent variable. From the results fixed effect and random effect, Hausman test, chi-square test, i.e., (8) 26 % indicate that fixed effect should be taken into consideration. R2 for fixed effect it is 79% and f-statistics 30% is also significant indicating that the explanatory power of the model is satisfactory. The results indicate that HCE and CEE is positively associated with ROE at 1% level of significance. It leads to reject (H01b and H05b) that human capital and physical capital does not make contribution in roe. INCE and PCE is positively impacting the roe which indicates that the innovation and process capital plays significant role in roe. Thus, results of the model stand to reject both the null hypothesis, i.e., H03b and H04b. the control variables also plays insignificant role in roe. Chu et al. (2011) have observed intellectual capital as the strong factor influencing ROE in corporate sector in China. Mavridis (2005) in Greek banking presented that physical and human capital were major factors in contributing value for best performing index.

TABLE 5 FIXED AND RANDOM EFFECTS OF MODEL 2 FOR PROFITABILITY (ROE)

VARIABLE	COEFICIEN T	FIXED EFFECT STANDARD ERROR	RANDOM EFFECT COEFFICIEN T	STANDAR D ERROR
C	-0.3422*	0.076769	-0.3422*	0.076769
	(-4.45745)		(-4.45745)	
HCE	0.009026*	0.002145	0.009026**	0.002145
	(4.207196)		(4.2071960)	
CEE	0.391238*	0.04808	0.391238*	0.04808
	(8.137175)		(8.137175)	
CCE	0.176049	0.169473	0.176049	0.169473
	(1.038804)		(1.038804)	
INCE	0.502287**	0.259861	0.502287**	0.259861



	(1.93291)			(1.93291)	
<b>PCE</b>	0.411175*	0.099269		0.411175*	0.099269
	(4.142026)			(4.142026)	
<b>SIZE</b>	-5.35E-09	8.84E-09		-5.35E-09	8.84E-09
	(-0.60488)			(-0.60488)	
<b>LEV</b>	-0.01901*	0.002339		-0.01901*	0.002339
	(-8.12951)			(-8.12951)	
<b>MCAP</b>	-5.09E-09	1.39E-08		-5.09E-09	1.39E-08
	(-0.36561)			(-0.36561)	
<b>R<sup>2</sup></b>		0.793874		0.662643	
<b>ADJUSTED R<sup>2</sup></b>		0.768188		0.654997	
<b>F-STATISTIC</b>		30.90742 *		86.v 86.67115*	
<b>HAUSMAN TEST</b>		X <sup>2</sup> (8)	26.10034 *		

Notes: \*, \*\*, \*\*\* AT 1 %, 5% AND 10% LEVEL OF SIGNIFICANCE

Value of t shows in parenthesis

Table 6 reported the MBV is the dependent variable. According to Hausman specification test, i.e.,  $\chi^2$  is (8)84 %, fixed Effect is more suitable for the analysis purpose. R2 is 87 % and F statistic 55 % indicates that the model does have satisfactory explanatory power. HCE are not significantly associated with market value. It leads to accept the null hypothesis, i.e., H01c. CEE is also found significantly contributing to the MBV, thus rejecting the null hypothesis (H05c) which indicates that physical capital contributes in market value. PCE is found to be significantly associated with the MBV at 10% level of significance. It stands to reject the null hypothesis (H04c). CCE and INCE are insignificantly associated with market value. Thus results leads to accept the null hypothesis i.e. hh02c and h03c. All control variables plays significant role in MBV. Chan (2009a, 2009b) physical capital had important for enhancing market valuation. Mauditous (2011) found IC was no significant association with market valuation.



TABLE 6 FIXED AND RANDOM EFFECTS OF MODEL 3 FOR MARKET VALUATION (MBV)

		FIXED EFFEC T		RANDOM EFFECT	
VARIABLE S	COEFICIEN T	STANDARD ERROR		COEFFICIEN T	STANDAR D ERROR
C	3.976936* (3.095729)	1.284652		-0.09282 (-0.08375)	1.108235
HCE	-0.01919 (-0.53454)	0.035899		-0.07287** (-2.21578)	0.032888
CEE	4.087752* (5.080646)	0.804573		6.802408* (12.28125)	0.553886
CCE	-3.68536 (-1.29951)	2.835953		1.746192 (0.730694)	2.389771
INCE	0.272466 (0.062657)	4.348495		7.679855** (2.079449)	3.693217
PCE	3.12081*** (-1.87869)	1.661164		0.607565 (0.452357)	1.343111
SIZE	-2.59E-07*** (-1.75188)	1.48E-07		-3.12E-07* (-2.63062)	1.19E-07
LEV	0.244972* (6.259291)	0.039137		0.233271* (6.104919)	0.03821
MCAP	1.28E-06* (5.494288)	2.33E-07		1.42E-06* (7.197915)	1.97E-07
R <sup>2</sup>	0.873212			0.363267	
ADJUSTED R <sup>2</sup>	0.857413			0.348837	
F- STATISTIC	55.26952*			25.17405*	
HAUSMAN TEST		X <sup>2</sup> (8)	83.52964 *		

Notes: \*, \*\*, \*\*\* AT 1 %, 5% AND 10% LEVEL OF SIGNIFICANCE  
Value of t shows in parenthesis

Table 7 reported the TOBIN’S Q which is the dependent variable. According to Hausman specification test, i.e.,  $\chi^2$  is (8) 33 %, Fixed Effect is more suitable for the



analysis purpose. R2 is 0.1802 and adjusted R2 is 0.078 which is very low. The result of the R2 is implying that the model does not have satisfactory power. Intellectual Capital components except HCE and PCE are not significant. CEE and CCE and INCE are not significantly associated with market value (TOBINQ). It leads to accept the null hypothesis, i.e., (H05d and H02d and h03d) respectively. HCE and PCE are also found significantly contributing to the TOBINQ, thus rejecting the null hypothesis (H01d, h04d).control variable also plays insignificant role in market valuation. Ghose and Monadal (2009), Pal and Soriya (2012) found IC was no significant role in market valuation.

TABLE 7 FIXED AND RANDOM EFFECTS OF MODEL 4 FOR MARKET VALUATION (TOBIN'S Q)

VARIABLES	FIXED EFFECT		RANDOM EFFECT	
	COEFICIENT	STANDARD ERROR	COEFFICIENT	STANDARD ERROR
<b>C</b>	-5.17014 (-1.24401)	4.156021	-1.97471 (-0.92995)	2.123465
<b>HCE</b>	0.192195*** (1.65488)	0.116138	-0.02492 (-0.29751)	0.083749
<b>CEE</b>	-2.08397 (-0.80063)	2.602902	3.226766* (3.290726)	0.980564
<b>CCE</b>	8.629278 (0.940553)	9.174686	8.826765*** (1.724777)	5.117626
<b>INCE</b>	17.71415 (1.259184)	14.06796	2.270083 (0.299798)	7.572036
<b>PCE</b>	11.50175** (2.140224)	5.374085	4.582405 (1.624444)	2.820907
<b>SIZE</b>	-1.93E-06* (-4.03105)	4.79E-07	-2.08E-07 (-0.96791)	2.15E-07
<b>LEV</b>	-0.12078 (-0.95393)	0.126615	-0.05601 (-0.51134)	0.109544
<b>MCAP</b>	1.16E-06 (1.537033)	7.54E-07	7.90E-07*** (1.768472)	4.47E-07
<b>R<sup>2</sup></b>	0.180267		0.063186	
<b>ADJUSTED R<sup>2</sup></b>	0.07812		0.041955	
<b>F-STATISTIC</b>	1.764775*		2.976144*	
<b>HAUSMAN TEST</b>		X <sup>2</sup> (8)	33.63152*	

Notes: \*, \*\*, \*\*\* AT 1 %, 5% AND 10% LEVEL OF SIGNIFICANCE  
Value of t shows in parenthesis



## 5 CONCLUSIONS AND POLICY IMPLICATIONS

The purpose of this study is to measure the impact of intellectual capital on firm value of cement firms in India. The Modified- VAIC method was used in a sample of 33 Cement firms. Financial performance is measured by ROA, ROE while Market Value is measured by Market to Book value and Tobin's Q. The results of the study have tried to steer attention to the importance of measuring Intellectual capital on business performance. The research contributes to the literature on current intellectual capital. Earlier studies measured intellectual capital using the VAIC model. Research can increase awareness and meaning intellectual capital in organizations. It can also help investors have a greater understanding of intellectual capital investment decisions. It can also support the academic world to better understand intellectual capital.

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## A STUDY ON THE IMPACT OF COVID-19 LOCKDOWN ON THE LIFE OF THE PEOPLE

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### **ABSTRACT:**

The World Health Organization, on 11 March 2020, has declared the novel corona virus to be a global pandemic. The pandemic have significantly made a great impact on the various fields of the World. The COVID-19, a new strain of corona virus is a dreadful disease spreads drastically across the world causing huge impact in the life of the people for the past few months. Different countries, states have announced different stages of lockdown, as a preventive measure to control the spread of the pandemic. This study is done to analyze such impact of the pandemic lockdown on the people's living and their day to day lifestyle. For the realization of the objective, questionnaire was distributed to the participants and their response was collected after ensuring their due consent. Results showed both the constructive and destructive sides on the lockdown impact. The findings are discussed in the paper.

**KEYWORDS:** Impact, Covid-19, Lockdown, People, Life

### **1. INTRODUCTION:**

COVID-19 is a pandemic disease caused by a new strain of corona virus. It is a new virus linked to the same family of viruses as Severe Acute Respiratory Syndrome (SARS) and some types of common cold with the symptoms including fever, cough and shortness of breath which are similar to other flu or common cold. Proper testing and procedures are required before confirming positive cases. The virus originated from Wuhan, now present all over the world, spreads through direct contact with respiratory droplets of an infected person to the normal person rapidly at a higher rate when compared to any other virus or disease in the past. At present, there is no vaccine to treat COVID-19; every country is trying its best to find the vaccine for the virus. In the meanwhile, as a preventive measure to control the spread of COVID-19, The Government of India as announced different stages of lockdown in the country from the month end of March 2020 till date as per the advice of World Health Organization and few top medical councils, and taking enormous steps to control the spread of the virus. The researchers and academicians have started analyzing the impacts of the virus and the lockdown on various perspectives.

### **2. NEED FOR THE STUDY:**

The major purpose of the study is to analyze the impact of COVID-19 lockdown on people's living and life style. The whole world irrespective of any



particular call was shaken by the pandemic. Almost all countries got affected and the people were left with the only choice to stay home in the name of lockdown to avoid and control the spread of the virus in many countries. India being one of the top developing countries is not able to perform its best in different sectors during the lockdown. Many economists, researchers and academicians have come up with their own findings on the impact of the pandemic. Therefore in this study, the researcher has tried to explore the impact of COVID-19 lockdown, whether being constructive or destructive in people's life.

### 3. OBJECTIVES OF THE STUDY:

- To explore the influence of COVID-19 lockdown on the life of the respondents.
- To identify the impact of the lockdown on the living of the respondents of the community.
- To measure the progressive and regressive changes on the day to day life of the respondents before and after lockdown.
- To analyze the perspective of the respondents towards the extension of the lockdown.

### 4. LIMITATIONS OF THE STUDY:

- The study was geographically restricted to the people of Chennai.
- Paucity of time restricts the sampling method and sampling size.
- Biasness of the respondent cannot be ignored.

### 5. RESEARCH METHODOLOGY:

- **Research design:** The study is descriptive in nature and the researcher has used quantitative research technique for analysis of data.
- **Sampling design:** The respondents of the study include people of Chennai and convenience and judgmental sampling technique was used to reach the respondents.
- **Sample size:** 110 Respondents.
- **Data collection method:** Both primary and secondary data were collected for the study. Primary data was collected using structured questionnaire, general observation on the society, telephonic interview and for the secondary data, data and research publication from journals, books and sites have been used.
- **Statistical tools used in the study:**
  - Percentage analysis
  - Ranking method
  - Likert rating scale
  - Correlation
  - Anova



6. DATA ANALYSIS AND INTERPRETATION:

6.1. Percentage analysis:

Table – 1: Frequency and Percentage of the respondents profile and responses

S.No.	CATEGORY	SUB CATEGORY	FREQUENCY	PERCENTAGE
1	Gender	Male	57	51.8%
		Female	53	48.2%
		Others	0	0%
2	Age	<15 years	8	7.3%
		16 years – 30 years	54	49.1%
		31 years – 45 years	28	13.6%
		45 years – 60 years	15	13.6%
		>60 years	5	4.5%
3	Occupation	Student	29	26.4%
		Private sector	37	33.6%
		Government sector	17	15.5%
		Self employed	14	12.7%
		Others	13	11.8%
4	Living in containment zone	Yes	53	48.2%
		No	57	51.8%
5	Working or attending classes from home	Yes	62	56.4%
		No	48	43.6%
6	State of comfort in working or attending classes from home	Yes	27	24.5%
		No	45	40.9%
		May be	38	34.5%
7	Lockdown affects the standard of living	Yes	81	73.6%
		No	6	5.5%
		May be	23	20.9%

SOURCE: Primary Data

INFERENCE: The demographic profile of the respondents and few of their responses are been considered for the percentage analysis. The calculated percentage analysis is been tabulated and represented.

### **6.2. Ranking method:**

**TABLE – 2:** Rank analysis for the hobbies carried out by the respondents during the lockdown

<b>Hobbies</b>	<b>Rank 1 frequenc y</b>	<b>Rank 2 frequenc y</b>	<b>Rank 3 frequenc y</b>	<b>Rank 4 frequenc y</b>	<b>Rank 5 frequenc y</b>	<b>Total point s</b>	<b>Ran k</b>
Books	24	24	20	18	24	672	<b>2</b>
Movies	29	33	26	14	8	782	<b>1</b>
Cooking	27	12	22	24	25	644	<b>4</b>
Gammin g	24	23	13	14	36	630	<b>5</b>
Others	24	18	20	26	22	652	<b>3</b>

SOURCE: Primary data

INFERENCE: The respondents are asked to rank their hobbies during covid-19 lockdown and with the help of their ranking for the categories mentioned in the questionnaire, points are provided (Rank 1 – 10 points, Rank 2 – 8 points, Rank 3 – 6 points, Rank 4 – 4 points and Rank 5 – 2 points) and the categories are ranked on a whole. The calculated analysis is been tabulated and represented.

### **6.3. Likert rating scale:**

**TABLE – 3:** The attitude of the respondents towards the extension of the lockdown

<b>Rating</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>Frequency</b>	14	16	45	23	12

SOURCE: Primary data – questionnaire.

INFERENCE: The respondents are asked to rate their attitude towards the further extension of the covid-19 lockdown using Likert’s rating scale method and the frequency of the responses is been tabulated and represented.

**6.4. Correlation:**

**TABLE – 4:** Correlation between the sleeping duration before and during lockdown

		Sleep (Before lockdown)	Sleep (After lockdown)
Sleep (Before lockdown)	Pearson Correlation	1	0.425**
	Sig. (2 tailed)		0.000
	N	110	110
Sleep (During lockdown)	Pearson Correlation	0.425**	1
	Sig. (2 tailed)	0.000	
	N	110	110

\*\* . Correlation is significant at the 0.01 level (2-tailed).

SOURCE: Primary data

INFERENCE: The correlation between the duration of sleep (in hours) before lockdown and during lockdown is analyzed, tabulated and represented using Karl Pearson’s 2 tailed significant correlation methods. It is inferred from the table that there is a positive correlation and the correlation is significant at the 0.01 level of significance.

**TABLE – 5:** Correlation between the skill enhancement or me-time duration before and during lockdown

		Skill enhancement (Before lockdown)	Skill enhancement (After lockdown)
Skill enhancement (Before lockdown)	Pearson Correlation	1	0.426**
	Sig. (2 tailed)		0.000
	N	110	110
Skill enhancement (During lockdown)	Pearson Correlation	0.426**	1
	Sig. (2 tailed)	0.000	
	N	110	110

\*\* . Correlation is significant at the 0.01 level (2 tailed).

SOURCE: Primary data

INFERENCE: The duration spent by the respondents on their skill enhancement and me-time is collected and analyzed using Pearson’s correlation method. It is inferred that there is a positive correlation and the correlation is significant at the 0.01 level of significance.

**TABLE – 6:** Correlation between the overall health (both mental and physical) before and during lockdown

		Health (Before lockdown)	Health (After lockdown)
Health (Before lockdown)	Pearson Correlation	1	-0.018
	Sig. (2 tailed)		0.852
	N	110	110
Health (During lockdown)	Pearson Correlation	-0.018	1
	Sig. (2 tailed)	0.852	
	N	110	110

SOURCE: Primary data

INFERENCE: The Pearson’s correlation method is used to correlate the rate of health of respondents before and during lockdown. It is inferred that there is a strong negative correlation between the variables.

**6.5. Anova:**

**TABLE – 7:** One way Analysis of variance of data

VARIABLES	Age		Gender		Occupation	
	F	P	F	P	F	P
Working or attending classes from home	7.370	0.000	0.111	0.740	19.065	0.000
Effect in the Standard of living	5.327	0.001	4.463	0.037	0.385	0.819
Attitude towards extension of lockdown	0.844	0.500	3.088	0.082	2.892	0.26

SOURCE: Primary Data

INFERENCE: A one way analysis of variance is conducted at the 0.05 level of significance by considering the standard factors affecting the dependent variables as mentioned in the table. It is also inferred that age, gender and occupation has a significant level of influence on the dependent variables between groups.



## 7. FINDINGS:

While conducting the study, the researcher came across various facts with the help of data analysis, discussions with the respondents and observation, which are mentioned below,

- Many of the respondents are working or attending classes from home and they do not find it comfortable to do so. The organized atmosphere, social environment, infrastructure and the framework pertaining to working hours, etc. is lacking behind when they work or attend classes from home.
- The majority of the respondents comparatively have more time for themselves, concentrating on their skill enhancement and passion during the pandemic lockdown, and with the mandatory condition to stay home to ensure their safety, they are able to eat homemade food, sleep for comparatively longer duration and spend time in home with their family and kids, with their most chosen hobby to watch movies, series, music, etc. with the help of the developing over the top media services which is been liked and encouraged by the people.
- The expenses pertaining to health, electricity, telecommunication services have increased many a time during the lockdown, whereas the expenses incurred on the transportation, outdoor entertainment, etc have been reduced.
- The contact with the people outside the home is been maintained with the help of virtual communication tools and the platform of advanced technologies. Fear for the pandemic, social distancing and the lack of physical contact with the real world makes the people suffer, mentally disturbed and their overall health is been affected during the pandemic lockdown.
- The majority of the respondents have a strong feeling that the pandemic and the lockdown will have a effect on their living standard but understanding the seriousness of the pandemic, many have a neutral attitude towards the extension of lockdown.

## 8. CONCLUSION:

The researcher has concluded from the study findings, that the current covid-19 pandemic lockdown has a significant impact on the overall life of the people in both constructive and destructive ways depending on their demographic profiles. During lockdown, with lots of hope for the situation to get back to the normal stage, the community of people who have a stable income, job and living find it quite good whereas, those who do not have a stable income and living are found affected more comparatively than others. Considering the growing rate of infected in nation, and further stage of lockdown extension, there is a high need to monitor and ensure the state of well being of the citizen across the nation.

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- [https://www.who.int/health-topics/coronavirus#tab=tab\\_3](https://www.who.int/health-topics/coronavirus#tab=tab_3)
- <https://prsindia.org/covid-19/overview>



## A STUDY ON COMPETENCY MAPPING

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### ABSTRACT

Competency based management has become a very crucial element in the effective operation of an organization, due to the increased need to be agile and adaptive to quick market changes and re-orientation of its business plans. Competency mapping is the core human resource tool, enabling the enterprise to manage and develop employee skills, recruit the most appropriate candidates, make effective succession planning and employee development plans. Competency mapping is a process a HR expert uses to identify and describe competencies that are most crucial to success in a work situation. The aim of this study is to identify the competency gaps of employees in a plastic industry in Chennai based on certain identified dimensions. This study would enable the organization to analyze training needs, the gaps in actual and desired skills and future perspectives for development in an individual. It will also help the company to improve its overall efficiency and effectiveness.

**Key words:** Competencies, Competency Gap, Skill Matrix.

### I INTRODUCTION

Dynamic economic, social and technological changes have spurred the need for flexible, skilled workers who can help their organizations succeed and sustain a competitive advantage. To be relevant within organizations and indispensable to clients and customers alike, professionals must continually reassess their competencies, update their skills and have the courage to make necessary changes. Competency mapping is a strategic HR framework for monitoring the performance and development of human assets in organizations.

Competency based talent management can improve both productivity and performance by identifying key characteristics of top performers and how those traits differ from average employees. These characteristics in turn can filter in a set of core competency profile that consistently lead to successful workforce. The remaining residual can further be developed into core competencies in some other functional areas, as HR philosophy has firm faith that people have potential and can be further nurtured if given proper environment and opportunities.

### II. OBJECTIVES OF THE STUDY

- To identify the differences in the performance of employees in the organization
- To identify the Competency gap of employees based on the 11 dimensions :Technical skills, Communication skills, Self management, Teamwork, Learning, Planning, Organizing, Initiative, Problem solving, Job role and environmental skills
- To contribute suggestions to overcome performance lagging
- To analyze employees performance in teams and mapping their competencies



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### III REVIEW OF LITERATURE

**Chanakya in his book “Arthashastra”** has explained competency mapping models as early as 3000 years ago .

**Harvard Psychologist, David McClelland (1973)** is credited with introducing the idea of competency into the Human resource literature in his efforts to assist the United States Information Agency improve its selection process.

**RaoT.V. (2006 )** Any underlying characteristic required in performing a given task, activity or role successfully can be considered as competency

**Katz (1994)** in his study on Competency Mapping grouped competencies under three categories including Technical, Managerial and Behavioral (Human).

Later **McBer (2003)**, a consulting firm had specialized in mapping the competencies of entrepreneurs and managers developed a new, simple methodology called the Behaviour Event Interviewing (BEI) to map the competencies.

**Solomon (2013)** in his study on Competency mapping has tried to explore the level of Competency prevailing among the executives of public sector. The results of the study show that nearly half of the respondents have moderate level of managerial HR and general competencies.

**Md.Ishtiaq Uddin, et. al.(2012)** in his study “Competency Mapping: A Tool for HR Excellence” has explained various tools for implementing Competency Model including Job Analysis, Job Description, Job Specification, Competency Matrix, 360 degree Feedback etc. He is of the view that Competency mapping can also be used for coaching and succession planning.

**Vikram Singh Chouhan, Dr. SandeepSrivastava (2013)** in their study” Competency Mapping For HR Professionals in IT Industry” have attempted to develop a competency mapping model for HR professionals in IT Industry for the purpose of Training Need Assessment. Rapid and unpredictable technological changes and the increased emphasis on quality of services are compelling IT businesses to recruit adaptable and competent employees. At the top of the competency model are five roles, or lenses, through which HR practitioners can view the model: Strategic partners, Administrative experts, Employee champions, Change agents and HR experts.

**Jain, V. K. (2013).** Competency Mapping in Indian Industries - A Case Study.

The present study was undertaken to analyze employee competencies including attributes, skills and knowledge parameters in detail and make a gap analysis in the actual and desired skills and assess the training needs of the employees. The parameters were derived from the Job roles, HR policies and Key Result Areas (KRAs).

**Dr. Deepti Sinha, Dr. Sachin Sinha, Kalpana Singh (2016)** inferred from their study “Applying competency mapping in the Information technology sector” that there exists a certain level of competency among the employees . It was identified that employees could be slightly improved in terms of their communication, knowledge level and team orientation

**Shivanjali, Mitushi Singh, Tripti Singh (2019)** in their study, “Competency mapping, a strategic perspective in employee retention” focused on the factors related to competency mapping that help in retaining talent and help in development of the



organization. Employees can be retained only if their competencies are developed and utilized in the right direction

Shobha Bhardwaj, Ajay Jain, Namita Gupta, Praveen Kumar Pandey (2019) in their paper "Competency mapping based on identifying the impact over productivity of SMEs" observed that ability advancement can be achieved by competency mapping. Competency management can be used for performance appraisal, conflict handling and preparing customized training schedules for employees

IV. RESEARCH METHODOLOGY

Descriptive research design is used for this study as it helps to understand and highlight the research question or the problem as it is. Population used in the study is 450 and sample size is 125. Sampling technique used in the study is convenience sampling. Primary data has been gathered through structured unbiased questionnaire distributed to the respondents. A total of 11 dimensions were framed for competency mapping and 23 specific questions were combined into a single instrument to measure the effectiveness of competency mapping .The Questionnaire consists of close ended questions with five point scale The common source of secondary data for the research includes the journals, articles, research papers and online sources.

V: ANALYSIS & INTERPRETATION

TABLE 5.1 : DEMOGRAPHIC FACTORS:-

FACTORS	CATEGORIES	RESPONSES	PERCENTAGE
AGE OF THE EMPLOYEES	18-25	18	14%
	26-35	47	38%
	36-45	43	34%
	46-55	15	12%
	Above 55 years	2	2%
GENDER	Male	12	10%
	Female	113	90%
QUALIFICATION	Diploma	1	1%
	UG	94	75%
	PG	30	24%

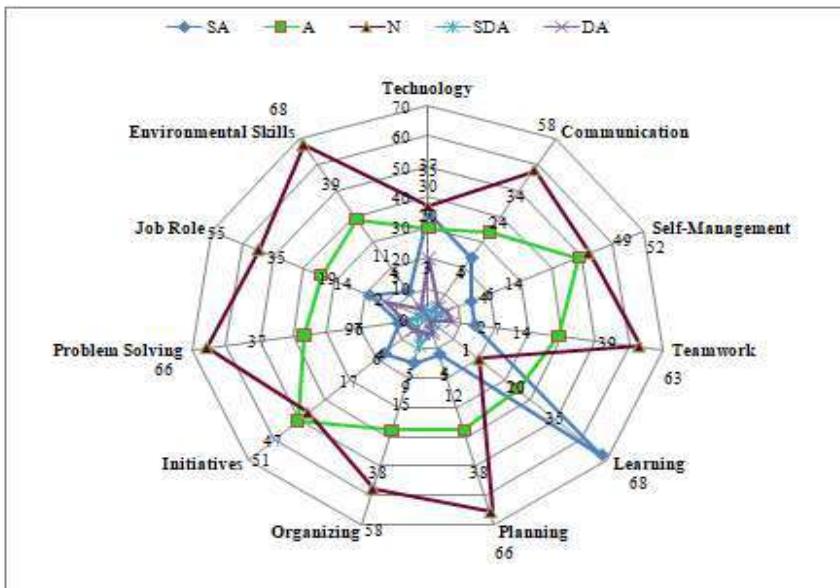
INTERPRETATION

- o 14% of the respondents are in the age group of 18-25 years, 38% are 26-35 years old, 34% are 36-45 years old, 12% are in the age group of 46-55 years and 2% are above 55 years

- 10% of the respondents are male and 90% of them are female respondents
- 1% of the respondents are diploma holders , 75% are graduates and 24% of respondents are post graduates

**5.2: RADAR CHART ON COMPETENCY DIMENSIONS**

Competency Gap	SA	A	N	DA	SDA	Total
Technology	35	30	37	20	3	125
Communication	24	34	58	5	4	125
Self-Management	14	49	52	6	4	125
Teamwork	14	39	63	7	2	125
Learning	68	35	20	1	1	125
Planning	12	38	66	5	4	125
Organizing	15	38	58	5	9	125
Initiatives	17	51	47	6	4	125
Problem Solving	9	37	66	7	6	125
Job Role	19	35	55	14	2	125
Environmental Skills	11	39	68	4	3	125



**INTERPRETATION:** The above radar chart shows that most of the respondents neither agree nor disagree with the existence of competency skill gaps.

### 5.3: CHI-SQUARE TEST

**H<sub>0</sub>** Age of the respondents is not related to their opinion on motivation to explore skill and knowledge among employees

**H<sub>1</sub>** Age of the respondents is related to their opinion on motivation to explore skill and knowledge among employees

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.226 <sup>a</sup>	16	.005
Likelihood Ratio	38.223	16	.001
Linear-by-Linear Association	6.643	1	.010
N of Valid Cases	125		

a. 15 cells (60.0%) have expected count less than 5. The minimum expected count is .06.

At 5% level of significance and df (16) the table value is 34.226

Calculated value = 0.005

Significance (0.005) >= calculated value (0.005)

**H<sub>0</sub>** is accepted

### 5.4 : MULTIVARIATE ANOVA

#### Hypothesis 1:

**H<sub>0</sub>**: Education will have no significant effect on respondents' opinion on top management's encouragement in working together as team

**H<sub>1</sub>**: Education will have a significant effect on respondents' opinion on top management's encouragement in working together as team

#### Hypothesis 2:

**H<sub>0</sub>**: Education will have no significant effect on respondents' opinion on top management's confronting and resolving conflicts

**H<sub>1</sub>**: Education will have a significant effect on respondents' opinion on top management's confronting and resolving conflicts

#### Hypothesis 3:

**H<sub>0</sub>**: Education will have no significant effect on respondents' opinion on top management's encouragement in working together as team and confronting and resolving conflicts

**H<sub>1</sub>**: Education will have a significant effect on respondents' opinion on top management's encouragement in working together as team and confronting and resolving conflicts

Multivariate Tests <sup>a</sup>									
Effect		Value	F	Hypothesis is df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>d</sup>
Intercept	Pillai's Trace	0.346	31.995 <sup>b</sup>	2	121	0	0.346	63.99	1
	Wilks' Lambda	0.654	31.995 <sup>b</sup>	2	121	0	0.346	63.99	1
	Hotelling's Trace	0.529	31.995 <sup>b</sup>	2	121	0	0.346	63.99	1
	Roy's Largest Root	0.529	31.995 <sup>b</sup>	2	121	0	0.346	63.99	1
Education	Pillai's Trace	0.058	1.827	4	244	0.124	0.029	7.306	0.551
	Wilks' Lambda	0.942	1.825 <sup>b</sup>	4	242	0.125	0.029	7.301	0.551
	Hotelling's Trace	0.061	1.824	4	240	0.125	0.029	7.294	0.55
	Roy's Largest Root	0.052	3.166 <sup>c</sup>	2	122	0.046	0.049	6.332	0.597
a. Design: Intercept + Education									
b. Exact statistic									
c. The statistic is an upper bound on F that yields a lower bound on the significance level.									
d. Computed using alpha = .05									

There was a statistically significant difference in academic performance based on a pupil's prior school,  $F(4, 242) = 1.825, p > .0005$ ; Wilk's  $\Lambda = 0.942$ , partial  $\eta^2 = .029$

Tests of Between-Subjects Effects									
Source		Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>c</sup>
Corrected Model	Encourage	2.873 <sup>a</sup>	2	1.437	1.799	.170	.029	3.598	.370
	Confronting	3.834 <sup>b</sup>	2	1.917	1.502	.227	.024	3.004	.315
Intercept	Encourage	38.637	1	38.637	48.388	.000	.284	48.388	1.000
	Confronting	32.587	1	32.587	25.531	.000	.173	25.531	.999
Education	Encourage	2.873	2	1.437	1.799	.170	.029	3.598	.370
	Confronting	3.834	2	1.917	1.502	.227	.024	3.004	.315
Error	Encourage	97.415	122	.798					
	Confronting	155.718	122	1.276					
Total	Encourage	741.000	125						
	Confronting	837.000	125						
Corrected Total	Encourage	100.288	124						
	Confronting	159.552	124						

a. R Squared = .029 (Adjusted R Squared = .013)

b. R Squared = .024 (Adjusted R Squared = .008)

c. Computed using alpha = .05

### INTERPRETATION

From the above table it is observed that in both the cases  $H_0$  is accepted. Hence respondent's education has no statistically significant effect on both Team work encouragement by top management ( $F(2, 122) = 1.799; p > .0005$ ; partial  $\eta^2 = .029$ ) and confronting and resolving problems ( $F(2, 122) = 1.502; p > .0005$ ; partial  $\eta^2 = .024$ ). It is important to note that you should make an alpha correction to account for



multiple ANOVAs being run, such as a Bonferroni correction. As such, in this case, we accept statistical significance at  $p < .025$

5.5: RELIABILITY ANALYSIS

Cronbach coefficient was employed to ascertain the reliability for this research. The results been presented as below:-

Case Processing Summary			
		N	%
Cases	Valid	125	100.0
	Excluded <sup>a</sup>	0	.0
	Total	125	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.842	.842	30

Item Statistics			
	Mean	Std. Deviation	N
Gender	1.9040	.29578	125
Age	2.4880	.93856	125
Education	3.0320	.47410	125
Income	2.2080	.71047	125
Expertise	1.7040	1.07030	125
Learn new	2.2800	.85760	125
Open	2.5600	.86509	125
Detailed	1.9280	1.26476	125
Aware	2.1200	.99677	125
Technology	2.4080	1.12949	125
Communication	2.4480	.95424	125
Self-management	2.4960	.87643	125
Teamwork	2.5520	.82751	125
Learning	1.6560	.83380	125
Planning	2.6080	.84143	125
Organizing	2.6400	.99515	125
Initiatives	2.4320	.90104	125
Problem solving	2.7120	.86896	125
Job role	2.5600	.93671	125
Environmental	2.5920	.79409	125
Training	2.3920	.86038	125
Effective	2.6640	.83225	125



Motivate	2.4000	.95038	125
Quality	2.6560	.83380	125
Top management	2.5760	.81581	125
Positive	1.5760	.87311	125
New steps	2.4880	.95559	125
Enjoy	2.6640	.86083	125
Encourage	2.2640	.89932	125
Confronting	2.3280	1.13433	125

Summary Item Statistics							
	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	2.378	1.576	3.032	1.456	1.924	.114	30
Item Variances	.808	.087	1.600	1.512	18.285	.082	30
Inter-Item Covariances	.122	-.235	1.139	1.374	-4.858	.041	30
Inter-Item Correlations	.152	-.270	.899	1.169	-3.331	.062	30

Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
71.3360	130.693	11.43209	30

**INTERPRETATION:** The closer the reliability coefficient gets to the value of 1.0, the better the reliability of the measures is [Cronbach, 1951]. It can be seen that Cronbach's Alpha value of this study is 0.842 and the Cronbach's Alpha Based on Standardized Items with n as 30 is 0.842. So, the collected data is highly reliable.

**VI. RESULTS**

**6.1 SUMMARY OF FINDINGS**

- ✓ 59% of the respondents strongly agree that expertise in technical or presentation or analytical skill gap on performance is found among employees
- ✓ 59% of the respondents strongly agree that gap on learning new things is found among employees
- ✓ 50% of the employees are undecided whether gap on openness to correct mistakes is found among employees
- ✓ 58% of the respondents strongly agree that gap on detailed knowledge of software and devices used in the company is found among employees



- 
- ✓ Majority of the respondents agree on the prevalence of gap on awareness of the result of work and specifications given by the company
  - ✓ 52% of the employees agree on the existence of competency gap on technology.
  - ✓ 46% of the respondents agree that competency gap on communication exists among employees and 46% are undecided
  - ✓ 50% of the employees strongly agree that competency gap on self-management is found among them though 42% are undecided
  - ✓ 41% of the respondents agree that competency gap on team work prevails among employees, 50% are uncertain
  - ✓ Majority of the respondents agree on the existence of competency gap on learning
  - ✓ 40% of the respondents agree that competency gap on planning is found among employee and 53% of the respondents are undecided
  - ✓ 42% of the respondents agree that competency gap on organizing exists among employees and 46% of the respondents neither agree nor disagree,
  - ✓ 56% of the respondents agree that competency gap on initiatives exists among employees and 38% are uncertain
  - ✓ 53% of the employees are undecided on the existence of competency gap in problem solving but 37% of the respondents agree and 11% of the respondents disagree
  - ✓ 43% of the respondents agree that competency gap on job role is found among employees, 44% of the respondents are undecided and 13% respondents disagree
  - ✓ 54% of the employees are indecisive regarding the existence of competency gap on environmental skills though 40% agree
  - ✓ 14% of the respondents felt the organization is providing training to improve competencies in an excellent way, 41% felt it is very good. According to 38% of the respondents it is good, 6% felt it as fair and 2% felt it is poor
  - ✓ 9% of the respondents opined that training programs are effective to train the skills of employee in an excellent way, 27% of the respondents felt it is very good, 56% felt it is good, 5% felt it is fair and 3% felt it is poor
  - ✓ 18% of the employees felt that organization motivates employees to explore skill and knowledge in an excellent way, According to majority it is good while 5% felt it is fair and 3% felt it is poor
  - ✓ Majority (83%) of employees opined that quality standards are good. 9% felt the quality standards of work or task is excellent, 5% felt it is fair and 3% felt it is poor
  - ✓ 10% of the respondents felt the top management is managing change in an excellent manner, 30% of the respondents felt very good. According to 52% of the respondents it is good, 6% felt it as fair and 2% felt it is poor
  - ✓ Majority (88%) of the respondents agree that employees are working with positive attitude,
  - ✓ Majority (54%) of the respondents are undecided whether employees enjoy working in groups or team though 29% agree
  - ✓ 67% of the respondents agree that top management encourages working together as team and 26% are undecided.
  - ✓ 56% of the respondents agree that top management is confronting and resolving conflicts, 26% are undecided and 17% respondents disagree



## 6.2 SUGGESTIONS & RECOMMENDATIONS

- ❖ Right people should be placed in the right job, because skills specified in the job should match with the employee competencies. Also training at regular intervals will enable employees to improve their competencies for the required job.
- ❖ Promotions, rewards can be given to motivate the employees and to improve their performance.
- ❖ When the mapping process attains a maturity stage, they can be moved for career development program.
- ❖ Employees who are not satisfied with the competencies can be moved to other teams where their skills match.
- ❖ Team members should have interpersonal skills, self-motivation, leadership and open communication skills.
- ❖ The newly identified competencies can be added in the performance appraisal form under the performance management system. Two competencies were identified under the managerial competency, namely Interpersonal Skills and System Orientation. Under the Core/Human competencies, three competencies were identified namely Team Working & Interpersonal Effectiveness, Communication and Networking Ability.
- ❖ Flexible working hours should be provided to the employees especially for the women employees who constitute a larger proportion of the workforce
- ❖ More responsibilities and decision making powers may be given to the employees to share their views and ideas

## 6.3 CONCLUSION

A study on competency mapping was done among the employees of a Plastic industry in Chennai. The aim of this study is to identify the competencies among the employees, mapping their competencies and also finding out various methods to bridge the gap so that the competency level of the employees can be increased

A structured questionnaire was administered to a sample of 125 employees. The study reveals that the awareness of competency mapping is yet to be spread among the employees. Even though they are knowledgeable about competency based approach, still they are not able to implement due to the deficiencies in the system. The study is of great significance to the employees and the organization as it provides an insight to the individual to ascertain the competencies he possesses, the potentials he has in him and the perception of the superiors and other members about his abilities. The employees should be convinced to accept changes, and also understand competency mapping will lead to their career advancement, and thus enhance organizational effectiveness.

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## IMPACTS OF RISING URBANIZATION ON THE RIVER VALLIES: A STUDY

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### **Abstract**

Rapidly changing demographics in the river valley have undergone tremendous changes in land use and land cover patterns. Following the increasing urbanization of the river basin and river basin system, many serious effects are assessed. With the disadvantages of these harmful effects identified due to urbanization, the decline in the quality of water, along with hydrology and geophysics, is the biggest change. This research reviews the various effects on urban river basins; the current research interval in the field of the study tells the date of assessing these effects. The changing river basin provides opportunities for planners, engineers and ecologists to study the effective relationship between urbanization and river basin. This paper can help to further manage better river basin management and research.

**Keywords:** River Basin, Urban River Basin, Urbanization, Land Cover Pattern, Management, Hydrology, Geophysics.

### **1. Introduction-**

Due to the movement of people from rural to urban areas, there is a physical increase in urban areas, which ultimately leads to urbanization. The river valley is suffering from anthropology in the whole world. Because of urbanization, industrialization and population growth, there is a change in the river basin. Any natural system, such as the river basin, has a beautiful path in its own right. All of these biological and inorganic components are connected with each other in a natural system and the study of this intestine is called ecology. Therefore, when any component is emphasized, it disturbs the whole system. A land area shed by the rivers and their tributaries are called river basin. This river basin helps in maintaining the cycle of water. It is also helpful in maintaining human life and other forms of resources. Most of the world's population lives on the different river valley. Therefore, changes in the river basin require extensive research for anthropogenic activities.

The uncontrolled travel of rural people from rural areas to the major city is mainly responsible for the unprecedented increase in the city. People migrate to the city in search of employment, technical, food, modern amenities and a better life. The same other natural resource is limited; the demand for the second and growing population is increasing. The results showed gradual reduction in natural resources. Due to the increasing urbanization and poor management of the natural resource, the quality of the natural river basin is spoiling the quality of the environment. Urban development is associated with changes in land use, the decline in water quality of rivers, an increase in floods and disturbances in natural river basin ecology. Flood disasters in Megacities like the flooding in 2005 and the flood of Delhi in 2010 left a lesson that encroachment on a



natural drainage system due to developmental purposes could threaten urban life. The important effects of urbanization on a river basin are summarized below:

1. River fission and flow Regulation River.
2. Due to morphological changes in the river and river channels.
3. A severe reduction of water in the river basin.
4. Lack of organic homogeneous and biodiversity in a river basin ecosystem.
5. Growing silt and sedimentation of rivers.
6. Frequent natural disasters like floods and droughts.
7. Beauty value or loss of entertainment.
8. Soil erosion due to increase in river runoff.
9. Unexpected local climate.
10. Deforestation and decline in the catchment of a river basin.
11. More exploitation of natural resources.
12. Changes in ecosystem processes.
13. Environment pollution.
14. Residence and community modification.
15. Changes in hydrology due to the increasing severity of the catchment area amendments in the aquatic ecosystem.
16. Reduction in water quality of rivers.

Knowledge of the relationship between sustainable development, urbanization, river basin ecosystem and climate in a river basin is required. Knowledge of the tools and techniques available for better planning and management of a river basin is also required. It is necessary to regularly monitor, manage and conserve these urban river valleys and to control their carries. Collection of data related to available river basin Preparation of integrated river basin management plan along with sophisticated equipment and technology can help in the form of a control strategy to reduce the decline of urban river basins.

## **2. Impact of urbanization on river valleys-**

The effects of urbanization can be broadly classified into three types on river valley, such as physical effect, chemical effect and biological effect. Other effects include built-in areas, open vegetation, water bodies, natural or human-born elements. Due to the rapidly growing urbanization landscape structure is also changing. With the major physical effects of urbanization, changes the landscape and temperature of the river basin along with the streams are undergoing changes. The change in the same open space scenario is like covering to an impressive surface cover, which affects the regional water science of a river valley. Due to this, there is a variety of problems like the decline in water quality, the closure of the basin, and the continuous flood of water in this area, such as water scarcity.

Due to urbanization, due to the improvement of the storm drainage systems, due to soil seal during the rain, the time gap in the urban catchment area decreases, resulting in the increase of floods more rapidly. Changing the flow of streams is another important influence of urbanization. For some of its proper ecosystem, some base flows are doing essential functions in the river basin. The same harvests the basin's water resources to meet rising human habitat water demand, which is the result of the closure of a basin. Anthropogenic activities in the basin change such as river shape, the pattern



of flow, sedimentation of rivers, and plumbing properties. River development and deposition increases within the channels from urban development. After this, there has been an increase in the erosion of river, which chalks the channels. The construction of the dams, on the one hand, the changes in the land-use of the entire basin and the construction of the flood protection construction transforms the behaviour of the river system. Recently, many studies have been done to understand the effect on global warming on aquatic ecosystems. It can be associated with the deterioration of the quality of river water through the Water of Rivers. [2] Urbanization increases the temperature of water in the rivers, either by discharging hot water directly from the furnaces or by adding water to the runoff during the summers. It is found to increase microbial activity in river water. [10] Warming increases the basic growth of water in the late spring and is responsible for phytoplankton mortality in the summer. [9]

Due to urbanization in river water, the chemical effects of the nutrients, metals, organic contaminants start to increase. In urban river banks, due to the discharge of municipality and industrial, their chemical properties change. Dumping of garbage directly in river runoff and adding harmful chemicals to agriculture also contributes to river pollution.

Pollution, salinity, total suspended solids, heavy metals, nitrate, biological microbial pollutants, acidification, euthanasia, death of river inhabitants, heavy metals storage in the river (such as lead), high biological by the presence of organic in rivers affected by urbanization Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) etc. are specialty. [8] Urban land use and water quality are correlated positively with the decline. [5] Due to eutrophication, the BOD and COD of urban river water, which leads to which other aquatic creatures like fish, are killed and urban rivers face serious problems of water pollution. A remedial measure within organic communities can be the recycling of organic matter. [10] During rain and flood from urban areas, highly poisonous organic pollutants such as polycyclic aromatic hydrocarbons (PAH), and secretion of coliform bacteria dissolve in the water of the river. It can lead to the death of cancer, aquatic creatures and diseases in humans. [1] [3] Urbanisation has a biological impact on the changes in the natural habitat of the native flora and fauna of the river valleys, the destruction of the rivers, the biodiversity and the ecosystem. Changes in the format of land use reduce the sustainability of the ecosystem, the richness and lack of species. In the format of urban development and ecological conditions, the benthic macro acts as the indicators for the relationship between invertebrates and fishes. [4]

### **3. Method and tools to study the effect of urbanization on river basins-**

There are various ways to study the urban river valley. Their quality, disturbances in the ecosystem are either inspired by nature or man-made. The methods used for this kind of conventional study are as follows:

**Biological indicators-** Indicators used to detect the health of the basin or its processes are of several types. In order to predict the status of the health river basin, biological indicators are especially used because they are extremely sensitive. Macro-invertebrates, fish mussels and river water quality are highly sensitive to physical-chemical change [4]. The occurrence eutrophication, which indicates the poor water quality of the river.



Biological indicators include the use of traditional methods such as on-site observation. It is very difficult to predict the source of the problem and future effects. It is also very difficult to study the traditional method of using a global phenomenon. In addition to an urban river basin, there are some drawbacks to using the model to study all the uses of the model, to study urban river basins.

**Some metals-** act as anthropogenic indicators such as Q and Zn. They are found in polluted urban rivers along with other metals like Hg, Cr, Al, Ca, K, Na, Fe, Mg, Cu and Zn. [11]

**Mathematical algorithms-** various complex mathematical algorithms use models for modelling and analysis. Some examples: such as EPIC, Patuxent landscape Modal (PLM), General Ecosystem Model (GEM), Stochastic Dynamic Methodology (STDM) Model, Mesoccal Hydraulic Model (catchment Model) and Eco-Hydraulic Model etc. Changes to the environmental hydraulic parameters of a river basin are used to study and influence the effects of land use. [6] [7]

The river basin is a very complex system that involves many variables such as various dynamic processes, space and time. The first defect in studies involves solving complex and massive equations in a river basin with mathematical models. A mathematical model of the mobility of an urban river basin is not known which can define and predict all the problems together. Sometimes it is necessary to be interested to understand two or more models in a single process. [15] [14] [16]

**Urban development models-** (LEAMluc) for urbanization is used to predict the flow of the stream. One-dimensional fluctuating state flow model (UNET) for better prediction of floods-HSPF model tells the timing of the simulation event of the daily flow of the river.

**Management models-** Simulating urban runoff for river flood, management, storage, treatment, overflow and runoff models (storm) and stormwater management model (SWM) do dynamics and long-term studies. The Variables used in these models such as rainfall, temperature, solar radiation, channel geometry, soil moisture, flood frequency, drainage pattern, water physicochemical parameters, LULC type, runoff, flow rule, impermeability, meteorological Input data etc. Flooding in river valleys, increase in surface runoff and river flux patterns due to profanity can help to understand these models [12] [13] [14]. Thus, models for urban river basin management are efficient evaluation tools.

**Remote sensing and geographic information systems-** To monitor the health of a river basin, there is a need to regularly monitor changes and developmental activities in a river basin. Nowadays, different types of sensors have helped in the availability of spatial data and in the propagation of various proposals, such as Air Borne Sensor and Space Generator Sensor. Therefore, remote sensing and geographic information systems have emerged as a modern and efficient tool for collecting information on a river basin. Store it with Aine devices and manage the data but with some limitations, it is easy to analyse. Coverage, better sampling, easy areas for inaccessible maps, homogeneous quality and satellite observation benefit the world as well as human favour and instrumental error are also less likely. In the remote sensing digital collection, data modes are reliable, easy storage, economical and time-saving. But there are some of your losses of remote sensing, such as limited spatial and temporal resolution.



**Other Advance Tools-** High spatial resolutions are available for the river basin, in which many satellites provide a great deal of information about an area extensively, such as IKONOS, Quickbird, CatoSet- 1 etc. provided by data from satellites. Moderate-resolution satellites such as MODIS, INSAT, LandSet etc. Although the moderate spatial resolution is coverage on one area but providing good cosmic resolution and better deliver. There are parameters of some river basin that use land-based and land cover (LULC), effective surface cover, surface runoff, infiltration, groundwater recharge, soil moisture and stream flow, vegetarian, pure primary productivity, using remoteseeing and GIS satellite-based models. (NPP), drainage morphometry etc. can be studied. [19] [18] [17] One study has found that to understand the distributed rain-up model, the data of surface geology, DEM, Landsat TM images, historical river flow data, rain and temperature weather centres have been used as input, from which the catchment, runoff the relationship between river flow and also can be understood. [20]

#### 4. Existing research intervals-

Due to urbanization, one of the major problems of the urban river basin is insufficient knowledge about one of the management factors and dates, which plays an important role in influencing the river basin. The following factors were seen during the research interval.

Points of study:

- 1) The self-purification of the entire river network of the capacity of a river basin is to create and forecast an interesting problem map.
- 2) The ecological disturbances of urban river basins will be explorer more.
- 3) There is a need to research in the relationship between hydrology and geomorphology of an urban river basin.
- 4) The effect of urbanization on urban valleys is to further research in tropical countries and also to find out that heavy rainfall and extreme weather clay in tropical areas are strong because of a sedimentary reaction.
- 5) To understand this link to climate change, more research is required to study the effect of temperature on soil and water.
- 6) Some future check-ups are required. How different types of questions such as urban surface affect the production of rainfall and sediment?
- 7) A better eco-hydrological modelling system should be developed for river valleys.
- 8) The option of continuous development of better river basin management is to be detected.
- 9) Pure primary productivity (NPP) is to be better estimated.

#### 5. Conclusion:-

Rapid urbanization has taken place due to population growth in river valleys. Landscape changes have significantly changed the river basin system. Urbanization has made the change in hydrology the most, as well as the water of pollution of urbanization; there are frequent and harmful effects on water bodies and river basins. Inadequate knowledge of river valleys and major research areas has identified the factors affecting their interrelationships. After collecting the information on the study area, for further analysis and to store this data, it can serve as remote sensing and GIS for the monitoring of river-drains. Therefore, need of an integrated-interdisciplinary



approach to be built for management and conservation of the basin of the river affected by the urban base.

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## शुद्धकस्य नान्दनिकत्वम्

### ड. दिलीपकुमारपण्डा

सहयोग्यध्यापकः, संस्कृतविभागः, घाटालरबीन्द्रशतवार्षिकी महाविद्यालयः

घाटालः, पश्चिममेदिनीपुरः पश्चिमवङ्गः भारतवर्षः

#### भूमिका

इन्द्रियग्राह्यसत्तायाः नान्दनिकताविषयालोचनायाः मुखभागे सौन्दर्यस्वरूपोद्घाटनमावश्यकम् । Asthetikos ग्रीकशब्दादिति Aesthetic शब्दोत्पत्तीति भूतेऽपि उक्ताडलशब्दस्यार्थः नन्दनतत्त्वमिति न वा विषयेऽस्मिन् मतानैक्यमस्ति। यथा शब्दार्थविषये मतभेदोऽस्ति तथैव सौन्दर्यस्वरूपविषयेऽपि प्राच्यपाश्चात्यसाहित्यतात्विकानां मतवैषम्यं विद्यते । दशरूपकानुसारिकुमारस्वामी मन्यते –“ **Beauty is absolutely independent of the sympathetic**’ .K.C. Pandey मन्यते ‘ **science and Philosophy of Fine art**’ इति सौन्दर्यतत्त्वं Keats महोदयस्य चिन्तायां – **A thing of beauty is joy for ever**’ . कविराजेन विश्वनाथेन उक्तम् ‘**वाक्यं रसात्मकं काव्यमिति**’ । अर्थात् तन्मते रसः एव काव्यस्य आत्मा । पण्डितराजेन जगन्नाथेन उक्तं सौन्दर्यतत्त्वमतीव स्पष्टम् –‘ **रमणीयार्थः प्रतिपादकः शब्दः काव्यम्**’ इति। अर्थात् अलौकिकानन्दानां जनकं यत् ज्ञानमनुभूतिर्वा तदेव काव्यसौन्दर्यम् । अतः जगन्नाथः केवलं रसोद्बोधकतां काव्यजीवनं न मन्यते , परन्तु स रमणीयतायाः उपरि कव्यसौधस्य भित्तिप्रस्तरस्थापनप्रयासं करोति। तदर्थं सौन्दर्यं न केवलं दृष्टिग्राह्यं तदनुभवयोग्यमस्वाद्यञ्चेत्यविशंवादितम्। अथा ब्रह्मा अवर्णनीयानुभववेद्यास्वाद्यश्च तथैव काव्यरसास्वादनमपि ब्रह्मस्वादतुल्यम्। उल्लेख्यं यत्, संस्कृतवाङ्मये काव्यशब्देन समग्रकविकृतिरेव बोध्यते ।

#### काव्यपर्यालोचनम्

दशाङ्कविशिष्टः मृच्छकटिकाबलम्बितः ‘मृच्छकटिकम्’ इति प्रकरणग्रन्थः नाट्यकारशुद्धकस्येकासामान्यनाट्यमनीषायाः परिचायकः। कालस्य कुटिलगत्या निरन्तरविमथितेऽपि पृथिव्याः बहुभाषायामनूदितस्य प्रकरणस्य बहूनि चित्राणि सर्वकालस्य मानवानां सहयान्निकानि भवेयुः। नाटकस्यास्य अङ्कादङ्कान्तरं शिक्षानन्दस्य च अदृष्टपूर्वमिलनचित्राङ्कितम्। वास्तविकमिदं यत्, नाटकेऽस्मिन् शुद्धकेन चिरावहेलितमानवानां रक्तरञ्जित पार्थिवमार्गरेव उपस्थापितः। प्रसङ्गेऽस्मिन् रवीन्द्रभारतीपत्रिकायां प्रकाशिता ड. करुणासिन्धु दासमहोदयस्य सार्थकोक्तिः –‘ **Come and see blood in the street**’.

सर्वस्तरीयसमाजिकानांदुःखदारिद्र्याणां चित्राणि नाटकेऽस्मिन् प्रदर्शितानि, येन समुद्भासितमापामररसिकानां हृदयचित्रफलकम् । ऋतुवर्णनायां, चित्राङ्कने, मिलनप्रदर्शने वानाट्यकारेण प्रवाहितस्वतौत्सारितफल्गुधारायाः क्षणस्पर्शादेव विदग्धमानसार्णवः समुद्बलितो भवति सौन्दर्यलहरिकायाः क्रमान्वयाभिधातैः । एतस्यालोकसामान्यप्रतिभायाः पुष्पसमृद्ध समग्र नाट्यकाननस्य पुष्प सौरभघ्राणं मत्साध्यातीतम् । तदर्थं सुसज्जितकुसुमकाननातौस्मात् कतिपय विचित्र वर्णपुष्पचयनेन पर्यालोचनायाः पुष्पपात्रमिदं विरचनार्थं प्रयास्यहम् ।



नाट्यारम्भे मङ्गलाचरणेन कविरक्तः यथा नीलकण्ठस्य कण्ठेन सह कृष्णवर्णमेघस्य, शुभाङ्गिगौर्याः सुकोमलभुजलतया सह विद्युल्लेखायाः सादृश्यं विकल्प्य सृजितमपूर्वचारुत्वमेकं तथैव चारुदत्तस्य दारिद्र्यं कृष्णवर्णमेघेन सह वसन्तसेनिकायाश्च ऐश्वर्यप्रावल्यं श्वेतक्षणप्रभया सह प्रतुल्य शब्दव्यञ्जनया सृजनं कृतः सौन्दर्यविग्रहापरेकः ।

अनन्तरं संगीतपरिवेशनान्ते क्षुधार्तः सूत्रधारः स्वगृहं प्रविश्य विपुलभोजनायोजनार्थतसलौहकटाहस्य भूमौ पुनः पुनः अवनमनेन कृष्णरेखाङ्कितभूमिदर्शनात् क्षुधार्तः भूत्वा अपि अनुभूतवान् सौन्दर्यस्पर्शम्- 'लौहकटाहपरिवर्तन कृष्णसारा कृतविशेषकेव युवती अधिकतरं शोभते' इति । नाटकेऽस्मिन् दुःखवर्णनान्तरे यथा शाश्वतसत्यं विद्यमानं तथा आनन्दरसोच्छलं हतदरिद्रहृदयमपि सुस्पष्टरूपेण वर्णितम् । एतदर्थं शूद्रकः एकदा वितानामुत्तुङ्गशिखरारोहणकरिनिःस्वचारुदत्तं प्रति पदस्य रैखिकचन्द्रेण सह सादृश्यं विचिन्त्य वर्णितः - " प्रतिपदचन्द्रस्येव परिक्षयोऽपि तेऽधिकतरं रमणीयम् "। अर्थात् प्रतिपदचन्द्रस्य आलोकोज्ज्वलांशाधिके विनाशोऽपि दृष्टक्षीणरेखा यथा मानवानां हृदये आह्लादकत्वसंचारं करोति तथैव क्षीणवितेऽपि चारुदत्त अद्यावधि मानवानां श्रद्धाभाजनः।

तावत् पश्यतु, हीनवित्तस्य गृहमतिथिविवर्जितं भवतीति सर्वजनविदितम्। साधारणचिन्तनमिदं कवेः लेखन्यां स्फुटितमसाधारणरूपेण, तद्यथा -

‘एतत्तु मां दहति यद् गृहमस्मदीयं  
क्षीणार्थमित्यतिथयः परिवर्जयन्ति ।

संशुष्कसाद्रमदलेखमिव भ्रमन्तः

कालात्यये मधुकराः करिणः कपोलम्”॥(१/१२)

न केवलमिदम्, अर्थस्य गमनागमनविषये हास्यरसेनापि कविरभिनवसौन्दर्यमेकं सृजितः- “ वरटाभीता इव गोपालदारका अरण्ये यत्र यत्र न खाद्यन्ते तत्र तत्र गच्छन्ति ’ । अर्थात् यथा वरटाभीतगोपालकः दंशहीनस्थानं पलायते तद्वत् अर्थोऽपि भोगस्य निष्प्रयोजनं स्थानं गच्छति ।

पुनः दारिद्र्यात् मृत्युमार्गं प्रदर्शनार्थं नाट्यकारोक्ता मनोजालोचना क्रमान्वयिकपुष्पविरचितैकामालिका सदृशा, यस्या प्रतिपुष्पवाक्ये यथा विद्यमानं शश्वतसत्यं तद्वत् विद्यमानपूर्व वाक्यविरचनसौन्दर्यम्। तस्मिन् शाश्वतसौन्दर्यस्य चित्राङ्कनार्थमुक्तं कविना -

दारिद्र्याधियमेतिह्यपरिगतः प्रभ्रश्यते तेजसो

निस्तेजाः परिभ्रूयते परिभवान्निर्वेदमापद्यते ।

निर्विण्णः शुचमेति शोकविहतो बुद्ध्या परित्यज्यते

निर्बुद्धिः क्षयमेत्यहो निर्धनता सर्वापदामास्पदम् ॥ इति (१/१४)

अनन्तरं कामदेवायतनोद्यानात् प्रत्यावर्तनकाल् शकारेण विटेनचानुसृतावसन्तसेनां यथा कविः कदापि व्यधानुसृता भीताहरिण्या सह कदापि वा मेघगर्जनभीता सारसीन्या सह तुलनां कृतः तद्वत् वसन्तसेनिकाभिलाषिणः शाकारस्य कामतापदग्धहृदयमपि अग्निना रक्तिमाङ्गारे निक्षिप्तमांसेन सह कल्पनां कृतः तद्यथा -

“कामेन दह्यते खलु मे हृदयं तपस्वि।

अङ्गाराशिपतितमिव मांसखण्डम्” इति ॥(१/१८)



यद्यपि वसन्तसेना वाराङ्गना, गणतुष्णिका च तथापि कवेर्दृष्ट्या सा वासन्तिकसौन्दर्यं सदृशा सर्वहृदयापहारिणी च। एतदर्थं तस्या सौन्दर्यहान्याशंकया अलंकारग्रहणविमुखस्य विटस्योक्तिः-  
“भवति! वसन्तसेने न पुष्पमोषमहर्त्युद्यानलता” इति । अतः दुरस्तं काव्यसौन्दर्यसामान्यैकागणिकायाः सौन्दर्यछेदनमपि न कवेरीप्सितम्। यतः स जायते यत् वृक्षस्य शखैकछेदनेन यथा वृक्षसौन्दर्यविनष्टं भवति तद्वत् काव्यमपि पुष्पपल्लवितैकं वृक्षस्वरूपं, यत्र चरित्रमेव तस्य शाखासदृशम्।

पुनः तमसावृतरात्रौ वर्षणप्रावल्यात् शाकाराणुश्रितादृश्यवसन्तसेनायाः अदृश्यता वर्णनकाले कविना वर्णितं

–“ अन्धस्य दृष्टिरिवपुष्टिरिवातुरस्य

मुखस्य बुद्धिरिवसिद्धिरिवालसस्य।

स्वल्पस्मृतेर्व्यसनिनः परमेवविद्या

त्वां प्राप्य सा रतीरिवारिजने प्रणष्टा” इति ॥ (१/४९)

अपूर्ववर्णनकौशलम् अचिन्त्य सर्जनशक्तिः कविशूद्रकस्य । दुश्चिन्त्यनीयेमां रचनशैलीं यस्या छत्रे छत्रे तालनिवद्ध संगीतमूर्च्छना विराजमाना । तमसावृतरात्रौ वसन्तसेनायाः अदृश्यतारूपं सामान्यदृश्यं कवेर्दृष्ट्या असामान्यकाव्यसौन्दर्याकररूपेण पर्यवसितम्। एतत् न शकारेण वसन्तसेनिका प्राप्त्युपायवर्णनाप्यर्थसौन्दर्येणाकीर्णा, तद्यथा-

“ आलाने गृह्यते हस्ती वाजी बल्गासु गृह्यते।

हृदये गृह्यते नारी यदीदं नास्ति गम्यताम् ” इति ॥ (१/५०)

अङ्केस्मिन् एका वर्णना दृश्यते, यत्र अतैलप्रदीपः निःस्वनागरदर्शनेनापमानकारिणी स्नेहहीनागणिकातुल्यः। पुनः पुर्णचन्द्रस्य प्रकाशनात् आलोकहीनराजमार्गः गमनोपयुक्तः भविष्यति विषयमिदं सम्यग्बोधनार्थं पुर्णचन्द्ररूपवर्णनायांकवेल्लेखनी भवति सौन्दर्यविह्वला । यथा-

उदयति हि शशांकः कामिनीगण्डपाण्डु

ग्रहगणपरिवारो राजमार्गप्रदीपः ।

तिमिरलिकरमध्ये रश्मयो खस्य गौराः

सुतजल इव पङ्के क्षीरधाराः पतन्ति ” इति ॥ (१/५७)

एतादृशं सौन्दर्यपुर्णवर्णनासमृद्धं नाटकमिदं चलमानचलच्चित्रतुल्यं, यत्र कवेर्वर्णनायां नास्ति क्लान्तिः नास्ति च क्षान्तिः । नाटकार्णवेऽस्मिन् एकैकं तेन सृजिता सौन्दर्यलहरिका, यस्याभिघातमात्रणैव मानवहृदयबेलायां अनुभूत भवति अव्यक्तानन्दस्पर्शः ।

अनन्तरं द्वितीयाङ्के वसन्तसेनायाः करिदन्ताभ्यां कर्णपूरकः लौहदण्डेनैकेन परिव्राजकमेकस्यमुक्तं कृते समुपस्थितनागरिकानां प्रशंसावर्णनकाले कवेर्कण्ठात् निर्गतास्ति नान्दनिकोक्त्येका –“ साधु रे कर्णपूरकः ! साधु ! इत्येतावन्नामात्रं भणन्ती, विषमः भाराक्रान्ता इव नौः एकतः पर्यस्तासकला उज्जयिनी” इति । दरिद्रता विद्यमानेऽपि चारुदत्तः संगीतप्रियासीत् । तदर्थं तृतीयाङ्के रेभिलेति मित्रगायकस्य संगीतश्रवणेन प्रीतचारुदत्तस्य सुखश्राव्य वीणावादनस्य-

“ उत्कण्ठितस्य हृदयानुगुणावयस्या संकेतके चिरयतिप्रवरो विनोदः।

संस्थापना प्रियतमा विरहातुराणां रक्तस्य रागपरिवृद्धिकरः प्रमोदः इति ॥ (३/३)



मित्रगायकस्य संगीतेन चारुदत्तस्य हृदयं सुदूराणीतम् । तद्धेतुः तस्यान्तरे विद्यमानं सुरताण्डवम्, दृष्टौ च प्रकृत्या लीलामाधुर्यम्, दरिद्र्यस्यातलान्ते विलीनं न भवति तस्य सौन्दर्यचैतन्यम् ।

न केवलं मुख्यचरित्रवर्णनायां, अङ्केऽस्मिन् तस्करस्यैकस्य चौर्यरीतिं वर्णना कालेऽपि कविना चित्रितं रम्यचित्रमेकम्, यत्र शर्विलकेति तस्करः प्रभाते नागरिकानाम् अनिन्दनीयत्वं विचिन्त्य सन्धिद्वाराकाराविषयेऽपि चिन्तितः । अन्तिमे च पक्केष्टकभीतौ पूर्णकुम्भसदृशसन्धिद्वारं कृत्वा नान्दनिकभावनायाः परिचयं प्रदत्तः । अपि च सन्धिद्वारात् ईषन्निर्गतालोकः कव्येऽस्मिन् निकषदृष्टस्वर्णरेखासदृशः प्रतिभाति । तत् कविनोक्तम् –

**शिखा प्रदीपस्य सुवर्णपिञ्जरा महीतले सन्धिमुखेन निर्गता ।**

**विभाति पर्यन्ततमः समवृता सुवर्णरेखेव कषे निवशिता ॥(३/१७)**

लक्ष्यणीयं यत् , चन्द्रदेवस्यास्ताचलगमनादीषदृष्टव्यवर्णणप्रसङ्गे तस्करेण यदुक्तं तदसामान्यचारुत्वमण्डितम् । तद् यथा – “घनतिमिरनिरुद्ध सर्वभावा रजनिरियं जननीव संवृणोति ” इति । अतः नाटकस्य पात्रमात्रस्य संलापेन कवेर्नान्दनिकचेतना सूचिता , विषयेऽस्मिन् नास्ति सन्देहः । चतुर्थाङ्के चित्रफलकं वसन्तसेनिकायाः कक्षे स्थापयित्वा तालवृन्तमानीतुमादिष्टा मदनिका वसन्तसेनिकया । परन्तु पथि शर्विलकेन सह साक्षाते तस्याः विलम्बमभवत् । विलम्बं दृष्ट्वा वसन्तसेना गवाक्षतः केनचित्पुरुषेण सह कथोपकथनरतां मदनिकामपश्यत् । मदनिका तस्याः दासी परन्तु तस्याः प्रणये विघ्नसृष्टिमकृत्वा वसन्तसेनिकया उक्तम् – “तद्रमतां रमताम्, मा कस्यापि प्रीतिच्छेदो भवतु । न खल्वाकारिष्यामि ” इति ( चतुर्थाऽङ्कः ) । अत्रापि नाट्यकारस्य सौन्दर्यतत्त्वमस्ति । स्वभावतः एव परिचारिकायाः कार्ये विलम्बं स्वामिना असह्यम् भवति तदुपरि प्रेमालापः नैव नैव च । परन्तु अत्र परिचारिकायाः कार्ये विलम्बे सत्त्वेऽपि वसन्तसेना तयोः प्रणये वाधादानं न करोति यतः सा मन्यते प्रणयः सर्वदैव सौन्दर्यमण्डितो भवति ।

न केवलमेतत्, तयोः गोपनप्रेमालापमपि श्रोतुं वसन्तसेना नेच्छति । तया उक्तम् – “कथं परमरहस्यम् ? तन्न श्रोष्यामि ” इति । अपरस्य गोपनवाचनं न श्रोतव्यम् इति अशोभनमपि । अतः एतत् सामाजिकाशोभनत्वमनुल्लङ्घ्य लेखकः तस्य सुन्दरमानसिकतायाः परिचयं ददाति ।

अपि च सामान्यया नाट्यां मदनिकया तस्याः मुक्तर्थं चौर्यवृत्ति असमर्थ्य तया उक्तम् – “स्त्रीकल्यवर्तस्य कारणेनोभयम्पि संशये विनिक्षिप्तम् ” इति । अत्र “उभये”ति शब्दे शरीरं चारित्रञ्च बोध्यम् । अतः मदनिकायाः मुक्त्यर्थं शर्विलकस्य चौर्यवृत्तिना तस्य शरीरं चारित्रं दोषदुष्टं भवतीति आशयः । अत्र मदनिका स्वमुक्त्यपेक्षया शर्विलकस्य चरित्रसौन्दर्यक्षयोपरि गुरुत्वं ददाति ।

चौरः सर्वं चोरयोष्यतीति स्वाभाविकम् , परन्त्वत्र शर्विलके चौरैऽपि तस्य चौर्यवृत्तिः भिन्नप्रकारका, तत्र दृश्यते ज्ञानपूर्वकचौर्यकार्यस्य दृष्टान्तः यत् कविना चित्रयितमित्येवम् –

**“ नो मुष्णाम्यबलां विभूषणवतीं फुल्लामिवाहं लतां**

**विप्रस्वं न हरामि काञ्चनमथो यज्ञार्थमभ्युद्धतम् ।**

**धान्युत्सङ्गतं हरामि न तथा बालं धनार्थं क्वचि**

**त्कार्याकार्यच्चारिणो मम मतिश्चौर्येऽपि नित्यं स्थिता ॥” ( ४/६)**



अयं चौरः न अपण्डितः तदर्थं सः यस्य कस्यापि न चोरयति, कस्यापि दुःखोत्पादयित्वा वा स न चोरयति ,यस्य द्रव्याणि अपहरणे तस्य सामयिकदुःखं भविष्यति न तु महत् तस्य द्रव्याणि सः चोरयति ।किमिदं न सौन्दर्यपूर्णम् ?

चारुदत्तस्य गृहात् वसन्तसेनिकाप्रदत्ताः अलंकाराः चौरं कृत्वा तेनैव मदनिकां मुक्त्यर्थं चेष्टते शर्विलकः परन्तु यदा तेन ज्ञातः यत इमे अलंकाराः न तु चारुदत्तस्य अपि च वसन्तसेनिकायाः एव तदा कविः नवीनोद्भावकप्रतिभया ईदृशरूपेण अलंकाराः वसन्तसेनिकाम् मदनिकाञ्च शर्विलकं प्रत्यर्पनं कृतः यत्र चौरस्य शर्विलकस्य चरित्रे यथा रेखाङ्कनं न भवति तथैव मदनिका-शर्विलकयोः अपि मनोरथः पूर्णो भवति ।पश्यतु तस्मिन्प्रसङ्गे किञ्चिदुक्तिप्रत्युक्तिः –

( चतुर्थाऽङ्कः )

अलंकारैः सह प्रविशति शर्विलकः

“ शर्विलकः – स्वस्ति भवत्यै ।

वसन्तसेना – आर्य !वन्दे । उपविशत्वार्यः ।

शर्विलकः –सार्थवाहस्तां विज्ञापयामि –“जर्जरत्वाद्गृहस्य दूरक्षमिदं भाण्डम् ,तद्गृह्यताम् ।

वसन्तसेना – आर्य! ममापि तावत्प्रतिसन्देशं तत्रार्यो नयतु ।

शर्विलकः –(स्वगतम्) कस्तत्र यस्यतिः । (प्रकाशम्) क्व प्रतिसंदेशः ?

वसन्तसेना –प्रतीच्छत्वार्यो मदनिकाम् ।

शर्विलकः –भवति ! नखल्ववगच्छाम् ।

वसन्तसेना –अहमवगच्छामि ।

शर्विलकः –कथमिव ?

वसन्तसेना – अहमार्यचारुदत्तेन भणिता –“य इदमलंकारकं समर्पयिष्यति, तस्य हस्ते मदनिका दातव्या ।

तस्य एवैतां ते ददातीत्येवमार्यणावगन्तव्यम् ।” इति ।

चतुर्थाङ्के एकस्या सामान्यायाः वारवनितागृहस्य यत् सौन्दर्यमण्डिता वर्णना नाट्यकारेण क्रियते तत्र नाट्यकारस्य सौन्दर्यरुचेः परिचयः अस्ति ।

अपि च परिहासच्छलेन विदूषकः वसन्तसेनिकायाः मातरमुद्दिश्य यदुक्तम् तत्रापि दृश्यते नानन्दनिकत्वम्, तद्यथा –

“विदूषकः – (सपरिहासम् ) दास्याः पुत्रि !वरमीदृशः शूनपीनजठरो मृत एव ।

सीधुसुरासवता एवावदवस्थां गता हि माता ।

यदि म्रियतेऽत्र माता भवति शृगालसहस्रपर्याधिका ॥” इति ।( ४/३०)

अर्थात् वसन्तसेनिकायाः माता स्थूलशरीरयुक्ता ।विदूषकेनोक्तम्, यदि अस्मिन् समये अस्याः मृत्युर्भवति तर्हि शृगालसहस्रस्य अपि महानन्दः उपस्थितो भविष्यति ।अहो! कीदृशं सुन्दरमिदम् ?हास्यरसेनापि कविरत्र सौन्दर्यसृष्टिं करोति ।

पञ्चमाङ्के चारुदत्तेन सह वसन्तसेनिका यदा साक्षायितुं समागता तदा तस्याः चेटः कुम्भीलकः चारुदत्तस्य सकाशात् विदूषकं लोष्टैः येन प्रकारेण ताडयति तदपि हास्यरसेन सह सौन्दर्यविधायकम् ।न



केवलमिदं तत्र विदूषकेन सह कुम्भीलकस्य यत् यत् हास्यरसस्मृद्धानि वाक्यानि प्रयुक्तानि भवन्ति तत् सर्वं असाधारणसौन्दर्यस्य परिचायकम् ।

षष्ठाङ्के वसन्तसेना यदा चारुदत्तस्य गृहे समागच्छत् तदा चारुदत्तस्य पूर्वपत्नी धूता अस्याः आगमने असन्तुष्टा भविष्यति इति विचिन्त्य चेति यत् आदिष्टवती तत्रापि दृश्यते सौन्दर्यस्य तथा भद्रतायाः निदर्शनम् । तयारुक्तम् –“चेति ! गृहाणैतां रत्नावलीम् । मम भगिन्या आर्याऊतायै गत्वा समर्पय । वक्तव्यं च –“अहं श्रीचारुदत्तस्य गुणनिर्जिता दासी, तदा युष्माकमपि । तदेषा तवैव कण्ठाभरणं भवतु रत्नावली इति । ( षष्ठाङ्कः ) । अत्र पश्यन्तु, वसन्तसेना चारुदत्तेन सह प्रणयं करोति, इत्यवस्थायां चारुदत्तस्य प्रथमापत्नी प्रति तस्याः सौख्यमचिन्तनीयम् । परन्तु कविना अत्रापि सौख्यं प्रदर्शयति येन उत्तरकाले तयोः सपत्न्ययोर्मध्ये कोऽपि विवादः नोत्थियो भवति । वसन्तसेना केवलं चारुदत्तस्य गुणैः आकृष्टा भवति न तु धूतायाः प्रतिद्वन्दी इति प्रतिपादयितुं आत्मानं तस्याः भगिनीरूपं मत्वा अपरैकां भगिनीं रत्नावलीमुपहाररूपेण प्रदत्ता । कीदृशं सौन्दर्यस्योदाहरणमिदम् ? एतादृशायाः मानवतायाः दृश्यमन्यत्र दुर्लभम् ।

#### उपसंहारः

सौन्दर्यानां पूजकाः मानवाः सर्वदैव । यत्र नास्ति सौन्दर्यं तत्र मानवताऽपि नास्ति । शुद्रकः इदृशैकः लेखकः यः समाजस्य दृश्यमानानि चित्रानि तस्य लेखन्या उपस्थापितं करोति अनेन एकेन सामाजिकेन नाटकेन । यद्यपि काव्यस्य आङ्गिकमात्रैव सौन्दर्यमस्ति तथापि लेखकस्य कल्पनाप्रसूतया भावनया काव्येषु अधिकतरसौन्दर्यलहरिका उत्थिता भवति । अतः समाजस्य सुस्थिरतायाः सुन्दरमानसिकतायाः प्रयोजनम् । यदि समाजे मानवाः परस्परं सुन्दरमानसिकतायुक्ताः भवन्ति तर्हि समाजोऽपि भविष्यति सुशुद्धः ।

#### सहायकग्रन्थाः

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## THE EVOLUTION OF PRE-HISTORIC TOOLS AND EARLY LABOUR PROCESS IN ASSAM

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### **Abstract:**

The progress of tools and technology and the labour process are two major intrinsic forces which relentlessly working in the course of evolution of human civilization. As labour is the prime and basic condition of human existence, it is stressed that it was labour that helped man to rise from the animal world, to master the forces of nature and put them at the service of his interest. The labour process played a dominant role in discovery, invention and development of numerous tools and technologies which finally became the decisive factor in the developmental paradigm.

The scope of the research work will confine to the study of the evolution of tools and labour process during pre-historic Assam. The approach of the study is historical and exploratory in nature. The methodology used in this work is conventional and analytical. Best effort is made to make the method of treatment on the subject historical and analytical, taking into account of all the available sources, whether primary or secondary.

**Keywords:** Pre-historic tools, Early labour process, Early Settlements, Tool Making Traditions, Pre-historic Assam.

### **Introduction:**

Pre-history tells us the story of human evolution, of physical, cultural and technological. The pre-historians define man as a tool-making animal. So, the history of the evolution of labour process and tools can be traced back to the time when the man-like creatures accidentally or deliberately converted naturally fragmented stones or pebbles into artifacts. The journey of man through the ages, from the primitive stage to modernity; the transition from the itinerant life of hunting, gathering and fishing to more sedentary existence with food production in villages, has been marked a tremendous journey indeed. The role of technology as a contributor to historical changes is a prime fact that must be given due attention. Technology is one of the crucial elements of productive forces that associate with the production relations set up a historically determined mode of production. Hence, technology cannot be isolated from the social context and a crucial driving force of civilization. Thus the basis of civilization are to be initiated not in technology alone, but in the sphere of social production and social relations taken as a whole. In this context technological determinism is found unacceptable as it attempts to prove that civilization is determined primarily by technology but also by the social structure and spiritual culture that technology gives rise to.<sup>i</sup>

Technology comprises tools, how they are utilized (technique) and the social action involved in their utilization. Technology is shared and transmitted within a group,



as is any other element of culture.<sup>ii</sup> Every civilization was based upon a specific historical mode of material production, for without this human society itself could not exist. The pre-historic condition of the world was brought to light first in Europe in the middle of the last century, when the geological antiquity of man was scientifically proved.<sup>iii</sup> The complete pre-historic situation of man from the Palaeolithic period was worked out scientifically after the implication of the radio-carbon dating methods in pre-historic studies since nineteen sixties there has emerged a complete picture of the stages of human evolution along with the sequence of cultural evolution during the stone, bronze and iron ages with scientifically determined reliable dates.<sup>iv</sup>

The Northeast Indian region is located at the junction of south Asia and South-East Asia and its natural and cultural interconnectivity, logically explain the rich cultural diversity of the people living in the region. Thus, geographically, Assam and Northeast India, through which India touches high Asia, is destined to play crucial role in eastern part of India. From Pre-historic period, regular movements occurred of human races into this region from mainland India, South China and South-East Asia. Therefore, the region may be considered as Great Indian Corridor.<sup>v</sup>

Apart from its geological formation and strategic location, the region can claim for its unique climate having heavy rainfall and humid place with associated flora and fauna which strongly influences the life and culture of the people of Northeast India, and thus, provided necessary support to early human migration and subsistence of Pre-historic and Proto-historic people from East and South-East of Asia.<sup>vi</sup> Due to dearth of evidences, it is difficult to reconstruct the early climatic conditions and relationship of man and environment of early Northeast India. Amongst the literary reference about the climate of early Assam, we have the testimony of Hiuen-Tsang who says that the country (Pragjyotisha-Kamarupa) was 'low and damp'.<sup>vii</sup> In 1662 AD, when Mirjumla invaded Assam, he was accompanied by Shihabuddin Talish who informs us that in Assam the rain rests for eight months and even during winter there are a few rainy months.<sup>viii</sup>

#### **Early Settlements and Tool Making Traditions:**

The unique monsoon climate, excessive humidity and tropical forest attired mountains are unique characteristic of the climate of early Northeast India.<sup>ix</sup> All these features attracted the antecedents to settle in the region, on the basis of the development of stone tool industry and domestication of plants and cereals. The region developed as suitable land for early settlements supported by its varied flora and fauna around late Pleistocene period or even earlier when migratory human beings started to develop tool making process. M.K. Dhavalikar in this respect opines 'Archaeologically Assam is terra-incognita'.<sup>x</sup> It means very little excavation and survey was done in this region to relate the missing link of history since independence except some stray and sporadic findings and occasional surface collections so far as Pre-history of the region are concerned. It was during colonial period some findings are reported from some sites. The study on pre-history of Northeast India started in 1867, when Sir John Lubbock<sup>xi</sup> first written about Stone Age culture of Assam in the Journal *Athenaeum* published from London. The British army and officers took initiatives in bringing to light the pre-history of Northeast India. The first systematic attempt to study the pre-historic period of Northeast India was made by J.H. Hutton<sup>xii</sup> in the year 1928, who first



carried a systematic survey on the Pre-history of Northeast India and brought to light the Neolithic cultural phase of the region. In 1949, E.C. Worman<sup>xiii</sup> of Washington Academy of Sciences had given special importance to the Neolithic problem of Assam with a view to substantiating his ideas on eastern Asiatic origin of Neolithic celt making tradition. In 1960, A.H. Dani<sup>xiv</sup> studied the pre-historic antiquities of Northeast India. However, his study was limited to only one kind of stray find neolithic stone implements, failed to present a comprehensive picture of the neolithic cultural pattern of Northeast India. These neolithic stone tools mainly Acheulian hand axes are being preserved in the Pitt River Museum in Oxford.

The recent phase of investigation into the pre-history of Assam and Northeast India may be said to have begun with Prof. M.C. Goswami and he initiated in the excavation at Rengchangiri in the Garo Hills and Neolithic site at DaojaliHading that situated in the North Cachar Hills.<sup>xv</sup> The Palaeolithic tools of Garo hills can be divided typologically into three distinct industrial traditions.<sup>xvi</sup> The first is a heavy tool hand cleaver representing lower Palaeolithic tradition. This group again subdivided into crudely flaked but thoroughly worked hand axe of early Acheulian type and finely flaked thin and ovate type of hand axe. The flake tool industry of the Garo hills discovered in Thebrongiri, MokbolAberi and Mishimagiri are well developed. These flakes were converted either into large variety of tools such as scrapers, points, awls and borers. These represent Middle Palaeolithic tools. The third group represents the blade tool industry which represents the upper Palaeolithic culture. This type of tools is made on long and thin flakes having parallel sides. Typologically Palaeolithic tools of Garo hills are closely associated with western Palaeolithic traditions. The Garo hills was one of the most suitable area of early settlement because of the rich availability of her natural product and easy availability of raw material for stone tools and perhaps suitable for hunting and food gathering.<sup>xvii</sup>

Palaeolithic sites have been discovered so far in many places of Northeast India. Palaeolithic sites of the Garo Hills are mainly in the Ganol, Rongram and Simrsang river valleys. In 1971, H.D. Sankalia visited the sites of Thebrongiri, Waram and Rongram, and examined the gravel and silt bed exposed by Rongram River and tools which occur on the ancient traces of the river and convinced that Garo Hills preserved the cultural relic of the Palaeolithic period.<sup>xviii</sup> The stone age sites so far been discovered in the Garo hills yielded a huge quantity of tools of various types found in association with a large number of cores used for detaching flakes to be converted tools as well as huge quantity of waste flakes and chips.<sup>xix</sup> The Palaeolithic sites discovered so far in the Garo Hills of Meghalaya are Rongram Alagiri, Ganol Abri, Mokbol Abri, Selbalgiri, Thebrongri, Watri Abri, Didami, Michimagiri etc.<sup>xx</sup> In Rongram Alagiri the archaeologist have discovered traces of ancient river and man who lived there.<sup>xxi</sup> All these sites so far discovered in the Garo Hills, generated a huge quantity of stone tools of various types found in association with a large number of cores used for detaching flakes to be converted then into tools as well as huge quantity of waste flakes and chips. Therefore, most of the sites could be taken to represent as primary factory sites. Moreover, the sites were located on or near the source of raw material consisting of out crops of dolerite dykes.<sup>xxii</sup>



Beside the Palaeolithic tools, pre-historians and archaeologists were able to discover tiny stone tools known as microliths in the Rongram Valley of the Garo hills. These have been found at two sites Sebalgiri and Thebrongire. During the excavation in these site, yielded stratified layer of Neolithic cultural layer on the top, below of which there occur a Hoabinhian Cultural level (named after the discovery of the site at HoaBinh near Honoi) characterized by pebble choppers, blades scappers, points arrowhead and broad-edged trapezes and plain handmade pottery.<sup>xxiii</sup> The stone tools excavated from the sites were made of dolerite. All the tools are heavily patented. Typologically these tools have a close resemblance with South-East Asia. Another interesting tools tradition of the chopper tradition was discovered at Nangalbibra in Simsang Nangal valley of East Garo hills.<sup>xxiv</sup> The tools included choppers prepared from river pebbles. Again, flake tools have also been recovered from a patch of gravel at the bed of same river. The Mesolithic cultural remains of Garo Hills are characterized by microliths and Hoabinhian cultural remains. The archaeological site at Selbalgiri and Thebrongiri have yielded non geometrical microliths with some handmade pottery and other sites various axes and choppers which clearly suggest a stage of hunting and food gathering economy. It has been suggested by many scholars that the Austric (Khasi) people who came as the first wave of migration to Northeast India brought this cultural tradition of tool making at Rongram Alagiri.<sup>xxv</sup> From the study of these tiny tools at Garo hills reveal that the people of the area were basically hunter and food gathers. Whether the people of the area domesticated any plants, we are not sure about that until further excavation is carried on in that area.

The second important site of Palaeolithic cultural assemblages are found in Arunachal Pradesh.<sup>22</sup> The tools include chipped, edge ground axes, pecked, and edge ground tools. B.P. Boperdikar<sup>23</sup> carried on a systematic survey in the Depabhum area of Lohit District on the high terraces of Kamla River and reported for the first time site with Palaeolithic antiquity in 1969-70. From the three sites at Kale, Teehum and Glow he had found choppers, hand axes cleavers, scrapers, flakes, points and cores. These tools were made of gneisses, quartzes, limestone and schist, which are locally available. Typologically they have close affinity with the lower Palaeolithic tools of Garo hills. Further, it is probable that in Post-Pleistocene period migratory people from East Asia of Tibeto-Burman stock settled in this area by adapting the local environment and their subsistence dependent on fish and hunting as evidence by different stone tools.<sup>xxvi</sup>

In 1935, W.Y. Sing first reported some archaeological findings at Manipur. These were some copper objects and other antiquities from the old palace at Imphal. In 1969, a cave and rock shelter at KhangKhui cave located near Ukhrul area was excavated.<sup>xxvii</sup> Stratigraphically the site is very simple. The excavation reveals scrapers, blade end scraper, point, knife, tabular flakes and large fluted cores of sandstone. The associated remains are the teeth of wild animals in association with charcoal and split bones of animals. Typologically they may be classified with the late Palaeolithic period. This is the first instance reported rock shelter of Northeast India.<sup>xxviii</sup> Another layer contains points, blades, burins flake blades, small fluted cores and bone tools including blade scrapers and points. Other important Palaeolithic sites of Manipur are Napachick<sup>xxix</sup> and Keithelmanbe<sup>xxx</sup>. In the first site, O.K. Singh<sup>xxxi</sup> found edge ground



knife of Hoabinhian character along with Neolithic celt and potteries and in the second site a number of tools of Hoabinhian period had been discovered.

The exploration at SajikTampak brought to light the evidence of Paleolithic period which have yielded scrapers, knives, flake blades and cores of sand stone and quartzite sand stone.<sup>xxxii</sup> Thus, Manipur became one of the prominent centres of early settlers right from late Pleistocene period or even earlier. From the basis of occurrence of stone tools along with animal bones in order to meet their subsistence with hunting of different wild animals as the remains of herbivores bones at Khangkui caves indicates. The tools and other associated findings indicate their close association with East Asiatic and South East Asiatic traditions.<sup>xxxiii</sup>

### **Neolithic Settlements and Beginning of Agriculture:**

The climatic and topographical condition of the region provided the foragers the setting to make important advances in their control of the environment and further, in domestication plants and animals. Historically there occurred a transition in the region which was already under the occupation of the nomadic hunters and food gatherers, and appeared a pattern of overall changes in tool making technology and settlement pattern. The nature and pattern of Neolithic settlements finally initiated the process of social formation in this part of Northeast India.

The mid part of the nineteenth century was very important for understanding the nature and pattern of early settlements in this part of eastern India. Prof. M.C. Goswami and T.C. Sharma excavated the site at Daojaliyhading in 1963 which located on a ridge of a hill in North-Cachar Hills of Assam (presently known as Dima-Hasao).<sup>xxxiv</sup> The excavation yielded a large quantity of potteries in broken and semi broken condition, which has been studied in detail by Prof. T.C. Sharma,<sup>xxxv</sup> H.C. Sharma<sup>xxxvi</sup> and Dilip Kumar Medhi<sup>xxxvii</sup>. These types of pottery are of grey colour. These study shows that most of the potteries contain cord-marked design. These are made of unevenly mixed impure clay, which is heavily tempered. All of this is handmade. The final shape of the pot is given by beating the walls of the vessels with the help of a beater, which is wrapped with either a cord or string. Instead of cord-marked pottery the excavator also discovered-dull red stamped ware, plain red wares etc.<sup>xxxviii</sup> The potteries with cord impression along with adzes and shoulder celts are very dominant tradition during late Neolithic period in China and South-East Asia. Therefore archaeologists are almost agree with the fact that the cultural group who migrated to this zone in Pre-historic times might have brought with them this technology and tradition of pottery making.<sup>xxxix</sup> Allchin states that this tradition comes from South-East Asia.<sup>xl</sup>

Further, the excavation at Daojaliyhading of North Cachar Hills of Assam also revealed edge tools, grinding stones, quern, mullers, flakes, chips and hammer stone, pieces of fossil wood along with different varieties of pottery. The edge tools were made on shale and others on grained sandstones. Excavation also reveals that fossil wood were used in limited quantity for making edge tools. Typologically tools at Daojaliyhading may be classified into flake tools, edge tools and fully grounded tools. The edge tools were shaped initially by chipping and then finished by grinding either fully or partially. These types of stone tools could be classified into triangular celt with flat and thin body, quadrangular celt flat sides and faces, and shoulder celt. Shoulder celt showing two varieties, i.e., curvilinear variety and rectilinear variety. All these



stone implements are made of local stones available in plenty in the North-Cachar Hills of Assam.<sup>xli</sup> Most important aspect of the Neolithic culture of Daojalihading is that the people who dwelt there were mainly food producers as the presence of stone rubbers, mullers and mealing stones strongly indicates the food producing character of the settlement.<sup>xlii</sup>

Besides Daojalihading of North Cachar Hills of Assam, there are two other Neolithic sites. One of them is Sarutaru. Sarutaru is located in the border of Khasi hills of Meghalaya and Kamrup District in South Guwahati. The site was first exposed by Dr. S.N. Rao,<sup>xliii</sup> and the excavation revealed single cultural horizon. The cultural objects contain ground celts made on slate, potteries and charcoal. Most of the stone tools represent shoulder celt and other round butted axes. Handmade core impressed pottery is also found along with the tool for the first time, full pot was discovered in the excavation. These potteries were gritty and brown, pale brown and grey in colour. The presence of cord mark wares signifies its relation with the pottery tradition of Daojalihading and a strong South-East Asian influence.<sup>xliiv</sup>

Another important Neolithic site which had been excavated during 1970-88 was at Dibru Valley in upper Assam.<sup>xlv</sup> There are three Neolithic sites viz. Kanaigaon, north Kanai Garuchora and Ahutali situated a few kilometres from the east of present Dibrugarh town. The first two sites yielded stone tools of various shapes and sizes and Neolithic potsherds and ashes, and the third site Ahutali contributed Neolithic stone tools, Neolithic cord marked potsherd, ash and a Palaeolithic chopping tool. In first two sites the excavators found the Neolithic tools, chipped and ground axes, polished axe, and polished and thin butt axe, round butt axe, straight butt axe, tenon type celt and shoulder celts. The study reveals that the stone tools of Kanaigaon north site is important as they are discovered along with cord-impressed potsherd, which is one of the important characteristics of South-East Asia's Neolithic tradition. The tools of Ahutali exhibits chipped, ground and narrower butted axes and adzes. Generally, the stone tools were made of basalt, granite, shale, sedimentary rocks and quartzes. The Chabua neoliths are an important find. It has got a neck for hafting purpose. It can roughly be compared to a modern iron axe. Hence, the tools of Dibru valley have some connection with tools found at Sadiya, Garo hills and tools of Daojalihading.<sup>xlvi</sup> Thus, it appears that in prehistoric period some group of men settled in the Dibru valley by attracting its fertile soil, fishing and hunting facility and available water resources. They were basically food producers, as because the presence of variety of stone tools and cord marked pottery is one of the strong point for the food production. Though none the tool and potteries are dated till now but it may suggest that they belong to both early and late Neolithic period.<sup>xlvii</sup>

Besides these sites, evidences of Neolithic tools is found in Nilachal hill area, Kalihipara, Pamohi, Basita and adjacent areas of present Guwahati city. Due to dearth of proper study and analysis, it is not possible to proceed further in the explanation of the findings. The recent excavation of the Neolithic celt at Koliabar in Amsoi has been studied by Sukanya Sharma of Indian Institute of Technology, Guwahati and others at Western part of KarbiAnglong, along with megalithic burials.<sup>xlviii</sup> Garo hill, which is adjacent to present state of Assam, also exposed a number of Neolithic sites. In 1968, the excavation at Garo hills by a team of Gauhati University resulted in the exposure of



number of Neolithic site at Sebalgiri, Rongram Alagiri and Chitra Abri in stratified context occurred at the terraces of Rongram River.<sup>xix</sup> The Sites yielded large quantity of microliths along with fluted cores in association with a gritty pottery wares, crude handmade potteries and chipped ground stone axes. The tools and other artefacts, which have exposed in the site, can be compared with that of Southern India.<sup>1</sup> Another site at Rongram composed of reddish silt on the top and a gravel bed below; which yielded polished and ground celts on the top layer, below of there was found large and heavy axes made on pebble stone. The site at Chitra Abri yielded a large quantity shoulder celts, which is typical East Asiatic Neolithic tradition.<sup>li</sup>

Another site of ancient settlement during Neolithic period was at Barapani. The site was first exposed in 1995 by a research team of North-Eastern Hill University. From the excavation and surface collection axes, adze Celts, points, scrapers, knife, hand axe, cores, pointed axes, shoulder celts etc. were found. The collection of big size crude points on quartz shows the use of this type of rock as raw material which is probably first time in this part of Eastern India. These crude shoulder celts is the evidence of the presence of Southeast Asian tradition.<sup>lii</sup> Presence of oval shape hand axe in Neolithic context is an indication of Palaeolithic continuation in Neolithic site. Another associated site at Barapani is SohpetBneng hill of Meghalaya, and the stone tools which are exposed by excavation from this site are axe with broad cutting edge, chisel tool, round butt axe, splayed axe, bar celt, shoulder tools, some flakes, points etc. Some handmade ceramic potsherd with cord impression is discovered from this site, which is the typical characteristic of South East Asia. The tools are of highly specialized functions, which are exposed from the site at Barapani. Apart from household and agricultural functions, these were also used for carpentry and other works which indicates the nature and pattern of the ancient settlement at Barapani.<sup>liii</sup>

Important Neolithic settlement is found in Arunachal Pradesh from where discovered a few stone celts, which are presently preserved in the Pitt's River Museum of Oxford University. T.C. Sharma<sup>liv</sup> made a scientific analysis of the material preserved there. In 1972, Prof. M.C. Goswami<sup>lv</sup> conducted excavation in the Kameng district of Arunachal Pradesh and collected eighteen Neolithic celts. In addition to celts, triangular, trapezoidal and splayed axes were discovered. However, no pottery was found in the site.

Several other Stone Age sites have been discovered in many parts of Haora and Khowai river valley of Tripura.<sup>lvi</sup> The sites were Bairagibari, Sonaram, Sonaibazer and Agartala in Haora valley and Teliamura in Khowai valley.<sup>lvii</sup> All the tools which were found in stratified context are made of silicified fossil wood which is locally available. The tools can be grouped into Pre-Neolithic assemblage and Neolithic tools. But no potteries were found. From typological analysis these tools can be grouped with tools found in neighbouring Bangladesh.<sup>lviii</sup> Typologically these stone tools can be compared with stone tools of Lalmai hills of Bangladesh and some tools of Daojalihading and Garo hills of present Meghalaya. On the basis of the typological analysis it can conjecture that the people of the settlement maintain contact with the people of Lalmai hills at Comilla and North Cachar hills of Assam. It should be mentioned here that similar pre-historic finds were reported from Howrah and Khowai valley of Tripura. The technological and typological similarities and distribution of fossil wood



throughout the eastern and south eastern part of Bangladesh, Tripura and Irrawaddy valley of present Myanmar strongly suggest an overall regional character.<sup>lix</sup>

Another early settlement of Neolithic age was found in Manipur implies that it played a critical role in the development of human culture from prehistoric time. Altogether forty-three Neolithic shoulder celts were discovered from Thoubal, Tangshan and Ukhhrul areas, which were found by villagers in their *jhum* fields. The collection includes edge ground, fully ground tools made on shale, schist, basalt, diorite and quartz.<sup>lx</sup> Typologically they could be classified into quadrangular axes, triangular axes and adzes, shoulder celts of quasi-tangled type and chisels. In the basin of Thoubal River, archaeologist have discovered the existence of Neolithic Settlement along with Hoabinhian cultural complex.<sup>lxi</sup>

In 1983, another important early settlement of Neolithic age was discovered at Napachik, and the layers of the excavation reveal cultural materials of Neolithic and Hoabinhian cultural traits.<sup>lxii</sup> The excavation exposed edge ground knife, grinding stone, choppers scrapers, flakes, ground and polished celts and potsherds including handmade tripod vessels.<sup>lxiii</sup> O.K. Singh<sup>56</sup> discovered potsherds from the Phunan hill in the central part of Manipur states that it has affinity with those with East Asia and South East Asia. These potsherds consist of plain and red wares, ware with circular spot and applique wares. Potteries discovered in the site were generally coarse in texture. From the indications, it is clear that they practiced agriculture in rudimentary form as evidence from presence of shoulder celts and cord marked potteries.<sup>lxiv</sup>

The observation on the process of displacement of hunting and gathering groups by the emerging agricultural populations of different races in the region will indicate the nature of early settlement and early form of social formation. N.N. Roy who studied extensively the tribes of Northeast India believes that amongst all, the Austro-Asiatic were the earliest inhabitants of the region.<sup>lxv</sup> G.V. Driem tried to put forward the idea of migration of Tibbeto-Burma language family in Szechwan Yunan, which is divided into western and eastern.<sup>lxvi</sup> The western branch migrated to the fluvial plains of lower Brahmaputra Valley and surrounding hill tract. Driem found some stone implements in the centre of the origin of language which he terms Eastern Indian Neolithic tools.<sup>lxvii</sup> Thus, the Neolithic stone tools in the shape of shoulder celts and other implements and potteries on cord impression indicates that these were due to the migration of western branch of Tibbeto-Burmese family.<sup>lxviii</sup>

In terms of rice cultivation, the influence of East Asia or South-East Asia ultimately lead to the fact that the rice cultivation of Northeast India has more of a connection with East Asian Neolithic culture than the South-East Asian culture.<sup>lxix</sup> The Eastern Indian Neolithic edges and tangled axes were identical with Upper Burma, Yunan and Szechwan. It is likely that the Tibeto-Burman language group who come from South of Szechwan introduced the technologies of Eastern Indian Neolithic to the Austro-Asiatic people of the region and linguistically and archeologically they may be grouped as first systematic farming community of Assam.<sup>lxx</sup> The archaeological and ethnographical analogy of the cultivation system of the Austro-Asiatic people of the region implies that they were mainly shifting cultivators. The lowland wet rice cultivation was less common among them. However, the Tibbeto-Burmese know the both system of agriculture. It is quite reasonable that this group probably introduced the



low land wet rice cultivation much before the advent of the Ahom to this region.<sup>lxxi</sup> The shifting cultivation in North East India closely related to the Neolithic agricultural system due to the adaptation strategy of Neolithic people of this area.<sup>lxxii</sup> In order to avoid possible flood, the early settlers probably choose this mode of subsistence.<sup>lxxiii</sup> S.K. Roy<sup>lxxiv</sup> who made a detail study of Neolithic artefacts and shifting cultivation of the region believes that the tool resemblance the present-day shifting cultivation. He also thinks that this kind of cultivation was insufficient for the early settlers, probable that they accepted local flora and fauna for their own consumption.<sup>lxxv</sup>

As stated earlier, the stone tools related to the survival activities, found in Daojalihadng and other areas are very important. At Daojalihadng, archaeologist discovered twenty-two grinding stones, four querns and six mullers with shoulders celts which strongly indicate the food processing technique of the early settlers of Assam. The excavation did not reveal any form of organic material of the plant but in consideration with other evidences exposing on archaeology and linguistic analysis, it elucidated that the early settler in this region produced food and other cereals supplemented by wild plants, fruits and roots.<sup>lxxvi</sup> On the basis of concurrent evidences such as archaeological evidences of tools and potteries, migration and linguistic patterns, it can be assumed that the early settlers in the region also practiced both high and low land cultivation, though the technique was very primitive in nature. In the historical period, with the migration of a new wave of Sanskritised group of people to this region and formation of the early state in Brahmaputra valley under political dominion of Pragjyotisha-Kamarupa, probably the earlier settlers could not survive in front of their advance knowledge of plough, seasonal and mode of cultivation. Therefore, the aboriginals went to the back, survived themselves in its hilly tracts, and some of them still practiced Neolithic tradition as the mode of subsistence. At the same time, in the culture of Assam, we find the different primitive elements which contributed the earliest phase of social formation and assimilation in the region.<sup>lxxvii</sup>

#### **Conclusion:**

The long sequence of pre-historic cultures of our country beginning with the Palaeolithic hunting-gathering nomadic societies, Mesolithic food-gatherers, Neolithic food producers, Chalcolithic copper and bronze tool using peasant societies, Bronze age civilization builders and Early Iron age Indians and Megalithic builders, bring forth a full picture of what happened in India during pre-historic times.<sup>lxxviii</sup> From the above discussion about the tools and settlement pattern of pre-historic Assam, it can be seen that during the pre-historic period antecedents choose this land because of the availability of water flows from the hill stream and suitable ecological condition. It appears that they practiced agriculture in rudimentary form as evident by the presence of shoulder Celts and ceramic wares. Unfortunately, the pre-historic Northeast Indian scene is far from complete. Very little work in this field of investigation has so far been done in this part of India. Large areas of this region are yet to be trodden by archaeologists. The proper excavation and scientific analysis can only reveal the concealed truth and developmental sequences of the period of pre-historic Assam.



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## STRUCTURE AND FUNCTIONS OF GOVERNMENT IN ANCIENT INDIA

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The Constitution or supreme law of a state establishes the main organs of the state – the legislature, the executive and the judiciary, defines their powers, demarcates their responsibilities and regulates their relationships with each other and with the people.<sup>1</sup> These organs of government perform their functions in their specified areas with coordination of each other. Normally, in a state, the judicial wing plays an important role. The legislative body controls executive, executive enforces law and politics and judiciary safeguards rights and the Constitution. These bodies are also the outcome of the constitutional history or development of the State. In order to understand India's constitutional setup in existence and operation, it is necessary to know about its background and history.

In Ancient Indian Political System, the politics was regarded as part and parcel of the cosmic law or Dharma. The King was bound by Dharma or rule of law, which was basically a code of duties. Politics was not independent or autonomous because it was subservient and subordinate to ethical ends. Tribal republicanism, monarchy or kingship and local democracy were some of the types of political organization that have been happened in the past. The notable advance in the functions and composition of the monarchic states was illustrated in such organs as the structure of the central government, economic organization, justice and law, military organization, inter-state relations etc. During that time, princes and potentates, sultans and generals, shop keepers and farmers have played their roles.<sup>2</sup>

During present times, the State performs two types of functions mainly, constituent and ministrant. Under the constituent category fall those functions of the State which are necessary for the welfare of society, viz., security from foreign aggression, protection of masses and property, maintenance of peace and order and adjudication. Under the latter category fall those activities of the State which it performs to promote the welfare of the masses, to increase their wealth by a collective effort, and to add to their amenities of life. Education, postal services, trades, roads and communications, development of mines and forest, welfare of the poor and invalid etc. would come under the ministrant functions of the State. The modern tendency of the State is to increase its ministrant functions. The available source shows that for a long time the State in ancient India limited itself only to the constituent functions. The earlier state protected masses from foreign aggression. It also maintained internal order by enforcing respect for the traditional law. The evidence of Mahabharata and the Arthashastra describes that the area of the State activity was very extensively extended between the Vedic and Mauryan age. The activities of the State, as expressed by the Mahabharata and the Arthashastra, relates to all the spheres of human life, - social, economic, political and religious.<sup>3</sup>

The Rigveda, oldest among the four vedas,<sup>4</sup> describes the structure of the society, social and political institutions existing in Vedic age. In this period, justice, religion and law were closely interconnected and there was no clear cut demarcation in



the above fields. Ancient India was divided into many independent states and in each state the King was the supreme authority. The King or monarch, with the help of his chief priest (purahita) and military commander (senani), carried on the administration of his kingdom or land. Each state was further divided into provinces and those into divisions and districts which differed in terminology or nomenclature as well as in area. For every province or district separate governors, according to their status, were appointed with various designations. Mostly they were related to the King. District officials were empowered with the judicial and administrative functions.<sup>5</sup>

Generally, the King in ancient India was the sovereign head of the legislative, executive and judicial branches. The members of the council of ministers could give suggestions to the King but final decisions were taken by the King. The average strength of the council of ministers was 7 to 8. The average area or territory of the State of the Rigvedic period was only a few square miles like the city-state of ancient Greece. It had a capital, smaller than the few dozen villages comprised in it. Villages had their own popular legislative assemblies known as Sabhas and the capital had the central legislative Assembly for the whole state, which was called Samiti. Sabha and Samiti enjoyed a central position in the Vedic age. They are in one place described as the twin daughters of Prajapati, the creator.<sup>6</sup> These both institutions of Sabha and Samiti mentioned in Rigveda, may be said to have contained rudiments of a contemporary parliament. These institutions were differentiated from each other in their role, status and functions. The Samiti was the general assembly or house of the people and the Sabha, a smaller and selected body of elders, broadly corresponding to the Upper House in modern legislative bodies.<sup>7</sup> Some of the salient features of the functioning of modern parliamentary democratic system like discussion and the decision by vote of the majority are known to have existed. The decision by the majority was regarded as "inviolable, not to be overridden, because where the many meets in an assembly and speak there with one voice, that voice or vote of the majority is not to be violated by others."<sup>8</sup>

Members of these institutions exercised considerable influence over the administration. Their status or position must have been high in society; they must have gone to the meetings in their full grandeur riding their horses or carriages. It is observed that the Samiti or the popular assembly of the Vedic age functioned as a constitutional check upon the King, there is evidence which shows that the King could hardly maintain his position if this assembly was not in agreement with him. Rule making or Legislation in the modern sense of the term was not the main function of those institutions of Sabha and Samiti in that period, laws, if secular, were sanctioned by custom and if religious, by the sacred texts. Neither the King nor the Sabha, Samiti or the central assembly, it was felt, had any jurisdiction in the matter of legislation. The King was the supreme judicial body in ancient India from the post-vedic period, but in practice many powers were delegated to the local popular courts and panchayats.<sup>9</sup>

The entire judicial administration functioned under the supervision of the King and the courts derived their powers and authority from him. The king was known as the dispenser of justice, in case, justice was denied to a person by the king's tribunals. In the King's court, the King was guided by learned Brahmins, the Chief Justice and other judges, ministers, elders and representatives of the trading community. Next to the King was the court of the Chief Justice (Pradvivaka). Besides the Chief Justice, the court



consisted of a number of other judges to assist him. All judges were from the three upper castes preferably Brahmins.<sup>10</sup>

In villages, the local village councils or Kulani, similar to modern panchayats or local bodies, consisted of a board of five or more members to deliver justice to villagers. It was empowered with all matters relating to endowments, irrigation, cultivable land, the punishment of crime, etc. At higher level in towns and districts, the courts were presided over by the government officials under the authority of the King to deliver justice. Main link between the village assembly and the official administration was the headman of the village. In every village, a local headman was holding hereditary office and was required to maintain law and order and administer justice. Headman was also a member of the village council. He acted both as the leader of the village and the mediator with the government.<sup>11</sup> Family courts were also established due to the prevailing institution of the joint family system. Another type of Puga assemblies made up of groups of families in the same village decided civil dispute amongst family members.

With the passage of time institutions of the Sabha and Samiti disappeared in the post-vedic period not because democracy became more and more unsuitable to the Indian atmosphere, but because the state turned bigger and bigger in size, rendering the meetings of a central assembly more and more impracticable. Members would have spent several days and weeks in reaching the capital in order to attend the assembly meetings and an equally long time in returning to their homes. The principle of representation was also unknown in those days both in the East and in the West.<sup>12</sup>

According to Manu and Yajnavalkya later in times, the King due to his inability to attend personally to the judicial functions except in special conditions used to dispute the learned Brahmins to take his place and do the justice but in all conditions justice was done in his name even in such cases. The judicial organization and legal procedures of the Mauryan period were based on the concept of law of Kautilya's Arthashastra's. The Arthashastra is a detailed code and makes legal provisions to protect the life and property of the masses and to protect them against encroachment, defamation, assault and attempts on their lives and property, as well as assaults on the liberty of a person and atrocities on the part of government officers.

As described in the Arthashastra of Kautilya there were two types of judicial courts during the Mauryan period: (i) the Dharmasthiya or the civil courts, and (ii) the Kantakasodhana or criminal courts. Apart from the two dominant courts, a large number of popular courts were also there, and the Arthashastra speaks of many cases which fell under the jurisdiction of the unofficial courts. Kautilya described courts in different territorial divisions and sub divisions of the kingdom such as sangrahana (10 villages); dronamukha (400 villages) and sthaniya (800 villages), but does not indicate whether there was any gradation of judges or courts, or judges of the same rank presided over all the courts in longer or smaller administrative units.<sup>13</sup>

The law formulated for almost all types of crimes to be punished. Yajnavalkya speaks of four classes of punishments inflicted upon the criminals e.g. Censure, Rebuke, Pecuniary, Corporal punishments including banishment, branding, cutting of limbs, etc.<sup>14</sup>



The institutions of the Sabha and Samiti of the Vedic period did not disappear without leaving their successors in the body politic of the later period. They were popularly known as Paura-Janapadas and figure frequently in literature and sometimes in inscriptions. The Janapada was mainly concerned with matters of constitutional and political importance. In every constitutional matter, the Paura always appeared with Janapada. The Paura had thus a double role or character, as a local self-administration of the capital and a constitutional assembly. The latter function they some times discharged, as one shall see, by themselves, especially in provincial capitals.<sup>15</sup>

During the post Vedic period the states of fairly big size came into picture and the power of the King was on the increase. Now, the Monarch or King controlled both the treasury and the military forces, though there were commander-in-chief and treasures under him. All ministers were selected by the Monarch and held office till his pleasure. The King presided over the cabinet or council of ministers and its decisions had to receive royal assent. Taxation was to a great extent fixed by the customary law, but the King could increase or decrease its incidence. In theory, the king had no legislative power, but he could supplement the provisions of the customary law by his own inputs, obedience to which was mandatory. Ordinances of kings like Ashoka and Kuamrapala are well known. The Dharmasatra sources or literature is particularly emphatic in pointing out that it is the duty of the King's to enforce the dharma, as determined by the sacred texts and accepted customs, and not to enunciate it on the authority of himself or any state organization. Dharmasatra and Nitisastras, are promulgated by the creator (God), it is the king's duty to enforce the rules laid down in them, and not to initiate or introduce any changes on his own authority.

According to Manusmriti the king has the power to pass administrative orders which were to be obeyed by the masses. Sukra Niti describes that the king should publish his laws and ordinances at important places by pasting them on the wall for the information of the citizens. At the time when these powers were granted, Samitis or popular assemblies like Sabha had already disappeared from the scene, and so they came to be exercised by the King in consultation with his ministers. This resulted in the considerable enlargement of the royal powers and the curtailment of the liberties of the people since they were not effectively represented at the central government by a popular assembly, when kings came to be invested with those new semi-legislative powers.<sup>16</sup>

The fore-going survey of ancient Indian political thought and institutions amply demonstrates that India had achieved great heights in the field of theoretical and practical politics. There were many small republican states in ancient India. The King was the ultimate head of the legislative, executive and judicial branches. He was accompanied in administration by a number of officials. There were two popular bodies in the Rigvedic period, Sabha and Samiti, which exercised considerable control over the king. After that in post Vedic period, the powers of the King was on increase and now he became the sovereign authority in executive, legislative and judicial spheres. There was no clear cut separation of powers between legislative and judicial branches of the State. They functioned with mutual cooperation with each other under the authority of Monarch or King. Slowly the democratic institutions like Sabha and Samiti later disappeared, gram sanghas, gram sabhas or panchayats survived and continued to



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function and flourish right under the rule of many Hindu and Muslim dynasties and till the advent of the British rule in India.

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UNDERSTANDING THE MULTI-DIMENSIONAL SEMIOTIC SYSTEM OF  
SFL THEORY IN THE ANALYSIS OF THE TRANSLATED TELUGU SHORT-  
STORY “CHIVARI PITCHIKA” AS “THE LAST SPARROW”

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**Abstract:**

The thought provoking Telugu short-story, ‘*Chivari Pitchika*’ is written by PapineniSivashankar and it is translated into English as “**The Last Sparrow**” by V. Rama Krishna. It draws the attention of the readers that how the man is a cause for the extinction of tiny birds from the nature. The nature is a marvelous creation and it is a private land of God in which all the creatures have the equal right to live. The writer of the story depicted the same concept that the man’s brutal activity and his selfish motive made the survival of the birds difficult. In the same way, the sparrow and the Bulbul lived happily for some time. But to their fate, the man started to destroy the nests of the birds wherever they have built. He started to raise constructions in the destructed place of the nests and also began to grow crops by using harmful pesticides to reap high produce. The Bulbul lost its life after eating the poisonous worms whereas the sparrow survived and remained as the last one in its race. The sparrow cursed the man as he will also be ruined completely as like it and it flew away to the other world.

**Key words:** Extinction, Acquaintance, Threat, Hungry State, Organic Manure, Other World.

‘*Chivari Pitchika*’ is a Telugu short story written by PapineniSivashankar, a winner of SahityaAkadamiaward and it is translated into English as ‘**The Last Sparrow**’ by V. Rama Krishna. The present story reveals about the extinction of birds from the nature.

The story begins as a sparrow requesting the crow to provide shelter to it because its nest was washed away in the cyclone. The crow turned down the request of the sparrow. It left from there with heavy heart and went into the nature where it became rich with unexpected luck. The crow died with jealousy in the way of getting rich like the sparrow. The sparrow did not realize the importance of the nest until its mother survived. It came to know the significance of it, constructed the same after having acquaintance with Bulbul. After sometime the Bulbul gave birth to young fondlings and led peaceful life. But the happiness of these birds did not last long for the man has destroyed the nests in order to raise constructions.



The sparrow and the Bulbul built nests in the bushes and in the gap of a stone well. The man ruined the nests in which the Bulbul has lost its fondlings. So, the two birds flew away to some other place where there was no threat from the man. Now these birds faced fodder problem as they have to fly to far off places for food. After a tiresome hunt, the sparrow found some worms fallen on the crop lands, the sparrow ate them hastily in a hungry state, and carried few to Bulbul. The Bulbul also ate them quickly and died because the worms have been poisoned with chemicals. The man who ruined the nests of the sparrow and the same man is a cause for the death of the Bulbul, because of using pesticides and other harmful chemicals to yield high produce.

Finally the sparrow was left alone and remained as “The Last Sparrow” in its race. While flying away to the other world, it cursed the man as ‘he will also be ruined completely as like ruining its race’.

**SFL Theory:** Systematic Functional Linguistics (SFL) Theory was propounded by Michael Alexander Kirkwood Halliday in the year 1960 in the United Kingdom and later in Australia. This idea was taken from his teacher, who was also a linguist called J.R. Firth. This theory is an approach to linguistics that largely considers language as a social semiotic system. He described language as a semiotic system not in the mean of signs but a systematic resource for meanings for him language is a ‘potential meaning’ and defines linguistics as the study of ‘how’ people exchange meanings by linguistics.

**Definition:** Systematic Functional Linguistics is defined as a theory of languages centered around the notion of language function, while it accounts for the syntactic structure of language, it places the function of language as a central in preference to more structural approaches, which place the elements of language and their combinations as central, SFL starts at social context and looks at how language acts upon and constrained by the social context.

**Application of Multi-dimensional Semiotic System to the story:**

**Sample.1:** “*Evannipaipaimaatale, nijaanikieejathiprapanchanimosaginchataanikimaatalunerchindhi*”. Here the expression, ‘*Paipaimaatale*’ is translated as ‘**no valid words**’. In general it should be translated as ‘**the words are superficial**’. The sentence of source text poses a problem of linguistic equivalence because the translator faced a problem of language in the context as if he translates it as, ‘**all these are superficial words, really this human race have learnt words to deceive the world**’, the reader of the target text do not receive the sense from it. So the translator has taken the choice to translate the source sentence sensibly.

**Sample.2:** “*Nijamprapanchammunupumaadhiriledhu,vegangabhayamgoluputu maaripotundhi,*” is translated as, ‘**it is real, the world is not like before but it is changing so fast by creating fear**’. Here the source text word ‘*munupumaadhiri*’ is transliterated word from English to Telugu. It should be replaced by its equivalent word, ‘**like last year**’ in the target text. The translator found a bit problem in bringing the linguistic equivalence, but he does by giving the sense of the source text reader to the target text reader.



Therefore the researcher has applied the first dimension i.e. **Paradigmatic dimension** (means ‘choice’ and generally users select from ‘options’ that arise in the environment of other options) to the sample 1 and 2 sentences because these come under the problem of linguistic equivalence. The translator used his wits with a choice by bringing the sense in the target text and achieved to give the same feel to the target text reader as like the reader of the source text. Hence, the translator has observed that it is absolutely appropriate to apply the first dimension for the above sentences.

### Sample.3:

“*Ippudupantachelameedhavandhalachethuluevotellanidraavakaaluchalluntunnayi, purugulumaadipotunnayi*” is translated as **‘now many people are sprinkling some kind of poisonous liquids on the crops, and the worms are scorching’**. Actually the words of the source text ‘*Vandhalachethulu*’, ‘*tellanidraavakaalu*’ and ‘*maadipotunnaayi*’ should be translated as **‘hundreds of hands’** ‘**white liquids**’ and **‘burning’** in the target text. But the source language pushes the target reader into utter confusion if it is translated directly.

Here the translator has observed two problems i.e. linguistic and cultural. So this sentence can be applied the third dimension i.e. **Metafunctional dimension** (means language displays functional complementary, in other words it is that evolves under the human need to make meanings about the world around and inside us and at the same time creating and maintaining interpersonal relations) as the culture of the farmers to sprinkle chemicals on the crops to kill worms and this particular activity can be done by several people. Hence sample 3 sentence attracts third dimension which is apt and meaningful.

### Sample.4:

“*Tiragaatiragaakaintimundhulothainabaavikanapadindhi, adugunekkadoneelunnaayi*” is translated as, **‘after going round for a long time, a deep well appeared in front of a house and the water is somewhere at the bottom’**. The translated source text is a fair translation into the target text as this involved a linguistic sense and culture of the tiny creatures. The translator sensibly conveyed the exact sense concealed in it. Hence this sentence can be applied the fifth dimension i.e. **‘Insantiation’** (means the relation between an instance and the system that lies behind in it). The sentence displays the system of the man. The birds and instance i.e. the situation. Here **‘the sparrow after going round to a far off area, it saw a deep well in front of a house’**. In olden days the people dug wells for drinking water, washing, cleaning etc. Failure of monsoons drove the birds away from one place to the other in search of safer place to construct nest. The translator has observed to apply the fifth dimension of SFL Theory in analyzing the sentence. Therefore it is well suited to the above source text sentence.

**Sample.5:** “*Chinnaripitchika! Chinnaripitchika! Vaanakaaru, chalikaaru, vadakaaru annemaaripotunnayichoosaavaa?*” is translated as **‘Dear sparrow! Have you observed that everything is changing including rainy season, winter season and**



**summer season'** Here the source words, 'vaanakaaru, chalikaaru, vadakaaru and choosava' did not give much difficulty to translate as the source reader will get the sense but in the case of the target text reader, the sense poses typical because the writer has used the dialect connected to a region.

The system of seasons been mentioned and they take place accordingly in the nature. Here the translator understood that this sentence equips with 'a system and instance' and also the linguistic problem. Therefore in analyzing the sentence of the story, he has observed to apply the **Paradigmatic dimension** and **Instantiation dimensions** which are apt and sensible to the context.

#### Sample.6:

"Appudumodhatisaarithattindhichuttaalu, chelikaalluanthaamellamellagaacheekatilo, kalisipothunnaarani," is translated as **thena thought struck to the sparrow for the first time that the relatives, friends and everything is disappearing deliberately**. The source text words like, 'thattindhi' (**occur**), 'cheekatilo' (**in the dark**) and 'kalisipothunnaarani' (**having thought to be going together**). If these extracted source words are translated into target text, the target text reader feels loathsome. The translator has faced a linguistic equivalence problem in the source text.

In analyzing the sentence, the translator has observed that **Paradigmatic dimension** (the first dimension of SFL Theory) can be applied because the translator has used the choice to translate the source text and succeeded in preventing the confusion of the target text reader while reading it.

#### Sample.7:

"Neekemamma! Okkathaavunchakkagaperigedaanivinemenopottakosampadhitaavulaki parigettalsinadaaniandhuketondaraannaanunenu" is translated as, **what is it for you! You grow pleasantly at one place but whereas me, I have to fly off to different places in order to feed my belly, so that it is my worry, I said**. The source word 'neekemamma' has no equivalent linguistic word in the target text. As there is a problem of linguistic equivalence, the translator succeeded to communicate the sense of the source text to the reader of the target text.

In my observation, this particular source text sentence attracts the fourth dimension of Multidimensional semiotic system i.e., **Syntagmatic dimension** which (means language unfolds syntagmatically as structure laid down in time (spoken) or space (written) within the lexico-grammar, for ex: the target is the clause and the morpheme is the smallest, intermediate between the ranks are the groups or word and a phrase) signifies the time and space in particular and word or phrase in general. Therefore the translator has applied the **Syntagmatic dimension** of SFL Theory aptly.

**Conclusion:** The translator successfully analyzed all the sentences that are extracted from the story, '*The Last Sparrow*' by applying Multidimensional semiotic system of MAK Halliday's SFL Theory. The five dimensions such as **Paradigmatic**,



**Stratification, Metafunctional, Syntagmatic** and **Instantiation** have been used and proved that these are suitable to the selected contexts.

I would like to quote a beautiful proverb which is quite applicable to the entire human race that ‘**As you sow, so you reap**’.

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## UNDERSTANDING POTENTIAL OF LEARNERS TO ACQUIRE AUTONOMY

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### **Abstract:**

‘Online Education’ has emerged as one of the new buzzwords surrounding us everywhere during the lockdown period due to COVID-19. With the surge in number of online courses, webinars and other forms of learning, it is clearly evident that learning has not stopped despite the various challenges. However, learning online in a remote environment demands a lot more than just technology. In order to channelize technology in the right way to accomplish one’s learning goals, learners must be independent and skilled. This study makes an attempt to understand the experience of higher education students while learning independently during the lockdown period. It tries to capture their response and attitude towards autonomous learning and their willingness to accept it. It recommends various measures to promote learner autonomy and strategies that can be adopted by stakeholders of higher education system to create autonomous learners.

**Keywords:** Learner Autonomy, Independent learning, Higher Education

### **Introduction:**

Learner autonomy states the ability of a learner to accomplish his learning goals independently. It does not mean that the teacher is nowhere involved in the learner’s process of learning. But it tremendously shifts the role of a teacher from spoon feeding students to just directing them to manage their learning efficiently. The teacher is more like a facilitator that helps a learner to understand and achieve his learning goals.

The purpose of Higher Education system is to make students competent enough to earn their living. Students are expected to develop high order thinking skills like problem solving and critical thinking to survive in the dynamic business environment. Learner autonomy thus becomes very crucial for students of Higher Education System. Also the jobs nowadays demand continuous learning and self-development. Learner Autonomy can help one, not only evolve as a learner but also to identify the right skills for upgrading themselves.

It is not unknown that most of the Educational Institutes in India are creating rote learners. This imposes several challenges for learners to incorporate Lifelong Learning. In this struggle to compete every day, somewhere we overlook the most important facet of learning to learn. Learning is the paramount skill we need to equip ourselves with, before learning anything else.

### **Review of Literature:**

Zulaihah et al. (2016) in their study recognize the need for autonomous learning in this era of technology. It also states that learner autonomy instills the motivation to learn in students. Autonomous learning is responsible to improve students' self-competence



according to the findings of this study. Identifying, Conceptualizing and Key of doing are the three stages that any autonomous learner needs to be capable of in order to achieve their learning goals. However the study leaves scope to further determine whether learners are willing to adopt complete autonomy without any educator and the role of an educator in facilitating autonomous learning.

Busaidi & Maamari (2016) in their qualitative study capture the perspectives of teachers towards learner autonomy bases on their experiences. The study advocates that for learner autonomy there is a need for teachers to be autonomous first. Hence it concludes by recommending that teacher education programs should focus on training the non-autonomous teachers to be autonomous. The study therefore effectively points out the role of an educator in learner autonomy.

Khawlani & Ammar. (2018) conducted a comparison amongst learners from two distinct universities and learning backgrounds. It attempts to investigate the impact of learning environments on degree of autonomy. The findings of the study indicate lack of motivation amongst students as a barrier for autonomous learning. It also points out the difficulty they face towards adopting autonomous learning due to the traditional methodology followed in teaching. It also found that goal oriented students are better than other students in autonomous learning. It concluded by stating the significance of learner autonomy in helping learners achieve their learning goals.

Smith R. et. al (2018) in their study reports the various aspects of learner autonomy in developing countries. Through various analogies it advocates the adoption of ICT to impart learning in developing countries especially in remote rural contexts. It recognizes the need for extensive research in the field of learner autonomy in order to develop the concept. Research by or with teachers and learners themselves, is one of the key areas of future research amongst the various areas highlighted in this study.

Padmanabha (2019) in her study comprehensively define the concept of learner autonomy and also highlight the various strategies to implement it. The study highlights that all the learners have the power and right to learn independently. It therefore points out the need for our education system to make our learners capable of accomplishing their learning goals. The researcher also indicates that total autonomy is not desirable under any situation. It further states the need for teachers to be independent first, in order to provide autonomy to learners.

### **Objectives of the Study:**

1. To understand the significance of learner autonomy in imparting education during times of Covid 19 and after.
2. To identify whether learners are capable of managing autonomous learning.
3. To determine if learners are willing to accept autonomous learning.

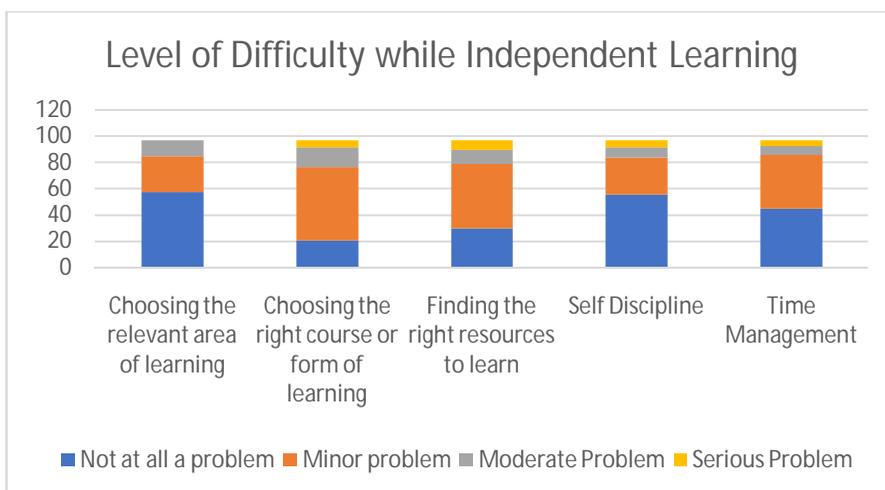
**Research Methodology:**

This research gathers data from both primary and secondary sources. Primary data was collected using questionnaires as a tool to conduct surveys. For secondary data, the study utilized various sources like journals and websites. Sample size of 100 students belonging to the age group of 16 years to 22 years from Mumbai City was taken for this research. Respondents were determined through convenience sampling methods. The collected data was analyzed through percentage methods and graphs.

**Data analysis and Interpretation:**

**Demographic Profile of Respondents:**

Gender	16-18 years	19-22 years	Total
Male	35	20	55
Female	19	23	42



**Figure 1**

The above table indicates the challenges faced by respondents while learning independently. Most of the respondents can manage to choose the area of learning themselves. Self-discipline and Time management are also not that serious concerns for most of them. It can be clearly inferred that choosing the right form and resources of learning are the areas where respondents need assistance. This reveals that the educators should assess the learning goals of each student and assist them in connecting with the right resources to accomplish those goals.

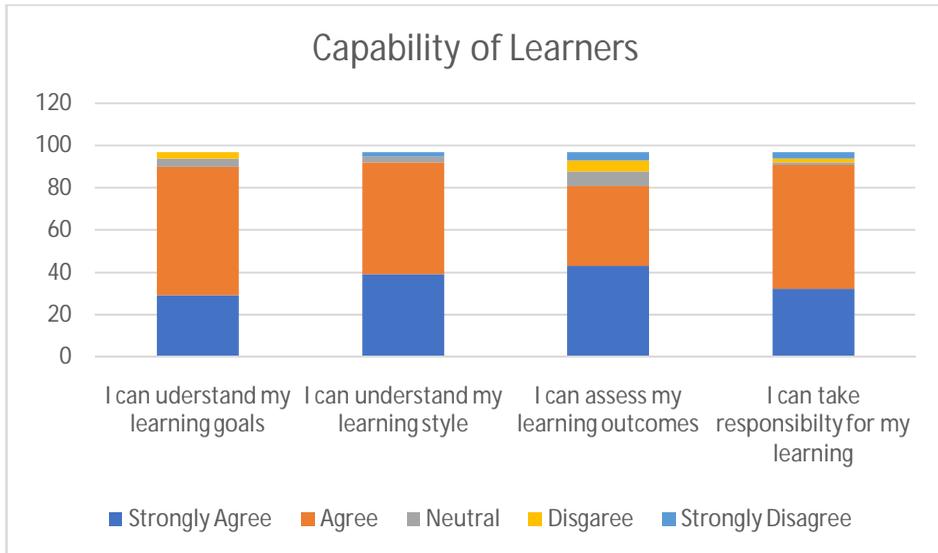


Figure 2

The above table exhibits the capability of learners to learn independently. Despite the fact that our education system lacks in making students autonomous to manage their own learning, the findings indicate that most of the respondents could take charge of their learning. Assessing learning outcomes is the area where most of the respondents were not confident. Right from the childhood educators, schools, tutors and parents are held responsible for a child's learning outcomes. It is high time each student should be trained to evaluate his own learning outcome at every stage of learning.

### Conclusion:

In this era of technology we are surrounded by knowledge everywhere. Times have changed when educators had to focus on giving notes and study material in their class. There is a strong need to shift the role of an educator from imparting knowledge to directing students in achieving their learning goals. They need to connect them with the right resources to achieve their learning outcomes. Since the negative side of technology cannot be ignored, students need to be made capable of filtering the right information from the wrong one.

Learning is somehow the most neglected aspect in the education sector today. Examination, Grades, Excellence are the only ways of assessing a learners outcome in the formal education system. Students have to be rigorously trained about assessing their learning outcomes rightly.



Findings of the study revealed that most of the students embrace independent form of learning with some guidance and direction. Now providing the right direction is the onus of education system and educators. Learner autonomy is the first step that can be taken in this direction where students need to think independently about their learning goals and accomplish them. Educators should emphasize on developing thinkers who can then turn into great leaders.

#### **Limitations and Future Directions:**

This study is confined only to Undergraduate learners of Higher Education System. Future research can focus on learners belonging to different age groups. Further, the concept of Learner Autonomy has been extensively studied only in the context of Language Learning. There are very few studies on Learner Autonomy that realize its significance in other fields. Hence this leaves a lot of scope for the future researchers to explore different ways in which learners can be made autonomous.

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## PRADHAN MANTRI GRAM SADAK YOJANA (PMGSY)

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Pradhan Mantri Gram Sadak Yojana (PMGSY) is a nation wide plan in India to provide good all weather road connectivity to unconnected villages. PMGSY Phase-I was launched in December 25, 2000 by the then Prime Minister Atal Bihari Vajpayee. It was initially a centrally sponsored scheme. Initially the objective of PMGSY was to provide single all weather road connectivity to eligible unconnected habitation of designated population size. Under this scheme 1,35,436 habitations were targeted for providing road connectivity and 3.68 lakh km for upgradation of existing roads including 40% renewal of roads funded by state governments. PMGSY Phase-II was approved in May, 2013. Under this Phase-II the roads already built was to be upgraded. The funding for plain areas is 75:25 by center and states respectively and 90:10 by center and states for hill states, desert areas, Schedule V areas and naxal affected districts. For LWE affected areas government launched road connectivity in 2016 and the fund sharing is 60:40 between center and states except North –East and three Himalayan states (J&K, Himachal Pradesh and Uttarakhand). PMGSY Phase –III was approved in July,2019. This involves the consolidation of through routes and major rural links connecting habitations to Gramin Agricultural Markets, Hospitals and Higher Secondary Schools.

Under PMGSY, all unconnected habitations under 2001 censuses are

- More than 500 population in plain areas,
- More than 250 population in North-East, hill, tribal and desert areas,
- For Left Wing Extremism (LWE) affected areas additional relaxation has been given To connect habitations with population of 100 persons and above.

### PRINCIPLES OF PMGSY

The principles of PMGSY to be implemented in villages are

- \* A habitation which already have all weather road connectivity is not eligible eventhough the present condition of the road is bad.
- \* The population of all the habitations within a radius of 500 meters and 1.5 kms in case of hill areas may be clubbed together for the purpose of determining the size of a population.
- \* PMGSY provides only single road connectivity.
- \* The unconnected habitations are connected to the near by habitations already connected to a all weather road.
- \* Coverting the dry season road to all weather road is treated as upgradation and Upgradations if permitted involves building existing road to desired specifications.

The below Table-I shows the funds releases under PMGSY State Wise data from 2014-15 to 2018-19

**REPORT OF FUNDS RELEASED UNDER PMGSY STATE WISE FROM 2014-15 TO 2018-19 (CRORES)**

**TABLE-I**

S.NO	NAME OF STATE	YEAR WISE FUND RELEASED UNDER PMGSY					INCREASE / DECREASE OF FUNDS FROM 2014-15 TO 2018-19
		2014-15	2015-16	2016-17	2017-18	2018-19	
1	Andhra Pradesh	32.26	371.66	197.59	40.00	97.75	65.49
2	Arunachal Pradesh	342.25	373.24	205.92	694.17	440.63	98.38
3	Assam	313.83	344.61	393.72	572.55	440.63	126.8
4	Bihar	1499.00	2781.00	2866.96	1336.34	0.00	-1499.00
5	Chhattisgarh	270.75	494.33	435.65	338.96	244.63	-26.12
6	Goa	0.00	0.00	0.00	0.00	0.00	0.00
7	Gujarat	418.77	474.10	31.04	0.00	0.00	-418.77
8	Haryana	218.96	304.70	23.76	0.00	0.00	-218.96
9	Himachal Pradesh	99.40	268.40	310.00	356.95	293.63	194.23
10	Jammu & Kashmir	414.00	488.00	747.77	1400.00	0.00	-414.00
11	Jharkhand	247.00	865.00	805.57	1086.07	0.00	-247.00
12	Karnataka	235.22	139.3	255.50	0.00	0.00	-235.22
13	Kerala	150.00	147.33	175.95	168.13	0.00	-150.00
14	Madhya Pradesh	708.00	1110.41	1748.07	1075.08	250.00	-458.00
15	Maharashtra	207.67	553.30	606.00	270.59	0.00	-207.67
16	Manipur	100.00	298.13	393.21	215.72	293.63	193.63
17	Meghalaya	62.56	150.57	205.28	44.81	97.75	35.19
18	Mizoram	54.74	50.90	92.86	195.50	0.00	-54.74
19	Nagaland	58.65	4.00	8.05	8.80	73.31	14.66
20	Odisha	1051.50	1367.54	1745.67	2027.07	1224.63	173.13
21	Punjab	310.21	221.10	255.00	318.73	0.00	-310.21
22	Rajasthan	425.66	550.45	558.83	883.21	0.00	-425.66
23	Sikkim	93.84	68.53	123.11	331.67	195.63	101.79
24	Tamil Nadu	236.89	205.00	254.00	589.25	293.63	56.74
25	Telangana	0.88	271.38	143.69	99.22	0.00	-0.88
26	Tripura	185.73	274.83	392.27	135.28	0.00	-185.73
27	Uttar Pradesh	630.16	1105.62	977.29	866.81	0.00	-630.16
28	Uttarakhand	313.13	402.73	524.06	686.31	489.63	176.5
29	West Bengal	1184.07	1427.58	814.07	990.39	240.50	-943.57
<b>TOTAL</b>		<b>9865.12</b>	<b>15114.02</b>	<b>15290.86</b>	<b>14731.69</b>	<b>4675.94</b>	<b>-5189.18</b>

SOURCE:<https://nrega.nic.in/netnrega/home.aspx>.



The funds sanctioned under PMGSY from 2014-15 to 2018-19 to the state of Andhra Pradesh has been increased to 65.49Cr. To the state of Arunachal Pradesh the funds sanctioned has been increased to 98.38Cr and funds sanctioned to the Assam state has been increased to 126.8 Cr. The funds of Bihar and Chattisgarh state has been decreased by 1499.00Cr and 26.12Cr respectively. The funds to Goa has been nil since initially. The funds of Gujarat, Haryana, J&K, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Punjab, Rajasthan, Telangana, Tripura, Uttar Pradesh, and West Bengal state has been decreased by 418.77Cr, 218.96Cr, 414.00Cr, 247.00Cr, 235.22Cr, 150.00Cr, 458.00Cr, 207.67Cr, 54.74Cr, 310.21Cr, 425.66Cr, 0.88Cr, 185.73Cr, 630.16Cr and 943.57Cr respectively. The funds to Himachal Pradesh, Manipur, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu and Uttarakhad has been increased by 194.23Cr, 193.63Cr, 35.19Cr, 14.66Cr, 173.13Cr, 101.79Cr, 56.74Cr and 176.5Cr respectively.

## CONCLUSION

From the above Table-I In 2014-15, 2015-16 and 2016-17 Goa has zero funds and highest funds sanctioned state is Bihar. In 2017-18 Goa, Gujarat ,Haryana have zero funds and highest funds sanctioned state is Odisha. In 2018-19 Goa,Gujarath, Haryana,J & K, Jharkhand, Karnataka, Kerala, Maharashtra, Mizoram, Punjab, Rajasthan, Telangana, Tripura and Uttar Pradesh have zero funds and highest funds sanctioned state is Odisha. And in 2018-19 the lowest funds sanctioned state was Nagaland and highest funds sanctioned state was Andhra Pradesh. The states are provided more or less funds under MGNREGA than the above said states.

Rural road connectivity helps in rural development by promoting access to economic and social services and there by generating income and employment which ensures sustainable poverty reduction.

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**RESISTANCE THROUGH IDENTITY CONSTRUCTION IN POST 9/11  
MUSLIM DIASPORA: CRITICAL ANALYSIS ON MUHSIN HAMID'S *THE  
RELUCTANT FUNDAMENTALIST***

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**Abstract**

*The Reluctant Fundamentalist* is a postcolonial novel especially set after the catastrophic incident of 9/11. The widespread discussion on identity and resistance became a cup of tea in postcolonial literary arena where some of the downtrodden histories and literatures came up to present and represent their voices. After 9/11, a few works from South Asia also have explored more about the marginalized. Whereas literature produced post 9/11 from the West supported the dominant narration of Islamophobic ideology and presented South Asians especially Muslims in bad light and a threat to whole world for being some of the muslim named terrorists are the masterminds behind the attack, the work *The Reluctant Fundamentalist* portrays against these ideas and presents it as resistance to these discourses through the identity construction of muslim characters.

As Stuart Hall pointed out that 'identity is becoming', the protagonist of the novel 'Chengez' character is getting changed as per the incident around him. For Muhsin Hamid, it seems, 'writing itself is a resistance' who tries to resist the prejudiced dominant narrative by presenting the muslims well not like the terrorist as considered of. He begins the discussion with a pretext that 'don't be afraid of my beard, I am lover of America', is the exposition and assertion of his identity and he utters it as resistance towards the narrative to which he or the whole diasporic muslim community are being undergone. Through analyzing the text, this study aims that how muslim diasporic identities are constructed after 9/11 and how the work *The Reluctant Fundamentalist* resists the dominant narrative of West, 'them' and 'us' dichotomy and indirectly reassess the stereotyped propaganda.

**Key Words:** Identity, Resistance, 9/11, *The Reluctant Fundamentalist*.

Muslim diasporas in the catastrophic post 9/11 incident are undergoing through difficult stages where their names, shapes and appearances have been questioned by the dominant powers and they are forcefully retreated not to engage in the public spheres even after two decades. The right of livelihood of Muslims have been periled in some parts of the world due to the terrible attack unleashed by so called muslim named terrorist group Al Qaida. It made majority to think that all Muslims are part of Al Qaida that has come to destroy the whole world. In the counter terrorism activities, America mainly focused on Islam and muslims due to the notion of the crusade and 'them' and 'us' dichotomy created by the western writers since long back. Here, the paper tries to look at the muslim diaspora in post 9/11 scenario from the lens of literary text of Muhsin Hamid *The Reluctant Fundamentalist* which presents as counter to the dominant narratives of 9/11.



As diasporic literature is postcolonial literature, study aims to bring forward the much-discoursed postcolonial theories of identity and resistance in the selected text which will be analysed how the work does resist the dominant western narratives of 9/11 and assert the muslim identity in hostland and homeland. Having seen postcolonial studies are themselves resistance to the domination and the legacies of colonialism as per the argument of Ani Loomba, the text tries to break the stereotypical notions of West on East and challenge some of the deep-rooted ideas of orientalism about Pakistan and Muslims. The writer considers, it seems, 'writing itself is a resistance', as Lyotard said, and he tries to depict his Pak-American muslim immigrant named Changez in a rebellious mode. It can be argued that Changez constructed his muslim identity before and after 9/11 in his hybrid attitude and ambivalent nature towards nation and culture though later he felt the grace of his home culture. Leela Gandhi says that "ambivalent nature of colonial discourse is what open space for the resistance of the colonized" (Gandhi, 149). Here, with the word 'colonized' can be perfectly labeled to Muslims and 'colonizer' can be the America or the westerners who have psychologically imperialized Muslims and others. Embracing hybridity or ambivalent attitude, the mixing of the past with changes of the colonial power can also be "resistance to colonial power" (Edward, 140). Hybridity according to Homi K Bhabha is a third space, the liminal space (Graves, 1) which means the space threshold, or the space in between where the differences meet and overlap. The exchanges of values and ideas, meaning and priorities and contradictions and conflicts of cultures easily happened this third space. Homi Bhabha says that "hybridity is also a political solution to exit the binary opposition between Other and Self identity and emerged as the Other of Itself" (Bhabha, 209). The authors of *The Empire Writes Back* say that colonization, annihilation and conquest of others are based on "the myth of group 'purity'" (Ashcroft, Griffith, & Tiffin, 36). In fact, hybridity dissolves the concept of "purity" and "authenticity" of nations, which is the root of colonial discourse (Edward, p.140). This hybridity and 'cross-culturality' in the postcolonial world helped to lessen the differences and it reached to "recognized but challenged" (Ashcroft, Griffith, & Tiffin, 36). By being hybrid in some parts of the novel, Changez enters into the purity of westerners and follows it in his life. Through constructing his identity such a way, it can be argued that, he personally resisted the stereotypes and apparitions the West created upon the East and Muslims.

Soon after the appalling 9/11 happened, American mainstream media targeted migrants especially muslim communities which ensued in the blind propaganda and stereotypical understanding against Muslims all over the world. Though some of the conspiracy theories that are abundant argue that the nefarious act is done within America itself, American administration and mainstream media concluded that Al Qaida, a so called muslim terrorist organization, from Asia is responsible for the incident and which led public to antagonize and marginalize the Muslims. Starting 'War on Terror' with the proclamation of eliminating the muslim terrorists, accompanied by the misrepresentation and negative campaigning of media, has awfully affected the lives, security, and future of Muslims especially the people who live in diaspora.

The American media promoted culture of fear, insecurity and suspicion among themselves and it helped to create an invisible enemy called terror. The emotions they aroused in the public that 'once America is attacked, it will be hit again by terrorist' as



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per the opinion of Boehmer and Morton in their work *Terror and Postcolonial: A Concise Companion* (Qtd in Shihada, 453). Showing the symbols of Muslims such as beard, turban, hijab etc. are represented as potential threat the 'democratic' values of American society, the Muslims who keep these symbols are visibly categorized as terrorists who will again harm Westerners especially Americans. This organized stereotype affected all the Muslims even namesake Muslims also are targeted and brutally victimized by public. Although the thumbing majority of the Muslims are against this wicked act, they are being marginalized and urged to prove always that they don't belong to this extremist caste. These stereotypes and subsequent 'War on Terror' ensued in the division of 'good muslim' and 'bad muslim' in respect to the support of war on terror with the emphatic power America. While writing the life of Muslims after 9/11, Sunaina Maira quotes Mahmood Mamdani's book *Good Muslim, Bad Muslim: America, the Cold War, and the Roots of Terror*.

Mamdani observes that after 9/11, President Bush moved to distinguish between 'good Muslims' and 'bad Muslims.'... '[B]ad Muslims' were clearly responsible for terrorism. At the same time, the president seemed to assure Americans that 'good Muslims' . . . would undoubtedly support 'us' in a war against 'them.' . . . But . . . unless proved to be 'good,' every Muslim was presumed to be 'bad' (Maira, 633).

This is a challenge that the Muslims need to cope up with the mainstream understating and should be liberal to the own ideology in tone with the American and other dominant interpretations to not to get targeted easily in the category of terrorists. This type of misrepresentation is already built up by American media according to the view of Alsultany who says that the U.S media has "stereotyped and misinterpreted Arabs and Muslims for over a century" (Alsultany, 2) and it is largely "simplistic and invidious" (Tolan, Valassopoulos & Spencer, 330) after 9/11. In fact, the American and Jewish media and popular literatures kept Muslims 'othered' centuries back onwards.

The antagonism and stereotype against Muslims continued since the dissemination of Islam throughout the world especially after the crusade. When the power in all terms is consolidated in one hand, its dominance overpowered other ideologies specifically on Islam. Western scholars presented Islamic ideologies and jurisprudence as outdated, irrelevant and good for nothing. The believers of Islam had been represented as barbaric, inflexible and misogynists. These negative representations continued centuries to ninetieth century where the communism emerged as a threat to the western or Christian ideologies. It influenced the clash between capitalism and communism called 'cold war'. Samuel Huntington says that most of the countries were divided on the basis of two ideologies either with capitalists or with communists. Once the communist Russia yielded to capitalist powers, the arch rival in the world is no longer in between ideologies and which is necessary to grow any opposite or competitive powers. Western capitalist country peculiarly America came into one side and the vacuum was filled by Islam which is already considered opponent throughout centuries. Richard Grey in his essay *Open Doors, Closed Minds: American Prose Writing at a Time of Crisis* says that "with the collapse of communism, a sinister other that enables American self-definition may have disappeared ....it has now been replaced by Islam." (Grey, 2009)



The occurrence of 9/11 established this antagonistic understanding which spread throughout media and literatures. Along with the 'war on terror' broadcasting, media flung the culture of hatred against Muslims. Post-9/11 literature too portrayed Muslims from the East as either radical suicide bombers who hate America and the West or confused disturbed personalities. The "Islamic world is negatively represented, and the East is constructed to look as a safe haven for terrorists" as per Lanker opined in his work *Literary Responses to 9/11: A Comparative Study of The Reluctant Fundamentalist and Terrorist* (Qtd in Shihada, 454). Considering fictions, there are several fictional narratives such as John Updike's *Terrorist* (2006) Don De Lillo's *The Falling Man* (2007), *The Submission* by Amy Waldman, *Saturday* by Ian McEwan and Alexie Sherman's *Flight* (2007) etc., which have reinforced the dominant post-9/11 rhetoric. While describing the themes of loss, insecurity, American identity, trauma, fear, anger, suspicion, terror, it is represented Muslims as threat to whole world. These narratives have also contributed to inflaming the American sentiments and consolidating stereotypes against Islam and Muslims, facilitating the creation of a state of Islamophobia.

But *The Reluctant Fundamentalist* tries to challenge the negative portrayal of Islam, the muslim diaspora and stereotyping Muslims as threat by presenting muslim named character with liberal ideologies. While the dominant narrations related to 9/11 deliberately associating muslim characters with any wicked activities to posit the allegations on all Muslims, Changez, the protagonist of Muhsin Hamid in the novel sheds light to the other world of life in which muslims are trying to be on par with other socio-religious communities. Changez is Pakistani immigrant landed in America to embrace the American dream as every American immigrant thinks. Being good at studies, he was fortunate to avail the foreign scholarship and studied in reputed Princeton University and worked in Underwood Samson, one of the most sought-after financial companies. He is presented as a successful muslim immigrant who earns handsome amount of salary and has patting of American beautiful girl friend, Erica. He is partly integrated and assimilated to American culture up to vicious 9/11 happened which blew fatally to his much-anticipated American dream as is it worked in all Muslim's lives particularly in the life of immigrant muslims. His life in America is frequently questioned and he has been perceived by public as 'other' who possesses the potential threat. Unable to cohabit in the newly topsy-turvy phenomenon, he left America and joined as professor in his home country, Pakistan. By depicting him, Muhsin Hamid portrays muslim's emotional, social, moral, psychological and physical impacts of 9/11 after 9/11.

The form and structure itself of this text implies that it is a presentation of resistance to the dominant narrations of 9/11 where Muslims and the diaspora have been represented in bad light. It is narrated in monologue form in which Changez talks to an unnamed American visitor in old Anarkali bazar, Lahore, Pakistan. It is believed that American visitor is a CIA agent, but he kept silent throughout the novel except some facial expressions and gestures. He might be muffled by the writer Hamid in order to not involve an American in the story, which is making on muslims after 9/11 and it could be again fallen in stereotyping Muslims. Muhsin Hamid himself explains in an interview with Deborah Solomon that "in a world of [...] the American media, it's



almost always the other way around; representatives of the Islamic world ‘mostly seem to be speaking in grainy videos from caves’ ” (Solomon, 1). Such representation of a muslim character in the public is a question or reaction to the dominant understanding about Muslims that they speak and threaten from caves to the world. Supporting this selection of literary device, Lee says that it is a “a necessary reaction to the dominance of U.S. interests, media coverage and perspectives in the global war on terrorism. It was time to give the stage to some other perspective” (Lee, 345). Since muslims are misrepresented, underrepresented and misunderstood throughout the media and literature in the world especially in Western countries, Hamid might have thought narrating own stories from experience by silencing the other voices may give true representation and nullify the dominant understanding.

The novel explores the power relations between East and West by following the argument of orientalism by Edward Said as West is superior and East is inferior. While in the predominant orientalist studies West is considered as western states and East is all Asian countries, it is a bit narrowed down and West is considered as America and the East is considered muslim world. The text is designed as resistance to the superior narratives done by American media on inferior narrative on South Asian states especially Pakistan. Though the colonialism and imperialism are not functioning visibly, its hangover or remnants are still there through the intellectual imperialism which always creates bad images of East especially of Muslims. *The Reluctant Fundamentalist* criticizes America and western understanding for stereotyping Muslims after 9/11. It is further functioned as the ‘Other’ is speaking back or rather the hybrid other telling his stories which questions the perception of stereotypical ‘muslim terrorist’ in the mass western media. Through the identity struggle, Changez says the story of a man who is not born into orientalist stereotype, but he was forced or shaped by prejudices and labelling.

Talking about his background in his home country’s situation is entirely different from what orientalist interpretations, he resists such narratives through own examples. Occidentals understands on Asians particularly on Muslims that are ‘uncivilized’, ‘savage’ and good for nothing. But he was born with silver spoon and comes to America from well-educated Pakistani family. Both his father and grandfather studied in England and they employed several servants at home. Seeing their wealth, American “would imply that we were a family of great wealth (Hamid, 10)”. As per his intelligence, he says that he was able to get any kind of scholarship from anywhere and he was much confident enough of jobs in future. “Students like me were given visas and scholarships, complete financial aid...and invited in the ranks of the meritocracy (Ibid, 5)”. And “I knew in my senior year that I was something special...I was confident of getting any job I wanted (ibid, 5)”. Among hundreds of American and non-American brilliant students from 2001 batch, only eight of them got selected for the interview and Changez, as a south Asian muslim immigrant, was one of them. Later on, after assigning the work and analyzing the result, Jim, the interviewer said him that “you did better than fairly well...and you’re number one in your class (ibid, 44)”. The intelligence and aptitude of Changiz shakes the bias and orientalist concepts of ‘uncivilized’ East and, here, its revenge is sweet that his competition worked with white and non-white people.



The author questions the supremacy of West and the inferior condition of East also through the protagonist's narratives. Westerners think that they have colonized and occupied the lion's share of the world and they have civilized every nook and corner of the world. It is believed that the places where their attention is not reached as 'dark places' and the people over there are barbaric and uncivilized. But, while comparing the old days of America and Pakistan or Eastern countries, Changez found that the ancestors of Americans were illiterate barbarians whom the civilization and the order of life was taught by Asians. He thinks that "four thousand years ago, we, the people of Indus River basin, had cities that were laid out on grids and boasted underground sewers, while the ancestors of those who invade and colonize America were illiterate barbarians (ibid, 34)." But later, the socio-political situations have been changed in both places.

In the initial days, his identity in the host land is developed with the idea of American dream. As enthusiastic and hardworking person, he has been considered as one among them by his friends and employers. He also felt that moving from Manhattan to New York is "like coming home (ibid, 32)". He becomes 'immediately a New Yorker' and "tend to become sentimental when he thinks about that city (ibid, 33)". He enjoyed all the fortunes of Americans except some of the bitter experiences of being him as a migrant. While he was in Manila, Philippines for a business assignment, he said "I attempted to act and speak as much as my dignity would permit, more like an American (ibid, 65)" and he used to respond that he is from New York in certain contexts where he was asked from where he is. His dignity wholeheartedly is not allowing him to say that he is an American and which indicates that he lived in America in the 'third world' or with hybrid identity up to the dangerous 9/11. September eleven occurred while he was in Manila which worked as major blow to him as well as entire muslim world. It brought the feeling that everything has changed within a day. While returning from Manila as a part of business trip, he was blocked in American airport and interrogated by American police. By stripping down the boxer shorts and keeping him with a criminal, he was pathetically humiliated while all of his colleagues were allowed to leave decently. The first incident itself made him feel that he is a less American or he is an outsider.

From the beginning itself he is accurate about his identity. Though he has come back from America, he still loves America inside. As a resistance to the idea that every Pakistani or Muslims hate Americans, or they will destroy the peaceful life of them, Changez said the American visitor that

Excuse me sir, but I may be of assistance? Ah, I see I have alarmed you. Do not be afraid of my beard: I am lover of America. I noticed that you were looking for something; more than looking, in fact you seem to be on mission, and since I am both a native of this city and a speaker of your language, I thought I might offer you my service. (ibid,1-2)

The first sentences or introduction of Changez itself give the feeling that Muslims are not against Americans, rather they are ready to help Americans anyways. Though the visitor suspiciously looks at him as he is on a mission, he says that don't be afraid of his beard about which media and other dominant narrative asserts that it is a symbol of terrorists as Anna Hartnell says "evil terrorist with beard" (Hartnell, 337). The



stereotyping and hate crimes after 9/11 mainly happened against the people who kept beard and turban. On account of this, even Sikhs also became the victims of hatred and some of them were brutally murdered by hate mongers. Changez is portrayed very politely to Americans which is one of the orientalist stereotypes, but he resists this idea through the assertion of his identity.

In some leaves of the novel, Changez asserts his identity through rebellious mode that can be seen in 9/11 attacks afterwards. He informed his parents that he wanted to stay longer when he prepared to depart from Pakistan after taking a short break at Lahore, his mother said “do not forget to shave before you go” (Hamid, 128). Changez arrives at New York and engages with other things but did not wax his beard. He says that “for despite my mother’s request, and my knowledge of the difficulties it could well present me at immigration, I had not shaved my two-week old beard. It was, perhaps, a form of protest on my part, a symbol of my identity” (ibid, p.130). He had been brave to choose the option by himself although the people around him whispered and stared at him with dislike. Thus, it is shown that it is a question to the hate mongers and again it was his resistance to the misunderstanding and labelling of a man who keeps beard is a terrorist.

Embracing the hybridity and western culture to resist the ‘purity’ and ‘authenticity’ of colonial power, Changez tries to be American though some of the places he fails and later changed after the incident. Before 9/11, he opted hybrid attitude or cross-cultural behaviour visibly in order to cope up with the American dream. The appearance of typical Pakistanis, as a muslim country, is stereotyped a bearded, wearing cap, turban and sandals without socks. The women are depicted as extreme believers who veil themselves and wear things that are free in size. Having hybrid identity, author pictures Changez in the words of Jim. He says “you are polished, well-dressed. You have this sophisticated accent” (ibid, 8). It is shown that Changez, an indigenous hybrid Pakistani, excels in his dress and physic “perfect breast, tan, succulent, seemingly defiant gravity” (ibid, 5) with Westerners and he is comparatively impressible too. He “wore a starched white kurta of delicately cotton over a pair of jeans” (ibid, p.48), a western dress once he visited Erica’s home. Such an outfit and physical appearance, he challenges the oriental stereotype and put forward another image of Muslim immigrant in the host country.

By showing up like that, Changez breaks the stereotype on Muslims by throwing extremist concept of Muslims along with exposition of physical appearance. It is believed that Muslims are fundamentals who are not flexible in tolerating any altering in belief. But Changez, a Pakistani migrant, follows the western cultures by drinking alcohol and having ‘illegal’ sex with his girlfriend. After getting familiarized with her they strolled to town and ordered beer to drink which is forbidden in Islam. He says “arriving in town, we found a café near the harbor with tables shaded by blue and white umbrellas. She ordered a beer; I did the same” (ibid, 27). While describing about Pakistan also, he says that we drink at home though it is restricted there. “alcohol was illegal to Muslims to buy and so I had a Christian bootlegger who delivered booze to my house in a Suzuki pickup” (ibid, 27). Again, he challenged the orientalist understanding of Erica’s father when he went her home and father said that a Pakistani who worked for me never drank. But he said that “I do, Sir” (ibid, 53). He asserts all



over again the hybrid identity who follows the indigenous culture and western cultures and questions the blind beliefs of Muslims and Pakistanis by equalizing with westerners. He deciphered this simple instance that Muslims or Pakistanis are not 'Others' as western media propagand tries to emphasise that everybody has emotion and merriment.

Through his hybrid culture, he peaks into top by adopting the sexual culture of Westerners. Having sex without the bond of marriage is strictly forbidden in Islam just like other religions uphold. But westerners legally engage in free sex, dating and living together before marriage which is punishable offence in Islam. Changez, a muslim immigrant makes love with Erica and have "physical intimacy" (ibid, 105) without marrying her. He explains the conditions in Pakistan, though it is more liberated now, "relationships were often conducted over fleeting phone calls, messages through friends, and promises of encounters that never happened. Many parents were strict, and sometimes weeks pass without is being able to meet those we thought of as our girlfriends" (ibid, 69). He comes from the county where living together and physical intimacy is considered illegal is not problematic in his hybrid condition in the American host land. This is his personal resistance to the orientalist interpretations that Muslims are strict towards their religion and won't follow another culture. It breaks the argument that Muslims are narrow minded and are not liberal to faith.

The muslim diasporic and non-diasporic identities are challenged in twenty first century and the wicked 9/11 functioned as catalyst to augment the stereotypical notion of Occidentals. While orientalism mainly discussed in between East and West, the post 9/11 scenario puts Muslims as opponents to whom the negative representation is ceaselessly imposed. Along with the ideas that East are barbaric, uncivilized etc. they have been pictured that they are a threat to the whole world. Plenty of literary works got published after 9/11 to assert the arguments but the text *The Reluctant Fundamentalist* questions these orientalist fixations and resists the negative representations by constructing the muslim identities by equalizing with all, not as terrorists.

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## IDEAS OF CIVIL SOCIETY IN INDIAN CONTEXT

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### Abstract

Literature on civil society in India covers wide range of themes like social movements, the question of governance etc. It has been written with a view to articulate specific socio-political phenomenon. This literature covered different themes and conceptions of civil society. It is not directly about civil society. Here, the term civil society is used to articulate specific impulses. Thus, here we attempt a thorough review of literature concerning variety of themes to lay bare the conceptions of civil society imagined as a part of discussion of such themes.

**Keywords :** Civil society, social movements, Indian

### Introduction

#### Civil society and social movements

Civil society and social movement are two terms used synonymously. It is truer in case of new social movements (hereafter NSM's). New social movements are distinctly different from old social movements. NSM's began as a criticism of old social movements particularly working class movements. The subject of new social movements is concrete like peasants, women etc. while the subject of old working class movement is abstract. The primary constituencies of NSM's are not economic categories, but cultural categories. The basis of subordination is culturally constituted. X is discriminated against because of historically constructed categories built into social understandings.

NSM's relationship to the state and its institutions are not essentially oppositional in the sense of overthrowing state structures. Their opposition is mainly with one group of society; sometimes they align with the state while they stand in opposition to the state. Their relationship to the state is nuanced.

NSM's are largely critical of state led modernization in economy and polity. In economy, they criticize developmental policies followed by the state for being destructive of ways of life and serving the needs of centralizing elite. In politics they do come into existence due to the failure of modernist agencies like bureaucracy and political parties. Political parties could not organically connect with the agendas of the people. They failed in the function of transforming people's agendas in to the system because the mobilization of people is disconnected with the people's true needs. Political parties resort to short



circuiting mediating processes. New social movements articulate issues that could not be expressed by political parties like protection of environment discrimination against women, dalits, or farmers issues etc.

NSM's role in leadership is not similar to the role of vanguardist parties. Vanguardist parties respond to a situation with a prior theoretical knowledge of the issue and that they have a correct way of addressing the issue. NSM's develop knowledge out of working with the people. In Indian context, the self conscious use of the term began with the failure of the left to articulate the issues of NSMs. Civil society is invoked to refer to a space of autonomous articulations of issues in public realm from the organized left. It was posited in opposition to the organized left. One example is how organized left mobilized women as objects for achieving revolutionary process. It did not treat them as agents. In other words, civil society is used to refer to emergence of autonomous categories in the public realm like women dalits, peasants etc. the claim to authentically represent them does not belong to any one of the political parties. A moral space is created for each of these categories in the public realm to represent them without being led by agencies like political parties claiming to represent all. Thus, civil society in the 80's has been used to refer to non left-non-political party space of public life. The nature of agency is also different because it was not led by any political party. What follows is how academic work articulated the term civil society in relation to NSM's.

Neera Chandhoke's analysis of Chattishgarh Mukti Marcha (CMM) as a civil society organization is analysed here closely to see how she uses the term civil society.

CMM had mobilized workers in one of the back ward regions of the country. It is basically a civil society organisation because it had been mobilizing weaker sections of the society, the Laboring class subjected to exploitation by the local mining industry in league with politicians, police and other state institutions. Laboring class is weak because in the economy they have been deprived of minimum wages, secure working conditions, right to unionize and to mobilize. Their labour and resources of the environment which belongs to them have been exploited by mining industry. Secondly, political parties police, and revenue officials joined hands with the powerful economic interests as against the laboring class in non-implementation of the provisions of the law. One can witness complicity between the structures of governance and other groups that represented powerful interests. In other words, we find a political society that is responsible for governance pitted against civil society."



CMM followed non-violent means and had organized mass protest movements to express the anger of the vulnerable to the powerful sections of society.

Chandhoke points to the function of voluntary community service undertaken by CMM. As the state did not provide basic necessities even after insistent struggles, CMM developed practices of voluntary self-help in terms of setting up schools, small health, centres etc. voluntarily. It represented a tradition of extreme self-sacrifice for the sake of the helpless people.

In Chandhoke's analysis, three points are crucial to her use of the term civil society (a) extreme helplessness of the labouring class (b) non-violent means for mobilization (c) complicity between state institutions and powerful interests (d) voluntary community service.

Sudha pai and Ram Narayan (Pai & Narayan, 2003, pp.243-284), in their article on, Democratic governance, Civil society and Dalit protest, narrated protest mobilization of Dalits led by Rashtriya Shoshith Morcha (RSM), following an incident of police firing in Shergarhi neighbourhood of Meerut city. The police firing took place due to scuffle between Dalits and police following installation of statue of Ambedkar in disputed place. It discussed the idea of civil society in relation to realization of good governance in the context of a Dalit protest and organization.

After the incident, huge mobilization of Dalit community took place in and around Meerut, civil society is spoken of as a protest mobilization. RSM achieved limited success in its attempt to promote democratic governance. It succeeded in getting the statue reinstalled, a number of police personnel involved in the incident transferred and a judicial enquiry initiated. On the other hand, state failed in its basic task of protecting the lives of Dalits (citizens).

In this context of Dalit mobilizations, state and civil society are viewed differently. From the perspective of Dalit movement, state is not viewed in oppositional terms, i.e. as opposed to the civil society. State is viewed as an agency vested with the task of democratizing hierarchical caste-ridden civil society. "In a post-colonial context, the centrality of state, both in the maintenance of order and development makes it overdeveloped and relatively autonomous of society....." (Pai & Narayan, 2003, pp. 245-246). Because of this centrality of the state in the process of development, it provided education free, out of which emerged educated Dalit leaders. Thus, state is central to emergence of educated leadership among Dalit's significant to the constitution of civil society.

Normatively speaking, civil society should ensure freedom, equality and justice in society. It requires squarely fighting against hierarchical, caste-ridden



Hindu society. Practically speaking, society is a dynamic of negotiation between traditional values in segmented, hierarchical society and of values based on equality, rights, and justice that are enshrined in the Constitution. In the process, social groups need to readjust among themselves which results in conflict. Thus civil society is viewed as an arena of contestation among different social groups with the dominant groups defending hierarchical values while subordinate groups struggling for rights and justice. Hence civil society is viewed as an arena of contestation for just claims of individual.

Still, if civil society is viewed as process their analysis depicts mobilization of a specific group with a sense of hurt over an issue of claiming a dignified status for its symbol. The mobilization can be viewed as a process of formation of community against a perceived injustice. The subjective processes lead to enormous sense of self-assertion apart from mobilization. These processes have not been translated into conceptual language by authors. However civil society ought to include these processes.

Thus, civil society constitutes, in their analysis, a decent civil society brimming with values of constitutional morality whose achievement is the task of the modern state. On the other hand, civil society viewed as a process is a dynamic of formation of community in which subjectivity is realized and assertion of personality and opposition to it is also vigorous.

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Pavement dwellers are totally helpless as they do not have economic, political or knowledge resources to fight the establishment. SAARC did not play leadership role. It did not lead the initiative. It allowed the agency of the people to be enhanced in public sphere it facilitated the increasing role of women in community affairs by mobilizing them. Secondly it forged linkages with various community based organizations and evolved an alliance with various women organizations in Mumbai. Thirdly, it offered legal resources to fight court cases. Fourthly, it facilitated a process of formation of public knowledge by the people themselves without indoctrination. Mahapatra (Mahapatra, 2003, pp. 304-305) stressed that experiences of collective actions and the sharing of common problems at an emotional level helped the pavement



dwellers to criticize existing knowledge and create a new epistemic orientation towards a larger world in which they lived.

His analysis points to totally different aspects of civil society as NGO mobilization. It is concerning facilitating mobilization, developing linkages with other similar efforts and the process of formation of new epistemes thereby forming new communities without resorting to pedagogy.

The three varieties of analysis presented here refer to three different sorts of mobilizations. However, they exhibit similar features. All three instances refer to mobilizations outside the framework of political party for justice for those who are living in precarious conditions. Secondly, they have faced indifference and opposition from institutionality of democracy. Yet they attempted approaching institutions like courts and political parties. Thirdly, all three instances refer to formation of new identity in the process of mobilization which also gave a perception of the public world and created knowledge of the public world. This is conception of civil society as space of organizational networks outside the institutional frame of democracy. It facilitated the process of formation of public knowledge and public identities.

### **Crisis of Governance and Alternatives**

The idea of crisis of governance has been articulated by many. It is attempted to look at here one version that emphasises on lack of civic virtue offered by Jayaprakash Narayan (Narayan, 2003, pp. 77-124). It offers unique ideas in to crisis of governance and solutions offered to address this crisis. He points to crisis in culture of politics and administration that has been the consequence of extensive functions that the state has assigned to itself. State has taken up extensive development functions instead of confining itself to the function of protection of law and mediation through power brokers' has become all too common. The overdependence of citizen on the state has resulted in an administrative culture of corruption, crime, intrigue and nepotism. The culture of administrative and political institutions has geared towards orientation of manipulations "unbridled and irresponsible populism, knee-jerk opposition to those in power, the unbridgeable chasm between rhetoric and action, endless opportunism and shameless plunder of state resources" (Narayan, 2003, p. 84). The authority of government could not be used for a positive function of promoting good over evil, while it has been abused for pelf, privilege and patrimony. The roles of the public servant and the citizen are reversed. Public servant has become master and citizen become servant, thereby perpetuating corruption. The key role of citizen in a democracy has been totally ignored.

He identifies key systemic feature as responsible for its afflicting the culture of politics. "In a Westminster model, there is a schism between power



sanctioned by legislative majority and public power or people's mandate. Public power is divorced from actual exercise of governmental power. As a consequence, integrity in public life and survival in politics are no longer compatible." Public power has been divorced from legislative power. That is how, political parties in India does not provide avenues for participation and leadership of enlightened and public spirited citizens. Instead, political parties became instruments of self aggrandizement and personal power. It has become a marked feature of public life that honest citizens cannot be elected to public office though fair and legal means. To restore virtue in public life, he suggests Governance reforms: reforming political parties, electoral reforms and citizens' activism.

- (i) Political parties be reformed to enable best men and women to participate in political processes by holding regular elections within the party, transparent funding etc.
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"The sense of common fate which is so vital to bind people together in an orderly society is missing in us. A civilized society can be sustained only if citizens recognize that rights and duties coexist and in fact one's rights translate as duties of others and vice versa" (Narayan, 2003, p. 117).

Jayaprakash Narayan brings out certain conceptions of death of public virtue and moral decline engulfing public life in to articulation which of use in analyzing ideas relevant to public life. Making virtuous citizenry is the task of civil society and state and its institutions suitably reformed. Institutional reform to offer a pride of place for virtuous citizenry is the task of politics and public reform. It includes reform of mediating institutions like political parties, electoral reforms. Citizens should be made to realize the common good where rights and duties are intermeshed into ideas of public virtue. Public virtues include honesty, courage and democratic virtues like equality and social justice. Thus, civil society consists of virtuous citizenry committed to public duty and active participation through decentralised mechanisms.

### **Civil Society as Libertarian Ideal**

Idea of civil society is invoked in good governance discourse sponsored by World Bank and international agencies. Its main features are elucidated here to think of critically to be brought in to civil society discourse in post-colonial contexts.



State has withdrawn from the welfare functions it has performed as a part of development agenda ever since independence. It did so with an idea that state should confine itself to providing adequate legal and political framework to the functioning and operation of free market. State should withdraw from redistributive function because it leads to imperfections in the free-market (Joseph, 2002). According to world bank discourse, state is vested with two functions “the creation and enforcement of rules to make markets work efficiently, in the absence of which production and investment would be deterred and development consequently hindered compensating market failures through corrective interventions, which includes, where necessary a key role in providing, education, health and essential infrastructure” (Jayal, 1997, pp. 407-412). However, the functions of the state so defined are not to achieve welfare, but to offer necessary conditions for better economic performance.

## Conclusion

Civil society offers scope for the exercise of creativity and self-reliance. It views participants as stake holders rather than mere recipients of benefit. In civil society, individuals get their due place on the basis of their talent and performance than on charity. According to this view civil society includes associations based on modern contractual relations as well as traditional social networks, communities, etc. It is hoped that non-voluntary social bonds could as well be used to the empowerment of individuals to make them self-reliant players in the market (Joseph, 2002, p. 300).

The major problem with this discourse is that it views governance process as totally bereft of politics. “For this, governance process is not a product that has emerged out of democratic processes. It has been decided by experts, consultancy firms or NGO’s. But, the question of necessity of idea of good governance as emanating from the citizens of a polity and exclusively from them is not generally raised. The definition of good governance in a particular society must be the product of consensus or a product of political negotiation (Jayal, 1997, p. 408). In some places elected politicians are left out of planning process. They had to compete with the consultancy firms and NGO’s in acquiring legitimacy (Joseph, 2002, p. 300). The idea of good governance is viewed as a merely technical task, uncoupled from moral and political aspects of participations. The technically viewed as consulting people to make a better project design.

The idea of civil society as available in good governance discourse is normatively limited and secondly it has been criticized as purely technical which empties its moral content.



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## IDEAS OF CIVIL SOCIETY IN INDIAN CONTEXT

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### Abstract

Literature on civil society in India covers wide range of themes like social movements, the question of governance etc. It has been written with a view to articulate specific socio-political phenomenon. This literature covered different themes and conceptions of civil society. It is not directly about civil society. Here, the term civil society is used to articulate specific impulses. Thus, here we attempt a thorough review of literature concerning variety of themes to lay bare the conceptions of civil society imagined as a part of discussion of such themes.

**Keywords :** Civil society, social movements, Indian

### Introduction

#### Civil society and social movements

Civil society and social movement are two terms used synonymously. It is truer in case of new social movements (hereafter NSM's). New social movements are distinctly different from old social movements. NSM's began as a criticism of old social movements particularly working class movements. The subject of new social movements is concrete like peasants, women etc. while the subject of old working class movement is abstract. The primary constituencies of NSM's are not economic categories, but cultural categories. The basis of subordination is culturally constituted. X is discriminated against because of historically constructed categories built into social understandings.

NSM's relationship to the state and its institutions are not essentially oppositional in the sense of overthrowing state structures. Their opposition is mainly with one group of society; sometimes they align with the state while they stand in opposition to the state. Their relationship to the state is nuanced.

NSM's are largely critical of state led modernization in economy and polity. In economy, they criticize developmental policies followed by the state for being destructive of ways of life and serving the needs of centralizing elite. In politics they do come into existence due to the failure of modernist agencies like bureaucracy and political parties. Political parties could not organically connect with the agendas of the people. They failed in the function of transforming people's agendas in to the system because the mobilization of people is disconnected with the people's true needs. Political parties resort to short



circuiting mediating processes. New social movements articulate issues that could not be expressed by political parties like protection of environment discrimination against women, dalits, or farmers issues etc.

NSM's role in leadership is not similar to the role of vanguardist parties. Vanguardist parties respond to a situation with a prior theoretical knowledge of the issue and that they have a correct way of addressing the issue. NSM's develop knowledge out of working with the people. In Indian context, the self conscious use of the term began with the failure of the left to articulate the issues of NSMs. Civil society is invoked to refer to a space of autonomous articulations of issues in public realm from the organized left. It was posited in opposition to the organized left. One example is how organized left mobilized women as objects for achieving revolutionary process. It did not treat them as agents. In other words, civil society is used to refer to emergence of autonomous categories in the public realm like women dalits, peasants etc. the claim to authentically represent them does not belong to any one of the political parties. A moral space is created for each of these categories in the public realm to represent them without being led by agencies like political parties claiming to represent all. Thus, civil society in the 80's has been used to refer to non left-non-political party space of public life. The nature of agency is also different because it was not led by any political party. What follows is how academic work articulated the term civil society in relation to NSM's.

Neera Chandhoke's analysis of Chattishgarh Mukti Marcha (CMM) as a civil society organization is analysed here closely to see how she uses the term civil society.

CMM had mobilized workers in one of the back ward regions of the country. It is basically a civil society organisation because it had been mobilizing weaker sections of the society, the Laboring class subjected to exploitation by the local mining industry in league with politicians, police and other state institutions. Laboring class is weak because in the economy they have been deprived of minimum wages, secure working conditions, right to unionize and to mobilize. Their labour and resources of the environment which belongs to them have been exploited by mining industry. Secondly, political parties police, and revenue officials joined hands with the powerful economic interests as against the laboring class in non-implementation of the provisions of the law. One can witness complicity between the structures of governance and other groups that represented powerful interests. In other words, we find a political society that is responsible for governance pitted against civil society."



CMM followed non-violent means and had organized mass protest movements to express the anger of the vulnerable to the powerful sections of society.

Chandhoke points to the function of voluntary community service undertaken by CMM. As the state did not provide basic necessities even after insistent struggles, CMM developed practices of voluntary self-help in terms of setting up schools, small health, centres etc. voluntarily. It represented a tradition of extreme self-sacrifice for the sake of the helpless people.

In Chandhoke's analysis, three points are crucial to her use of the term civil society (a) extreme helplessness of the labouring class (b) non-violent means for mobilization (c) complicity between state institutions and powerful interests (d) voluntary community service.

Sudha pai and Ram Narayan (Pai & Narayan, 2003, pp.243-284), in their article on, Democratic governance, Civil society and Dalit protest, narrated protest mobilization of Dalits led by Rashtriya Shoshith Morcha (RSM), following an incident of police firing in Shergarhi neighbourhood of Meerut city. The police firing took place due to scuffle between Dalits and police following installation of statue of Ambedkar in disputed place. It discussed the idea of civil society in relation to realization of good governance in the context of a Dalit protest and organization.

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In this context of Dalit mobilizations, state and civil society are viewed differently. From the perspective of Dalit movement, state is not viewed in oppositional terms, i.e. as opposed to the civil society. State is viewed as an agency vested with the task of democratizing hierarchical caste-ridden civil society. "In a post-colonial context, the centrality of state, both in the maintenance of order and development makes it overdeveloped and relatively autonomous of society....." (Pai & Narayan, 2003, pp. 245-246). Because of this centrality of the state in the process of development, it provided education free, out of which emerged educated Dalit leaders. Thus, state is central to emergence of educated leadership among Dalit's significant to the constitution of civil society.

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Thus, civil society constitutes, in their analysis, a decent civil society brimming with values of constitutional morality whose achievement is the task of the modern state. On the other hand, civil society viewed as a process is a dynamic of formation of community in which subjectivity is realized and assertion of personality and opposition to it is also vigorous.

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## Conclusion

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## HUMAN RESOURCES PRACTICES AND EMPLOYEES PERFORMANCE

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### ABSTRACT

Human Resources (HR) are the key component of any organisation, or it may be argued that they are the organization's foundation, without which it is scarcely feasible to attain goals. Like the concept itself defines, Human Resource Management (HRM) is the organization's management or managing of human capital that includes personal fulfilment and accomplishment of objectives. HRM activities provide benefits, performance evaluation, preparation and growth and career management plays a key role in the organization's development, engagement, and employee retention. The key purpose of this review paper is to consider the effect of HRM activities on employee success at work. The review showed that HR practices have a direct influence on the success standard of workers. Implementation of acceptable HR procedures must be completed. This research paper illustrated the banking operation that thrives on the strength of human power. People are the direct generators of the quality of their facilities and people are their sole clients. The literature research was undertaken to investigate the extent of the activities of HRM commonly followed by major Indian banks. In order to analyze the problems involved in workforce selection and recruiting, training & growth, compensation and pay, techniques of role appraisal, performance evaluation, employee engagement, metrics to evaluate their job satisfaction rate, the literature review was undertaken. "This research paper critically analyzed about the **"Human Resources practices and Employees Performance"**

**Keywords:** HR Practices, Public Sector Banks, Private Sector Banks, Performance, Human Resource Management, Human power

### Statement of the Problem

*"People change jobs much more often, and therefore companies on average, invest less than in employ development".*

*Andrew Ng.*

In recent years, Human Resource Development (HRD) has gained tremendous significance, whether it is a corporate enterprise or a bank or an office, HRD is essential for its productive and successful activity. In an evolutionary phase in which global growth struggles to reach higher living standards, the need to improve the human capital to address the bigger and new demands of rising the quality of life of the masses can hardly be overlooked. The definition of HRD is concerned in particular with the advancement of



human output in general and the growth of human skills, norms, understandings and implementation in production enterprises. As such, HRD has become an essential program for all companies not only to increase the efficiency and productivity of output but also to bring in qualitative changes at various levels among employees.

Management of human capital is the foundation of every company and there is no exception to that in the banking sector. As a service business, banking is mainly dominated by individuals or clients. More or less the performance of the banking sector relies on the banks' productive and successful human capital. The level of operation and consumer loyalty will be improved by the banking staff's attitude and hospitality. During the last three decades, this field has experienced a metaphorical transition in terms of the activities in human resources administration. In addition, over the years, the role of the HR department in this field has also increased. Recruitment and retaining of staff were perceived to be the most daunting job of modern times. Many studies have been carried out, especially in the Indian sense, addressing various facets of Human Resource Management (HRM) in the banking sector. In the subsequent paragraphs, a close analysis of these fragmented attempts in the study sector is attempted. The research of the practice of HRM has been an interesting and crucial field of management and organizational success, especially in the banking industry over the past several years. A significant field of study in the past 15 years has been the impact of HRM strategies on organizational efficiency, suggesting a favourable association between Human Resources (HR) practices and organizational results. In the olden days, management gurus and academics were interested in researching how HRM activities influenced employee performance and overall bank performance, and HRM methods are increasingly viewed as contingent rather than independent variables. In the economic and social growth of a nation, the banking sector, one of the main segments of the financial system, plays a crucial role. As a financial intermediary, a stable and safe banking sector is indispensable in modern society and holds a unique role in the economy of a country. The Indian banking sector has passed through numerous periods, including pre-nationalization, post-nationalization and post-liberalization.

### **Banks in Public Sector**

Banks in the public sector are such banks that the government controls. These banks are owned by the nation. There were 20 banks nationalized in India in 1969 and 1980, respectively. The primary goal of these banks is social welfare. They are split into two communities i.e. nationalized banks and the Indian State Bank and their partners. Among them are 19 nationalized banks and 8 associates of the State Bank of India. Deposits and developments in the financial business were dominated by public sector banks. The commercial banking situation in India is regulated by public sector banks. It is necessary to further group these public sector banks into: State Bank of India, Nationalized Banks and Regional Rural Banks .

### **Private Sector Banks**

Such banks are banks owned and managed by the private sector. A person, in proportion to the banks' shares owned by him, has power over these banks. In order to complement the success of public sector banks and better serve the needs of the economy, private sector banks have come into being. As the banks of the public sector were merely



under the possession of the government, banks had little opportunity for profit making and financial development. The key distinction is that public sector banks exclusively obey RBI interest laws, but certain amendments may be made by private sector banks, but only after RBI approvals .

### **Why Human Resource Management Is Important?**

For any company working with individuals, the organization wants strong human resource management to function efficiently. Banking has been and always will be a People Business. The organization's robust and reliable HRM renders it a good one. For finance, because of the existence of the banking sector, which is largely service based, the value of HRM has multiplied. The most powerful issues confronting the banking sector in any particular time period are the supervision of individuals in the enterprise and the treatment of financial and economic threats at a larger stage. Only the financial risks that banks need to take on a daily basis can be handled by effective and trained personnel in the field. The Department of HR is responsible for identifying and locating those skilled workers in the correct bank positions. In addition to the threats in the financial industry, consumer loyalty has to be held in mind by persons managing banks' day to day affairs. The front office workers become the face of the bank and it is thus the task of the HR to guarantee that qualified persons operate up front. Before they start their job, they need to ensure that the applicants chosen in the banks go through the required preparation so that they are well aware of the complexities of the core banking business and consumer relationship. HR management has to think of both the quantity and efficiency specifications of the banking industry and successfully fix the shortfall in the availability of qualified labor in the business.

### **Human Capital In The Banking Sector**

- Recruitment strategy ahead: The ever changing banking market, which has developed rapidly over the past decade, has culminated in several vacancies and overall development in the business. The number of divisions of the public sector has increased dramatically and the need for professional manpower has also increased accordingly. In both relevant banks, the HR management committee is responsible for evaluating their organization's potential needs and constantly calibrating the recruiting phase.
- Maintaining a combination of workplace expertise and youth: The changing banking scenario with the advent of internet banking and core banking facilities requires youth vitality and workplace exuberance to be combined. Although like with every other market, there should be a delicate mix between youth enthusiasm and seasoned practitioners to make it a viable and fruitful mixture. Therefore it is the duty of the HRM to preserve this equilibrium and to undertake some cultural and management changes to suit the people employed.
- Manpower training: Technologies and the way of operating in the financial industry are evolving rapidly. Over time, not just the computers, but attitudes to different systems, regulations and banking facilities shift. To grasp the same from time to time, the fresh hires and the older ones must undertake the requisite preparation. The administration of HR guarantees that no other difference is faced by the individuals employed in the



banking company. Empowering workers with preparation and also assessing their success is something the department of HR has to look after.

- Performance monitoring and spotting of talent: HR management tends to be accountable for evaluating the total performance of staff in multiple divisions. They concentrate more on persons that lack the spirit of operating in the enterprise and aim to make them boost their results for the bank's improvement. The HR department provides them with sufficient recognition and promotion to add meaning to the hard work and commitment of workers.
- Holding a watch on the employee's personal requirements: Like every organisation, the employee finds their value in the business. They prefer to perform much more once they feel like the business is a significant source and the company thinks in exchange about them. Some of the aspects that the HR department wants to look at include offering pay incentives for successful deeds, maintaining some personal details and wishing them on holidays, authorizing leave and holding a track on the promotional and transition criteria.
- Holding a watch on retirements and resignations: The HR section is also responsible for the acquisition of talent. It is also the duty of the HR team to make plans to avoid the resignations offered to a specific company by the workers. They ought to examine and assess the factors behind the workers' decision to leave the organisation and try to change the situation. The HR team still wants to keep a list of the retirements expected in a few years to ensure sure they are able to fill the empty shoes with recruiting updates.

There is a strong financial and economic market in the banking sector, which relies primarily on the workers. Managing and attracting this staff is also the focus of the banks' HR department. It is also important for the HRM team to take a look at the banks' existing and potential future needs and deal with them accordingly. For banks, HRM is important because banking is a service sector. People and risk control are two main problems confronted by banks. Without effective and professional manpower, successful risk control will not be feasible. Banking has always been a people company and will always be. While pricing is significant, there could be other legitimate reasons why individuals choose a specific bank and stick with it. Banks need to try to differentiate themselves by developing their own niches or photos, especially in open, highly competitive circumstances. The very sustainability of the banks in coming times would rely on customer loyalty. Principles ought to be emphasized on the ground by tangible acts and it will be the human capital of the bank who would deliver this.

The determinants of job satisfaction among select Indian banks were investigated by the researcher. The study concluded only on secondary data that the key determinants of job satisfaction were the working climate, supervision, job protection, peer cooperation, compensation facilities, approval of workers, delegation of power, job contentment, inequality in the workplace, development potential and transparent wage structure.

### **Employees and HR Practices**

The researcher developed the theoretical framework for determinants of deviant behavior in the workplace, such as person factors, systemic factors, and work related factors.



Employment satisfaction is found to be a mediating variable between the three possible determinant groups and deviant behavior in the workplace. The author selected this analysis on the basis of the aforementioned examination to explore the interaction between three Strategic HRM Activities i.e. pay, advancement and success measurement, and perceived performance of workers. As these three strategic methods in HRM have a comparatively direct influence on an employee's pay and status. Therefore the key variables that decide the efficiency of the employee should be regarded.

The effect of HR activities on work satisfaction in the Hyderabad – Warangal private bank sector was examined. They find that the position of boss has a strong positive influence on job satisfaction, while pay policy and decision making engagement have no significant impact on job satisfaction. Authors have also explored the effect on employee work satisfaction in their places of high efficiency HRM activities. Empowerment, work rotation, staff retention, merit based advancement and performance based compensation and grievance management practices were shown to be favorably associated with the job satisfaction of workers. According to the authors, the purpose of this analysis was to examine the connection between best practices in HR and company results. The analysis showed that HRM best practices were success evaluation, organizational collaboration, HRM cohesion in the enterprise, and career preparation. The author claimed that employee wellness facilities enable employees to enjoy a life that is richer and more fulfilling. They ought to be preserved and managed to represent the company well after workers have been recruited, educated and remunerated. Welfare services are meant to take care of the workers' well being, usually do not result in any tracking incentives for employees, which are offered by companies themselves, government and non-governmental organizations, and labor unions to add to the benefits of employees.

### **Indian Economy and HR Practices**

A significant position in the Indian economy has been played by the banking sector. However, there has been a worrying development inside the industry considering all the good achieved by our banks. The downturn in economic development and the global financial crisis also positioned these banks in a tough position by impairing their assets, competitive burdens and fluctuations in non-interest income, although increased competitiveness, higher operational costs and regulatory tightening all lead to the challenges faced by these issues. Studies have found that the secret to meeting both short and long term targets is the successful application of HRM practices. The authors advocated the argument that workers represent a critical part of the capital of the company, with the ability to improve the sustainable competitive advantage of the organization. Authors defined a system of HR as a set of separate but interrelated activities, functions and processes aimed at attracting, developing and maintaining or disposing of the HR of a company. HRM practices indicate that it is a series of policies and practices that enhance the human capital of the company to lead to the achievement of business goals. HRM activities include corporate investment in the preparation, decision making and engagement of specific workers, advancement prospects, and the usage of contingent performance incentives and transparent contact. The effect of HRM activities on employee work satisfaction in Pakistan's public sector banks was examined by the authors. Training and growth, compensation and appreciation and their outcomes have shown that recognition and training and development are a primary source of employee work satisfaction in Pakistan's public sector banks, though reward has had no



major influence on employee job satisfaction. The effect of HRM activities on employee happiness and employee loyalty among Pakistan's government owned public sector banks was also examined by the authors. Three HRM techniques were utilized, such as the method of reward, empowerment, and evaluation. Their results revealed that the most significant factor in generating employee retention is employee pay, while employee empowerment was found to be an essential factor in developing employee engagement. The authors concluded that since banking is a service sector, HRM is essential for banks. Risk control and individual management are two main issues confronting banks. He concentrated mostly on the evolving needs of HRM in today's world banking industry.

As an important part of their management learning plans, numerous companies use such initiatives. Past analysis on action learning programs has demonstrated how the balance of action and learning increases the operational effect of the production of management. In the same way, author explored the HRM association with organizational devotion and work satisfaction. Empirical findings showed that HRM activities had a beneficial association with successful HR response, i.e. work satisfaction, to improve skills, encouragement and interaction enhancement. The author concentrated on the reasons for the advancement of training and management utilizing the Indian banking sector as a case study. The study depended on both qualitative and quantitative data analysis. The findings of the study show that banks regard the creation of training and management as essential considerations, as well as finding the motivation to invest in the development of training and management. These factors include: emerging technology; productivity; reacting to shortcomings in skills; moral duty; call for new hires; and request for workers. Some of the findings based guidelines include that preparation can be viewed as one of the most effective methods for organisations to help workers acquire appropriate information and expertise required to overcome environmental challenges; it should also be remembered that training and growth, while mainly associated with individuals, also concerns technology, the exact way a company does.

### **HR and Sustainable Development**

The HR function of an enterprise may be influential in promoting a holistic commitment to developing a culture of sustainability and environmental stewardship. As such it is proposed that the Sustainability Co-coordinator of an organisation collaborate more closely with the HR executive of the organization. A modern priority field for the realistic application of sustainable growth in an organization may be perceived to be this concept. The method includes introducing substantial adjustments to the organization's processes for: hiring candidates, choosing new workers, performing fresh orientation to staff, performance reviews, assessing employee pay, establishing a mechanism of succession planning, delivering instruction and advancement to employees, and mentoring employees and managers. It also includes forming a win-win relationship between different parties that are in dispute with each other. There are several instances that illustrate how an emphasis on each of the HR processes has enabled organisations to build a culture of sustainability. Multiple measures are available to assist in the study perception, and usage of interpersonal types while communicating with others, according to the source. Interpersonal skills instruction should be theoretically related to the evaluation methods in order to be maximally successful, and training should include not only details about the assessment method, but also the expertise and skills involved with the effective usage of the tool to evaluate and react to others' behaviour.



## What Need to be done?

Literature on the position of supervisor as a history of transition of instruction and encouragement by author to learn in training programs. The literature for the training and growth program emphasizes two key characteristics of the position of the supervisor: assistance and contact. In relation to training programs, the willingness of supervisors to provide appropriate support and practice good communication styles can contribute to improved transition of training and encouragement to learn. While the essence of this partnership is relevant, nothing is known about the predictive properties of the positions of the supervisor in the literature of the training program. In addition, four essential observations were revealed by the effects of stepwise regression analysis: first, help associated insignificantly with willingness to learn. Second, the desire to learn was strongly associated with connectivity. Thirdly, assistance was associated strongly with the transition of instruction. Finally, contact was strongly associated with learning transition. Statistically, this outcome indicates that encouragement is an important precedent for learning motivation, and collaboration is an important precedent for learning motivation. Conversely, assistance and contact in the observed organisation are essential antecedents of training transition. Furthermore, debate, consequences and inference are elaborated.

## Summing up

Various factors have been used, such as empowerment, team work, task rotation, involvement and deferred pay. The methodological outcome shows that employee engagement in decision making is the dominant predictor for employee happiness. It can infer from the review that HR activities have developed in the past few decades in the Indian banking sector. In an enterprise, HR activities play a critical function and they are significantly linked to the success of workers. In the private sector, HR policies are far better than the HR practices adopted by public sector banks. With new players joining the industry, development in the service sector is likely to pose new challenges to HR activities in the Indian banking sector. It is crucial for the success and sustainable development of Indian banks that the management of human capital must be completely aligned with the banking organizations' strategy.

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