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Research Papers

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FABRICATION AND MECHANICAL CHARACTERIZATION OF RIGID CELLULAR EPOXY MATERIAL FOR CORE APPLICATION IN SANDWICH PANELS

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ABSTRACT

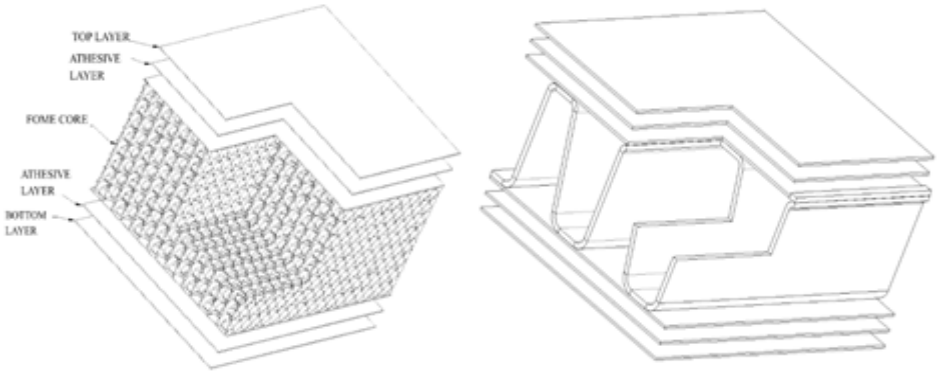
The objective of this study is to manufacture and evaluate the mechanical properties of the rigid cellular epoxy panel. The proposed material could be used as core material for manufacturing sandwich panels for structural applications. Manufacturing technique presented here could reduce the production cost and manufacturing difficulties while improving performance. In this work, epoxy is taken as matrix material along with polystyrene (Thermacol) particles as filler in 97.5% and 2.5% by weight fraction respectively. The panel is produced by curing the mixture in controlled conditions. Tensile, compression and flexural tests are conducted with three replications in each case. Results are compared with rigid polyurethane foam available in the market. The developed material is three times cheaper than rigid polyurethane foam. Though a slight decrease in tensile is observed in our case the compressive strength is approximately double to polyurethane foam.

Keywords: Epoxy, Tensile, Polystyrene, Polyurethane

INTRODUCTION

Composite structural members made of two thin, stiff faces separated by a weak, light-weight core are known as sandwich panels. Separation of the stiff faces by the core increases the moment of inertia of a sandwich beam or plate with little increase in weight, enhancing the properties in bending and buckling. Sandwich structures are widely used because of its ability to provide high bending moment stiffness coupled with light weight. Because of this, sandwich panels are often used in applications where weight-saving is critical: in aviation applications in recent years for flooring, helicopter rotor blades, and tail and wing components. Panels for aircraft structures almost invariably employ fiber composite faces with metal or paper-resin honeycomb or corrugated [1, 2]. Their good energy absorbance combined with high flexural rigidity, furthermore makes them ideal for the manufacture of large panels and modern sports equipment: the decks and ship hulls of racing yachts, and water and snow skis [3, 4]. Also, the automobile industry is beginning to use the concepts developed by the aircraft industry for sandwich construction in the cars of the future. In the non-residential building market sandwich panel roofing is gaining increasing popularity because of its low weight. Other constructions applications include: portable buildings and fold-up bridges (of potential use to the Army) [1]. The innovative, high performance design of load bearing components is crucial in high-tech applications, such as aircrafts, space crafts, satellites or F1 racing cars. These structures should be light in weight, while having high stiffness, sufficient strength and reasonable damage tolerance. This requires structurally efficient construction. Structural efficiency can be maximized by using the most efficient materials and optimizing the geometry of the structure. To produce an optimum design, both these factors need to be considered in the design process.

Currently, sandwich structure manufacturing technique is very popular due to the development of artificial cellular core materials. Materials, such as polymers, aluminum, wood and composites are being used for manufacturing of cores. Use of foam, honeycomb and corrugated construction forms are trending to minimize the structure weight. On basis of skin and core interaction, sandwich structures are categorized as a homogeneous support system and non-homogeneous support systems. Homogeneous support system uses foam as a core material while non-homogeneous system uses structured cores. Various sandwich structures are shown in figure1.



(a) (b)

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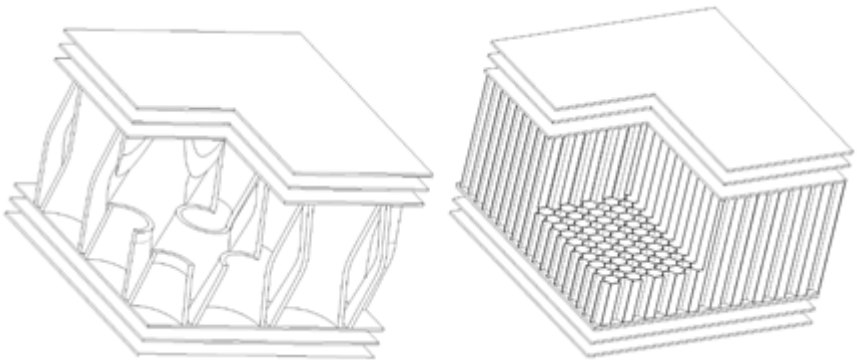

(c) (d)

Figure: 1 (a) Components of sandwich panel and homogeneous support (b) and (c) Non- homogeneous (structured) support (d) Honeycomb structure support

Open cell foams contain interconnected gas pockets while close cell foams have discrete and independent cells. Cellular plastics and polymers have been prepared by a wide variety of processes involving many methods of cell initiation, growth and stabilization. Liquid chemical stabilization and physical stabilization processes are used to produce cellular polymers. Structural components with an integral skin, cellular core and high specific strength are formed by means of injection molding, extrusion or casting depending upon product requirements [5, 6]. The most extensively used injection molding processes are the UC low pressure process [7] and the USM high pressure process [8]. Large structural foam products are manufactured by casting expandable plastic pellets containing a chemical blowing agent in aluminum molds. It is conveyed through a heating zone, where pellets soften, expand and fuse together to form the cellular products. This process produces structural foam products with uniform closed celled structures without solid skin. The syntactic cellular polymer is formed by dispersing rigid, foamed, microscopic particles in a fluid polymer and then stabilizing the system. The particles are generally spheres or micro-balloons of phenolic resin, urea-formaldehyde resin, co-polymers of vinyidene chloride and acrylonitrile [9], glass or silica, ranging 30-120μm diameters. The resin, catalyst and micro-balloons are mixed to form a mortar, which is then cast into the desirable shape and cured. Very specialized electrical and mechanical properties may be obtained but at a higher cost. This method of producing cellular polymers is applicable to a small quantity, specialized applications.

In this paper an attempt is made to manufacture the rigid cellular epoxy panel by using epoxy as the matrix material along with the polystyrene (Thermacol). The various mechanical properties of the developed material are investigated and is been compared with the rigid polyurethane foam which are available in market. The results revealed that the compressive strength is double to that of polyurethane foam. Thus, the proposed material could be used as core material for manufacturing sandwich panels for structural applications and also it's much cheaper compared to the rigid polyurethane foam.

EXPERIMENTAL

Fabrication of rigid cellular panel

The panel is produced by mixing, epoxy (resin and hardener) and polystyrene (Thermacol) macro balls in 97.5% and 2.5% by weight fraction respectively. The mixture is poured into the desired mold and leaves it for primary curing for 24 hours, then the sheet is removed from the mold and kept in a hot air oven for secondary curing. Time - temperature graph during secondary curing is shown in figure 2. The sheet is machined to get the preferred size. Test specimens are prepared according to ASTM standards for the mechanical characterization of rigid cellular material.

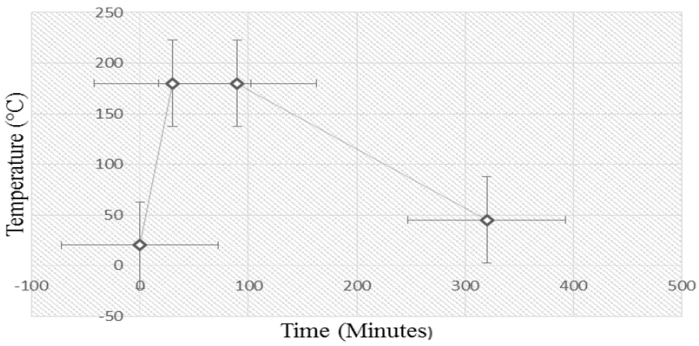

Figure-2: Temperature - Time curve for secondary curing

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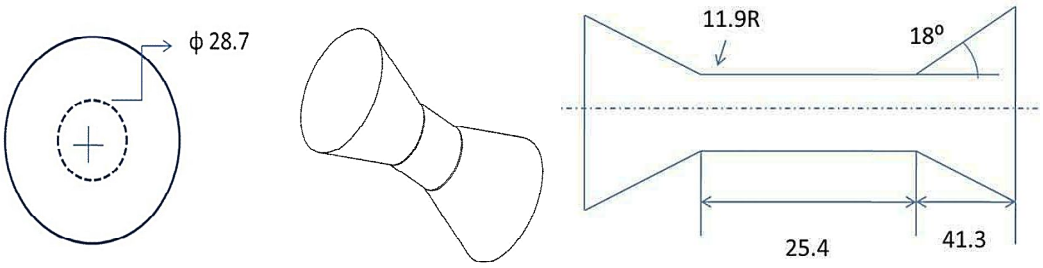
MECHANICAL PROPERTIES

Tensile test specimen

To conduct a tensile test for the developed core material (rigid cellular epoxy) ASTM D 1623-9 [10] standard is referred. According to this standard the specimen has the dumble shape, other dimensions are shown in figure 3. The tests is carried out with three samples and the average value of these three gives the final tensile strength value.



(a) (b)

Figure-3: (a) & (b) Tensile test specimen

Compression test specimen

To conduct compression test for the developed core material, ASTM D 1621-00 [11] standard is referred. According to this standard the specimen is cuboidal in shape with the size of 50.8×50.8×25.4 mm^3, shown in figure 4. The tests is carried out with three samples and the average value of these three gives the compression strength value.

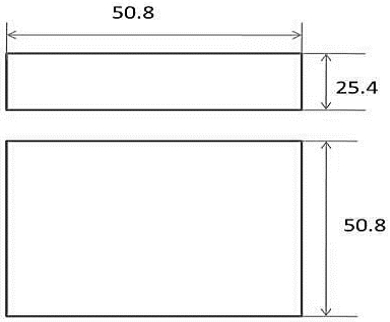


Figure-4: Compression test specimen

Flexural test specimen

To conduct three point bend test for the core material (rigid cellular epoxy) ASTM D 790-02 [12] standard is referred. According to this standard the specimen has the following specifications as shown in figure 5. The tests is carried out with three samples and the average value of these three gives the final flexural strength value.

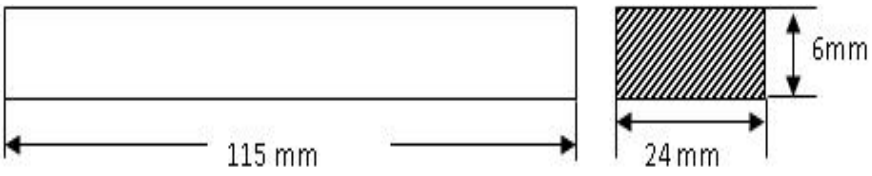


Figure-5: Flexural test specimen

Density test specimen

To evaluate the density of the material (rigid cellular epoxy) ASTM D 1622-8 [13] standard is referred. According to this standard the specimen has a size of 25.4×25.4 ×25.4 mm^3. The tests is carried out with three samples and the average value of these three gives the final density of the material.

RESULTS AND DISCUSSION

Tensile test, compression test and flexural test have been studied by using INSTRON-1195. It is a computerized universal testing machine of capacity 100 kN. The results obtained in the various tests are as follows.

Tensile test

Tensile test carried out is triplication on Instron-1195 as per ASTM standard D1623-09 with the cross head speed of 1.3 mm / min. The load- displacement curves and stress strain curves are shown in figure 6 (a) and (b).

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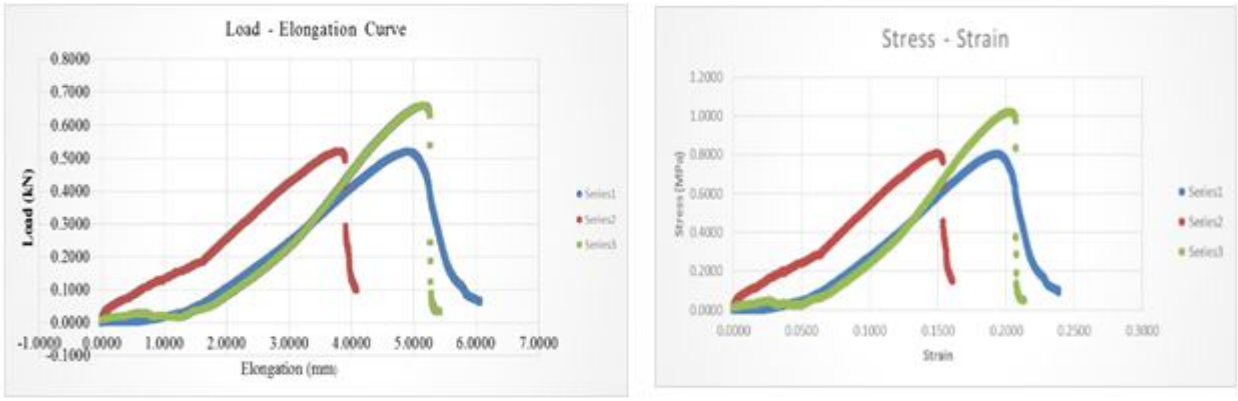


(a) (b)

Figure 6 (a) Load- Elongation curve for specimen A, B & C (b) Stress- Strain curve for specimen A, B & C

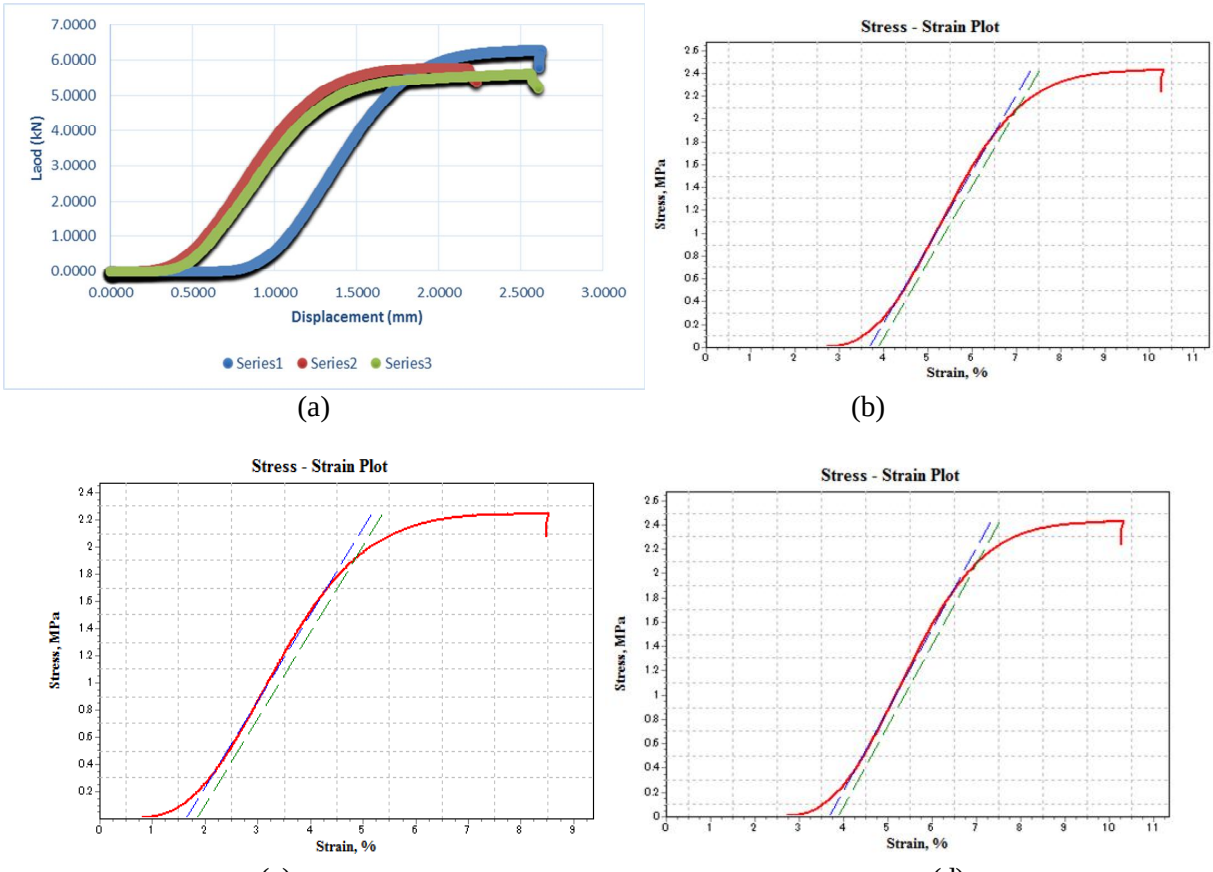
The tensile tests is carried out with three samples and the final tensile strength of the specimen is 0.87833MPa. Table 1 represents the tensile strength results obtained in the tensile test.

Table-1: Tensile strength results

S. No.	Specimen No.	Tensile Strength (MPa)	Average Strength (MPa)
1	A	0.806	**0.8783**
2	B	0.807	
3	C	1.022	

Compression test

Compression test carried out is triplication on Instron-1195 as per ASTM D 1621-00 with the cross head speed of 2.5 mm / min. The specimen is compressed up to 13% of its original thickness. The load- displacement curves and stress strain curves are shown in figure 7 (a), (b), (c) and (d)



(a) (b)

(c) (d)

Figure 7 (a) Load- displacement curve for specimen A, B & C (b), (c) & (d) Stress - strain curve for specimen A, B & C respectively.

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The compression tests is carried out with three samples and the final compression strength of the specimen is 2.281 MPa. Table 2 represents the tensile strength results obtained in the compression test.

Table-2: Compression strength results

S. No.	Specimen No.	Compressive Strength (MPa)	Average Strength (MPa)
1	A	2.428	**2.281**
2	B	2.243	
3	C	2.172	

Flexural test

Flexural test carried out in triplication on Instron-1195 as per ASTM D 790-02 with the cross head speed of 2.5 mm / minute. The environmental test conditions are 23 ± 2°C and 50 ± 5 % relative humidity. The load-displacement and stress-strain curves are shown in the figure bellow.

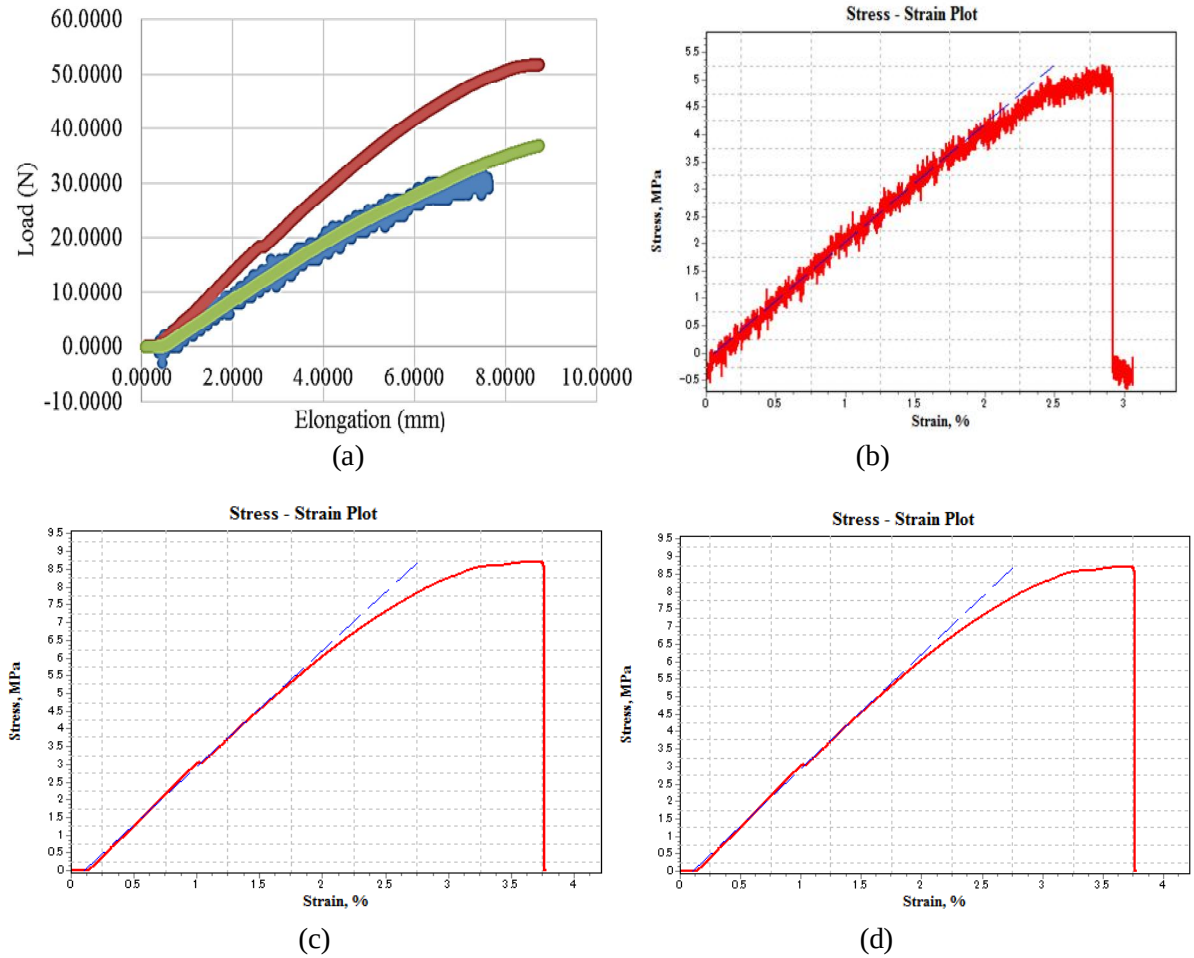

Figure 7 (a) Load - displacement curve for Specimen A, B & C (b) Stress – strain curve for specimens A (c) Stress – strain curve for specimens B (d) Stress – strain curve for specimens .The flexural tests is carried out with three samples and the final flexural strength of the specimen is 6.866 MPa. Table 3 represents the flexural strength results obtained in the flexural test.

Table-3: Flexural strength results

S. No.	Specimen No.	Flexural Strength (MPa)	Average Strength (MPa)
1	A	5.278	**6.866**
2	B	8.70	
3	C	6.622	

Density test

To evaluate the density of the material (rigid cellular epoxy) ASTM D 1622-8. The density tests is carried out with three samples and the final density of the specimen is 0.3291 g/cc. Table 4 represents the density values obtained.

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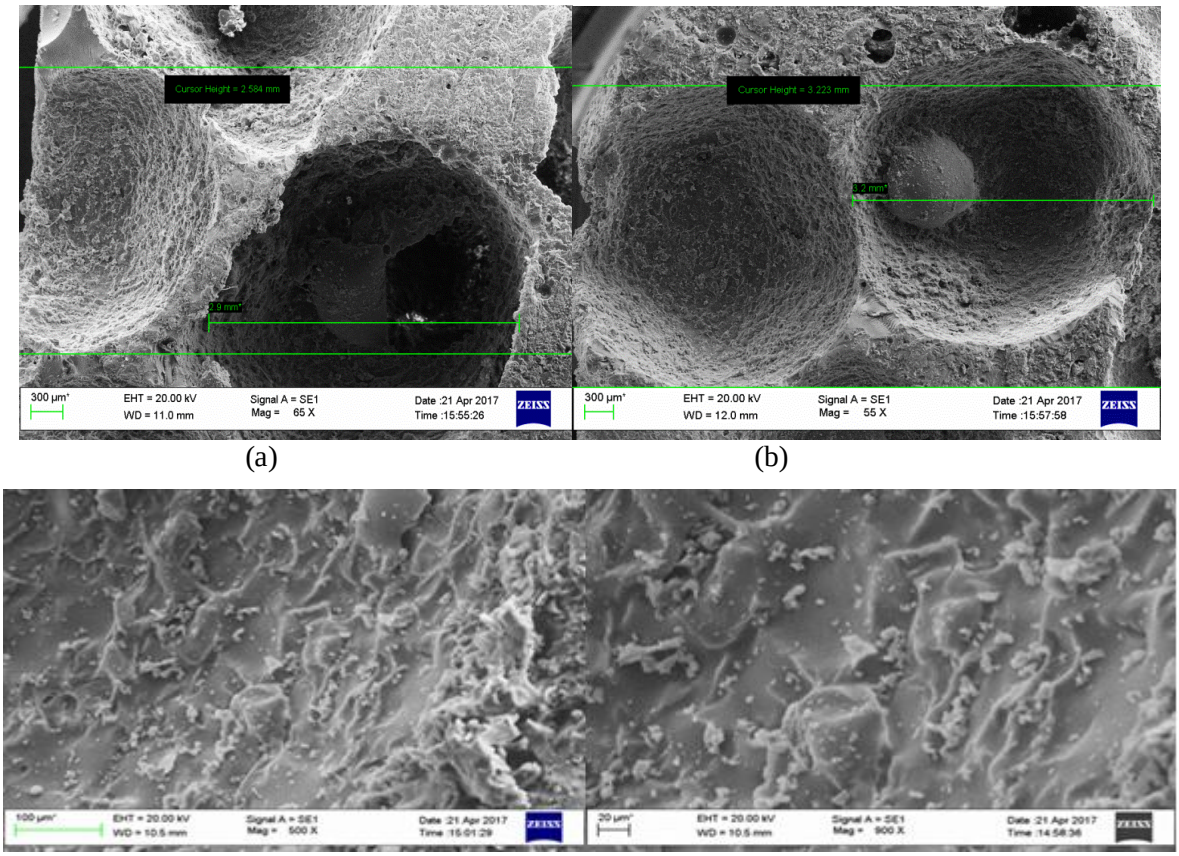
Table-4: Density of the specimens

S. No.	Specimen No.	Density (g/cc)	Average Density (g/cc)
1	A	0.3277	**0.3291**
2	B	0.3338	
3	C	0.3259	

Scanning Electron Microscope (SEM) Analysis

The morphology of the foam core was studied by examining images taken using scanning electron microscope (SEM). SEM images were taken of the cross-sections of the foam core sample that were cut perpendicular and parallel to the back of the core. The cells of the foam core were observed to be spherical in shape when viewed both in the perpendicular and parallel directions. A representative image of the foam core sample is shown in figure 8 using a scanning electron microscope (SEM). The foam core sample had an average cell diameter of around 2.3mm. There was a wide range of cell shapes and sizes seen throughout the foam core sample. Smaller micro-cells were also observed in the foam core sample.



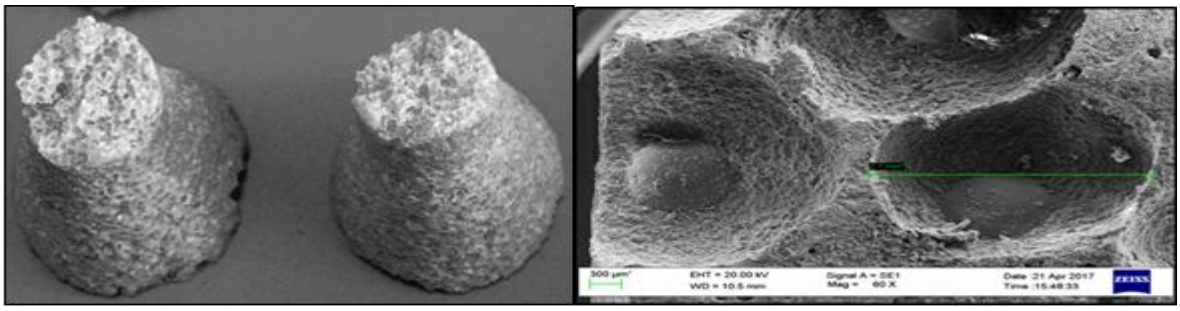
(a) (b)

(c) (d)

Figure: 8 (a) Cellular core with two adjacent cells (b) Average cell size (c) Surface at 500× (d) surface at 900×

Fractographic Study

Fractographic study is been carried on the fractured surface of the specimen. The fractured specimen image is given in the figure 9.



(a) (b)

Figure: 9 (a) fractured specimen (b) Micro-structure

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CONCLUSIONS

The tensile test revealed that material has good tensile strength i.e. 0.8378MPa; during fracture material shows brittle nature as it can be seen in fractured specimen cross section figure 9 (a). Compression test exhibits improved compression strength as compare to polyurethane rigid foam, it is because of the regular cellular structure of 2.8 mm average cell size. Smaller cell size leads to increment in compressive strength with incremental effect in material density. The flat wise flexural test revealed moderate flexural strength, during test material was fractured with sound and behaved like brittle material. It is understandable from the image, that material has close cell structure as cells are well separated from each other by the cell wall.

Rigid, cellular epoxy material for core application is fabricated and its mechanical behavior investigated successfully. The obtained results are compared with rigid cellular polyurethane foam, available in the market. The tensile strength of the fabricated material is 0.8783 MPa which is lesser than compared material strength i.e. 1.2304 MPa. The developed material has shown the good compressive strength of 2.281 MPa which is double in comparison with the compressive strength of rigid cellular polyurethane foam. The material exhibits flexural strength of 6.866 MPa which enables the material to contribute to the flexural strength of the sandwich structure. The material has a density of 0.3291 g/cc with close cell structure; it is heavier than the compared material. Due to innovative manufacturing technique, the developed material is three times cheaper than the compared material.

Table-5: Comparison of the mechanical properties

S. No.	Property	Developed Material	Polyurethane foam
1	Density (g/cc)	0.3291	0.0961108
2	Tensile strength (Mpa)	0.8783	1.19969
3	Compressive strength (Mpa)	2.281	0.9583
4	Flexural strength (Mpa)	6.866	1.4479

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ECONOMIC PERFORMANCE AND SCIENTIFIC ORIENTATION OF SUGARCANE GROWERS IN WESTERN UTTAR PRADESH

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ABSTRACT
The study was conducted in the two districts of Western Uttar Pradesh. The total sample size was of 200 sugarcane growers and ex-post facto research design was used for this study. The data was collected with the help of the interview schedule. The results of this study revealed that most of the sugarcane growers were medium level scientific orientation of sugarcane growers regarding sugarcane production technology because it has average interest to scientific orientation for relating to improved sugarcane cultivation practices. Most of the respondents were having medium level of economic performance regarding sugarcane cultivation because various farmers associated with the small business enterprises and its allied sectors.The variables like age, family type, social participation, annual income and communication behaviour were found non-significant correlated with the economic performance of sugarcane growers.

Keywords: Sugarcane growers; Percentage; Economic Performance;

INTRODUCTION
Sugarcane is an important cash crop in many tropical and subtropical countries and accounts for over 70% of the world sugar production. In India, this is a major commercial crop that sustains sugar industry in particular and so many other allied industries like ethanol, industrial alcohol, liquor, paper, rubber, wax, cardboard etc. in general. Sugarcane's juice is used for making white sugar, brown sugar (khandsari) and jaggery (gur). Sugarcane is one of the main cash crop for earning foreign exchange. The main by-product of sugarcane industry is bagasse and molasses. Bagasse is mainly used as a fuel. It is also used for the production of compressed fiber board, paper, plastics and furfural. Molasses is used in distilleries for the manufacture of ethyl alcohol, butyl alcohol, citric acid etc. Molasses is also used as an additive to feed for live stocks. Green tops of the cane are a good source of fodder for cattle press mud is used as manure in alkaline and saline soils. Sugar industry in India is next in importance only to the textile industry and provides employment to a large number of people.

The current scenario in sugarcane cultivation is vastly different from the earlier years in terms of demands and sustainability. The demand for sugar and sweeteners is steadily increasing, consistent with population growth. Apart from sugar and sweeteners, sugarcane has an equally important state in biofuel and bio energy sectors as well. To meet these demands there is need for enhanced sugarcane production which is possible only by increasing the productivity per hectare, since the scope for further expansion of cane area is limited. Productivity is constrained by several factors like biotic and abiotic stresses, resource constraints and climate change etc. (Yadav and Yadav 2018).

In India, area and production of sugarcane has been fluctuating from year to year depending upon price policy and climatic conditions. It occupies about 5.07 million hectares. The total production of cane is 362 million tones.

Table-1: State wise area and production of sugarcane during 2014-15.

S. No.	State	Area (000 hectares)	Production (000 tones)
1.	Andhra Pradesh	139	9987
2.	Assam	30	1099
3.	Bihar	254	14034
4.	Chhattisgarh	19	49
5.	Gujrat	208	14330
6.	Haryana	97	7169
7.	Karnatka	480	43776
8.	Madhya Pradesh	111	4567
9.	Maharashtra	1030	84699
10.	Orrisa	10	723
11.	Punjab	94	7039
12.	Rajasthan	6	409

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13.	Tamil Nadu	263	28093
14.	Uttar Pradesh	2141	133061
15.	Uttrakhand	102	6165
16.	West Bengal	18	2106
17.	Others	65	5024
All India		**5067**	**362333**

(Yadav and Yadav 2018)

Uttar Pradesh has the largest acreage under sugarcane and accounts for about 52 percent of the area in India and also accounts for 40 percent of the total annual production but the production per hectare is the highest in Tamil Nadu followed by Maharashtra and Karnataka.

Sugarcane is an important cash crop in India and grown on an area of about 4.5 million ha, which is around 3.7 percent of the net area sown in the country. Sugarcane contributes about 4.6 percent of total value of output from agriculture and supports rural livelihood of about 50 million sugarcane farmers and around 5 lakh workers are directly employed in sugar mills. India is the largest producer of sugarcane, second largest producer of sugar after Brazil and the largest consumer of sugar in the world. However, productivity level in India is much lower compared with other major producing countries like Thailand and China. There were 731 sugar mills in the country, out of which about two-thirds (485) were in operation during 2016-17. Out of total 731 mills, 328 are in cooperative sector, 44 state owned and 359 in private sector. The share of closed mills was the highest (75 per cent) in the public sector, followed by cooperatives (36.6 percent) and the lowest in private sector (25.9 per cent). Average capacity utilization of sugar industry was about 75 percent during 2015-16 *(*Price Policy for Sugarcane 2018-19 Sugar Season).

METHODOLOGY

The study was conducted in Meerut and Muzaffarnagar districts of Western Uttar Pradesh. The four blocks Machhra, Rajpura blocks in district Meerut, and Khatauli, Charthwal blocks in district Muzaffarnagar were purposively selected. The data was collected with the help of the interview schedule. The total sample size was of 200 sugarcane growers selected randomly from 20 villages for this study. The responses of respondents were collected through a comprehensive schedule developed by the researcher in consultation with the experts. Later the responses were tabulated, analyzed appropriate statistical method to understand the preference of sugarcane growers.

(i) Frequency distribution

It was used to find out the number of respondents in the particular cell.

(ii) Percentage

This was used for making simple comparison for calculating percentage; the frequency of the particular cell was divided by the total number of respondents in that particular category and multiplied by 100.

$$P = \frac{F}{T} \times 100$$

Where,

F = Frequency of a particular cell

T = Total number of respondents in that particular cell

P = Percentage

Economic performance

Economic performance is defined as the ratio of value of output of total expenditure in index value. The procedure developed by Shankaraiah and Crouch (1997) was adopted in the present investigation.

Measurement of economic performance

For estimating the total expense on the sugarcane cultivation, the expenditure onsugarcane production, labour, fertilizer, plant protection measures, transportation, marketing and miscellaneous were considered for a period of one year. To estimate the total value of output, the amount realized from the sale of sugarcane, sugarcane by-products were considered for a period of one year.

Economic performance index for sugarcane growers was calculated by using the following formula:

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$$EPI = \frac{VTO}{TE} \times 100$$

Where,

EPI = Economic performance index

VTO=Value of output for a period of one year

TE= Total expenditure incurred for a period of one year.

Correlation coefficient (r)

The coefficient of simple correlation (r) in a measure of the mutual relationship between two variables *i.e.* x and y, where the relationship is measured and commonly termed as product moment correlation coefficient and is computed by the following formula:

$$r = \frac{\sum (xi - \bar{X})(yi - \bar{Y})}{\sum (xi - \bar{X})(yi - \bar{Y})}$$

Where,

r = correlation coefficient

xi = i^{th} value of x variables

$\bar{X}$ = mean of x

Yi = i^{th} value of y variables

$\bar{Y}$ = mean of y

RESULTS AND DISCUSSION

Table-2: Distribution of the respondents according to their economic performance:

S. No.	Categories	Respondents	
		Frequency	Percentage
1.	Low	10	05.00
2.	Medium	166	83.00
3.	High	24	12.00
4.	**Total**	**200**	**100**

Table-2 reveals that the majority of the respondents (83.0%) were found medium level of economic performance followed by, (12.0%) high and (5.0%) under low level of economic performance respectively. Hence, it can be inferred that most of the sugarcane growers were having medium level of economic performance.

Thus, it is clear from the table that the majority of the sugarcane growers belonged to medium level of economic performance because farmers wereassociated with various small business enterprises and its allied sectors. Findings conformity to (Prasad *et al.* 2014).

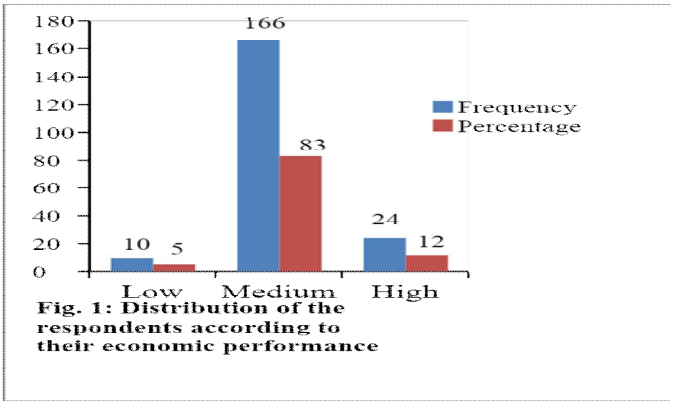

Fig. 1: Distribution of the respondents according to their economic performance

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Table-3: Distribution of the respondents according to their scientific orientation:

S. No.	Categories	Respondents	
		Frequency	Percentage
1.	Low (up to 23 members)	27	13.50
2.	Medium (24 to 26)	143	71.50
3.	High (and 26 above)	30	15.00
4.	**Total**	**200**	**100**

It is evident from the Table-3 that in the scientific orientation (71.5%) of the sugarcane growers were found medium level followed by, (15.0%) per cent high and (13.5%) per cent were found in low level of scientific orientation. Hence, it can be concluded that the sugarcane growers have average interest to scientific orientation for relating to improved sugarcane cultivation practices.

Thus, it is clear from the table that the majority of the sugarcane growers had belonged to medium level of scientific orientation. Similar result reported by Devi *et al.* (2012) and Chouhan*et al.* (2013).

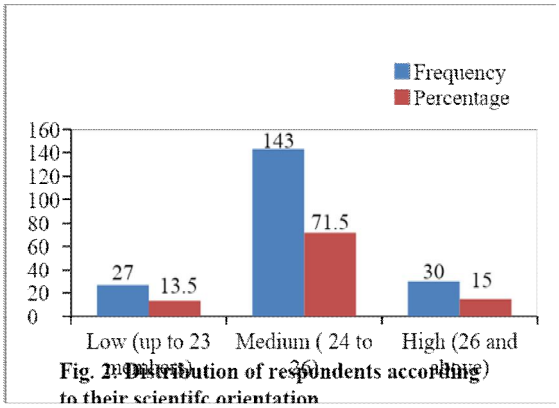

Fig. 2: Distribution of respondents according to their scientifc orientation

Table-4: Correlation coefficient (r) between different independent variables and economic performance:

S. No.	Independent variable	Correlation coefficient
1.	Age	-0.07369
2.	Education	0.172322*
3.	Caste	0.101996
4.	Family type	-0.00975
5.	Family size	0.041896
6.	Housing pattern	0.039104
7.	Landholding	0.009093
8.	Occupation	0.025222
9.	Social participation	-0.0695
10.	Material possession	0.067821
11.	Annual Income	-0.07721
12.	Communication behaviour	-0.12178
13.	Economic Motivation	0.019601
14.	Scientific orientation	0.040424

*Significant at 0.05%** probability level Significant at 0.01% probability level

It is clear from the values of correlation coefficient as appeared in Table-4 that out of 14 variables namely education significantly at 0.05 % probability level and caste, family size, housing pattern, landholding, occupation, material possessions, economic motivation and scientific orientations were found non-significant but positively correlation. The variables like age, family type, social participation, annual income and communication behaviour were found non-significant correlated with the economic performance of sugarcane growers.

CONCLUSION

The study has clearly brought out that the access of economic performance and scientific orientation of sugarcane growers. It is clear from the study that the majority of the sugarcane growers belonged to medium

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level of economic performance because of their association with various small business enterprises and its allied sectors. It is also concluded that the majority of the sugarcane growers also belonged to medium level of scientific orientation. Hence, it can be concluded that the sugarcane growers have average interest to scientific orientation for relating to improved sugarcane cultivation practices. The variables like age, family type, social participation, annual income and communication behaviour were found non-significant correlated with the economic performance of sugarcane growers.

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PHYTOCHEMICAL SCREENING AND THEIR BIOEVALUATION OF *EUPHORBIA HIRTA* LEAF EXTRACTS

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ABSTRACT
The aim of the present study was to investigate the phytochemical screening and antimicrobial & antifungal activities of our selected medicinal plant Euphorbia hirta leaf extracts. Phytochemical screening revealed the presence of various active phytoconstituents in the extracts of aerial part of Euphorbia hirta due these phytochemicals our plant show significantly antimicrobial & antifungal activity.

Keywords: Euphorbia hirta, Antimicrobial activity, Anti fungal Activity.

INTRODUCTION
Medicinal plants are gifts of nature which is store house of remedies to cure limitless number of diseases of human beings. The plant kingdom represents an enormous reservoir of biologically active compounds with different chemical structures and protective or preventive properties these biologically active compounds are called as phytochemicals. These phytochemicals are generally secondary metabolites which are present in smaller quantities in higher plants, include the alkaloids, steroids, flavonoids, terpenoids, tannins, and many others. Biologically active compounds are widespread from plant sources have always been of great interest to researcher working on infectious diseases. Over the past decade there has been an explosion of interest among the researcher in the antimicrobial, particularly antibacterial and antifungal, activity of natural products the abundance of plants on the earth's surface has led to an increasing interest in the investigation of different extracts obtained from traditional medicinal plants, as potential source of new antimicrobial agents.

Euphorbia hirta is a medicinal, rhizomatous herb belonging to Euphorbiaceae family generally found in southern Western Ghats of India and northern east coast of Tamil Nadu. In African countries the extract of this plant are commonly used in the treatment of asthma and respiratory tract inflammations. It is also used for coughs, chronic bronchitis, and other pulmonary disorders

in Malagasy. The plant is also widely used in Angola against diarrhea and dysentery, especially amebic dysentery. In Nigeria, extracts or exudates of the plant are used as ear drops and in the treatment of boils, sore, and promoting wound healing.

The use of plant extracts and phytochemicals with known antimicrobial properties, can be of great significance in therapeutic treatments. This Herbal and natural products have been used in herbal medicine for centuries throughout the world, but there are relatively lower incidences of adverse reactions to plant preparations compared to modern conventional pharmaceuticals, this coupled with their reduced cost, is encouraging for both the consuming public and national health care institutions to consider plant medicines as alternatives to synthetic drugs. But the majour challenges facingin herbal medicine industries are the overall quality safety and and efficiency of the herbal medicines. With this respect in current study we made extracts with different solvents .we did phytochemical screening of these extracts and evaluate all extracts for antimicrobial and antifungal activity.

MATERIALS AND METHODS
Plant Collection and Authentication
The leaves of *Euphorbia hirta* was collected from the different part of dehradun and authenticated by Botany department of FRI, Dehradun. The leaves of selected plant was washed thoroughly 2-3 times with running water and once with sterile distilled water.

Preparation of extract
Shade-dried plant leaves of euphorbia herita was converted in to small pieces by using mortar and pestle grinded into powdered form The powdered plant material was udergo to sequential solvent extraction by using soxhlet extraction method. The extraction was done with different solvents in their increasing order polarity such as hexane, chloroform and ethanol. The isolated extract was evaporated using rotary evaporator and the percentage yield was thus recorded. Dried extracts were stored in airtight containers for further studies. Concentrated extracts were subjected to various chemical tests in order to detect the various phytoconstituents.

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Phytochemical screening
The concentrated extracts of selected plant was subjected to different chemical tests for the detection of different phytoconstituents using standard methods [19, 20].

(i)Test for saponins
Crude extract when mixed with 5ml distilled water in a test tube then it was shaken briskly. The formation of stable foam which indicate the presence of saponins.

(ii) Test for flavonoids
Crude extract when mixed with 10ml distilled water, 5 ml of dilute ammonia solution were added to a portion of the aqueous filtrate solution then added 1ml concentrated sulphuric acid. Indication of yellow color shows the presence of flavanoids.

(iii) Test for steroids
The crude extract of selected plant was dissolved in 0.5mL dichloromethane to prepare a dilute solution and then 0.5 mL of acetic anhydride was added followed by four drops of concentrated sulphuric acid. A blue-green colouration indicated the presence of steroids.

(iv) Test for tannins
Curde extract of plant was mixed with small amount of water and heated on water bath. The mixture was filtered and ferric chloride was added drop by drop to the filtrate. A dark green appear which indicates the presence of tannins.

(v) Test for Alkaloids
Curde extract was dissolved with 2ml of 1% HCl and heated gently. Wagners and Mayers reagents were added to the mixture. Turbidity of the resulting precipitate was taken as confirmation for the presence of alkaloids.

(vi) Test for carbohydrate
Both Felhing A and Felhing B solution were mixed in equal volume. These reagent are added in crude extract and smoothly boiled. A brick red precipitate is appeared at the bottom of the test tube and indicate the presence of reducing sugar.

Microbial samples
The human becteria such as *Streptococcus mutans, Clostridium absonum, and Escherichia coli* were obtained from department of biotechnology of JS university and were maintained in Nutrient agar at 4 ºC for experiment studies. The different fungus strains such as *Arthogrophis cuboida, Aspergillius fumigates* and *Aspergillius nigar* were isolated from potato dextrose agar.

Screening for Antibacterial Activity
Assay of anti-bacterial activity of leaf of *Euphorbia hirta* was done by Disc Diffusion method. In this method 30 ml of sterilized Mueller Hinton Agar was poured into sterile petri plates, after solidification, 130 µl of bacterial culture poured on the plates and the culture was spread on plates using spreader. Then, the Whatmans filter paper discs (5mm in diameter) were kept over the agar plates using sterile forceps at various concentrations. Concentrated solvent was used as negative control. The anti-bacterial assay plates were kept incubator, where all the plates were incubated at 37ºc for 24hours. The diameter of inhibition zone was noted down.

Screening for Antifungal Activity
Assay of anti-fungal activity of leaf extract of *Euphorbia hirta* was done by Disc Diffusion method. In this method 30 ml of sterilized Mueller Hinton Agar was poured into sterile petri plates, after solidification, 130µl of fungus culture poured on the plates and the culture was spread on plates using spreader. Then, the Whatmans filter paper discs (5mm in diameter) were kept over the agar plates using sterile forceps at various concentrations. Concentrated solvent was used as negative control. The anti-fungus assay plates were kept incubator, where all the plates were incubated at 36ºc for 24hours. The diameter of inhibition zone was noted down.

RESULT AND DISSCUSION
In the present study, different leaf extract of *Ephorbia herita* were subjected to qualitative phytochemical analysis to explore its anti microbial and antifungal activity for its medicinal applications.

The percentage yields of leaf extracts with different solvent and the phytochemical constituents of the plants are shown in table 1 and 2 respectively. The highest yield of leaves extract was found when extraction was done with ethanol and the lowest in case of hexane. This is most probably due to change in the polarity of solvents.

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Table-1: The Yield of extract with different solvent (%)

Plant Sample	Ethanol Extract (%)	Chloroform Extract (%)	Hexane Extract (%)
Leaves	34	21	12

Table-2: Preliminary phytochemical analysis of different leaves extract of *calotropis gigantea*

Phytochemical constituents	Ethanol	Chloroform	Hexane
Alkaloids	+	+	_
Flavonoides	+	+	+
Terpenoids	+	+	_
Tannins	-	+	_
Saponins	-	_	_
Carbohydrates	-	+	_

+ = indicates presence of phytochemicals

- = indicates absence of phytochemicals.

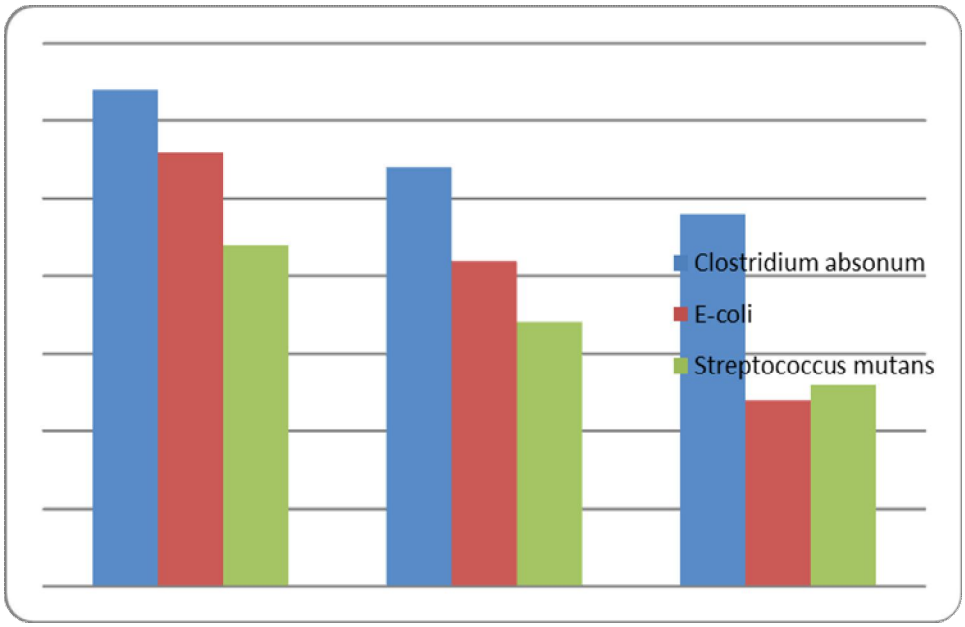
The result of the preliminary phytochemical screeing of different leaves extract of *Euphorbia herita* shows in table 2. The present study reveals that the phytochemical screening and qualitative estimation of leaves extract of *Euphorbia herita* showed the presence of alkaloid, flavanoid, tannin, terpenoid and carbohyrate in choroform. In ethanolic extract of leaves alkaloid, flavanoid, sponins, carbohydrate and terpenoids are present.In the hexane extract of leaves only flavonoid is presnt.

Antibacterial activity

Result of the antibacterial activity of the isolated leaf extract of our selected plant was shown in table 3. The dried leaves extract of *euphorbia extract* shown to posse's antibacterial activity. The antibacterial activity of ethanol, chloroform and hexane of extract of leaves of *euphorbia extract* were inspected against the selected experiment pathogens such as *Streptococcus mutans, Clostridium absonum, and Escherichia coli* by disc diffusion method.. The ethanolic leaf extract of *euphorbia herita* showed the maximum zone of inhibition against in *Clostridium* (32 mm) which is gram positive bacteria and cause several diseases such as food poisoning, pneumonia and brain abscess. The hexane extract of leaves extract of *euphorbia herita* showed minimum zone of inhibition against *Escherichia coli* (12 mm).

Table-3: The Zone of inhibition (mm) of different extracts against the tested bacteria

Microorganisms	Leaves Extract (zone of inhibition in mm)		
	Ethanol	Chloroform	Hexane
Clostridium absonum	32	27	24
E-coli	28	21	12
Streptococcus mutans	22	17	13



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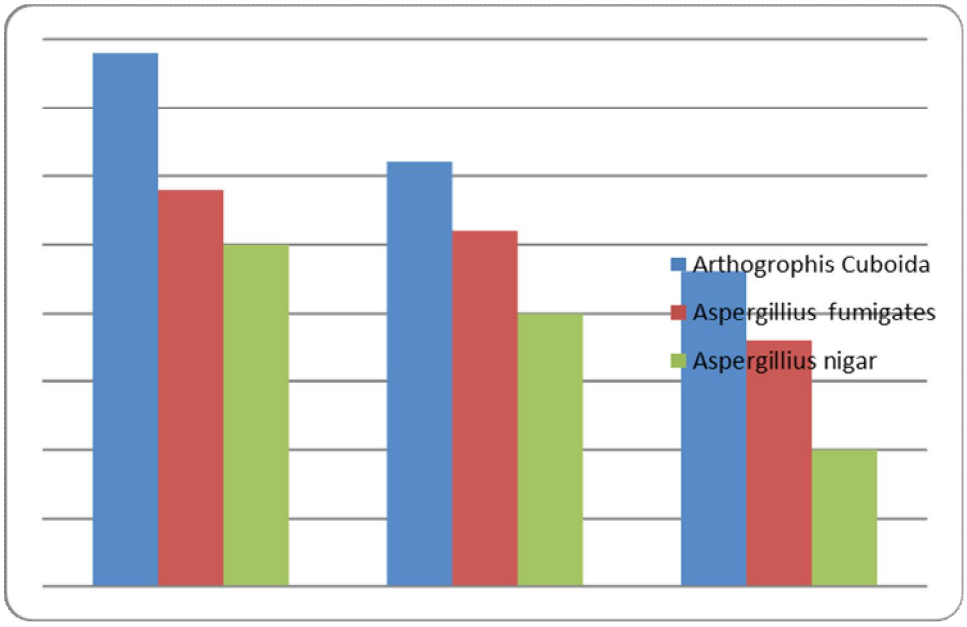
Antifungal activity

Result of the antifungal activity of the isolated extract by using different solvent (ethanol, chloroform, and hexane) was showed in table 4. The antifungal activity of ethanol, chloroform and hexane of extract of dried leaves of *euphorbia herita* were inspected against the selected experimental pathogens such as *Arthogrophis cuboida*, *Aspergillus fumigates* and *Aspergillus niger* by disc diffusion method. The ethanol leaf extract of *Calotropis gigantea* showed the maximum zone of inhibition against in *Arthogrophis Cuboida* (39 mm). The hexane extract of leaves extract of *Calotropis gigantea* showed minimum zone of inhibition againest *Aspergillius nigar* (10 mm). Minimum Inhibitory Concentration (MIC) of *Calotropis gigantean* was also determined and the result was shown in table-**5**

Table-4: Antifungal activity of leaves of *Euphorbia herita*

Microorganisms	Leaves Extract (zone of inhibition in mm)		
	Ethanol	Chloroform	Hexane
Arthogrophis Cuboida	39	31	23
Aspergillius fumigates	29	26	18
Aspergillius nigar	25	20	10



CONCLUSION

The finding of our study clearly indicate that the Euphorbia herita may be used as potential antimicrobial and antifungal agents.

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A COMPARATIVE STUDY BETWEEN LIQUID CULTURES AND SOIL CULTURES OF *SPIRULINA PLATENSIS* (NORDST) GEITLER

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ABSTRACT
Liquid cultures of Spirulina platensis (Nordst.) Geitler were grown in sand, clay and red sand enriched with liquid media for a period of 40 days along with suitable control culture. The liquid culture (control), was compared with those grown in the 3 different types of soil mentioned above, with respect to the arrangement of trichomes and the percentage of occurrence of the various trichome types together with morphological characters, viz., the number of spirals, distance between the spirals and width of the trichome. Cultures of Spirulina showed maximum growth in red sand as compared to clay and sand. Growth was minimum in clay soil. The number of spirals was variable, whereas the distance between the spirals increased in the soil as compared to the liquid medium. The width of the trichome underwent a reduction in the red sand compared to other types (soils and liquid). There was a reduction in the percentage of straight trichomes and increase in the percentage of circular trichomes in the soil types as compared to liquid cultures. The results are analysed.

Keywords: Spirulina platensis, CFTRI Medium, MCRC…

INTRODUCTION
Spirulina platensis (Nordst.) Geitler considered synonymous with *Arthrospira platensis* (Nordst.) Gomont is an aquatic alga, highly variable (see desikachary 1959) and is usually raised and maintained in liquid or agarised media (see Venkataraman 1980 , 1989). With the objective of studying the alga under soil conditions, cuttures from liquid medium were inoculated into three diffrent soil types. The results are discussed.

MATERIALS AND METHODS
Weighed quantities (10.0 g) of red soil, sandy soil and clay samples were put in petriplates in triplicate and sterilized, After cooling, 1 ml *Spirulina* Culture was added to each soil sample uder sterile conditions. This inoculum was from 15 day old cultures of *Spirulina* obtained from CFTRI, Mysore, and grown in the CFTRI liquid medium. The Soil cultures and control liquid cultures were incubated in continuous illumination and room temperature for a period of 40 dyas. During this period, the samples in the petriplates were moistened with minimum amount of sterile CFTRI medium under aseptic conditions. At the end of the incubation period the samples were withdrawn and analysed for the pattern of growth of the trichomes, their shape, number of spirals, distance between the spirals and width. Sufficient number of trichomes (minimum 100) were studied to make averages. Comparisons were made with liquid cultures. (Table1).

Table-1: *Spirulina platensis* – comparison of liquid and soil cultures

Characters	Sand	Clay	Red Soil	Control
1. Arrangement of trichomes	sparse rarely, clumped	Sparse,Clumping Common	Sparse Clumping rare	Sparse
2. % long trichomes	48.5	47.6	40.8	63.8
3. % Short trichomes	16.8	15.8	13.9	20.8
4. %cirucularlycoiled trichomes	21.6	21.8	21.6	15.0
5. Average number of spirals	5.1	2.7	3.9	5.3
6. Distance between spirals	54.8 mm	46.8 mm	53.8 mm	37.3 mm
7. Width of trichomes	3.5 mm	3.4 mm	2.4 mm	3.95 mm

With a view to test the water retention capacities of the different soil samples subsequent to the growth of *spirulina* equal weighed quantities in triplicate of treated and untreated soils were placed in filter papers. To each of these, 10 ml water was added. The amount of water collected after a lapse of 10 minutes was measured in each case. The is tabulated in Table 2.

Table-2: Water retention in untreated (control) and treated soils (with *Spirulina* Cultures).

Sample	Amount of water collected after 10 minutes*	
	Untreated	Treated
Sand	8.0	9.0

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Clay	6.6	7.9
Red Soil	7.9	8.6

*amount of water added 10ml

RESULTS

Trichomes of *Spirulina* from the liquid medium were able to survive and grow in all the three types of soils under consideration, for 40 days. The trichomes were however sparse and showed occasional clumping in the sand and red soil. Clumping of the trichomes was more common in the clay. The percentage of long trichomes in the control was 64. This was found to be much lower in the soil culture; 48.5 in sand; 47.6 in clay and 40.8 in red soil. The number of short S.- Shaped trichomes was 20.8% in liquid cultures, 16.8%, 15.8% and 13.9% in sand, clay and red soils respectively. 15% was circulary coiled in liquid cultures. This was found to increase to 21% in all the soil cultures. The average number of spirals was 5.3 in liquid cultures and nearly the same in the sand and red soil cultures. The value was 2.7 in clay cultures. The distance between the spiral was on the average 37.3 mm in control, 54.8 mm in sand 46.8 mm in clay and 53.8 mm in red soil. The average width of the trichome was 3.0-4.0 mm in the control, sand and clay cultures, but 2.4 mm in red soils culture. These are indicated in Table 1. As may be seen from Table 2, in all the treated samples, the water collected from the soil was more than in the untreated soils.

DISCUSSION

Spirulina is an aquatic alga in nature. The present study reveals that it is capable of growing in soil, though slowly. It is able to survive in the soil samples. The percentage of long trichomes is reduced in the soil conditions. there is a marked increase in the percentage of circular coiled trichomes. This type of trichome encircling appears to be common under soil conditions. In the clay, the number of spirals gets markedly reduced. In the long trichomes, there is a marked increase in the distance between the spirals under soil conditions. The reduction in trichome width is marked in there sand culture.

The aquatic alga, *Spirulina* appears to adopt itself to soil conditions by becoming coiled. Trichome elongation is not as much-publicized pronounced. There is also a general trend in the diminution of trichome width. *Spirulina* does not appear to bind the soil. On the contray, it appears to promote soil aeration, by loosening the soil.

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BOTANICAL PHARMACOGNOSY OF LEAF AND STEM OF *ACHILLEA MILLEFOLIUM* L. (BRINJASIF)

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ABSTRACT
Achillea millefolium L. (Brinjasif) is an ancient therapeutic herb of Europe that is explored to cure wounds, gastrointestinal, menstrual problems, arthritis, inflammation, asthma and liver disorders. The drug has colossal remedial potentials such as anticancer, antiulcer, hepatoprotective, anti-inflammatory, antioxidant, antimicrobial, immunosuppressive and cardiovascular effects. The present investigation has been undertaken to delineate the pharmacognostical contour of leaf and stem of the plant. Findings of the research disclosed that the microscopic study showed the presence of epidermis with thin layer of cuticle, spiny trichomes, mesophyll cells full of chloroplast in leaf. Presence of cortical cells, suberized endodermis, ring shaped vascular bundle surrounded by pericyclic fibers and well developed pith serve as the noted features from the anatomical study of the plant stem. The powder microscopic study showed the presence fragments of trichomes, epidermal tissue, prismatic calcium oxalate crystals, stone cells and vessels with spiral or annular thickenings. The finding demonstrated that the present study will provide the scientific data on macro, micro and powder microscopic standards for the proper identification and authentication of Achillea millefolium L.

Keywords: Achillea millefoilum, Microscopy, Pharmacognosy, Standardization

INTRODUCTION
Achillea millefolium L. (synonym: *A. lanulosa* Nutt.) belonging to the family Asteraceae, popularly known as "yarrow" is an erect, woody, perennial, pubescent herb. The leaves of the plant are of green or grayish-green colour, slightly pubescent on the upper surface and very pubescent on the lower surface, twice- and thrice pinnate into linear segments with finely pointed tip. Stems are pubescent, green, partly brown or purple colour, longitudinally striated, with a light core [1]. The genus *Achillea* is widespread all over the world and comprises over 130 perennial herb species indigenous to the Northern Hemisphere from Europe to Asia and grows in temperate climates in dry or semi-dry habitats [2]. The name *Achillea* is referred to the Achilles in the literary Trojan War of the Iliad who used yarrow to treat the soldier's wounds [3, 4]. The genus is listed among the most commonly used plant species in both folk and conventional medicine for over 3000 years [5]. *A. millefolium*, a very important medicinal plant in Unani (Greco-Arab) system of medicine under the name of Biranjasif [6]. Several traditional uses have been investigated and confirmed in experimental studies, including anti-inflammatory, analgesic, antiulcer, anxiolytic, hepatoprotective, hypotensive, and antiproliferative against human tumoral cells [7–13].

A. millefolium has a long history of use as traditional herbal medicine even in veterinary medicine [14]. The plant also has also been used as a powerful healing herb typically for wound, cuts and abrasions [15]. Phytochemical screenings revealed that chemical constituents of *A. millefolium* (AM) present several secondary metabolites, including essential oils, sesquiterpenes, the alkaloid achilleine, steroids, triterpenes, and flavonoids, as presented by De Souza et al. [7]. Nowadays, it is commonly used in herbal pharmacies for the tinctures and capsules preparations exploiting dry flowers or aerial parts. The plant is also used as a component of a variety of industrial tea mixtures and an ingredient of phytoremedies (e.g. Amersan) [16]. Reports have been published on the phytochemistry and pharmacology of the aerial parts of the plant but no report is available on the pharmacognostical characters on stem and leaf of the plant. Considering its ethno pharmacological importance the present study was conducted for the pharmacognostical investigation, of A. *millefolium* L. leaf and stem which could be used in the authentication of the sample and monograph preparation.

OTHER NAMES

Arabic	Al-Biranjasif
Urdu	Burabhasuf
Unani	Biranjasif
English	Yarrow; Milfoil

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Gujarati	Biramjasif
Kashmiri	Inomadnu, Momadru, Chopandega
Arabic	Al-Biranjasif
Persian	Birajasp, Palang Asp. Bue-Madran
Kannada	Roojamari
Sanskrit	Biranjasipha
Marathi	Rajmari, Rojmari

Part used: Leaf and Stem

MATERIAL AND METHODS

Pharmacognostical Studies

The leaf and stem of the plant *Achillea millefolium* L. were purchased from the Khari Baoli, a local market of New Delhi and authenticated by Botany Section (Pharmacognosy Lab.), Drug Standardization Research Institute, Ghaziabad. Hand section of the leaf and stem with the help of potato pith was taken, stained and mounted following usual micro-techniques [17] and representative photograph were taken with the help of digital microscope for photo documentation (Motic).

OBSERVATION AND RESULTS

Macroscopic: The drug contain aerial dried part in the form of stem pieces of yellowish green colour with sweet scent, which are ribbed and round. The peduncle is downy and pale in colour. Flowers occur in characteristically dense terminal corymbs having capitulum. The leaves are 5–20 cm long, hairy, bipinnate or tripinnate, almost feathery and arranged spirally near the middle and bottom of the stem. The leaves are very finely dissected like soft dainty ferns (Fig. 1).

Microscopic

Leaf: It is composed of outer most layer of epidermis with thin layer of cuticle having spiny trichomes with capitate type. Below to this mesophyll cells, full of chloroplast are presents. In the centre cortical tissues are presents (Fig. 1).

Stem: Transverse section of stem showed an almost round outline with fine ridges and furrows. Cuticle striated, covering a single layered epidermis, parenchymatous in nature. Below to this cortical cells and endodermal cells are present that are covered with waxy substance suberin. Several vascular bundles arranged in a ring, each with a group of thick walled, lignified pericycle fibres forming a continuous band. Presence of Prominent dark brown colour due to tannin. Pitch quite wide and well developed (Fig. 2).

Powder: The dried leaves and stem of *A. millefolium* L. were examined for powder characteristics. The extract was brownish yellow in colour, bitter taste. After clearing in *Chloral hydrate*, under microscope it shows a lot of fragments of long covering trichomes. Occasional glandular trichomes, some stem epidermal tissue, Prismatic calcium oxalate crystals and stone cells. Xylem elements with spiral or annular thickenings were also observed (Fig. 3).

CONCLUSION

The present study asses the pharmacognostical properties of *A. millefolium* L. for standardizing the plant on the procedures in UPI (Unani pharmacopoeia of India), a valid Unani document. Histological attributes revealed that it is a dicotyledonous plant, having circular vascular bundles, pith well developed and wide in the stem, mesophyll cells filled with chloroplast and thin layer cuticle in leaves. Stem shows cortical cells and endodermis covered with a waxy substance suberin. Calcium oxalate crystals with stone cells were also seen in the plant. Findings of the study are in conformation with [18,19] who proposed that presence of secretary cavities associated with the endodermis in the family Asteraceae is a common characteristic, as in some species of the genera *Achillea, Gerbera, Scolymus, Scorzonera, Solidago* and *Tragopogon.* This macro, micro and powder microscopic features (Fig-1, 2 & 3) of the stem and leaf of *A. millefolium* L. will be beneficial in the identification of the plant as a whole and in powdered form. Additionally the study will also help in monograph preparation and would work as a reservoir for further information in relation to marphoanatomical and pharmacognostical study. In conclusion, the studied parameters can be deemed sufficient to identify the purity and examine the authenticity of this drug and that can be can be incorporated as standards in Pharmacopeia.

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ACKNOWLEDGEMENT
The authors would like to thanks to the Director General, Prof. Asim Ali Khan, Central Council for Research in Unani Medicine (CCRUM), New Delhi and Assistant Director In-Charge DSRI, Ghaziabad, for encouragement and providing necessary facilities for the study.

Conflict Of Interest
No interest

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Branjasif (Leaf and Stem)

Leaf and stem sample in petriplate

Surface view with Non glandular trichomes

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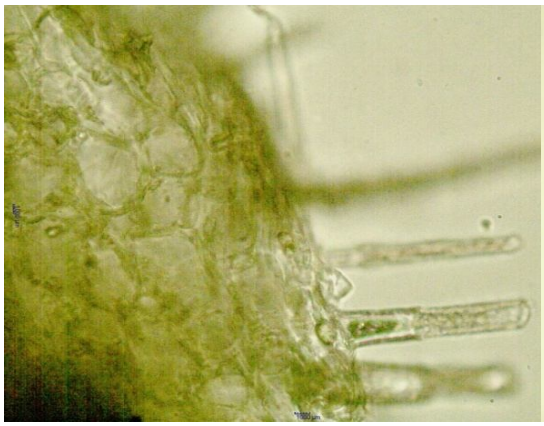
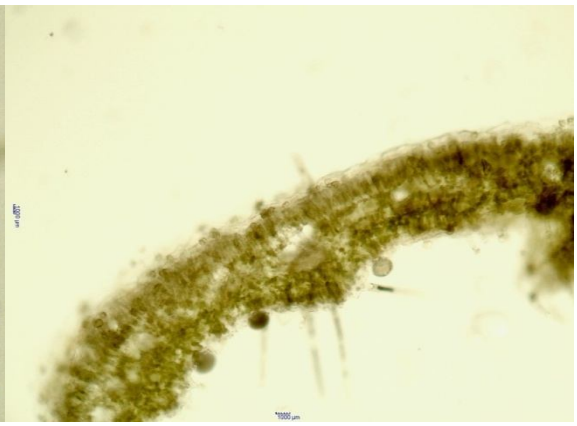
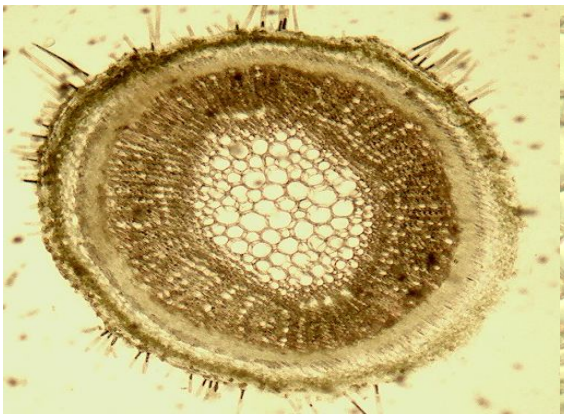

Mesophyll cells and trichomes

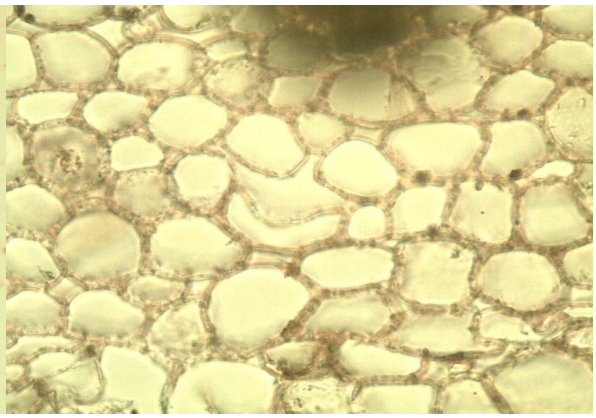

Cuticle and mesophyll cells


Elongated epidermal cell and cuticle with trichome

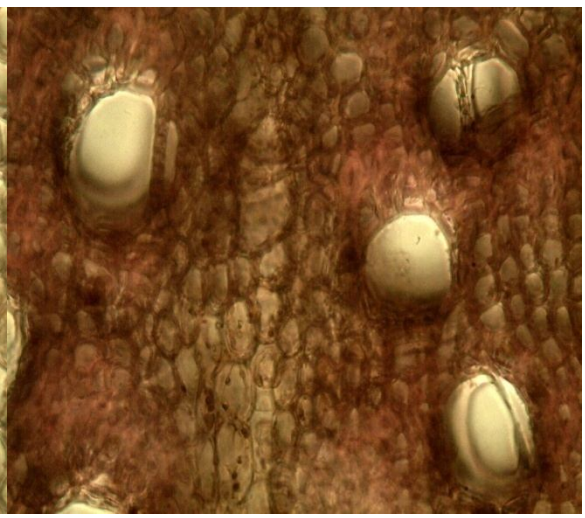
Figure-1: Macroscopic and microscopic study of *Achillea millefolium* L leaf.

Stem


T.S. of the stem with trichomes


Parenchyma cells of pith


Cortical cells


vascular tissue

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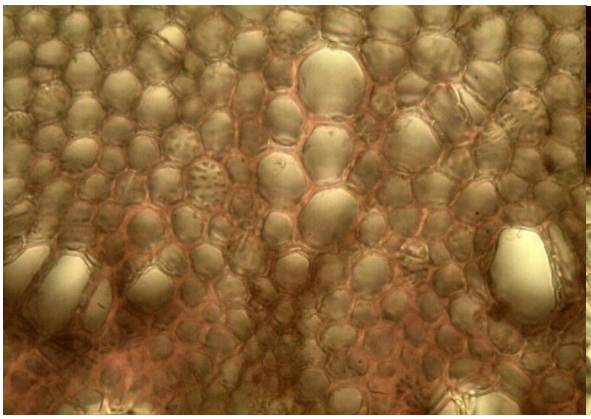
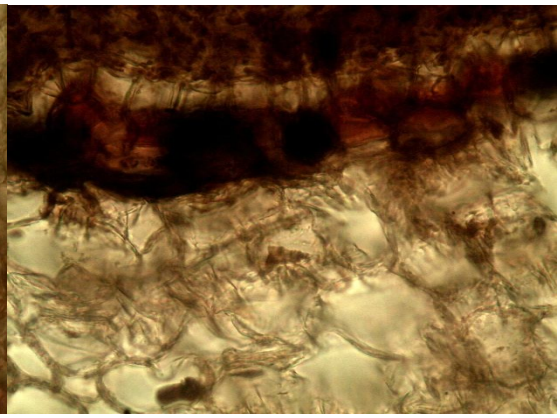
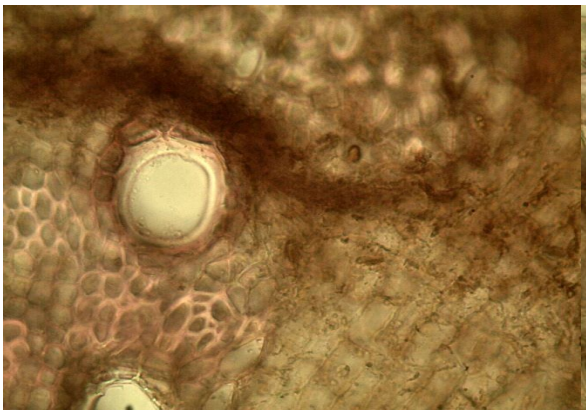

Vascular tissues and cortex


Prismatic crystals


Vascular tissues and secretary duct

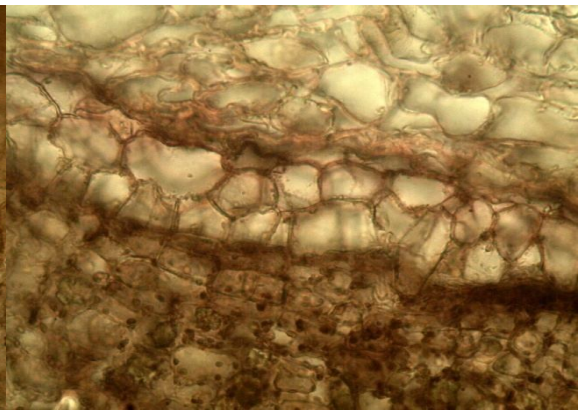
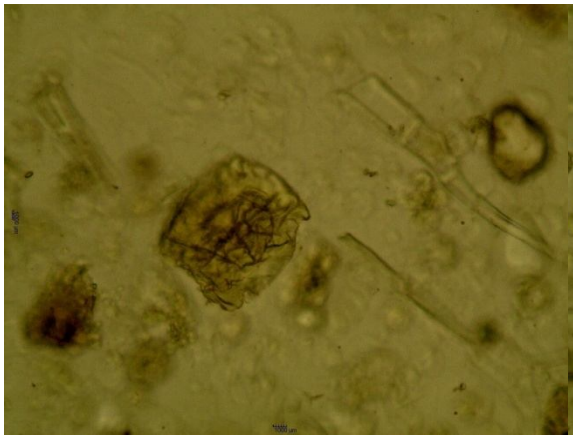
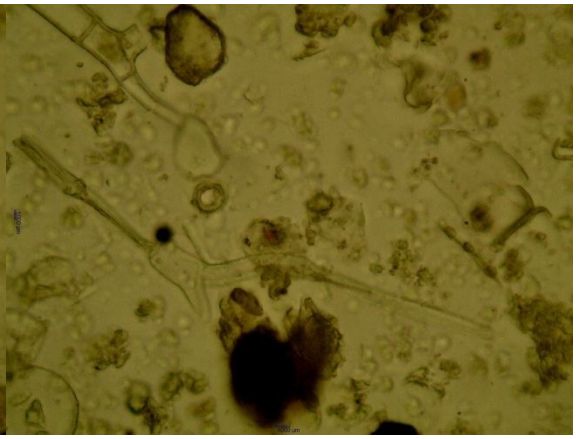
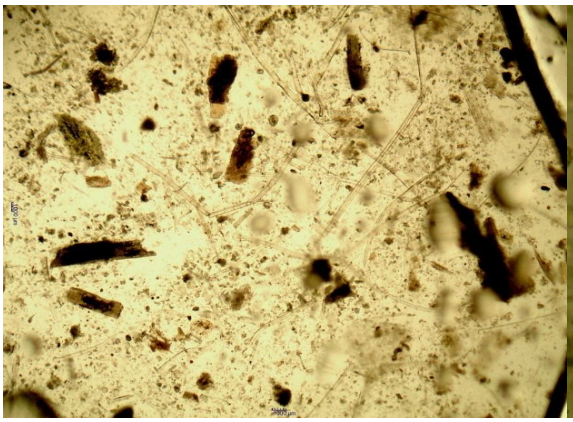

Endodermal cells with pericycle

Figure-2.Macroscopic and microscopic study of *Achillea millefolium* L stem.

Powder Study


Stone cells with narrow lumen


Different type of trichomes


Powdery view


Oxalate crystals and rounded apical cell

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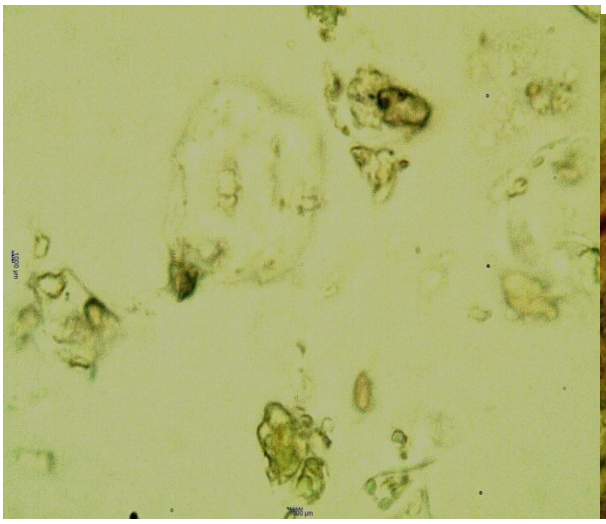
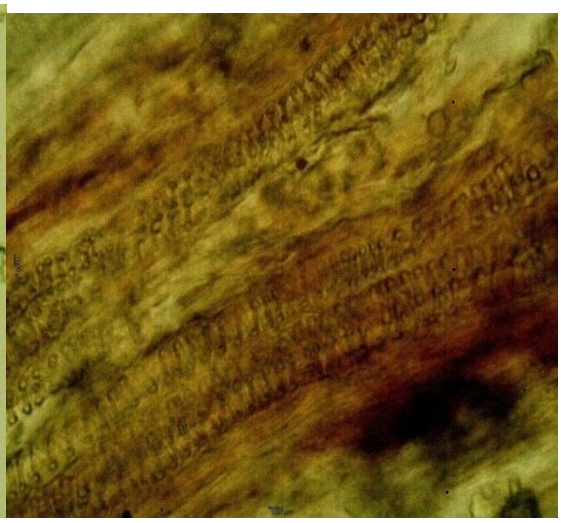
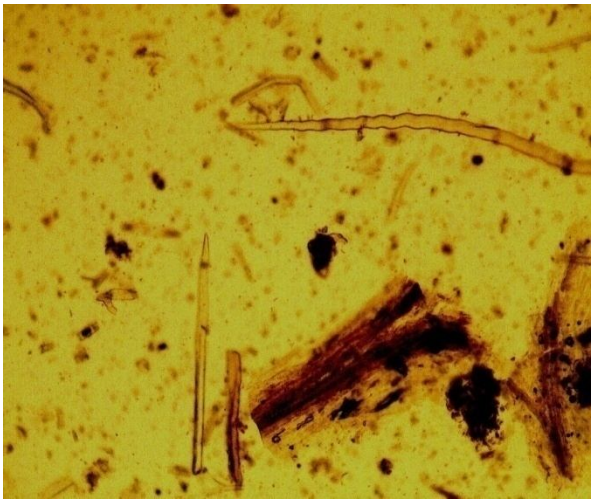


Prismatic and druse crystals



Spiral thickening of the xylem vessels



Non glandular trichome with basal cell

Figure-3: Powder study of *Achillea millefolium* L

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PHYTOSOCIOLOGICAL STUDY ON THE HERBS AND GRASSES IN THE SLOPES OF RAVINE OF OTTANGAN RIVER AT KHANDER, AGRA, U.P., INDIA

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ABSTRACT
Phytosociological study on the herbs and grasses in the slopes of protected and unprotected ravine of Ottangan River at Khander has been done by the standard Methods in the three seasons of two years. Comparatively and recoded that biotic interference is the main cause in reduction the number of species of herbs and grasses in unprotected ravine Cynodon dactylon (L.) Pers., Heteropogon controtus (L.)Roem & Schult , Justicia niveus D. Don, Cyperus mixeus Retz; Pluchea lanceolata Cl; Desmostachya bipinata (L.) Stapf & Peristrophe bicalyculata, (Regz) Nees were most abundant species of protected ravine. Whereas in unprotected ravine, Tephrosia purpurea Linn. Cynodon dactylon (L.) Pers; Kickxia ramosissima (wall) Jancher, Indigofera cordifolia Heyne ex' Roh were the most successfull species on bases of abundance inspite of biotic interference Cynodon daclyton (L.) Pers was in more reduced form due to grazing effect.

Keywords: Phytosociology, Protected ravine, unprotected ravine, biotic interference, Ottangan, khander, grazing.

INTRODUCTION
In our country an estimated 36.7 lakhs hectares is the ravine land. Out of which 12.3 lakhs hectares of ravines are located in Uttar Pradesh along which works out to 33 percent of the total revine land in the Country. In Uttar Pradesh, Agra district accounts for 1.76 lakhs hectares of ravine land mainly located along the river Yamuna. On th conservation estimate, the country is losing a total output of Rs. 157 crores a year by failure to reclaim. The origin of ravines is not recent in India, that is date back to the eleventh Century and is still grawing. An intensive system of gullies forms ravines. These ravines caused by major rivers and their tributories are extending fast towards agricultural lands and habitation (sharda et.al. 1982). Phytoramidial technology take part in blocking the improving harmful ravinious condition of land. Therefore phytosociological study of herbs and grasses is necessary, so that we observe actual structure of lower strata of plants.

Phytosociological studies have carried out by several workers such as Parandiyal et. al. (2000) studied natural vegetation of chambal ravines at Kota (Rajasthan) for assessing the impact of varing levels of biotic disturbances on the physociological characters of the flora. They observed that species richness and overall plant density in woody layer increased with decreasing biotic pressure. The overall density and species richness in the herbaceous layer increased with declining protection due to increase in the occurrence of unpalatable and obnoxious species.

Samra et. al. (1999) studied the impact of long term protection of a denuded ravine at Agra (U.P.) on vegetational development and chronosequence of succession of different species at three topographic situations like top, slope and bottom over a span of twenty four years and described vegetational changements remained according to time under protected area. Phytosociology is an useful to deseribe the population dynamics of each plant species occurring in a particular community & to understand how they relate to the other species in a same community (Mishra et. al 2012)

Impact of protection on the plants has also been studied by many workers from past time as A. tasted et. al. 2010, observed that plant cover was significantly higher on protected sites as compared to unprotected sites.. The grazing pressure was the main cause of decreasing number of annual species from 87% on the protected site to 57% on the unprotected area. Prajapati et.al. (1999) studied the vegetation of two sites such as protected and unproctected to biotic interferences on three topographies such as top, slope and bottom in subtropical Yamuna ravines at Agra. They recorded 6 species in protected area and 12 species in unprotected area. Chandra et. al. (2001) conducted the regenerative survey in ANR (Assisted Natural Regeneration) protected mixed forest area (5B Clc and C_2 and 5A Clb and C_3) of Barhi, Katni (M.P.). They recorded 18 species in ANR area and 12 species in unprotected adjacent area.

MATERIAL & METHODS :

Experimental Site – The Khandar experimental site is comprised of ravine system made up of different classes of gullies varying from very shallow to very deep. This village is spread in 553 sq. hectares situated in deep

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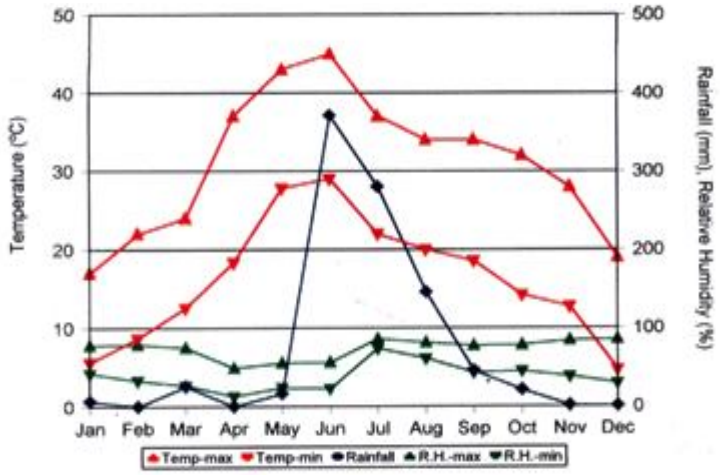
ravine on the sides of Ottangan river. This river has very high current & large area of spread. The residents of this village do not build permanent residences due to the high current of the river which destroys their houses. This Ottangan river is formed by combination of various streams & this village is near the combination side.

Climatic condition of Experimental Site – Experimental site has dry climate except during the monsoon months, with an average annual rainfall of 765 m.m., 90% annual rainfall is received during monsoon season. Monsoon rains which starts in the last week of June & very active in July to August, tapering off by the middle of September, cause of considerable erosion; May-June being the hottest months when the maximum temperature touches 48^0C & minimum temperature goes as low as 1^0C in month of December-January. The evaporation ratio is also high due to strong wind velocity & high temperature.

During the First Year of Study



During the Second Year of Study

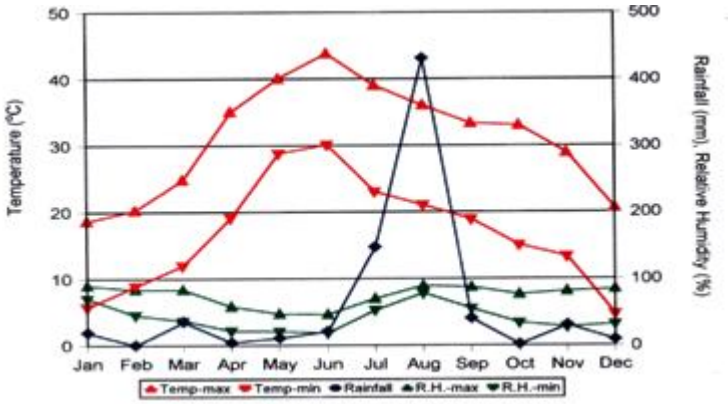
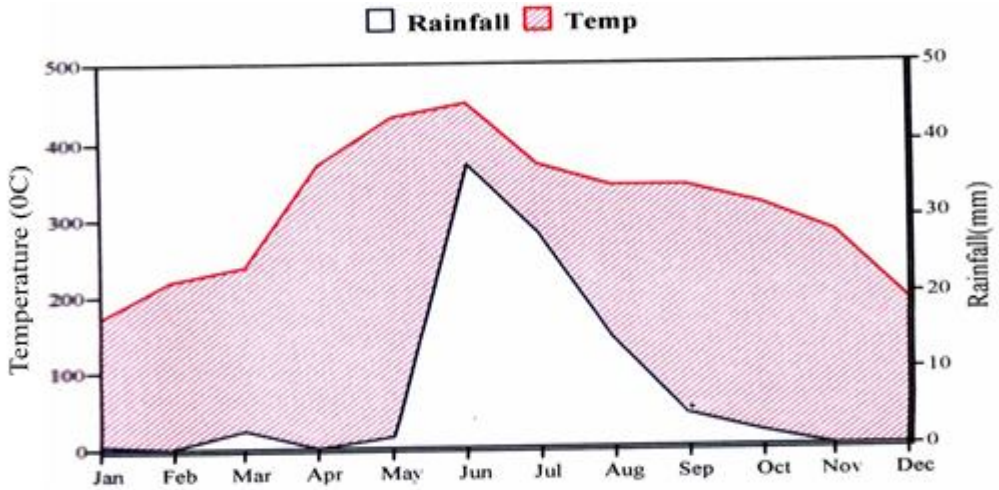


Figure No-1: Meteorological Element of the Site

During the First Year of Study



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During the Second Year of Study

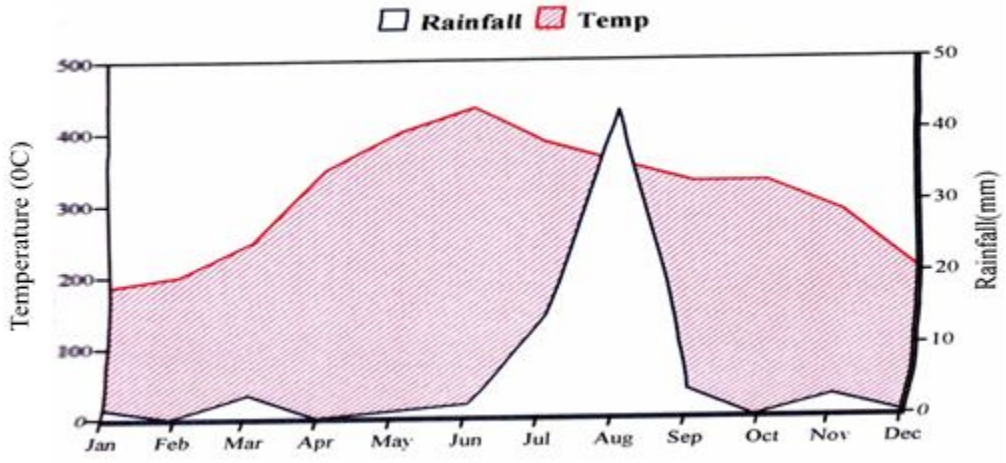

Figure No-2: Ombrothermic Diagram of the Site

The phytosociological studies were done on the top in the protected & unprotected ravine by quadrat method as suggested by Mishra & Puri (1954) & Mishra (1973) & impact of protection on the herbs & grasses has been recorded. Ten quadrats of 50 sq. c.m. each were laid down for herbs & grasses on the selected spots in different seasons such as rainy, winter & summer & the following characters were noted.

A. ANALYTICAL CHARACTERS : -

1. **Quantitative Characters**- For herbs & grasses the following quantitative values were observed in each plant community.

a. **Frequency** – The no. of quadrats in which a given species occurred & thus express the distribution for dispersion of various species in a community. For this the percentage of frequency was calculated as –

$$\frac{No.of\ quadrats\ in\ which\ species\ occured}{Total\ no.\ of\ quadrats\ studied} \times 100$$

b. **Density**- The no. of ndividuals per sampling unit in a community (species may or may not occur in all sampling units) as

$$\frac{Total\ no.of\ individuals\ of\ the\ species\ in\ all\ sampling\ units}{Total\ no.\ of\ sampling\ units\ studied} \times 100$$

c. **Abundance**- No. of individual of a species per sampling units of occurrence as

$$\frac{Total\ no.of\ individuals\ of\ the\ species\ in\ all\ sampling\ units}{Total\ no.\ of\ sampling\ units\ in\ which\ species\ occurred}$$

2. Qualitative Character

Sociability- It refers to the space relationship of plants or how closely together the individual plants grow (Hanson, 1950). Thus, the degree of the sociability that a species will develop in an area will depend upon the biological equipment of species in relation to the environment Braun-Blanquet's (1932) scale given below for rating the sociability of species were used.

SI= Grow one in a place, singly.

S2=Groups or tufts.

S3=In troops, small patches or cushions

S4=In small colonies, in extensive patches or forming carpets.

S5=in great crowds (Pure populations).

B. SYNTHETIC CHARACTERS

Presence & Constance- It expresses the extent of occurrence of individuals of a particular species in the community; Constance shows to some extent; the interrelation between different communities. Presence & constance values were calculated from the frequency data in following five figures (Sharma, 1979).

Presence & Constance 1 = 1% to 20% frequency

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Presence & Constance 2 = 21% to 40% frequency

Presence & Constance 3 = 41% to 60% frequency

Presence & Constance 4 = 61% to 80% frequency

Presence & Constance 5 = 81% to 100% frequency

RESULTS

It was observed during the first year of study on the slope of protectd ravine of ottangan river that *Launaea procumbens* Roxb; Ramaya & Rajgopal; *Lindenbergia indica* (L.) vatke; *Justicia simplex* D Don; Euphorbia hirta Linn and *Cynodon dectylon* (Linn.) Pers. Were most abundant herbs and grass in winter season (Tab. No.1). *Pluchea lanceolata* Cl. *Blepharus Molluginifolia* Pers. *Cynodon dactylon* (Linn.) Pers. and *Cyperus niveus* Retz. were most abundant herbs & grasses in summer season (Tab. No.2). *Aristida adscensionis* Linn., *Tephrosia purpuria* Linn. & *Desmostachya bipinnata* (L.) stapf, *Dactyloctenium sindicum* Bioss were more abundant herbs & grasses of rainy season (Tab. No. 3).

During the study of second year, it was recorded the *Justicea simplex* D. Don and *Heteropogon contortus* (L.) Roem & Schult were most abundant herb & grass in winter season (Tab. No.4). *Heliotropium echwalii* steud and *Cynodon dactylon* (Linn.) Pers were high abundant herb & grass of summer season (Tab. No.5). *Peristrophe bicalyculata* (Retz.) Nees and *Dactyloctenium sindicum* Bioss were more abundant herb & grass of rainy season (Tab. No.6)

Presence & constance classes were indicated that species growing in rainy season were showing high value of it, on the slope of protected ravine of Ottangan river are Alysicorpus vaginalis DC; Justicea simplex D.Don; *Achyranthus aspera* Linn. And *Aristida adscensionis* Linn.

Herbs and grasses were found in small colonies or in troop or single in a place. On the slopes of protected ravine of Ottangan river.

It is recorded during the first year of study on the slope of unprotected ravine of ottangan river that *Tephrosia purpurrea* Linn., *Blepharis malluginifolia* Pers, and *Cynodon dactylon* (Linn) Pers. Were found in most abundant condition in winter season (Tab. No.1). *Kickxia ramosissima* (wall) Juncher and *Cynodon dactylon* (Linn.) Pers. Were founded as a more abundant herb & grass in summer season. (Tab. No.2). *Indigofera cordifilia* Heyne ex- Roth and *Abutilon indicum* Linn. and *Cynodon dactylon* (Linn.) Pers. were found most abundant species of rainy season (Tab. No. 3).

During the study of IInd year, it was found that *Tephrosia purpuria* (L.) Pers and *Cynodon dactylon* (L.) Pers. were found on slopes as a most abundant berbs & grass in winter season (Tab. No.4). The *Kickxia ramosissima* (wall) Jancher and *Cynodon dectylon* (L.) Pers were found on slopes as a most abundant herb & grass in summer season (Tab. No.5). *Indigofera cordifolia* Heyne ex. Roth and *Cynodon dectylon* (L.) Pers were found on slopes as a most abundant herbs & grass in rainy season (Tab. No.6).

Presence & constance value of species which were growing in best growing season such as rainy season are *Indigofera Cordifolia*. Heyne ex. Roth and *Cynodon dactylon* (L.) Pers on the slope area of unprotected ravine of Ottangan river.

After two years study, it has been recorded that herbs and grasses were in small groups on single in place on slopes of unprotected ravine.

Table No-1: Quantitative, qualitative and synthetic values of herbs and grasses on the slopes of protected and unprotected ravine in winter season of 1st year

Particular of quadrats -10 (50 cm^2)

S.No.	Name of species	Slope of protected ravine					Slope of unprotected ravine				
		F	D	A	P	S	F	D	A	P	S
1.	*Argemon mexicana* Linn.	20	0.2	1.0	1.0	1.0	10	0.1	1.0	1.0	1.0
2.	Hibiscus micranthus Linn.	50	0.7	1.4	3.0	2.0	-	-	-	-	-
3.	Abutilon indicum (Linn) Sweet.	40	07	1.7	2.0	1.0	40	0.5	1.2	2.0	1.0
4.	Sida cordata Burm. F.	60	2.1	3.5	3.0	3.0	-	-	-	-	-
5.	*Sida cordifolia* Linn.	90	3.0	3.3	5.0	4.0	-	-	-	-	-

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6.	*Tephoria purpurea* Linn.	40	3.0	7.5	2.0	2.0	90	9.0	10.0	5.0	4.0
7.	Launaea procumbens Roxb, Rammaya & Rajgopal	10	1.4	14.0	1.0	1.0	30	0.3	1.0	2.0	2.0
8.	*Tridex procumbens* Linn.	20	1.2	6.0	1.0	2.0	-	-	-	-	-
9	*Convolvulus arvensis* Linn.	40	1.3	3.2	2.0	1.0	30	0.3	1.0	2.0	1.0
10.	Convolvulus microphyllus (Roth) Sieb ex spreng.	10	0.1	1.0	1.0	1.0	20	0.7	3.5	1.0	1.0
11.	*Solanum nigrum* Linn.	10	0.3	3.0	1.0	1.0	10	0.2	2.0	1.0	1.0
12.	*Lindenbergia indica* (L) vatke	20	3.2	16.0	1.0	1.0	-	-	-	-	-
13.	*Blepharis malluginifolia* Pers.	10	1.2	12.0	1.0	1.0	10	0.9	9.0	1.0	1.0
14.	*Justicia simplex* D. Don.	30	4.8	16.0	2.0	1.0	20	0.7	3.5	1.0	1.0
15.	Peristrophe bicalyculata (Retz,) Nees	50	0.9	1.8	3.0	1.0	20	0.4	2.0	1.0	1.0
16.	Rungia pectinata (Linn.) Nees.	20	0.2	1.0	1.0	1.0	-	-	-	-	-
17.	*Boerhaavia diffusa* Linn.	20	0.4	2.0	1.0	1.0	40	1.3	3.2	2.0	2.0
18.	*Achyranthus aspera* Linn.	10	0.1	1.0	1.0	1.0	20	0.9	4.5	1.0	1.0
19.	Euphorbia hirta Linn	20	3.5	17.5	1.0	1.0	10	0.2	2.0	1.0	2.0
20.	Commelina benghalesis	10	0.2	2.0	1.0	1.0	-	-	-	-	-
21.	*Cenchrus ciliaris* Linn.	60	1.2	2.0	3.0	1.0	30	0.3	1.0	2.0	1.0
22.	*Cymbopogon Jwarancusa* (Jones) Schult.	40	0.4	1.0	2.0	2.0	20	0.2	1.0	1.0	2.0
23.	*Cynodon dactylon* Linn. Pers.	80	14.5	18.1	4.0	4.0	70	7.0	10.0	4.0	4.0
24.	*Desmostachya bipinnata* (L.) Stapf.	50	0.7	1.4	3.0	4.0	60	0.7	1.1	3.0	3.0
25.	*Heteropogon contortus* (L.) Roem & Schult.	30	0.4	1.3	2.0	3.0	-	-	-	-	-
26.	*Saccharum munja* Roxb.	30	0.3	1.0	2.0	3.0	-	-	-	-	-
27.	Chrysopogon fulvus (spreng.) choir.	10	0.1	1.0	1.0	2.0	-	-	-	-	-
28.	Dactyloctenium sindicum Boiss	10	0.4	4.0	1.0	1.0	-	-	-	-	-
29.	Cyperus niveus Retz.	30	1.1	3.6	2.0	1.0	-	-	-	-	-

F= Frequency, D= Density, A= Abundance, P= Presence & Constance,

S= Sociability, - = Species Absent

Table No-2: Quantitative, qualitative and synthetic values of herbs and grasses on the slopes of protected and unprotected ravine in summer season of 1st year Particular of quadrats -10 (50 cm^2)

S.No.	Name of species	Slope of protected ravine					Slope of unprotected ravine				
		F	D	A	P	S	F	D	A	P	S
1.	*Indigofera linifolia (L.) Retz.*	10	0.1	1.0	1.0	1.0	10	0.2	2.0	1.0	1.0
2.	*Pluchea lanceolata* Cl.	10	0.7	7.0	1.0	1.0	40	1.4	3.5	2.0	2.0
3.	*Volutarella ramora* (Roxb.) Santapau.	20	0.2	1.0	1.0	1.0	-	-	-	-	-
4.	*Calatropis procer*a (Ait) R.Br.	30	0.5	1.6	2.0	1.0	10	0.2	2.0	1.0	1.0
5.	*Heliotropium echwaldii* Steud.	20	1.4	7.0	1.0	1.0	60	0.9	1.5	3.0	1.0
6.	*Convolvulus*	60	0.7	1.1	3.0	2.0	20	0.2	1.0	1.0	1.0

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	microphyllus (Roth.) Sieb. Ex. Spreng.										
7.	*Kickxia ramorissima* (wall) Jancher.	70	1.6	2.2	4.0	2.0	90	4.5	5.0	5.0	2.0
8.	*Lindenbergia indica (L.)* Vatke	30	0.7	2.3	2.0	1.0	-	-	-	-	-
9	*Blepharis molluginifolia* Pers.	20	1.6	8.0	1.0	1.0	-	-	-	-	-
10.	*Boehaavia difusa* Linn.	70	1.4	2.0	4.0	2.0	30	1.3	4.3	2.0	1.0
11.	*Euphorbia hirta* Linn.	10	0.2	2.0	1.0	1.0	40	1.4	3.5	2.0	1.0
12.	*Cynodon dactylon (*Linn) Pers.	10	1.2	12.0	1.0	2.0	70	3.5	5.0	4.0	2.0
13.	*Cyperus niveus* Retz	80	6.4	8.0	4.0	2.0	-	-	-	-	-
14.	*Erigiron bonariensis* Linn.	-	-	-	-	-	20	0.7	3.5	1.0	2.0
15.	*Xanthium strumarium* Linn.	-	-	-	-	-	50	1.5	3.0	3.0	2.0
16.	*Datura metal* Linn.	-	-	-	-	-	20	0.4	2.0	1.0	1.0

F= Frequency, D= Density, A= Abundance, P= Presence & Constance,

S= Sociability - = Species absent.

Table No-3: Quantitative, qualitative and synthetic values of herbs and grasses on the slopes of protected and unprotected ravine in rainy season of 1st year. Particular of quadrats -10 (50 cm^2)

S.No.	Name of species	Slope of protected ravine					Slope of unprotected ravine				
		F	D	A	P	S	F	D	A	P	S
1.	*Hibiscus micranthus* linn.	30	0.7	2.3	2.0	2.0	-	-	-	-	-
2.	*Abution indicum* linn.	20	0.7	3.5	1.0	1.0	20	1.2	6.0	1.0	1.0
3.	*Indigofera cordifolia* Heyen Ex. Roth.	10	0.3	3.0	1.0	1.0	90	6.3	7.0	5.0	2.0
4.	*Sida cordata* (Bunm F.)	40	0.4	1.0	2.0	1.0	-	-	-	-	-
5.	*Corchorus aesthuans* linn.	20	0.5	2.5	1.0	1.0	-	-	-	-	-
6.	*Corchorus depressus* (Linn.) Stocks.	40	1.2	3.0	2.0	2.0	10	0.2	2.0	1.0	1.0
7.	*Alsicorpus vaginalis* Dc.	80	1.4	1.7	4.0	3.0	-	-	-	-	-
8.	*Tephrosia purpurea* Linn.	10	0.7	7.0	1.0	1.0	20	0.4	2.0	1.0	1.0
9	*Indigofera linifolia* (L.) Retz	30	1.2	4.0	2.0	1.0	10	0.3	3.0	1.0	1.0
10.	*Indigofera linnaei* (L.) Ali.	20	0.3	1.5	1.0	1.0	20	1.2	6.0	1.0	1.0
11.	*Borreria articulata* (Linn.F.)	30	1.0	3.3	2.0	2.0	40	1.2	3.0	2.0	1.0
12.	*Convolvulus microphyllus* (Roth) Sieb ex. Spreng.	50	1.1	2.2	3.0	1.0	20	0.4	2.0	1.0	1.0
13.	*Justicia simplex* D. Don.	80	5.0	6.2	4.0	1.0	50	0.5	1.0	3.0	1.0
14.	*Peristrophe bicalyculata* (Retz.) Nees.	50	2.3	4.6	3.0	5.0	40	0.7	1.7	2.0	2.0
15.	*Baerhaavia diffusa* Linn.	10	0.2	2.0	1.0	2.0	20	0.2	1.0	1.0	2.0
16.	*Achyranthes aspera* Linn.	70	1.2	1.7	4.0	2.0	10	1.0	1.0	1.0	1.0
17.	*Euphorbia dracunculoides* Lamk.	10	0.3	3.0	1.0	1.0	-	-	-	-	-
18.	*Euphorbia hirta* Linn.	20	0.2	1.0	1.0	1.0	30	0.4	1.3	2.0	3.0

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19.	*Phyllanthus fraternus* Webs.	10	0.2	2.0	1.0	2.0	-	-	-	-	-
20.	*Commelina benghalensis* Linn.	20	0.4	2.0	1.0	1.0	-	-	-	-	-
21.	*Aristida adscensionis* Linn.	80	5.6	7.0	4.0	3.0	40	0.4	1.0	2.0	2.0
22.	*Cenchrus ciliaris* Linn.	30	0.3	1.0	2.0	1.0	60	1.2	2.0	3.0	3.0
23.	*Cenchrus setigerus* vahl.	20	0.4	2.0	1.0	1.0	-	-	-	-	-
24.	*Cymbopogon Jwarancusa (Jones)* Schult.	60	1.5	2.5	3.0	3.0	70	1.2	1.7	4.0	3.0
25.	*Cynodon dactylon* (Linn) Pers.	40	0.9	2.2	2.0	3.0	10	0.7	7.0	1.0	2.0
26.	*Desmostachya bipinnata* (L.) Stapf	40	3.2	8.0	2.0	4.0	90	4.2	4.6	5.0	4.0
27.	*Eragrostis ciliaris* (Linn.) R. & Br.	60	0.9	1.5	3.0	3.0	10	0.2	2.0	1.0	1.0
28.	*Eragrostis diarrhena* Beauv.	30	0.3	1.0	2.0	1.0	40	0.5	1.2	2.0	1.0
29.	*Eragrostis poaeoides* Beauv.	20	0.2	1.0	1.0	1.0	-	-	-	-	-
30.	*Eragrostis tenella* (L.) P. Beauv. Ex Roem & Schult.	10	0.4	4.0	1.0	1.0	10	0.2	2.0	1.0	1.0
31.	*Heteropogon contortus* (L.) Roem & Schult.	50	0.5	1.0	3.0	2.0	-	-	-	-	-
32.	*Saccharum munja* Roxb.	20	0.4	2.0	1.0	3.0	-	-	-	-	-
33.	*Aristida funiculate* Train	20	0.2	1.0	1.0	1.0	-	-	-	-	-
34.	*Chrysopogon fulvus* (Spreng) Choir.	40	0.5	1.2	2.0	2.0	-	-	-	-	-
35.	*Dactyloctenium sindicum* Bioss	20	0.9	4.5	1.0	1.0	-	-	-	-	-
36.	*Cyperus niveus* Retg.	40	0.4	1.0	2.0	1.0	-	-	-	-	-

F= Frequency, D= Density, A= Abundance, P= Presence & Constance,

S= Sociability - = Species absent.

Table No-4: Quantitative, qualitative and synthetic values of herbs and grasses on the slopes of protected and unprotected ravine in winter season of IInd year Particular of quadrats -10 (50 cm^2)

S.No.	Name of species	Slope of protected ravine					Slope of unprotected ravine				
		F	D	A	P	S	F	D	A	P	S
1.	*Argemon mexicana* Linn.	20	0.2	1.0	1.0	2.0	10	0.2	2.0	1.0	1.0
2.	Hibiscus micranthus Linn.	40	0.4	1.0	2.0	2.0	-	-	-	-	-
3.	Abutilon indicum (Linn) Sweet.	60	0.9	1.5	3.0	1.0	50	0.5	1.0	3.0	1.0
4.	Sida cordata Burm. F.	20	0.4	2.0	1.0	1.0	-	-	-	-	-
5.	*Sida cordifolia* Linn.	50	0.5	1.0	3.0	2.0	-	-	-	-	-
6.	*Tephoria purpurea* Linn.	10	0.2	2.0	1.0	1.0	100	8.0	8.0	5.0	4.0
7.	Launaea procumbens Roxb, Rammaya & Rajgopal	20	1.4	7.0	1.0	1.0	40	0.4	1.0	2.0	1.0
8.	*Tridex procumbens* Linn.	10	1.0	10.0	1.0	1.0	-	-	-	-	-
9	*Convolvulus arvensis* Linn.	40	1.4	3.5	2.0	1.0	-	-	-	-	-
10.	Convolvulus microphyllus (Roth) Sieb ex spreng.	10	0.1	1.0	1.0	1.0	40	0.4	1.0	2.0	1.0
11.	*Solanum nigrum* Linn.	10	0.3	3.0	1.0	1.0	10	0.2	2.0	1.0	1.0
12.	*Lindenbergia indica* (L.) Vatke	20	2.2	11.0	1.0	1.0	-	-	-	-	-
13.	*Blepharis malluginifolia* Pers.	20	1.7	8.5	1.0	1.0	10	0.7	7.0	1.0	1.0
14.	*Justicia simplex* D. Don.	40	4.8	12.0	2.0	1.0	20	0.6	3.0	1.0	1.0
15.	Peristrophe bicalyculata (Retz,)	30	0.3	1.0	2.0	1.0	20	0.2	1.0	1.0	1.0

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	Nees										
16.	*Boerhaavia diffusa* Linn.	10	0.2	2.0	1.0	1.0	40	1.2	3.0	2.0	2.0
17.	*Achyranthus aspera* Linn.	90	9.9	11.0	5.0	4.0	20	0.7	3.5	1.0	1.0
18.	Euphorbia hirta Linn.	10	0.2	2.0	1.0	1.0	10	0.2	2.0	1.0	2.0
19.	*Rungia pectinata* Linn.	20	0.4	2.0	1.0	1.0	-	-	-	-	-
20.	*Commelina benghalesis* Linn.	10	0.2	2.0	1.0	1.0	-	-	-	-	-
21.	*Cenchrus ciliaris* Linn.	50	1.2	2.4	3.0	2.0	40	0.4	1.0	2.0	2.0
22.	*Cymbopogon jwarancusa* (Jones) Schult.	40	0.4	1.0	2.0	2.0	20	0.2	1.0	1.0	1.0
23.	*Cynodon dactylon* Linn. Pers.	70	0.9	1.2	4.0	1.0	100	8.0	8.0	5.0	4.0
24.	*Desmostachya bipinnata* (L.) Stapf.	30	0.6	2.0	2.0	1.0	60	0.7	1.1	3.0	3.0
25.	*Heteropogon contortus* (L.) Roem & Schult.	40	4.8	12.0	2.0	1.0	-	-	-	-	-
26.	*Saccharum munja* Roxb.	10	0.4	4.0	1.0	2.0	-	-	-	-	-
27.	*Chrysopogon fulvus* (Spreng.) Choir	10	0.2	2.0	1.0	1.0	-	-	-	-	-
28.	*Dactyloctenium sindicum* Boiss	10	0.4	4.0	1.0	1.0	-	-	-	-	-
29.	*Cyperus niveus* Retz.	40	1.2	3.0	2.0	1.0	-	-	-	-	-

F= Frequency, D= Density, A= Abundance, P= Presence & Constance,

S= Sociability, - = Species Absent

Table No-5: Quantitative, qualitative and synthetic values of herbs and grasses on the slopes of protected and unprotected ravine in summer season of IInd year Particular of quadrats -10 (50 cm^2)

S.No.	Name of species	Slope of protected ravine					Slope of unprotected ravine				
		F	D	A	P	S	F	D	A	P	S
1.	*Indigofera linifolia* (L.) Retz.	20	0.2	1.0	1.0	1.0	10	0.4	4.0	1.0	1.0
2.	*Pluchea lanceolata* Cl.	10	0.3	3.0	1.0	1.0	50	0.5	1.0	3.0	2.0
3.	*Volutarella remora* (Roxb.) Santapau.	10	0.1	1.0	1.0	1.0	-	-	-	-	-
4.	*Calotropis procer*a (Ait) R.Br.	30	0.5	1.6	2.0	1.0	10	0.2	2.0	1.0	1.0
5.	*Heliotropium echwaldii* steud.	20	1.1	5.5	1.0	1.0	40	0.7	1.7	2.0	1.0
6.	*Convolvulus microphyllus* (Roth.) Sieb. ex. spreng.	10	0.2	2.0	1.0	1.0	100	1.2	1.2	5.0	3.0
7.	*Kickxia ramorissima* (L.) Vatke.	60	1.6	2.6	3.0	2.0	90	4.5	5.0	5.0	2.0
8.	*Lindenbergia indica (L.)* Vatke	20	0.6	3.0	1.0	1.0	-	-	-	-	-
9	*Blepharis molluginifolia* Pers	40	0.4	1.0	2.0	1.0	-	-	-	-	-
10.	*Boehaavia deffusa* Linn.	50	0.5	1.0	3.0	2.0	30	1.3	4.3	2.0	1.0
11.	*Euphorbia hirta* Linn.	10	0.2	2.0	1.0	1.0	30	1.1	3.6	2.0	1.0
12.	*Cynodon dactylon* Linn. Pers.	70	4.2	6.0	4.0	4.0	90	5.4	6.0	5.0	4.0
13.	*Cyperus niveus* Retz	40	0.4	1.0	2.0	1.0	-	-	-	-	-
14.	*Erigiron bonariensis* Linn.	-	-	-	-	-	30	1.2	4.0	2.0	2.0
15.	*Xanthium strumarium* Linn.	-	-	-	-	-	10	0.2	2.0	1.0	2.0
16.	*Datura metal* Linn.	-	-	-	-	-	20	0.7	3.5	1.0	1.0

F= Frequency, D= Density, A= Abundance, P= Presence & Constance,

S= Sociability - = Species absent.

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Table No-6: Quantitative, qualitative and synthetic values of herbs and grasses on the slopes of protected and unprotected ravine in rainy season of IInd year. Particular of quadrats -10 (50 cm^2)

S. No.	Name of species	Slope of protected ravine					Slope of unprotected ravine				
		F	D	A	P	S	F	D	A	P	S
1.	*Hibiscus micranthus* Linn.	20	0.5	2.5	1.0	2.0	-	-	-	-	-
2.	*Abutilon indicum* Linn.	10	0.4	4.0	1.0	1.0	10	0.9	9.0	1.0	1.0
3.	*Indigofera cordifolia* Heyen ex. Roth.	50	1.1	2.2	3.0	1.0	90	9.0	10.0	5.0	2.0
4.	*Sida cordata* Bunm F.	20	1.0	0.2	1.0	1.0	-	-	-	-	-
5.	*Corchorus aesthuans* Linn.	10	0.3	3.0	1.0	1.0	-	-	-	-	-
6.	*Corchorus depressus* (Linn.) Stocks.	30	0.7	2.3	2.0	2.0	10	0.2	2.0	1.0	1.0
7.	*Alysicarpus vaginalis* Dc.	50	1.5	3.0	3.0	3.0	-	-	-	-	-
8.	*Indigofera linifolia* (L,) Retz	60	1.4	2.3	3.0	4.0	10	0.2	2.0	1.0	1.0
9	*Indigofera linnaei* (L.) Ali.	10	0.2	2.0	1.0	1.0	20	1.3	6.5	1.0	1.0
10.	*Borreria articulata* (Linn.F.)	20	0.2	2.0	1.0	2.0	100	3.1	3.1	5.0	4.0
11.	*Convolvulus microphyllus* (Roth) Sieb ex. Spreng.	20	0.7	3.5	1.0	2.0	10	0.3	3.0	1.0	1.0
12.	*Justicia simplex* D. Don.	40	0.4	1.0	2.0	1.0	10	0.2	2.0	1.0	1.0
13.	*Peristrophe bicalyculata* (Retz.) Nees.	30	2.4	8.0	2.0	1.0	20	0.4	2.0	1.0	1.0
14.	*Baerhaavia diffusa* Linn.	10	0.4	4.0	1.0	1.0	10	0.2	2.0	1.0	1.0
15.	*Achyranthus aspera* Linn.	50	1.1	2.2	3.0	2.0	10	0.7	7.0	1.0	1.0
16.	*Euphorbia dracunculoides* Lamk.	10	0.4	4.0	1.0	1.0	-	-	-	-	-
17.	*Euphorbia hirta* Linn.	20	0.2	1.0	1.0	1.0	30	0.5	1.6	2.0	2.0
18.	*Phyllanthus fraternus* Webs.	10	0.2	1.1	1.0	2.0	-	-	-	-	-
19.	*Commelina benghalensis* Linn.	10	0.2	0.3	1.0	1.0	-	-	-	-	-
20.	*Aristida adscensionis* Linn.	80	2.6	3.7	4.0	4.0	20	0.3	1.5	1.0	2.0
21.	*Cenchrus ciliaris* Linn.	40	0.7	1.2	2.0	1.0	40	0.8	2.0	2.0	2.0
22.	*Cenchrus setigerus* Vahl.	50	0.5	1.5	3.0	1.0	-	-	-	-	-
23.	*Cymbopogon jwarancusa (Jones).*	60	1.2	2.0	3.0	4.0	60	1.0	1.6	3.0	3.0
24.	*Cynodon dactylon* (Linn) Pers. Schult.	20	0.2	1.0	1.0	2.0	100	10.0	10.0	5.0	4.0
25.	*Desmostachya bipinnata* (L.) Stapf	30	0.9	3.0	2.0	2.0	30	1.2	4.0	2.0	1.0
26.	*Eragrostis ciliaris* (Linn.) R. & Br.	40	0.8	2.0	2.0	3.0	10	0.1	1.0	1.0	1.0
27.	*Eragrostis diarrhena* (Schult) Steud	10	0.2	2.0	1.0	1.0	20	0.2	1.0	1.0	1.0
28.	*Eragrostis poaeoides* Beauv.	20	0.3	1.5	1.0	1.0	-	-	-	-	-
29.	*Eragrostis tenella* (L.) P. Beauv. ex. Roem & Schult.	10	0.3	3.0	1.0	1.0	10	0.2	2.0	1.0	1.0
30.	*Heteropogon contortus* (L.) Roem & Schult	40	0.7	1.7	2.0	2.0	-	-	-	-	-
31.	*Saccharum munja* Roxb.	20	0.7	3.5	1.0	2.0	-	-	-	-	-
32.	*Aristida funiculate* Trin	20	0.7	3.5	1.0	2.0	-	-	-	-	-
33.	*Chrysopogon fulvus* (Spreng) Choir.	30	0.4	1.3	2.0	1.0	-	-	-	-	-

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34.	*Dactyloctenium sindicum* Boiss	10	0.7	7.0	1.0	1.0	-	-	-	-	-
35.	*Cyperus niveus* Retg.	40	0.4	1.0	2.0	1.0	-	-	-	-	-
36.	*Tephrosia purpurea* Linn.	-	-	-	-	-	30	0.3	1.0	2.0	1.0

F= Frequency, D= Density, A= Abundance, P= Presence & Constance,

S= Sociability - = Species absent.

DISCUSSION

On the slopes of protected ravine, during the course of study, it was recorded that even some biotic interferences which affected the abundance of herbs & grasses. Species of this area were indicating succession generally. The species of unprotected ravine were destroyed by over exploitation due to severe grazing by domestic animals & human interference etc. resulting into barred land. Such type observation was recorded by earlier by Bore (1941)

Study of three season of two years on the slopes of protected and unprotected ravines indicated that number of herbs & grasses species & their frequency, density & abundance mostly always increased in all season in protected ravine in comparision to all season of unprotected ravines.

From the two year study on slopes in protected and unprotected ravines, it was found that rainy reason was very rich in relation to density and number of species and followed by winter & summer. Many annuals & some perennials were occurred in winter season & density of population has been declined due to withdrawal of rainy season & it was least in summer season due to extremely dry & adverse conditions Singh & Ambasht (1980) also observed greater number of species during rainy season in Navgarh forest of varanasi division.

During the study on slopes in protected ravine, it was recorded that herb & grasses were hardly present in small colonies & in great crows. The sociability pattern, one in a place, in groups and in troops was dominant. The unprotected ravine generally occupied with one in a place and in groups.

Presence & constance classes represented that the distribution of frequency of species was high in protected ravines in comparision to unprotected ravine. On the basis of seasonal study, it was found that presence & constance value increase in rainy season in both protected & unprotected ravine.

Similar work as phytosociological analysis & species diversity of herbaceous layer in Rashad and Alabassia localities south kordofan state, Sudan was also done by Ismail M et. al. (2015) and carried out dominant species & distribution pattern of species of different places in both sites.

CONCLUSION

It has been concluded after two years study on the slopes of protected and unprotected ravine that herbs and grasses were highly affected by protection and seasonal changes and *Cynodon dactylon* (Linn) Pers. *Heteropogon contortus* (L.) Roem & Schult and *Justicia simplex* D. Don grasses & herb in winter season, *Cynodon dactylon* (Linn.) Pers, *Cyperus nivens* Retz. & *Pluchea lancealata* Cl. grasses & herb in summer season, *Desmostachya bipinnata* (L.) stapf, and *Peristrophe bicalyculata* (Retz.) Nees herb & grass of rainy season were most abundant species in protected ravine whereas in unprotected ravine, *Tephrosia purpurea* Linn. and *Cynodon dactylon* herb & grass of winter season, *Kickxia ramosissima* (Wall.) Jancher & *Cynodon dectylon* (L.) Pers. herb & grass of summer season, *Indigofera cordifolia* Heyne ex. Roth and *Cynodon dactylon* (L.) Pers herb & grass of rainy season were most successful species on bases of abundance inspite of biotic interference. *Cynodon dectydon* (L.) Pers was in very reduced form in unprotected ravine in comparison of other species due grazing factor.

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ANALYSING THE PARTICIPATION OF STAKEHOLDERS IN SECURITY REQUIREMENTS ENGINEERING PROCESS

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ABSTRACT
Stakeholders are the primary source of requirements elicitation in the development process of secure software systems. They therefore must be considered in a security requirements engineering process. With the intention of getting a quality software development, they must be also participated and then combined with requirements, design and implementation phases of software development life cycle. Security requirements engineering process involves several participants for the effective and efficient elicitation of security requirements. Several possible stakeholders are engaged with the software development process. In security requirements engineering process, arranging the discussion of relevant stakeholders is a vital concern and it should be acceptable and on time. The main problem is that all relevant stakeholders do not participate in security requirement elicitation most of the time. Several literatures are available which suggests different types of stakeholders, and examples of stakeholder, but does not provide help in identifying stakeholders for the software security requirement engineering. In this paper, we analyses and discuss the participation and role of stakeholder in security requirements engineering process. We also discuss about the stakeholders identification and prioritization based on its role in the elicitation and specification of security requirements.

Keywords: Security requirements, Requirements engineering, Stakeholders, Security threat, Risk assessment.

I. INTRODUCTION
Security requirements elicitation at the requirements engineering phase is a vital concern for the development of quality software product. The security requirement engineer tries to elicit all the relevant security requirements in the early phase of software development lifecycle so that he can assist the developer in developing the secure software product and the developed software product continues to work properly under malicious attack. Stakeholders assist the security requirement engineer in identifying the asset, potential vulnerabilities, and threats [1].

Stanford Research Institute (now SRI International) discussed that administrators of any organizations like managers needed to recognize the concerns of shareholders, workers, clients, contractors, lenders and society, in order to develop objectives that stakeholders would support. This support was necessary for long term success. Therefore, management should actively explore its relationships with all stakeholders in order to develop business strategies [7]. Stakeholder's role and involvement are very much important for the security requirement elicitation. These stakeholders are categorized based on their importance in the software development process. The stakeholders with high importance may be heavily in demand. There are several literatures available in the strategic management area which deliberates organisations in terms of a stakeholder model. The analysis of stakeholders can be used to analyse an organisation's performance and regulate its upcoming strategic direction [2]. The software system which is to be developed may have several stakeholders. Only some stakeholders participated in the development of software products, but all stakeholders are associated with the software system. Some stakeholders are capable to help in the identification process of the asset. Relevant stakeholders can include personnel from the business function(s) involved, IT management, risk management, as well as senior executives [3]. In requirements elicitation, the stakeholder concept is fundamental. Stakeholders are the primary requirements source for software projects [4]. Each stakeholder has a unique view on the system. By means of their coordinated efforts the system is conceived, created and maintained [5]. Types of stakeholder comprise end-users, managers and others involved in the organisational processes influenced by the system, engineers responsible for system development and maintenance, clients of the organisation who will utilize the different function of the system to provide a service, external bodies such as regulators, domain experts, and so on. They will each have different goals, and will try to satisfy their own without recourse to others [6].

This paper consists of four sections. The next section discusses the concept of stakeholder and its importance in a software development organization. The third section describes the identification the relevant stakeholders within an organization from a survey of the relevant literature. This provides an overview of stakeholders identification addressed by existing approaches and indicates areas requiring further investigation. Finally the paper concludes with an outline of some important future research directions.

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II. WHAT IS STAKEHOLDER

Stakeholders include not only the ultimate system users but purchasers, maintainers, testers, trainers, and manufacturing. Satisfaction is greatly improved by improving the quality of the work products and by working with relevant stakeholders throughout the process [12]. A much broader definition, which has also been attributed to Freeman, is that a stakeholder is anything influencing or influenced by the firm, but it has been claimed that this definition is problematic because it leads to the identification of a very broad set of stakeholders. It is significant to distinguish between influencers and stakeholders because while some potential stakeholders may indeed be both stakeholders and influencers, some who have a real stake in an enterprise may have no influence, e.g. a employment candidate, while some influencers may have no stake, e.g. the media [8].

According to Nutt and Backoff, All parties who will be affected by or will affect the organization's strategy is known as stakeholders [15]. Eden and Ackermann define stakeholder as People or small groups with the power to respond to, negotiate with, and change the strategic future of the organization [16]. Cotterell and Hughes [9] suggest that stakeholders might be in one of three categories: internal to the project team; external to the project team, but internal to the organisation; and external to both the project team and the organisation. Newman and Lamming [10] suggest a different division: into those who will use the system directly or indirectly, and those who will be involved in developing the system.

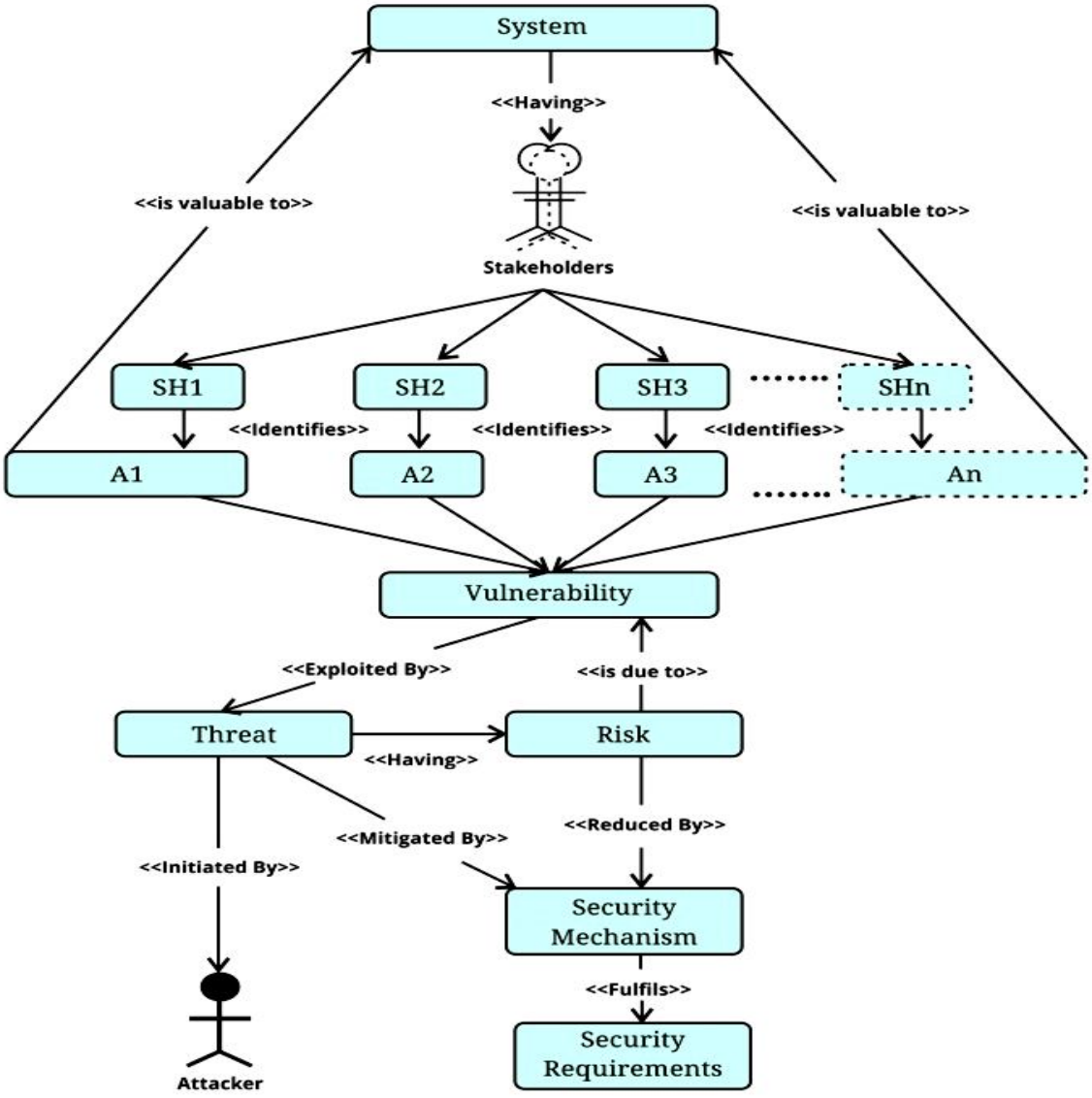

Fig-1: Stakeholder involvement in STORE methodology

Stakeholders in the requirements definition process may have several organisational roles or areas of concern, and thus it is possible for a stakeholder to have more than one viewpoint. A viewpoint may also be associated with more than one stakeholder, where a number of stakeholders share a common area of concern or a particular role. A viewpoint therefore captures the domain knowledge and understanding relevant to a particular role or view of the problem domain adopted by the viewpoint agent [11].

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Software security is an increasingly important issue for Internet-based information systems. New kinds of threats keep coming up, and many technologies have emerged to protect systems and data [25]. Consequently, identifying and analyzing security requirements are an important element of the software engineering process [13]. Although security is generally addressed at a technical level, it is ultimately about social, legal and personal concerns of relevant stakeholders [14]. Threat helps the security requirement engineer to calculate the risk associated with it and also represents the adversary's abilities. Stakeholder plays an important role in the STORE methodology. The following Figure 1 shows the stakeholders involvement in Security Threat Oriented Requirements Engineering (STORE) methodology [1]. This shows that a software system which is to be developed can have several stakeholders, only a few stakeholders are associated with the security of software products. Those stakeholders, who have security concern of the software system, have knowledge about the related assets of the systems which are to be protected from the threats. In STORE methodology we identify and prioritize all such stakeholders based on their importance. It is important to consider every significant stakeholder from the beginning of software development to elicit effective and efficient security requirements.

III. STAKEHOLDER IDENTIFICATION

Software engineers need to identify, characterize, and handle all viewpoints of the different types of stakeholders [6]. Stakeholders, meaning all those involved in a project and have some interest in the software to be developed, may vary from one project to another. It is, therefore, always necessary to carry out an adaptation assessment of stakeholders' contributions and their vested interests in a project. In spite of the importance of identifying all the relevant parts (stakeholders) involved in a software project, the SIP area has received less attention than others in the SE. Some of the main initiatives of SE recognize the existence of different types of stakeholders and who therefore need to be identified in each project.

The "Software Engineering Body of Knowledge" (SWEBOK), highlights the explanation of the tasks related to each one of the proposed fields of knowledge, principally in what are called Requirements. For the SWEBOK, the process of requirements elicitation is a human activity in which stakeholders and relationships established between the development team and the client must be identified. [17]. Requirements engineering is an interdisciplinary process in which all actors must become involved. Ignoring this can lead to the development of inappropriate systems. SWEBOK assigns the role of negotiator to the requirements engineer while other stakeholders are not taken into account. • In an SEI Technical Report [8], stakeholders are identified at the requirements elicitation stage. They come from at least five communities involved in software development: clients/sponsors, users, developers, quality personnel, security personnel and the requirements analyst. The SEI's Capability Maturity Model Integration (CMMi- SW) [18] specifically proposes that stakeholders be selected from among customers, final users, developers, producers, test staff, suppliers, marketing staff, maintenance staff, and anyone who may affect or be affected by the software process and the final product. The CMMi defines two process areas related to RE: Requirements Management and Requirements Development. In each one of these areas, the different stakeholders involved are classified, and their different roles are defined on the basis of activities performed.

In the standards developed by ISO and IEC, the ISO/IEC 12207 (software life cycle processes) provides a specific guideline to define the roles and responsibilities of some stakeholders in the life cycle of a software project, or product, or service. Some of the stakeholders mentioned are customers, quality personnel, software developers, etc. [19]

In [20] the author discussed the identification of stakeholders within the stages of obtaining and analyzing the software requirements. Among the identified stakeholders are the final users who will interact with the system, and also anyone inside the organization who will be affected by such a system. Stakeholders also include engineers who develop or support other related systems, for example, business managers, the IT specialist, workers' representatives, etc. Roger S Pressman argues that stakeholders must be identified in the beginning of the RE process because many different participants are involved at this stage. Pressman identifies the following stakeholders as being the most common: business managers, brand managers, marketing staff, external and internal customers, consultants, product engineers, software engineers, sup-port and maintenance engineers, etc. [21]. In the Rational Unified Process (RUP) within the SE process, stakeholder identification is carried out at the management requirements processing stage. The most obvious stakeholders in a software project are: the final user, the software developer, the purchaser, the project director, and anyone strongly interested in the project or those who need the project to solve their needs [22]. The aforementioned studies confirm the variety of existing stakeholders involved in software development, each having different priorities and interests. All of these studies take SIP for granted and don't go beyond indicating "who" the stakeholders may be. They do not mention "how" the process must be carried out to properly identify stakeholders as a prerequisite to obtaining exact and complete requirements.

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In STORE methodology, it is discussed that the tasks to identify stakeholders and then prioritize them. This can be done after stakeholder requirements are identified. According to [1] the first task is to identify all of the relevant stakeholders. Typical stakeholders include:

- President
- Director
- Senior Executives
- Internal Auditor
- Purchasing Manager
- Project manager
- Database administrator
- Developer
- Networking team
- Key Users
- End Users

These are the people the system must satisfy and you must work with these stakeholders if you want to elicit all the effective and efficient security requirements with the help of STORE methodology.

According to [23] "A stakeholder is a person or organizations who influences a system's requirements or who are impacted by that system." A stakeholder can be a customer, end user, developer, requirement engineer, project manager and other persons who are associated with software development. All stakeholders are not equally vital; therefore we must prioritize the identified stakeholders. The identified stakeholders may be prioritized into critical, major and minor. Each stakeholder has different security constraints to enforce the same service. Each stakeholder has their own security needs that may conflict with the other stakeholder's needs. [24]. All stakeholders in a software development do not have equal importance, so [23] prioritize the identified stakeholder roles with their importance. The following Table 1 shows the list of stakeholders with their significance in a software development organization.

- **Critical:** The stakeholder's role is critical if ignoring the stakeholder may destroy the project or render the system useless.
- **Major:** The stakeholder's role is major if ignoring the stakeholder would have a major unenthusiastic impact.
- **Minor:** The stakeholder's role is minor if ignoring the stakeholder would have a minor impact on the system.

No.	Name	Significance	Type
1	President	Critical	Managerial
2	Director	Critical	
3	Senior Executives	Major	
4	Internal Auditor	Critical	
5	Purchasing Manager	Critical	Marketing
6	Key users	Major	
7	End users	Critical	
8	Project manager	Critical	Information System
9	Database administrator	Critical	
10	Developer	Critical	
10	Networking team	Major	

Table-1: List of stakeholders with their significance

IV. CONCLUSION

Throughout software requirements elicitation we decide what exactly is to be produced. At this stage, the appropriate identification of stakeholders is vitally important as a means of understanding the environment in

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which the software project will be developed and operated, and also to identify which stakeholders will participate in the requirements specifications, in the sense that they must be appropriate, complete, and free of contradictions. This means that all stakeholders need to have appropriate knowledge and none stakeholder can be omitted. Good interaction is vital during the requirements-gathering process, and also between all stakeholders and the system to avoid conflicts and problems of communication arising from different points of view. This is a key aspect in the process of obtaining the expected quality the presence of stakeholders during security design also provides additional benefits in raising awareness and knowledge of security issues in the system. Finally, understanding stakeholders' capabilities also facilitates the design of appropriate countermeasures, making the final system well-suited to its intended users.

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STRUCTURAL MODELING AND SEQUENCE ANALYSIS OF NIF B PROTEIN IN *RHIZOBIUM LEGUMINOSARUM*

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ABSTRACT
Biological nitrogen fixation in legumes is a functional combination of nodulation by nod genes and regulation by nif, fix genes. The Rhizobium leguminosarum that we considered for analysis of nif B are proved to be the best isolates with respect to N2 fixing. An attempt has been made to understand the structural characteristics and variations of nif B gene that may reveal the factors influencing the nitrogen fixation. The 3D-model and sequence analysis of nif B protein was analyzed by using bioinformatics tools. The availability of structural model of a protein is one of the key for understanding biological processes at a molecular level. However, very little is known about the structure and role of nif B proteins. Identification of the 3D structure of a protein is very difficult and complex assignment. Generally two techniques X-ray crystallography and NMR have been used, which are time consuming and expensive. In this regard, a viable alternative approach is to predict the 3D structure of proteins based on homology modeling technique serves the purpose with better validation. Homology Modeling is known to be one of the best and extensively used methods where in the alignment of known protein structures (templates) was done with the unknown protein sequence which has more than 35% of similarity. Literature shows that the homology modeling of nif B protein has not been explored yet which insisted the immediate development for better understanding of nif B structure and its influence on biological nitrogen fixation. In the present predicted 3D structure, the nif B protein was analyzed by and validated accordingly which can be considered as an acceptable model.

Keywords: Rhizobium leguminosarum, nif B, Homology modeling

1. INTRODUCTION
Nitrogen fixation involves the conversion of atmospheric nitrogen into organic compounds like ammonia that can be used for plant development. This process requires some important genes nod, nif and fix. These genes play an important role to produce several crucial enzymes that are involved in the nitrogen fixation. During nitrogen fixation, the enzyme nitrogenase is involved in the breaking of the bonds that hold nitrogen atoms together by covalent bonds. By breaking this bond, the nitrogen atoms are free to form bonds with other atoms. This process requires a lot of energy, by using energy sources from the plant, the bacteria gains sufficient energy that makes it possible for the enzymes to break down nitrogen molecules into nitrogen atoms. The relationship between leguminous plants and Rhizobium bacteria is referred to as a symbiotic relationship because the bacteria and the plant benefit each other. The bacteria convert atmospheric nitrogen to ammonia which is required for proper growth and development of the plant.

Nitrogen fixation is a complex mechanism, not any single gene involved in the whole process but there are several nif genes with their specific function in nitrogen fixation, assimilation and regulation. These nif genes are also found on symbiotic bacterial plasmids along with nod genes nif genes code for proteins that are essential to fix and regulate nitrogen in legumes, nitrogenase being one among them. Environmental effectors usually regulate the activity and synthesis of nif genes. Oxygen and ammonia are the two major signals which regulate the nitrogen fixation at the extent of nif genes. Nif B plays a major role in transcriptional activation and controls the expression of nitrogenase structural genes. Bacterial conversion of Nitrogen (N2) to ammonia (NH3) is an energetically expensive process and very sensitive to oxygen (O2).

Nif B involved in the biosynthesis of the iron-molybdenum cofactor (FeMo-co or M-cluster) found in the dinitrogenase enzyme of the nitrogenase complex in nitrogen-fixing microorganisms. Sequences of all nif B proteins are roughly of similar lengths, about 490 (R. leguminosarum). Nif B is a three-domain protein with a central domain of about 220 amino acids which is sufficient by itself to activate transcription. For better explanation of the mechanism behind nitrogen fixation we checked the protein structural variation and conserved amino acid sequences by modeling 3D structure. However, tertiary structures of large number of nitrogenase proteins of symbiotic ones has not been yet resolved. Therefore, there is a need to model a tertiary structure of the nif B for further understanding of transcriptional activity.

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2. MATERIALS AND METHODS

The nif B protein sequences of R. leguminosarum, was retrieved from Uniprot a freely accessible resource of protein sequence and functional information. The accession number of R. leguminosarum is P24427. To produce the tertiary structures of protein, template was selected from PDB (Protein Data Bank) by using BLASTp algorithm. Sequences of protein that are more similar to the query sequence, were selected as template. The modeling of the three dimensional structure of the protein was performed by swiss-model homology modeling program and Swiss-PDB Viewer. After optimization the 3D model was verified ProSA web server used to validate the modeled protein structure with available protein structure derived from PDB.

3. RESULTS AND DISCUSSION

The nif B protein sequence of R. leguminosarum was retrieved from the Uni-Prot software. The unique ID of nif B is Uniprotkb-24427 for R. leguminosarum considered for further analysis. UniProt is a universally acceptable database for the researchers to identify their specific protein's knowledge regarding quality, richness, and accuracy with wide-range cross references and querying interfaces always accessible. The sequence alignment result of BLASTp provides 94% identities with nitrogenase cofactor biosynthesis protein nif B (Rhizobium leguminosarum).

BLASTp score of nitrogenase cofactor biosynthesis protein Nif B (Rhizobium leguminosarum)

Query 1 MSRGMSKCRITNTAPSARGWKATTFGDYAFSSRGSSEPNAMAPAIIEQIKDHPCFSREAH 60

MSRGMSKCRITN AP+AR +ATTFGDYA SSRGSSEP+AM PAI E+IKDHPCFSREAH

Sbjct 1 MSRGMSKCRITNAAPAARVSEATTFGDYAPSSRGSSEPDAMDPAIREKIKDHPCFSREAH 60

Query 61 LYFARMHLAVASACNIQCNYCNRKYDCANESRPGVASHRLTPDQALRRAIAVANEVPQLS 120

LYFARMHLAVA ACNIQCNYCNRKYDCANESRPGVASHRLTPDQALRRAIAVANEVPQLS

Sbjct 61 LYFARMHLAVAPACNIQCNYCNRKYDCANESRPGVASHRLTPDQALRRAIAVANEVPQLS 120

Query 121 VVGIAGPGDACYDWRKTKATLIPIAREIPDVKLCISTNGLALPEHVDDLVDMNVGHVTIT 180

VVGIAGPGDACYDWRKTKATLIPIAREIPDVKLCISTNGLALPEHVD+LVDMNVGHVTIT

Sbjct 121 VVGIAGPGDACYDWRKTKATLIPIAREIPDVKLCISTNGLALPEHVDELVDMNVGHVTIT 180

Query 181 INMVDPRIGTKIYPWIFYDGRRYNGIDASRILHERQMLGLEMLTERGILAKVNSVMIPGV 240

INMVDPRIGTKIYPWIFYDGRRYNGIDASRILHERQMLGLEMLTERGILAKVNSVMIPGV

Sbjct 181 INMVDPRIGTKIYPWIFYDGRRYNGIDASRILHERQMLGLEMLTERGILAKVNSVMIPGV 240

Query 241 NDEHLIEVNKWVKDRGAFMHNVMPLISERSHGTFYGLNDQRCPATSELIALRDRLEGGTQ 300

NDEHLIEVNKWVKDRGAFMHNVMPLISERSHGTFYGLN QRCPA SELIALRDRLEG T+

Sbjct 241 NDEHLIEVNKWVKDRGAFMHNVMPLISERSHGTFYGLNGQRCPAPSELIALRDRLEGNTK 300

Query 301 VMRHCHQCRADAVGLLGDDRAREFTLGQFPADETYDSAKRNAYRQLIERERRGQTLEESD 360

VMRHC QCRADAVGLL DDRA EFTLGQ PADETYDS KRNAYRQLIERERRGQTLEESD

Sbjct 301 VMRHCRQCRADAVGLLSDDRAHEFTLGQLPADETYDSGKRNAYRQLIERERRGQTLEESD 360

Query 361 AATPVSAPSDELLLIAVTTKGGGRVNGHFGHAQEIQIFSVCQKGNGLIGHLKIDPYCLGG 420

AATPVSAPSDEL LIAVTTKGGGRVN HFGH QE+QIFSVCQKG GLIGHLKIDPYCLGG

Sbjct 361 AATPVSAPSDELFLIAVTTKGGGRVNEHFGHPQEMQIFSVCQKGIGLIGHLKIDPYCLGG 420

Query 421 WGEEATLNTIIDALKGLDVLICSEIGKSPKNKLARRGVRATGAYDGSYIEQAIGALYRAV 480

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WGEEATLNTIIDA KGLDVLICSEIGKSPKNKLARRGVRATGAYDGSYIEQAIGALYRAV

Sbjct 421 WGEEATLNTIIDAFKGLDVLICSEIGKSPKNKLARRGVRATGAYDGSYIEQAIGALYRAV 480

Query 481 LHNEALATAI 490

LH EALATAI

Sbjct 481 LHIEALATAI 490

The 3D structure was analyzed, and different parameters were computed using ExPasy ProtParam tool. The results suggested that the average molecular weight of nif B proteins calculated is 53926 Da. The modeling of three dimensional structure of protein was performed by Swiss-model homology modeling programs.

The assessment of the predicted models generated by swiss-model was shown in figure. The main chain parameters. The 3 Dimentional proteins designed for nif B of R. leguminosarum was analyzed by swiss-model software and the results revealed that the allowed regions of residues are 96.8%. The distribution of the main chain bond lengths and bond angles were found to be within the limits for these proteins. The modeled structure of nif B proteins were also validated by other structure verification servers, ProSA-web.

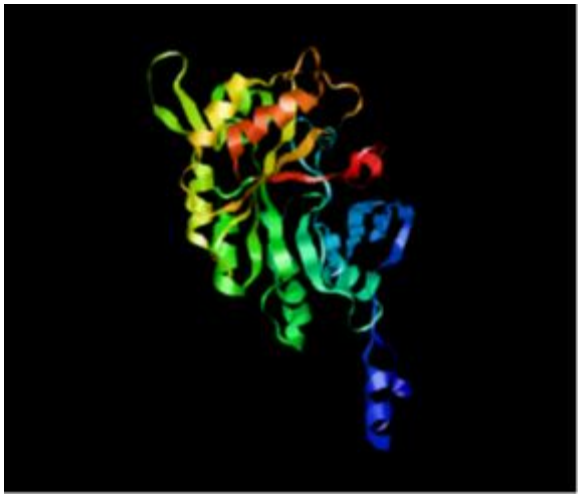

Figure-1: Structural 3D-model of nif B protein (R. leguminosarum)

The predicted structures conformed well to the stereochemistry indicating reasonably good quality. After model building, the structure was validated through energy minimization with Z-Score by using ProSA-web. The Rampage-score provides an estimate of the absolute quality of a model by comparing it to same sized reference structures present in the PDB and solved by experimental techniques.

4. CONCLUSION

To achieve optimistic results in biological nitrogen fixation a deep understanding of protein at structural level is essential. In computational biology provides an opportunity to accomplish the structural modeling and analysis of any protein. In the present study, nif B sequence of R. leguminosarum was selected to determine the physicochemical properties and various protein structure levels. Primary structure analysis revealed that most of the nif B employed in the current study was hydrophilic in nature and presence of cysteine residues seems to correlate with the oxygen sensitivity of these proteins. Tertiary structure predictions were analyzed by different homology servers like Phyre 2 and swiss-model. The model was validated by protein structure checking tool called Rampage. Out of three servers our results revealed that the swiss-model is acceptable tool for the designed nif B protein. We hope that our future studies with the 3D structure of nif B protein will provide a better incite of exact or most probable molecular mechanisms involved in nitrogen fixation. One of the challenging research goals in the future is to elucidate the mechanism.

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RANSOMWARE: A DIGITAL EXTORTION

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ABSTRACT

We are living in information technology era today, storage of paper based data is eliminated or greatly reduced. This is done by transforming documents and other paper based data into digital form. This process is known as digitization. Digital data security and privacy protection have become essential priorities in an increasingly digital and data-dependent business and society. Ransomware is a new threat which rapidly growing to the data files of individuals and businesses. Ransomware encrypts the data files in the hacked computer system and holds the key to decrypt the files until the victim pays the demanded money. This malware is responsible for huge money losses yearly. Due to the large amounts of money to be made, new versions appear frequently. This type of virus allows bypassing antivirus software and other intrusion detection methods. In this paper, we present the overview of ransomware to reveal out the analytical similarities and differences among them, which will help in understanding the mindset of cyber crooks crawling over the dark net. Further we discuss the evolution of ransomware for its distribution and side by side examining the new possibilities of its dispersal. We also describe the ransomware attack mechanism to understand the functionality of ransomware attacks.

Keywords: Ransomware, malwares, botnets, cryptography, web crawlers

I. INTRODUCTION

A growing number of online entities are collecting vast amounts of personal data makes users keep their confidential information in digital form to protect it from several threats. Then the most challenging task is to keep the user's data secure, because most of the attacker attack into the user's system and decrypt the important file through the malicious virus and they demand money which name is Ramsomware attack. The ransomware expansion has included new architectures such as Internet of Things (IoT), hospitals, business, police, among others [1].

The ransomware victim has three paths left when he gets attack by malicious virus. First try to restore their data from backup, pay the ransom or lose their data. Attacker demands money from the user to make payment through bitcoins, because bitcoin is a decentralised currency According to [2] the advancement in Information Technology, these cybercriminals also made progress and more expertise in concealing their malware codes to safely bluff the hard to escape latest security solutions. A new computer's Information technologies generation infection is known as ransomwares. The attacker spreads the infection via multi-phase ransomware. The criminals are so successful with their ransomwares because Attacker are continuously adapting new technology according to the modern technology into their ransomware and use them in more pace than others. For instance, through the well-known phenomenon of social engineering and concealing these criminals are capable of befooling anyone by generating a real-seeming fake webpage or application, advertisement or e-mails. Most often, the security keeping agencies are interested in stopping such cybercrimes but not the criminals. In addition to it, use of Dynamic DNS for ransomware distribution and crypto-currencies for ransom payment make it further difficult to trace their exact location.

The real problem is not ransomware itself, but it is the ignorance regarding ransomware and its unusual spread. The strong defensive techniques and a bit of alertness is sufficient to tackle the ransomwares and get rid of it

Today the extent up to which the Internet and Computers are involved in our lives, security is always on risk due to unawareness and low protection measures. That day is not so far when a car, a mobile phone, a Television set or any other internet enabled smart gadget will not start and shows DDoS (Distributed Denial of Service) error or ask for ransom because they are hacked by someone and one have to pay ransom in order to get access to them. Ransomware which locked the computer system with the help of malware and demanded payment from victim was first seen in Russia/Russian speaking countries in 2009. Prior to that, ransomware was encrypting files and demanding payment for the decryption key [3].

The attacker sends a message, which claims to be from Microsoft, states that your computer must be activated before use. To activate, a specific number must be entered. This number is obtained by sending an SMS message to a premium rate number. In 2011 several major changes occurred. First, the new image claimed to be from law enforcement instead of using a pornographic image. The image text would claim the computer was inaccessible because a crime was devoted and a fine was consequently required. The second major change was

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the language. New protection approaches are needed to defend computer users from being abused by ransomware attacks. It is also necessary for not only to detect these malicious malwares but also to avoid them from imposing damage in the first place. A thoughtful understanding of the nature of ransomware attacks is essential for comprehensive examination of this malware to come up with effective self-protective solutions.

The organization of this paper is as follows. Section 2 ''Rise of Ransomware'' discusses the year-wise evolution of ransomware malware. Section 3 "Ransomware Attack Mechanism" presents the systematic attack mechanism of ransomware to understand the functionality of ransomware attacks. Section 4 ''Conclusion'' summarizes our work.

II. RISE OF RANSOMWARE

Over the past few years, numerous organizations are becoming heavily dependent on information technology applications to get more benefit quickly. This severely dependency has produced a necessity for protecting software systems from threats [15, 20]. According to [4] the first VIRUS created before the commercialization of the Internet in the around late 1980s or in the beginning of 1990s. The Creeper virus was the first virus that was developed by Bob Thomas in 1971, Bob Thomas was working in BBN Technologies [6]. According to Symantec's report [8], the following countries are most affected by ransomware - USA, Japan, UK, Italy, Germany, Russia, Canada, Australia, India, Netherlands, Brazil, and Turkey. These countries represent industrialized and developing economies that roughly make up 85 percent of the World's global domestic product (GDP). India is the ninth most affected region in the world by ransomware. India is also facing ransomware attack it is third-highest country to affected ransomware attacks in Asia with over 60,000 attacks last year. According to Symantec press release, "In India, a staggering 86 percent of all ransomwares was cryptoransomware posing a threat to consumers and enterprises alike" [9].

Cybercriminals are using ransomware to turn extortion into a profitable venture. They attack big and small targets. Ransomware attacks grew 113 percent in 2014, and more than 4,000 percent increase in crypto-ransomware attacks [10]. Two businessmen from Agra were targeted in the first half of 2015, the criminals was demanding ransom pay more than $10,000 to unlock the data [11]. In November 2015, East Delhi-based businessman who failed to decrypt the 500 GB of his company's data and personal files which was hacked by the unidentified Attacker and demand ransom pay of $500 to restore data [12]. In Information Technology era there is a lots of ransomware on the internet; which spread through drive-by downloads, torrent, scams, etc., these common pieces of ransomware target is to scare users. Some are just scams and fear appeals, with no impact on data—for instance, fake antivirus warnings showing annoying pop-ups everywhere with messages like "you have been infected by a dangerous malware, we are currently protecting your files, but sooner or later they will be deleted by the virus if you don't act. Click here to buy our antivirus and solve all your issues [5]

The Table 1 shows the ransomware evolution timetable year wise based on what is known about the ransomware. Ransomware updated general evolution and growth of ransomware according to over time. The first ransomware virus named the AIDS Trojan was developed by Joseph L. Popp. Popp was a Harvard-trained evolutionary biologist. It was distributed by floppy disk at the World Health Organization's International Aids Conference, 2005. The first modern ransomware was invented as Trojan.Gpcoder, It is also known as GP Code and GPCoder. GPCoder was released in May 2005 and primarily used a custom symmetric encryption technique that was weak and easily overcome. Gpcoder malware was spread via a spam email attachment claiming to be a job application [13]. The bulk of the early ransomware was developed in Russia by Russian organized criminals. It was mostly aimed at Russian victims and those in neighboring countries, like Belarus, Ukraine, and Kazakhstan [14].

Year	Ransom Malware
1999	AIDS Torjan
2001	Fake Antivirus
2005	Gpcode
2006	Trojan.Cryzip, Seftad
2008	Winlock, Krotten, BlueScreen
2009	Calelk, Urausy
2010	Tobfy
2012	Reveton, Loktrom, Filecoder, Weelsof

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2013	CryptoLocker, Kovter
2014	CBT-Locker, CryptoWall
2015	CRPTXXX, TeslaCrypt, Chimera
2016	Locky Ransom32, Jigsaw, Petya, Samas
2017	WannaCry

Table-1: Year-wise ransomware evolution timetable

In early 2006, ransomware was starting to gain traction, and more attackers started to try their hand. Trojan.Cryzip appeared in March 2006. It copied data files to password-protected archive files and deleted the originals. The code for the malware included the password, so recovering it was straightforward. Trojan.Archiveus also came on the scene in 2006. It operated much like Trojan.Cryzip, except instead of asking for a ransom, it required victims to buy medication from specific online pharmacies and submit the order ID to get the password [16].

Locker ransomware began to appear. Early versions struck Russia and displayed a pornographic image on the machine and demanded payment to remove it, either by SMS text message or calling a premium-rate phone number. Attacks soon spread to Europe and the US [17]. A variant of Trojan.Gpcoder called GPcode.AK first appeared. It used a 1024-bit RSA key. It left a text file with instructions in each subdirectory where it encrypted files. It asked for payment of $100 to $200 in e-gold or Liberty Reserve [18].

Mid 2011 saw the first large-scale outbreak of ransomware, mainly due to emerging anonymous payment services. There were about 30,000 new ransomware samples in quarter one and another 30,000 in quarter two. By quarter three, there were 60,000 new samples [13]. A toolkit called Citadel was released at a cost of about $3,000. Citadel made it simple to produce and distribute ransomware [19]. Another toolkit, called Lyposit, also came out in 2012. It was designed to produce ransomware that pretends to come from law enforcement with the exact agency depending on the computer's regional settings. One version International Management Review Vol. 13 No. 1 2017 12 created with Lyposit was known as Reveton. It displayed a pop-up message saying the machine had been involved in child porn activity, downloading copyrighted material, or some other criminal activity, and had been locked by the FBI or Justice Department [13,16]. Another early ransomware was Trojan.Randsom.C. It spoofed a Windows Security Center message and asked the user to call a premium-rate phone number to reactivate their Windows license. Deficiencies in locker ransomware, as well as other extortion schemes not discussed here, lead to a pivot back to crypto ransomware in 2013. A typical attack requests payment of around $300, and the attacks became much more [16]. 2013. The most famous piece of ransomware, CyptoLocker, was released in August 2013 by a hacker named Slavik. It used public and private cryptographic keys to encrypt, and later decrypt, a victim's files. It was originally distributed via the Gameover ZeuS banking Trojan botnet. Later, it was distributed via an email that appeared to come from UPS or FedEx [17]. The original version of CryptoLocker encrypted about 67 different file types, including all Microsoft Office data files. CyptoLocker gave victims three days to pay. Prices were around two Bitcoins, or $100 at that time. Other payment methods included CashU, Ukash, Paysafecard, and MoneyPak. With some versions, if the three-day deadline was not met, victims could pay a much higher ransom to retrieve their files.

In May 2017, the WannaCry ransomware attack infected over 300k Windows computers in over 150 countries. The measurer of the malware carries two modules. One uses the "EternalBlue" exploit against a vulnerability of Windows' Server Message Block (SMB) protocol to propagate, and the other is a WannaCry ransomware encryption component [21,22]. WannaCry produced major financial consequences, as well as extreme inconvenience for critical businesses across the globe.

III. RANSOMWARE ATTACK MECHANISM

This section elaborates the ransomware attack mechanism along with the major functionalities performed by it during various stages of its attack. There could be several opportunities by which an adversary can plant a ransomware on the victim's computer system. The two common technique used for ransomware attacks are and fraudulent websites and phishing/spam emails. The Figure 1 shows the mechanism of a ransomware attack.

A. Ransomware Attack Startup

The adversary can be deployed the ransomware attack to a particular target or it could be randomly spread among various users. Random attacks are not specific to a person or an organization. Random ransomware attack is launched via phishing/spam emails to a mailing list containing email addresses of thousands of users. Alternative way of launching a random ransomware attack is through a cooperated website where all the users

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who visit the website are infected through drive-by downloads. Random attacks are most effective against inexpert users. In target-specific attacks, the adversary chooses either specific users or an organization. As will be seen in the Case Studies section, target-specific attacks have higher success rates.

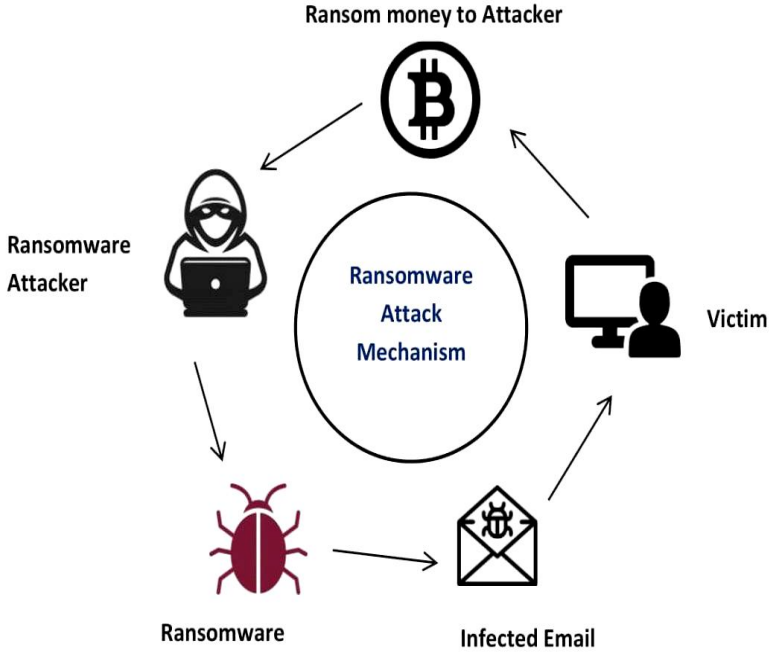

Fig-1: Ransomware attack mechanism

B. Malware execution on victim's system

Once the ransomware attack has been launched by the adversary, all the users who have downloaded the email attachments or files through download would have the malware on their systems. Once the malware reaches the user's system, it starts its execution. A distinctive type of ransomware accomplishes actions such as producing a unique computer identifier, confirming "reboot survival", deactivating shadow recovery, initiating start-up recovery and windows error recovery, injecting itself into explorer.exe and svchost.exe, searching the system directories for GUID (global unique identifier) and important files, and retrieving the IP address.

C. Communication with command and control server

Once the ransomware becomes installed on the users system, it communicates with its command and control (C & C) server. This server is accountable for providing the ransomware with further instructions and a public encryption key. There are several anti-viruses and computer firewalls that preserve a list of malicious proxies and IP addresses to find the existence of malware if it attempts to communicate with any server in the list. However, this method is not very operative as it is nearly difficult to build a list of all malicious destinations. Furthermore, adversaries may use Dynamic Domain Generation Algorithms instead of a static C & C server. A new ransomware known as Cryptolocker produces a list of 1200 domains to make a connection and keeps trying to connect to them until a positive connection has been made. Such interconnected C & C servers and compromised systems (botnets) allow adversaries to control the compromised system from multiple points.

D. Encryption of Victim's Data

The next step is file encryption on the victim machine. Long-standing versions of ransomware would just encrypt the local files but at the present time they have started to encrypt the backup first. To accomplish this, they search for the directories or files specifically named in date format (e.g. data20160323.bak) or comprising .bak and encrypt these first before encrypting specific files. Since encryption can be detected by anti-virus software, the ransomware typically encrypts important files first so that harm is caused as quickly as possible before detection takes place.

E. Ransom demand for Decryption of Data

The last stage of ransomware attack is demand for ransom maney for decryption of victim's data. After the files are encrypted, the ransomware informs the victim about the destruction that it has done and steps to recover the files. For example, Cryptolocker provides a new installation link in case anti-virus has uninstalled the malware from the system. It also shows users the steps to disable/uninstall anti-virus programs from the system along

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with all the steps to pay the ransom amount. It may take up to 48 hours for the adversary to verify the payment and respond after the ransom is paid. After the verification, adversary may deliver the private key. The decryption of the files starts after the private key is received by the victim's machine and ultimately the files are recovered.

IV. CONCLUSIONS

In recent years, ransomware has progressed into one of the biggest cyber security threats. Use of information technology applications over internet is becoming a massive advantage for the adversary, not only for ransomware, but also for malware, in general. The Internet has generated a criminal ecosystem that provisions the development, deployment and economic mechanisms to help these types of attacks. Ransomware has become one of the most crucial issues in the information technology world. The recurrent attacks in the recent years and the news they produce have devastated the misapprehension that organizations have regular backups and do an exceptional contract of protecting their digital data and resources. Undoubtedly, protecting digital resources from ransomware is not an easy task. If organizations find it challenging, then it is a big problem for individual users. Ransomware is a problem for both organizations and individuals who are moving more and more of their data, and personal data over internet. The ransomware attackers are typically mysterious persons from other countries that have weak or absent law prosecution related to cyber security, making it questionable that law implementation is going to make much of a dip in the flood of ransomware. Only some avoidance can be taken so that computers are not infected. In this type of circumstances, awareness of users about ransomware is of greatest significance as social work.

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IMPACT OF POWER IN SUSTAINABLE ECONOMIC GROWTH- KHADI GRAMODYOG

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ABSTRACT
Khadi and Village Industries from a part of rural Industries and are based on socioeconomic and cultural fabric of life. These industries constitute an important segment of the decentralized sector of our economy and provide employment mostly to the weaker of the society of which women constitute a substantial part of the work force. One of the major requirements for sustainable and inclusive economic growth is an extensive and efficient infrastructure network. It is critical for the effective functioning of the economy and industry. The key to global competitiveness of the Indian economy lies in building a high class infrastructure. To accelerate the pace of infrastructure development and reduce the infrastructure deficit, the Government has initiated a host of projects and schemes to upgrade physical infrastructure in all crucial sectors. Despite several challenges, the positive results of the Government's initiative are showing in some sectors. However, required capacity addition in a time-bound manner needs focused attention in other sectors.*

Former President, Abdul Kalam in his 59th Independence Day speech had said "Energy security, which means ensuring that our country can supply lifetime energy to all its citizens; at affordable costs at all times, it thus a very important and significant need and is an essential step forward. But it must be considered as a transition strategy, to enable us to achieve our real goal that is Energy Independence or an economy which will function well with total freedom from oil, gas or coal imports". Putting energy as our nation's first and highest priority, he had called for determination on to achieve this within the neat 25 years i.e. the year 2030. The present government has set the target to provide affordable, 24x7 power to all households by 2019.

Keywords: Infrastructure, Energy security, Required capacity, Strategy, Provide Affordable, Khadi Gramodyog, MSME.

INTRODUCTION
Khadi and Village Industries Commission (KVIC) established under the Khadi and Village Industries Commission Act, 1956, is a statutory organization under the aegis of the Ministry Of MSME, engaged in promoting and developing Khadi and village industries across India. The functions of KVIC as prescribed under the KVIC Act, 1956 includes: (A) to encourage and assist in the creation of common service facilities for the processing of raw materials or semi-finished goods and otherwise facilitate production and marketing of Khadi or products of village industries; (B) to promote the sale and marketing of Khadi or products of village industries or handicrafts and for this purpose create links with established marketing agencies wherever necessary and feasible. This paper focuses on understanding the role played by KVIC in promoting Khadi as a brand in India. This paper is based on content analysis after collecting secondary data from various websites including Government and Non-government websites.

Energy is an important input in absence of which economic growth impossible. It is required not only for production, but also consumption. It should increase persistently coupled with eco-friendly nature that does not deteriorate environment quality, which can be called as eco-friendly or sustainable energy. This demands to study management of the energy for the sustainable growth of the economy. With this background the present paper intends to examine energy demand supply management for the sustainable economic growth of India the post economic reforms.

OBJECTIVES OF THE STUDY
1. To know energy challenges for India.
2. To highlight India's energy scenario till 2030
3. To study energy demand-supply condition in India
4. To reveal energy management strategy for the sustainable growth in India.
5. How to equilibrium to connect Growth and K.V.I.C.

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HYPOTHESIS OF THE STUDY

A hypothesis of the present study is 'Rapidly growing requirements for energy necessities its appropriate management strategy so as to enable sustainable economic growth the economy."

DATA BASE

The study solely relies on the secondary data published by Government of India, and other agencies i.e. Economic Survey, India energy policy reports, energy statistics etc.

ENERGY CHALLENGES FOR INDIA

At present, India houses about 18 percent of the world's population but consumes only 5.7 percent of the global energy. Per capita energy demands has grown modestly since 2000, but continues to remain about a third of the global average and slightly lower than the level in Africa. About 75 million households, a third of the total, are still not connected to grid electricity, and 80 percent of rural households use traditional biomass as a primary source for cooking.

Across the countries, America and Europe happen to have high per capita energy consumption. Countries like Japan and Korea also have high per capita energy consumption, but comparatively, the energy intensity is the lowest in these two countries due to their process efficiency, improvement in technology, and energy conservation measures adopted by them. The developing countries on the other hand happen to have very low per capita energy consumption but at the same time their energy intensity happens to be the highest due to inefficiency and lack in technology; India one of the fastest developing countries faces the same problem. This inefficiency further results in high amount of pollution and GHG emissions contribution to global warming and climate change.

India today happens to be amongst the largest producers and consumers of energy in the world. The energy use here is highly intensive and happens to be amongst the highest, whereas the per capita consumption of energy is lowest compared to the OECD countries and even most of Asian countries. India today happens to be ranked sixth in terms of energy consumption. The per capita energy consumption of world is 2600, whereas for India it happens to be just over 600 units a year, even much below some of the developing countries. The sad part is that even today about 35 percent of the population in India lives below dollar per day. India is one of the fastest growing economies in the world with brilliant performance in the 10th Five year plan. The pace of growth unfortunately has not been able to match the supply and demand and as such India is still a net importer of energy. India today imports around 25 percent of its primary energy. India is highly dependent on imports for meeting its petroleum needs and as such 70 percent of its petroleum products are imported mainly from Middle East countries.

Table-1: Number of People in India without Access to Electricity & Relying on Biomass

	2005*	2015	2030		
		Reference Scenario	High Growth Scenario	Reference Scenario	High Growth Scenario
Without electricity access - Rural	380	274	102	59	0
Without electricity access - Urban	32	2	0	0	0
Relying on biomass - Rural	597	565	529	436	380
Relying on biomass - Urban	71	67	51	36	15

Source- IEA Analysis.

Energy security of late has become one of India's biggest challenges. To mitigate the risk of supply disruption from the Middle East countries, it has started diversifying its source of fuel from other African countries also. India has also started bidding and buying oil stakes in foreign countries.

India along its border is surrounded by Pakistan, Afghanistan, Nepal, Bhutan, China, Bangladesh and Sri Lanka. Over a period of time rapid changes in the world have taken place causing a metamorphosis in the socio-economic and political environment. The change has been evident in the recent years making it incumbent on the part of every nation to react to events with caution and responsibility. Regional Cooperation with its neighboring countries is crucial for ensuring the availability of required natural resources for meeting its present and future energy needs.

INDIA'S ENERGY SCENARIO TILL 2030

India is among the countries with INDC targets set for 2030. The INDC submitted by India has proposal unconditional target to achieve reduction in emission intensity of GDP by 33 percent to 35 percent below 2005

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levels and creating cumulative additional carbon sequestration of 3GT by 2030. Further, a conditional target of increasing cumulative share of non-fossil fuel based power generation capacity of 40 percent has been given.

It must be noted that India's INDC targets of emissions intensity reduction are related to greenhouse gases (GHGs) as a whole, but given that CO2 accounts for the largest share in total GHGs and energy sector accounts for the largest share of total CO2 emissions, if we consider this level to be broadly in line with energy sector related CO2 emissions intensity reduction, this translates to a requirement of containing CO2 emissions to a level of around 5 Gt by 2030, depending on the lower/upper range of 33 percent or 35 percent emission intensity reduction.

The power sector is likely to need the greatest level of transformation in India's energy system until 2030. Moving from minor levels of renewable capacity today to a sizeable share by 2030 requires adequate attention to be focused on understating future energy demand patterns, planning for appropriate, demand-supply matching in a dynamic manner, and planning for appropriate base loaded generation and storage options to manage the intermittent nature of renewable.

POSITION OF ENERGY DEMAND - SUPPLY IN INDIA

India needs economic growth and development to free itself from the evil clutches of poverty and hunger. To ensure the desired rate of growth of the economy it also needs adequate energy either indigenously or by means of import. This entails that in order to maintain the required economic growth India would have to exploit the natural resources in the form of coal, hydro, gas nuclear, and wind. But the challenge is how it can harness the energy resources so as to ensure its energy needs and at the same time make is sustainable for its future generation. Majority of Indians still use traditional fuels such as cow dung, agricultural wastes, and firewood and cooking fuel. India's Integrated Energy Policy Report 2008 lays stress on the energy security aspects as well diversification of its fuel mix coupled with indigenous use of resources to meet its energy challenges and its efforts to raise its level of human development. "India faces formidable challenges in meeting its energy needs and in providing adequate energy of desired quality in various forms in a sustainable manner at competitive prices. India needs to sustain an 8 percent to 10 percent economic growth rate, over next 25 years, if it is to eradicate poverty and meets its human development goals". In order to deliver a sustained growth of 8 percent through 2031, India would at least need to grow its primary energy supply 3 to 4 times whereas the electricity supply needs to grow at the rate of 5 to 7 times the present consumption. In real sense of the Indian context, the issue of sustainability is larger compared to OECD countries as we as a nation have to address the basic needs of teeming millions both today as well as tomorrow.

Environmental taxes, green taxes, carbon taxes, and subsidies etc. needs to be levied so as to affect choices of end users. India can have differential taxes if they can appropriately reflect environmental externalities. Industries are energy intensive and by simply increasing the energy efficiency by use of technology is important for ensuring its energy security and abatement of pollution.

To meet the demand for energy, India has to depend largely upon coal. Coal today accounts for 50 percent of India's commercial energy consumption and around 78 percent of the domestic coal production is dedicated to power generation. Coal shall remain the most dominant energy source till 2031-32 and possibly beyond. Coal for instance, will dominate India's energy basket in terms of catering to its present and future needs considering the volatility of crude oil both in terms of price and supply disruptions. By the end of the 15th Plan (Year 2032), India's coal power capacity has to increase to at least 400GW as planned. This would need almost 900 more 500MW sized plants. The incremental cost alone would be $104-259 billion (around INR 5.55-7-98 trillion), depending on the technology chosen, with annualized investments in the range of $4-8 billion. (Arunabha Ghosh) Hydro has a potential of 150,000 MW in India.

Though the contribution to the overall energy requirement is small, its flexibility and suitability to as peaking power makes it very valuable. But along with the exploitation of hydro potential arise the environmental concerns and the problems of resettlement and rehabilitation of project affected people. The issue of resettlement and rehabilitation has been often caught great amount of social and political agitation and needs to be handled in a better way to avoid future public outbursts.

Nuclear energy offers India powerful means for long term security. It needs to develop its thorium cycle for nuclear power. India and USA recently have signed a historic nuclear deal. This will help India in removing the hurdles that if faced in procuring nuclear fuel and technology in the future. This is a win-win from India's perspective as this will enable India to build more nuclear plants to meet its future energy needs. This will also enable India to reduce its dependence on foreign oil and gas.

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Table-2: India's Energy Demand in the High Growth Scenario

	2005*	2015	2030		
		Reference Scenario	High Growth Scenario	Reference Scenario	High Growth Scenario
Without electricity access - Rural	380	274	102	59	0
Without electricity access - Urban	32	2	0	0	0
Relying on biomass - Rural	597	565	529	436	380
Relying on biomass - Urban	71	67	51	36	15

Source - World Energy Outlook.

Renewable will need to pay a greater role to maximally develop domestic supply options as well as the need to diversify energy resources. Solar power, wind energy, biofuels etc will have to play a big role to ensure energy security as well as being environment friendly. It India exploits entire renewable sources, it will be able to meet only 5 percent of its total requirement with the existing technologies. As such renewable can be used as a supplement but not as a supplant. These can be stand alone systems and such can do well for the rural poor people by providing them with energy for their economic growth as well provide them with means of earning their livelihood. With regard to the energy basket, liquid fuel dominates the basket followed by coal and natural gas. Transportation sector plays a crucial role in creating a huge amount of demand for the liquid fuels as in the present scenario most of the vehicles are designed to run on liquid fuel. With the rising income the urge to own and use one's own vehicle has further added to the problem. Further the energy security in terms of availing the energy resources from energy rich countries is another big challenge due to the risk of volatility either in terms of price or supply.

India is among the countries with INDC targets set for 2030. The INDC submitted by India has proposed unconditional target to achieve reduction in emission intensity of GDP by 33 percent to 35 percent below 2005 levels and creating cumulative additional carbon sequestration of 3GT by 2030. Further, a conditional target of increasing cumulative share of non-fossil fuel based power generation capacity to 40 percent has also been given.

It must noted that India's INDC target of emissions intensity reduction are related to greenhouse gases (GHGs) as a whole, but given that CO2 accounts for the largest share in total GHGs and energy sector accounts for the largest share of total CO2 emission, if we consider this level to be broadly in line with energy sector related CO2 emissions intensity reduction, this translates to a requirement of containing CO2 emissions to a level of around 5 Gt by 2030, depending on the lower/upper range of 33 percent or 35 percent emission intensity reduction.

ENERGY MANAGEMENT STRATEGY FOR SUSTAINABLE GROWTH IN INDIA

The strategy of the management of the energy should consist of both the management of the demand as well as supply of the energy in India, that will enable sustainable growth of the Indian economy. It is clear that the energy requirements are higher and rapid so far as its growth is concerned. Hence, it is essential to increase the supply of the energy in India coupled with management of the demand for energy. While talking about management of the supply side of energy, it is also necessary to take due precaution of increasing supply of eco friendly energy. We heavily rely on thermal energy, which is non eco friendly due to its contribution very significantly to environmental degradation. This heavy dependence on thermal energy should be reduced by exploiting renewable and eco friendly energy sources like solar energy, tidal energy, wind energy, hydro energy, and energy from waste. It is a fact that these energy sources are costly, but here it is necessary to play a very significant role by the engineering, technological institutes and colleges to evolve and develop that technology, which will produce cost efficient energy. This will require emphasis on the development and research activities by the technological institutes and universities by providing incentives and encouragements. Attempts should be made to attract inflows of foreign direct investment especially in renewable and eco friendly energy generating activities, but due precaution of cost efficiency and absence of exploitation is a must. Government both the union as well as state engage in generating renewable and eco friendly energy through its public sector undertakings. The increase in energy production will promote per caput energy consumption, but control on population rigorously and honestly must be attempted. The fall in energy intensity is very dismal, which demand increased concentration over its decline. Here also technological advancement and energy efficient production machines could be useful and desirable. It is a must to control imports of energy by producing electricity generating projects like electricity generation from municipal waste and cogeneration units. This will save foreign currency, and more importantly promote our self reliance in electricity in

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transmission in significant, which demands its due control, which can be materialized creating special cell by the electricity generating and supplying agencies in India. Participation of people also helps in the control of theft of the electricity. On energy demand side management, over use of electricity should be eliminated, and that responsibility should be assigned to the state government in India. Likewise, domestic purpose use of energy should be assign to the state government in India. Likewise domestic purpose of energy should be controlled by inbuilt provisions in home appliances, and energy education and awareness among people and their active participation. A mechanism at state level should be created, that will frequently examine nature and extent of electricity for domestic purpose as a watch dog. Energy Commission should be appointed both at national and state level to look into the matters relating to energy and its problem and give recommendations to the union and state governments so as to deal with its various problems. The inbuilt provision of energy saving home appliances, with use of renewable should be made and increased therein.

Several policies, measures and schemes headed in the right direction already been launched over the past few years in the energy sector. However, there is a need for careful planning both in terms of the choices we made and in terms of the timing of adoption and scale-up of alternative options, in order to bring in careful balance between options that may be more optimal in the shorter and longer term. Planning in this sector therefore needs to be dynamic and flexible over time, making best use of options as they become available and viable both domestically and globally.

Learning from international experiences and practices in other countries can be useful in this regard. At the same time, India, should focus on bringing together real-time data to better understand and analyse the options that exist and may become available over time across sectors, develop human and institutional capacity to ensure that appropriate skill sets and capacities exist at all times to manage the transitions in India's energy future; and be open to innovative thinking and developing of business models that work in the Indian context.

Careful planning is also required to direct investments to appropriate sectors of the economy, such that larger benefits of growth and employment can be harnessed to move along a long-term sustainable pathway.

CONCLUSION

Energy is an important input necessary not only for production, but also for consumption. Energy plays a pivotal role in the economic growth of the economy. Rapid the economic growth, more the demand for energy and vice versa.

The Planning Commission of India has outlined Human Development Goals in line with the UN Millennium Development Goals is highly ambitious and as such special focus needs to be there to ensure its effective implementation. Energy policies are in place and there needs to be an increased importance of Sustainable Development discourse in public policy. India has to have successful environment policies to protect the earth's ecosystem, there has to be more participatory approach for fighting the global menace and each and every individual needs to think green. India's high rise in energy consumption and unprecedented economic growth has to be sustainable in the sense of catering to both present and future needs of people acknowledging the fact of limited potential of the Earth to regenerate. For India, the best approach for economic growth and sustainability of its environment is to adopt clean energy efficient technology along with energy conservation measures to ensure sustainability of the planet in the years to come.

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DCF BASED DISPERSION MANAGEMENT APPROACH TO HIGH DATA RATE LONG HAUL WDM OPTICAL FIBER COMMUNICATION NETWORKS

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ABSTRACT

optical fiber networks offers high band width in the range of THz and thus it can support a high data rate transmission, but this comes with various signal degradation effects, the most common of them is dispersion effect results in ISI, aliasing or lost of information. This paper offers an approach to encounter these effects at greater extent. Here a WDM optical communication network is simulated which utilizes DCF technique to overcome chromatic dispersion effect and ISI with substantial improvement in quality factor and BER. This paper also utilizes the concept of multi carrier optical modulation technique in order to improve overall transmission quality and performance index. A high data-rate signal in Tbps is transmitted and simulated, resulting in reduced SNR, low BER and high quality factor at the receiving side.

Keywords: Chromatic dispersion, aliasing effect, BER, ISI, SNR, DCF technique, transmission Q-factor, BER, band width Threshold Value, Eye-Height

I. INTRODUCTION

In long haul optical communication network, considering various effects of signal distortion effect, ISI is one of the biggest problems caused due to dispersion phenomena. For such type network having SMF, the effect of intermodal dispersion is too much but this is, only-not a significant problem. PMD and chromatic dispersion can degrade the system performance. Now a days there are various techniques available, to compensate these effects.

Fiber Bragg's Grating is one of the methods but for significant improved quality of transmission we used the DCF technique here. We have formulated a WDM system using this technique. The fundamental concept of this technique is shown in fig (1) representing a long haul SMF followed by DCF for compensation of ISI in such kind of networks.

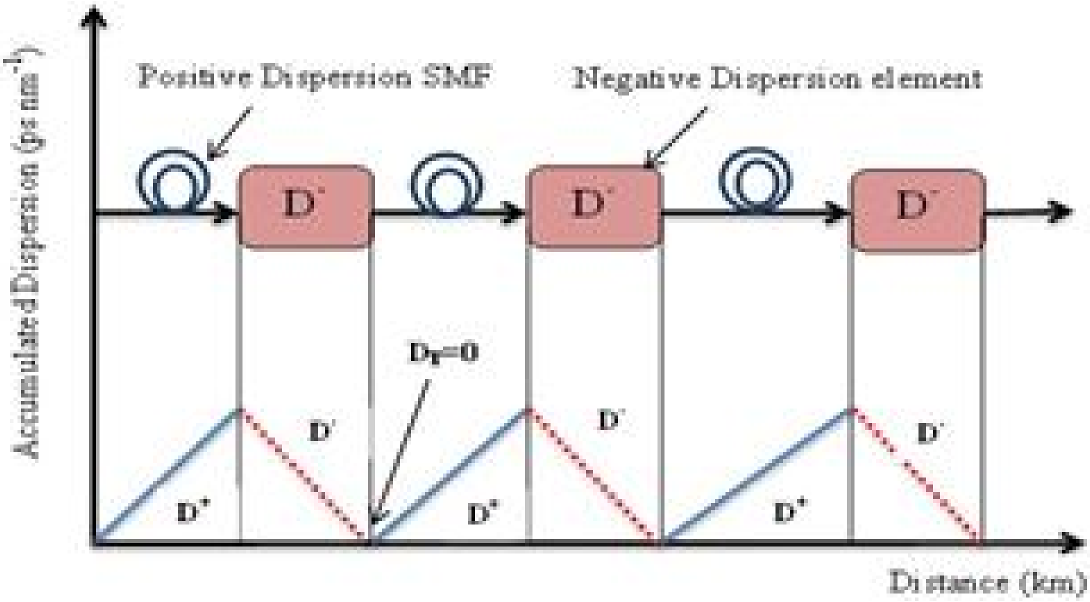

Figure-1.1: An illustration of DCF technique

II. SYSTEM MODELING & SPECIFICATIONS

In order to design a WDM optical network here a 4×1 multiplexer is used, and at the receiver end 1×4 de-multiplexer is used and shown in fig (1.2), however the setup was also simulated for higher order multiplexing data. All four different users at transmitting side have different bit sequence which are shaped and processed through NRZ pulse generator. Each sequence is modulated with individual subcarrier frequency, with the help of MZM offering unique transmission characteristics. At the receiver end, de-multiplexer is followed by individual LPF, that allows the noise filtering and band limiting the received sequence. At each stage of signal processing several visualization analyzers is installed to monitor the sequence pattern.

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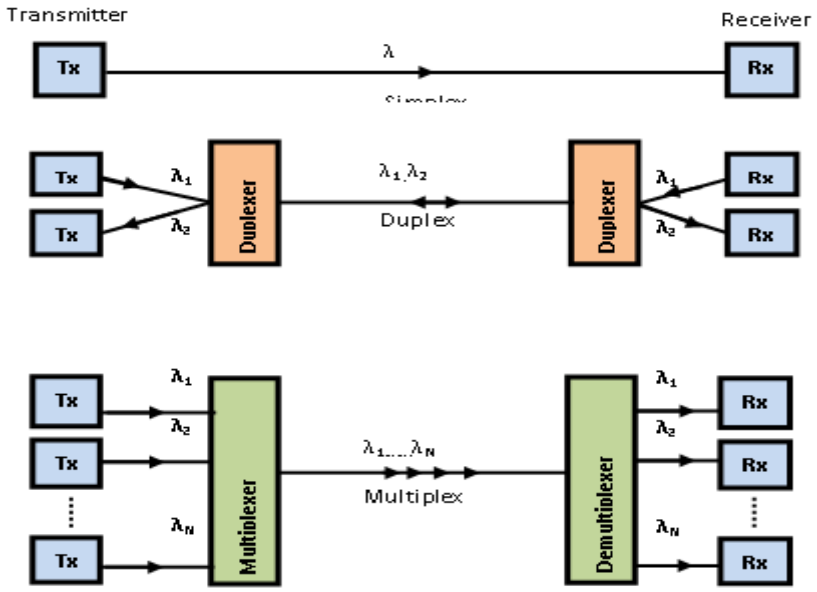

Figure-1.2: An Illustration of WDM Network

Here all wavelength for individual user are different λ1, λ2 , λ3, λ4. OFC channel is arranged in such a way that the ratio of SMF and DCF is 1:5, which is used to compensate dispersion effects, to overcome the effect of power degradation few EDFA are incorporated, an additional amplifier of 100 meter also used with the channel to counter the effect of attenuation.

A multicarrier modulation phenomenon is governed by OFDM formulations as:

$$s(t) = R\left\{\left(\sum_{k=-k/2}^{k/2} c_{m,j,k} e^{j\frac{2\pi k}{T_u}(t-t_s)}\right) e^{j\pi f_c(t-t_s)}\right\}, t_s \leq t \leq (t_s + T_u)$$

$$s(t) = 0, t < t_s^t > (t_s + T_u)$$

Where fc is the RF carrier frequency, m is the frame number, l is the OFDM symbol number, and k is the subcarrier number.

$$R_{m,l,k} = \sum_{i=0}^{N-1}\left\{\left(C_{m,l,j}\frac{1}{N}\sum_{n=i}^{N-1} e^{j\frac{2\pi ni}{N}}.e^{-j\frac{2\pi k}{N}(n-i)}\right) + \left(C_{m,l+1,j}\frac{1}{N}\sum_{n=0}^{i-1} e^{j\frac{2\pi ni}{N}}.e^{-j\frac{2\pi k}{N}(n+N-i)}\right)\right\}$$

$$R_{m,l,k} = e^{j\frac{2\pi k}{N}} C_{m,l,k}\frac{N-i}{N} + e^{j\frac{\pi}{N}(i-k)(N-1+i)}\frac{\sin\left(\pi(i-k)\left(1-\frac{l}{N}\right)\right)}{N\sin\left(\frac{\pi}{N}(i-k)\right)} + e^{j\frac{2\pi kl}{N}}\sum_{i=0}^{N-1} C_{m,l+1,j} e^{j\frac{\pi}{N}(i-k)(l-1)}\frac{\sin\left(\frac{\pi}{N}(i-k)(l)\right)}{N\sin\left(\frac{\pi}{N}(i-k)\right)}$$

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The signal now consists of disturbances caused by ICI and inter-symbol interference (ISI) and a useful portion attenuated and rotated by a phasor whose phase is a function of subcarrier k and a fixed l. Now the protection against ISI is required up to l=P since the input to the FFT is

$$r_{m,l} = \left\{r_{m,l,N-p+i}, r_{m,l,N-p+i+1}, \ldots . r_{m,l,N-1}, r_{m,l,0}, r_{m,l,1}, \ldots . . r_{m,l,(N-1-p+i)}\right\}$$

and the output of the FFT becomes

$$R_{m,l,k} = \sum_{i=0}^{N-1} C_{m,l,i} \frac{1}{N} \sum_{n=0}^{N-1} e^{j\frac{2\pi ni}{N}} e^{-j\frac{2\pi k}{N}(n+p-l)}$$

$$= e^{-j\frac{2\pi k}{N}(p-l)} \sum_{i=0}^{N-1} C_{m,l,j} e^{j\frac{\pi}{N}(i-k)(N-1)} \frac{\sin\left(\pi(i-k)\right)}{N \sin\left(\frac{\pi}{N}(i-k)\right)}$$

which is just a phase rotation formulation. it can also be observed from above outcome taht, the ISI and ICI part is completely eliminated in the received signal. Thus it will offer lesser the dispersion and higher synchronization for long haul communication networks.

Now the DCF offers cancellation of pulse broadening with arrangements

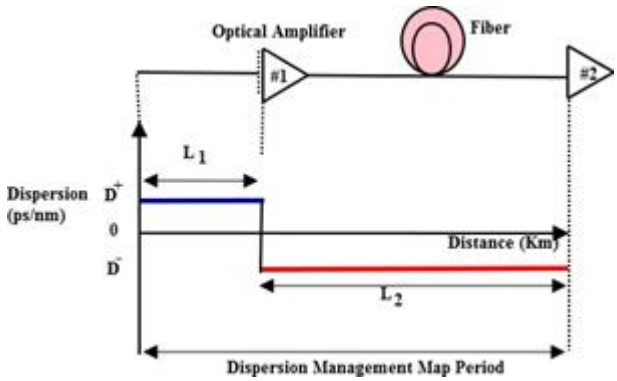

Figure-1.3: An Illustration DCF management technique

$$D_T L_{map} = -\beta_{21} L_1 - \beta_{22} L_2$$

$$\beta_{21} L_1 + \beta_{22} L_2 = 0$$

For perfect dispersion compensation the dispersion map strengths for the fiber path lengths L1 and L2 should cancel the negative and positive dispersion effects on each path and therefore D¯_T L_map must be equal to zero.

III. SIMULATION SYSTEM MODELING

An optics modeling & simulation tool named as "OPTYSTEM 16.0" is used hare. A distinguished 16 bit data sequence is transmitted by individual user with the modulation frequency of 193.1THz, 193.2THz, 193.3THz and 194.4 THz with uniform sweep power level 13 dBm. For all users

reference wavelength for DCF signal transmission is chosen 1550 nm, and attenuation is considered 0.6 dB/km, typical values of dispersion is selected as -80 ps/nm/km, dispersion slope for the fiber is chosen as 0.21 ps/nm2/km, second order dispersion β2= -20 ps2/km, Differential group delay for the system is considered as 3 ps/km, however PMD coefficient is chosen as 0.5 ps/km, the values of mean scatter section 50 m and scattering section dispersion is taken as 100 m, maximum nonlinear phase shit is chosen 5 mrad, with typical lower calculation limit of 1200 nm and upper calculation limit 1700 nm, effective area of waveguide transmission taken 30 um2, n2= 3e-020 m2/w, Raman self-shift time 1 = 14.2 fs, Raman self-shit time 2 = 3 fs, fract. Raman contribution 0.18 and orthogonal Raman factor 0.75. data sequence for bit sequence generators is taken as 1101100100011101, 1010 1001 0001 1001, 1001011101110001, 1010110010001011 for user1, usser2, user3, user4 respectively, and chosen Bit rate is 1 Tbps. maximum amplitude of NRZ sequence generator is taken 1

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a.u. and values of both Rise and Fall time taken 0.05 bit. MZM have the Excitation ratio 30 dB and symmetry factor -1.

loop control system has 2 loops. The PIN photo detector have the Responsibly of 1 A/W and Dark current 10 nA the down sampling rate is 800 GHz for the central frequency 193.1 THz considering thermal noise 2.048e-023 W/Hz. The Random seed index is 11 with the filter sample rate 5 GHz. A forth order low pass Bessel filter is connected at the output having 100 dB depth and sweep value of Cut frequency "0.7×Bit rate" Hz. An Ideal EDFA is considered having Gain and Noise figure of 20 dB, 4 dB respectively with power and saturation power level of 10 dBm, the noise BW is 13 THz and noise bins spacing is 125 GHz. For center frequency of 193.4 THz.

SMF have the reference wavelength of 1550 nm with attenuation 0.25 dB/km, Dispersion 16 ps/nm/km and dispersion slope 0.08 ps/nm2/km with β2=-20 ps2/km and β3=0 ps2/km. Differential group delay for PMD is taken 0.2 ps/km with the PMD coefficient of 0.5 ps/km.

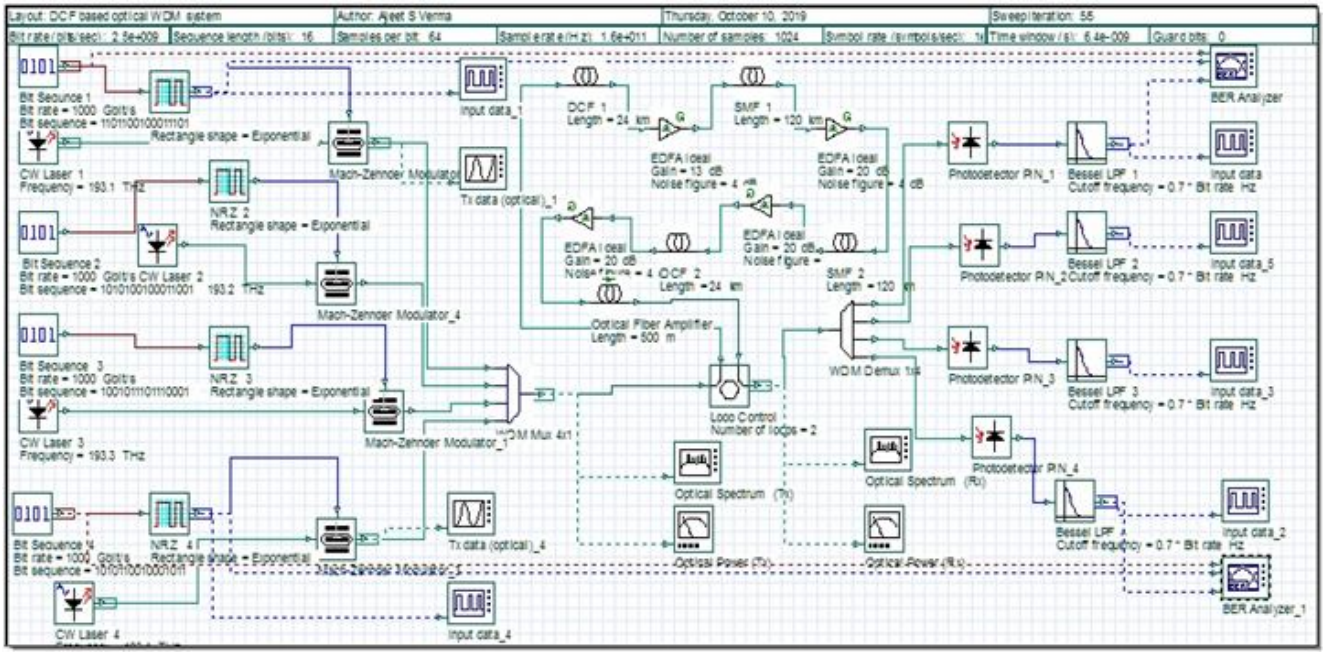

Figure-1.4: Simulation Model for proposed Technique

IV. SIMULATION RESULTS AND PARAMETERS

Fig (1.5) shows transmitted data sequence for user-1 and its equivalent received data sequence. The values are almost identical to each other with some non linear effects caused by channel noise and fiber nonlinearities.

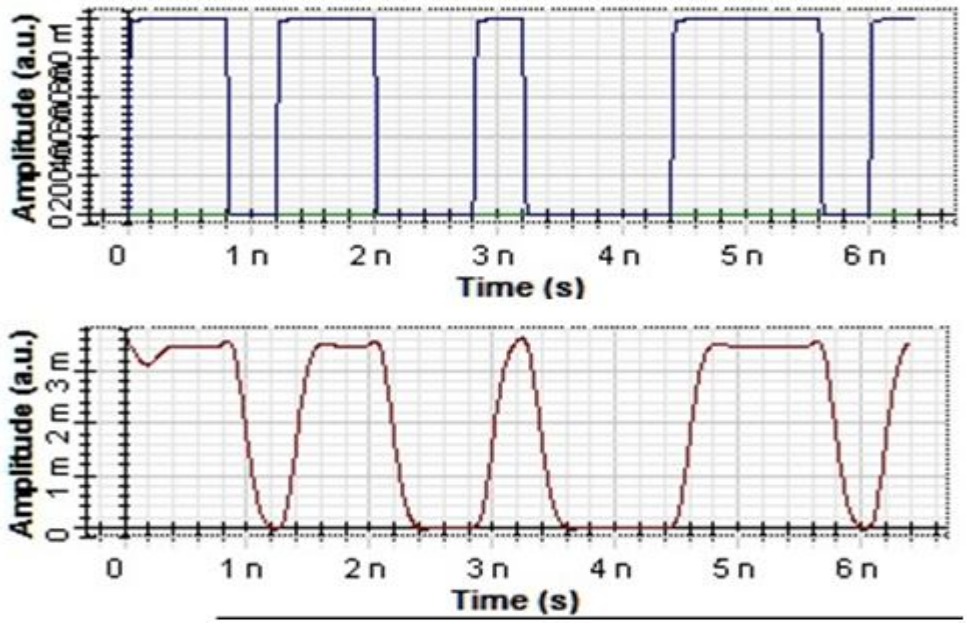

Figure-1.5: Input and output data sequences

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Horizontal axis shown in fig (1.5) is time axis, and shows "start" and "end" time for each dada as well as hole sequence, observation to both primary and secondary graph shows sharp start and end of data, without causing any ISI.

Sequence transmission quality for the system is defined by "Q-factor" with eye pattern of transmitted data is obtained 57.2356 is much better for such kind of long haul transmission as shown in fig (1.6)

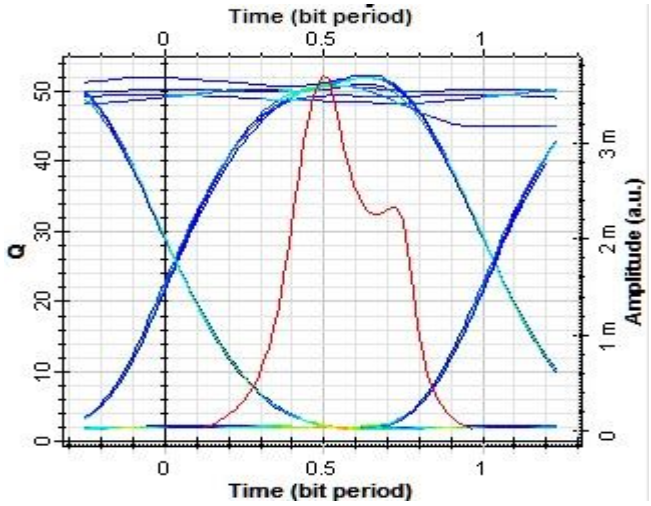

Figure-1.6: Q-factor for transmitted data sequence

Fig. (1.7) shows zero bit error rate for this model, which shown system modeling is perfect and all data are completely received, as they were transmitted thus supporting the result of fig (1.5). Although some jitter part is present there only just because of system noise.

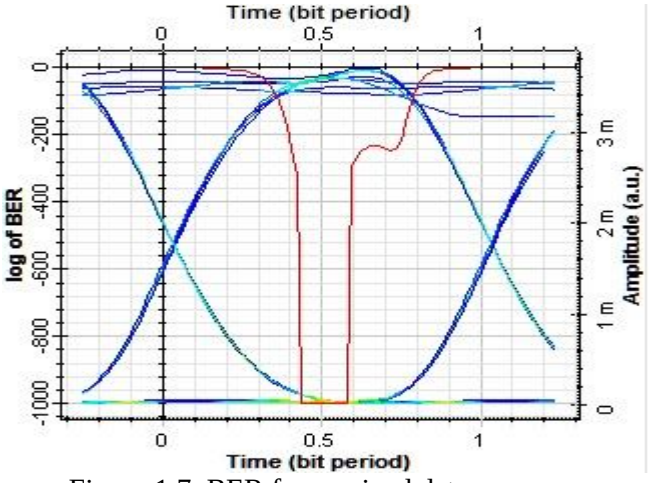

Figure-1.7: BER for received data sequence

Sequence threshold values shown here in fig. (1.8) is below the half part of eye opening, shows better SNR and transmission quality, typical values obtained here is 0.00026862.

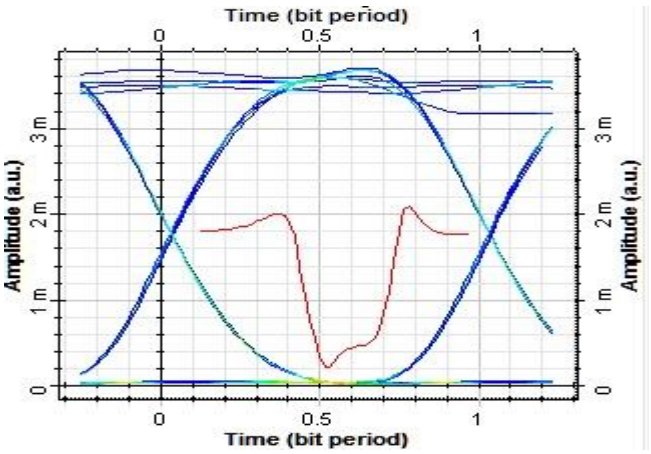

Figure-1.8: Threshold for received data sequence

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Eye opening at maximum height represent more the bandwidth it support, available for signal transmission. fig. (1.9) represent the simulated graph providing maximum coverage to eye pattern making system more efficient.

BER pattern simulation represent here, all the sequence bits are lying in close near to each other, illustrating a good synchronization among all transmitted light sequences, subjected to multicarrier modulation. Fig. (1.10) shows the pattern of sequencing for data symbols.

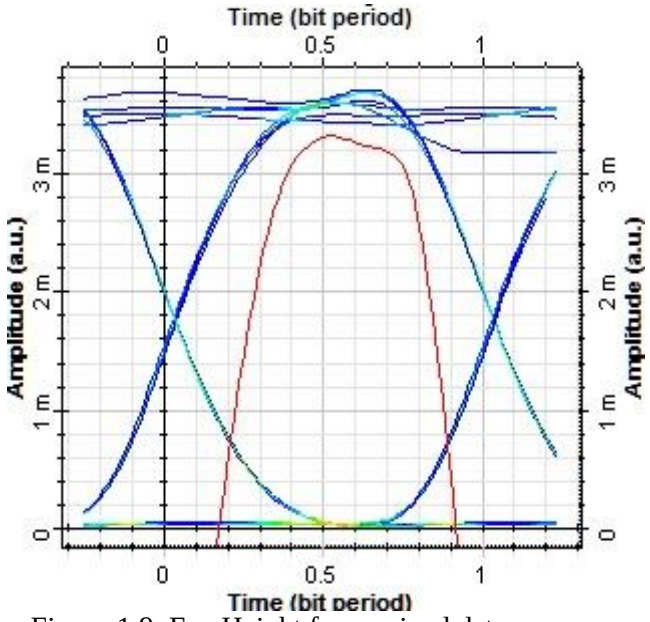

Figure-1.9: Eye Height for received data sequence

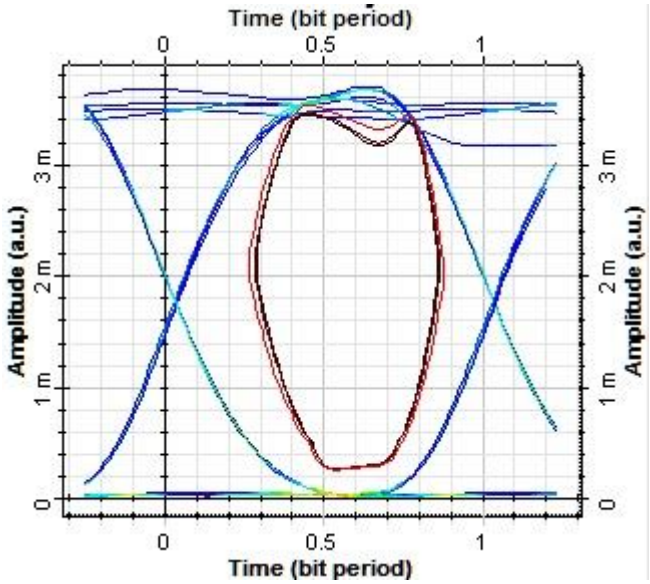

Figure-1.10: BER Pattern for received data sequence

V. CONCLUSION

WDM system formulation for long haul distance transmission is simulated here. Different parameters such as BER, Q-factor of system, found much better resulting to better received sequence identical to transmitted data. Signal transmission quality is improved to better extent, eliminating ISI caused due to dispersion effect. High data rate transmission is possible with multicarrier frequency modulation. Simulated bit sequence shows that the effect of channel noise and aliasing effect can be eliminated with the proposed system formulation. Received sequences for all the users in synchronous in nature, showing the concept of parallel processing. Bit sequence pattern is identical to transmitted one, improving height of eye diagram shows the bit transmission quality and minimal error occurrence with improved SNR.

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LIGHT TRANSMITTING FROM CONCRETE BLOCK BY USING OPTICAL FIBER

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ABSTRACT
Light transmitting concrete or translucent concrete, Transparent concrete is a concrete in which light passing through it by using optical fiber. It is material which makes green building . The first light transmitting concrete was mentioned in 1935 Canadian patentt. The concept of light transmitting concrete was used in 2001 which is introduced by Hungarian Architect, Aron Losoczi and the first light transmitting concrete block was successfully made in 2003 by using large amount of glass fiber and it is termed as LiTraCon. The light transmitting concrete mainly focuses on transparency and its objective of application pertains to green technology and artistic finish .it is the mixture of optical fiber and fine concrete. light transmitting concrete allow less weight and more light compared to conventional concrete.

Keywords: Fine aggregate, Cement , Optical Fiber, light transmitting,Transparency.

I. INTRODUCTION
Light transmitting concrete is not different from conventional concrete and this type of concrete use without compromise of strength of conventional concrete ..this is based on total internal reflection. it have same material with addition of optical fiber. In many concrete fibers are used to increase the tensile properties of concrete but in Light transmitting concrete optical fibers are not used for such purpose it transmit only lights from one side to another side .In light transmitting concrete the sun light used as a light sources and reduce consumption of power and make eco-friendly environment .

Figure-1: Light transmitting concrete

2 MATERIALS USED FOR LIGHT TRANSMITTING CONCRETE
In light transmitting concrete basic materials used

1-Cement

2-Fine aggregate

3-Water

4-Optical fibre.

A. Cement-
Cement is a binding material, when the water added then its hard like stone after setting and curing

- Initial set: When the paste begins to stiffen noticeably (typically occurs within 30-45 minutes)
- Final set: When the cement hardens, being able to sustain some load (occurs below 10 hours)

Figure-2: Cement used in LiTraCon

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B-Fine aggregate
Fine aggregate like sand and it should be passing from sieves and its size should 1.18mm.

Figure-3: Sand used in LiTraCon

C- Water
For making Light transmitting concrete portable water should be used. Its used for mix all ingredient of concrete .water should be free from impurities.

Figure-4: Water used in LiTraCon

D- Optical Fiber
Optical Fiber are used for transmitting the light from one end to another end. Optical fiber are the main component of the Light transmitting concrete. It also used in electronic communication .which permits transmission over longer distances and at higher bandwidths .the diameter of optica l fiber is thicker then the human hair. Optical fibre has good light guiding property which can be arrange to transmit the light. Optical fiber consist low tensile strength ,low brittleness property .

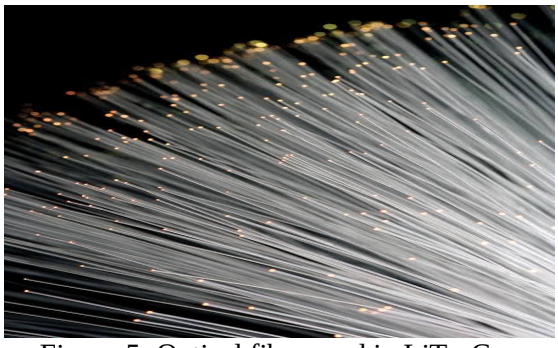

Figure-5: Optical fiber used in LiTraCon

II. MANUFACTURIING OF LIGHT TRANSMITTING CONCRETE
The manufacturing process of In light transmitting concrete is almost same as regular concrete

Light-transmitting concrete is produced by adding 4% to 5% optical fibres by volume into the concrete mixture. Thousands of strands optical fiber are cast into concrete to transmit light.

A. Procedure for making light transmitting concrete
Step-1 Preparation of mould
The dimension of mould should be 10cmX10cmX10cm.A mould of rectanglular cross section is made with wood or steel .

Step-2 Insert optical fiber in mould
The commonly diameter of optical fibers are .25mm, .50mm, .75mm , 1mm and 2mm .the optical fibers are cut carefully to the required size of mould .fibers should placed either in organic distribution or in layered distribution. Optical fibers are allowed to passes through the holes which are driven on the wooden or steel plates.

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Figure-6: Optical fiber inserting in mould

Step-3 Placing of concrete in the mould

We have to poured thoroughly mixed concrete in the mould with slowly and carefully without disturbance because previously laid optical fibers after that removing air voids from concrete by using mechanical method such as vibrator

Figure-7: Concrete placing in mould

Step-4 De-moulding process

After setting mix concrete, remove mould and pull of the mud .after de-moulding ,the specimens were marked.

Figure-8: Concrete block before finishing

Step-5 Final Finishing

Cut the extra fiber same as the thickness of specimens .

By using the sand paper polish the surface of specimen

Figure-9: Concrete block before finishing

3 PRINCIPLE

Thousand of optical fiber is reinforced from one face to another and transmit lights. When the light passing from denser to rare medium and incident angle is greater then critical angle ,and light traveling in an optically dense medium hits a boundary at a steep angle ,light is completely reflected.This is called Tota Internal Reflection

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5 MERITS AND DEMERITS OF LIGHT TRANSMMITING CONCRETE

Merits

- By Light transmitting concrete we can save the energy because of sun light used as a light sources.
- Light transmitting concrete use as green building material
- Light transmitting concrete has a good physical appearance according to architectural pint of view .
- Light transmitting concrete used in such type of building where sun light can not be reach properly
- It can be also use as a decorative piece in the wall or at any corner as a night lamp.
- Light transmitting concrete main work is to create a transparency

Demerits

- Light transmitting concrete is more costly because of optical fiber
- In light transmitting concrete required skilled labour
- Light transmitting concrete have low tensile strength

6 APPLICATION

This concrete can also be used cold countries to transmit heat with sunlight. It is presently used mostly in interiors as decoration, but is making its foray into exterior structural walls

- This concrete can be used as flooring a passable surface illuminated from below
- Light fixtures
- Increasing visibility in dark subway stations.
- Illuminating speed bumps on roadways at night
- Light sidewalks at night.
- You can also create a logo with colorful figures, pictures and can used forbeautification purpose.
- Light transmitting concrete has good light guiding property and ration of optical fiber volume to concrete is proportion to transmission .

CONCLUSIONS

- Light transmission concrete the new type of concrete which is carries special property of light transmitting due to presence of optical –fiber.
- From the study ,its can be conclude that there is 5% to 10% increase in initial compressive strength for 7 days and also 10% to 15% increase initial compressive strength for 28 days
- The light transmitting concrete not losses the strength when compare to conventional concrete and also it has very vital property for the architectural point of view
- It can also used where the light can not reach properly so, the concept use in green energy saving with the uses self sensing property
- It can be used for best architectural appearance of the building
- Light transmitting concrete also used where light can not reached in appropriate intensity
- Light transmitting concrete not loose the strength parameter when compare to regular concrete

ACKNOWLEDGMENT

The research work would not have been possible without my guide Dr. Gaurav Yadav.and also my co-worker..This paper is dedicated to all the civil engineers to look world in a smart way. And lastly I want to thank my parents for their unconditional support

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EUTHANASIA OR ASSISTED SUICIDE

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This terms usually refers to Physician Assisted Suicide (PAS). The Physician assistance is usually limited to writing a prescription for a lethal dose of drugs.

Assisted Suicide is legal in some countries, under certain circumstances including Canada, Belgium, The Netherlands, Colombia, Switzerland and parts of The United States. People who want to use the assisted Suicide model to die must meet certain criteria, including, having a terminal illness, proving they are of sound mind, voluntarily and repeatedly expressing their wish to die, and taking specified, lethal dose or drugs themselves.

Euthanasia refers to active steps taken to end someone's life to stop their suffering and the "final deed" is undertaken by someone other than the individual For Example If the person concerned has requested this, it falls under the terms "voluntary Euthanasia" Assisted Suicide is about helping someone to take their our life at their request.

The National council on disability (NCD) released a new report highlighting the dangers of legalizing assisted Suicide for the disability community. NCD found that mast often disabled patients requested assisted Suicide because of unmet service and support needs, especially when ensures deny expensive medical treatment and care but pay for lethal drugs. This issue is compounded because people in the disability community are more likely to be unemployed and qualify as low income, which means less access to financial resources for health care.

Sudden Loss, Loss of a child or a partner, low self esteem, belief, lack of social support, low education and young age have been identified as risk factors for developing traumatic grief to unnatural death such as suicide.

Voluntary Euthanasia was legalized in the Netherland in (2002), Belgium (2002), Canada (2016). The laws require that the patient's attending, physician verify mental competence. Oregon was the first united states to legalize assisted suicide which was achieved through popular vote.

Opposition :- The most current version of the American medical Association's code of Ethics states that Physician assisted suicide is prohibited, because it is "fundamentally incompatible with the physician role as healer".

Some Doctors remind that physician assisted suicide is contrary to the Hippocratic oath, which is the oath historically taken by physicians "I will give no deadly medicine to anyone if asked, nor suggest any such counsel".

Catholicism Views are – The Roman Cathalic Church acknowledges The fact that moral decisions regarding a person's life must be made according to one's own conscience and faith. Catholic tradition has said that one's concern for the suffering of another is not a sufficient reason to decide whether it is appropriate to act upon Euthanasia According to Catholic Church – "God is the creator author of all life therefore God is the judge when to end life".

Pope Francis is the currant dominant figure of the catholic. Church He affirms the "death is a glorious event and should not be decided for by anyone other than God".

There are many organization which opposed to assisted suicide. ADAPT - The American Disabled for attendant programmes today is a united states organization.

That is active in the disability right movement. This organization argue saying that "It is a violation of the equal protection guaranteed by the ADAPT.

The saints of the Jesus Christ church are against Euthanasia "Anyone who takes part in Euthanasia as assisted suicide regarded as having violated the Commandments of God".

The Russian Orthodox church Canons consider any form of suicide committed out of mental disturbances (insanity) is a grave sin and human fault.

In U.K. Euthanasia and Assisted suicide are illegal. To kill another person deliberately is murder or manslaughter, even if the other person asks to kill them.

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Nevertheless, the Authorities may decide not to prosecute in cases Euthanasia after taking into, account the circumstances of the death Euthanasia is against the law and it may carry a jail sentence in the united states. The law varies between states.

The literature suggests that even in jurisdictions that prohibit assisted suicide, patients with terminal illnesses or severe chronic disability request assistance in ending their own lines. ICU's are designed for patients who can be kept alive only with life – sustaining interventions. Most ICU patients would die simply as a result of discontinuing interventions. Most ICU patients would die simply as a result of discontinuing all non palliative therapies.

Withdrawing treatment honors the patient's legal and ethical right to refuse treatment Similarly, withholding antibiotics respects the Patient's autonomy. It is the infection, That kills the patients, not the withholding of medication prescribing Morphine and other narcotics to patients who are having mechanical ventilation withdrawn or who have terminal diseases and are in pain. The goal must be pain. The reduction of anxiety or even sedation; respiratory depression is a side effect; and it is tolerated in such cases, even to the point of hastening death, as long as the patient has been fully informed and has consented Dosage must be titrated to achieve the intended goal.

Some observers agree that if the practice of Euthanasia were legal, physicians would exercise their medical judgment in an unrestrained fashion, increasing the possibility of abuse of discretion in relation to a very serious matter life or death.

ALWAYS CARE NEVER KILL.

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EFFECT OF ANNEALING TEMPERATURE ON PHYSICAL PROPERTIES OF ZnO THIN FILMS DEPOSITED BY RF MAGNETRON SPUTTERING

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ABSTRACT
Nanocrystalline thin films of zinc oxide (ZnO) were fabricated on Si and quartz substrates by RF magnetron sputtering at room temperature. These as deposited films were annealed at different temperatures ranging from 300 to 700 ^{0}C. Structural and optical properties of thin films such as crystallite size, optical transmittance, and band gap were studied as a function of annealing temperature, using XRD, UV-VIS spectrophotometer. Electrical properties were also analyzed by I-V (current-voltage) characteristics. XRD patterns show that the pristine film is polycrystalline. The full width at half maximum decreases after annealing treatment which indicates the crystal quality improvement. Optical measurements of annealed films show a decrease in direct band gap from 3.17 eV to 2.85 eV. The transmittance increases with annealing temperature from 85-92%. From I-V characteristics, increase in resistivity was observed with annealing temperature.

Keywords: RF sputtering, ZnO thin film, UV-VIS spectroscopy, XRD

INTRODUCTION
Transparent conductive oxide (TCO) thin films are used in variety of applications such as transparent electrodes in display devices and in photovoltaics, etc. [1, 2], because of their special physical properties like large band gaps, typically larger than 3 eV [3] and consequently high optical transparency (~90%) in visible spectral region. These films have low resistivity ($\rho < 10^{-4}$ Ω cm) [4]. Among these TCOs, Zinc oxide (ZnO) has been paid much attention because it has a direct wide band gap, 3.3 eV [5], a very large exciton binding energy (60 meV) [6]. It is a II-VI compound, n-type semiconductor and has a hexagonal wurtzite crystal structure with lattice spacing a= 3.249Å and c = 5.206Å [7]. As a wide band gap material, it is a suitable candidate for optoelectronic applications, e.g. in UV light emitting diodes, UV laser, UV detectors and laser systems [8, 9]. ZnO is also abundant and has higher thermal and chemical stability than the other wide band gap semiconductors such as GaN and ZnSe. ZnO exhibits a good stability in reducing atmospheres used for thin film deposition. Due to its unique conducting mechanism based on oxygen vacancies, ZnO is also used in oxygen gas sensors [10] and optical UV lasing has already been observed at room temperature [11].

Since, ZnO has many attractive properties for practical applications; much attention has been given to the synthesis of ZnO thin films in recent decades. ZnO thin films have so far been deposited by various deposition techniques such as pulsed laser deposition (PLD) [12], molecular beam epitaxy (MBE) [13], magnetron sputtering [14], chemical vapor deposition (CVD) [15], sol-gel technique [16] and spray pyrolysis [17]. Among the above deposition techniques, RF magnetron sputtering is considered as a versatile deposition technique because of several advantages, (i) low substrate temperatures (down to room temperature), (ii) good adhesion of films on substrates, (iii) very good thickness uniformity and high density of films and (iv) good controllability and long term stability of the process [18].

Nanocrystalline materials attract considerable attention from both theoretical and experimental research to provide a variety of improved properties [19-21]. Nanocrystalline thin films play a significant role in improving the performance and reliability of nanoscale devices [22]. The properties of grown thin films and interfaces depend on the deposition process and various deposition parameters such as deposition rate, substrate temperature, sputtering pressure, annealing temperature and so on. In order to produce and to be able to reproduce, exact optimization of deposition parameters is necessary. Among these parameters, annealing temperature is one of the important factors influencing electrical resistivity, optical and structural properties of ZnO thin films. In the present study, nanocrystalline ZnO thin films were deposited by RF magnetron sputtering technique at room temperature on Si and quartz substrates. Post-deposition thermal annealing was performed at different temperatures. The effect of annealing temperature on physical properties of ZnO thin films has been studied in comparison with an as-deposited sample.

EXPERIMENTAL
Thin films of ZnO were synthesized by RF magnetron sputtering method on n-type Si (100) and quartz substrates, using a pellet as a sputtering target (99.99% pure) with diameter of 60 mm and of 4 mm thickness. The pellet was sintered at 1200 ^{0}C for 12 hours and then it was cooled down to room temperature naturally

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before employing as the sputtering target. All the substrates were thoroughly cleaned before deposition using acetone and alcohol. The substrates were immersed for 5 minute in acetone. The dried substrates were rubbed gently with cotton and then mounted on the substrate holder. The target to substrate distance was maintained at 10 cm. Pure argon (Ar) gas was used as sputtering gas. The sputtering chamber was pumped down by rotary and diffusion pumps to evacuate the vacuum chamber up to vacuum 2×10^{-5} mbar before the introduction of argon gas into the vacuum chamber. The sputtering pressure was maintained at 1.5×10^{-2} mbar. The pressure in the sputtering chamber was monitored by Pirani and Penning gauge combination. The magnetron sputtering process was performed in Ar atmosphere for 1 h. A RF power of 160 W was applied to ZnO target at a frequency of 13.56 MHz. The target was water-cooled and the substrate was kept at room temperature (RT). For eliminating the dust and surface pollution, the target was presputtered in an argon atmosphere for 30 minutes. The details of deposition parameters of ZnO thin film are listed in the table 1.

Table-1: Deposition parameters maintained during the deposition of ZnO films by RF magnetron sputtering.

Deposition parameter	Conditions
Substrates	Silicon, n-type (100) and quartz (1 x1 cm)
Sputtering Target	ZnO with 99.99% purity, 60 mm diameter and 4 mm thickness
Target to substrate distance	10 cm
Base pressure	2×10^{-5} mbar
Sputtering pressure	1.5×10^{-2} mbar
RF power	160 W
Sputtering time	1 hour
Substrate temperature	RT

After deposition, the thickness of ZnO films was measured, using spectroscopic ellipsometry method and was found ~140 nm. The deposition and thickness measurement of thin films was performed at University of Rajasthan, Jaipur. These as deposited films were subjected to annealing treatment in air for 1 h at different temperatures viz. 300 ^{0}C, 500 ^{0}C and 700 ^{0}C in a tube furnace. Then the samples were left to cool down to room temperature before the structural, optical, and electrical measurements.

Zinc oxide thin films grown on silicon substrate were analyzed by X-ray diffraction (XRD) [BRUKER AXS D8 Advance] using Cu $K_{\alpha 1}$ radiation ($\lambda = 1.5406$ □) to study the structural properties of pristine and annealed films, at **Dayalbagh Educational Institute,** Agra. The diffraction angle 2θ was scanned from 20^0 to 60^0. Optical properties were examined by using Hitachi U-2900 UV-VIS double beam spectrophotometer. The I-V characteristics of the films were measured by the four-point probe method using Keithley source meter setup (model no. 2400), interfaced by GPIB software, at R.B.S. College, Agra.

RESULTS AND DISCUSSION

XRD analysis

The crystal structure and orientation of pristine (as-deposited) and annealed ZnO thin films at different temperatures ranging from 300 ^{0}C to 700 ^{0}C were analyzed using X-ray diffraction technique.

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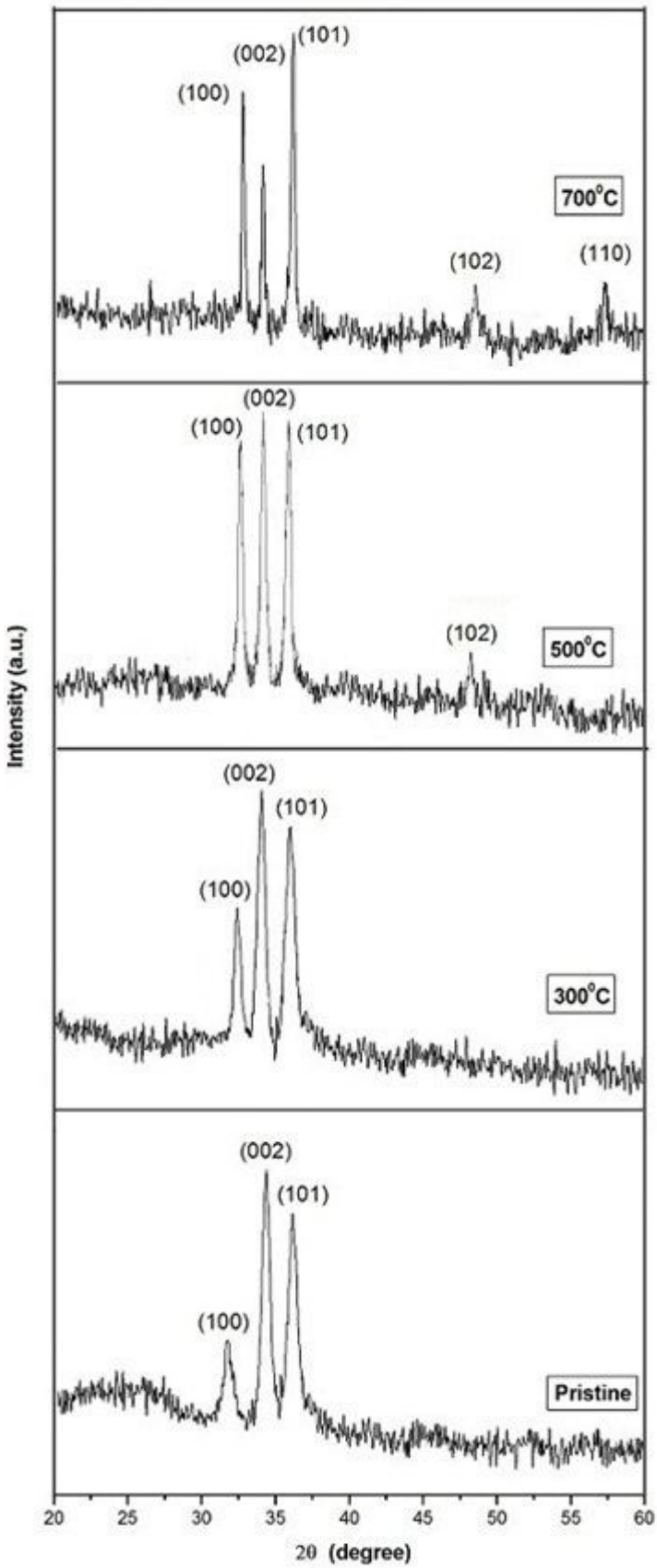

Fig-1: XRD patterns of pristine and annealed ZnO thin films at different temperatures.

XRD patterns for the ZnO thin films are shown in Fig. 1. It indicates that pristine films turn out to be polycrystalline in nature and exhibit hexagonal wurtzite crystal structure. Three peaks appear on the XRD pattern for the as-deposited film with (002) preferred orientation while the other orientations like (100) and (101) are observed comparatively with lesser intensities. Most of the films which grow with wurtzite structure consist (002) preferential orientation.

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It can be seen from the figure that the intensities of the all XRD peaks and the full width at half maximum (FWHM) vary with annealing temperature but the orientation remains same at higher temperature also. The maximum intensity peak corresponds to the (002) predominant orientation. XRD spectra of annealed films show that the crystallinity of the films improve with increasing the annealing temperature up to 500 ^{0}C as the intensity of (100), (002) and (101) peaks increases and FWHM decreases. The FWHM for (100), (002) and (101) planes as a function of annealing temperature is shown in Fig. 2.

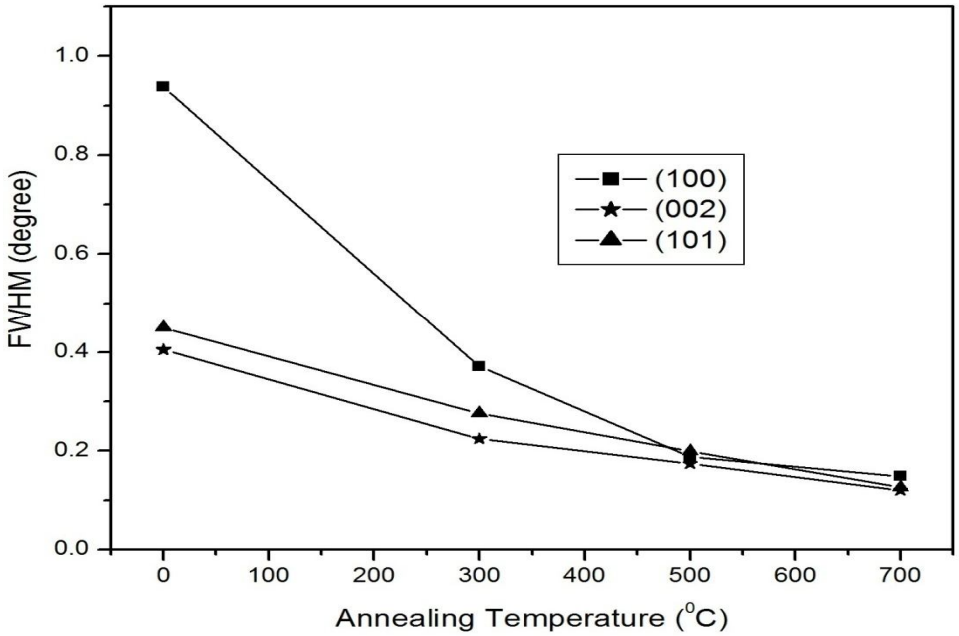

Fig-2: Variation of FWHM of ZnO films as function of annealing temperature

The improvement of crystallinity may be ascribed to a decrease in defect density with annealing in air. A new peak of (102) plane has been observed with low intensity at 500 ^{0}C. The diffraction intensity evidently increases with the annealing temperature increasing, suggesting that the annealing at high temperature improves the crystal quality of ZnO films. The results are consistent with the report of Gupta et al [23] on annealed ZnO films grown by RF sputtering method. When the annealing temperature is further increased to 700 ^{0}C, the intensity of the (002) peak decreases due to the deterioration of crystallinity in this orientation and the peak of (101) orientation plane and peaks of other orientations appear. In addition, a new peak of (110) plane has also been appeared. Thus, it could be stated that annealing causes increase in intensity and reorientation of planes and a similar behavior is also reported by Yakuphanoglu et al [24]. Therefore, annealing temperature plays an important role on the surface reactions and species mobility.

The diffraction peak positions of the pristine and annealed ZnO films at 300 ^{0}C, 500 ^{0}C and 700 ^{0}C temperatures appears at $2\theta = 31.7^0$, 34.4^0, 36.2^0, 47.5^0 and 56.6^0 corresponding to the lattice planes (100), (002), (101), (102), and (110) respectively. All the peaks in the diffraction pattern were indexed on the basis of JCPDS (36-1451) data file. The values of lattice constants a and c were calculated using equation (1) & (2) for the as deposited and annealed films [25] and the calculated values are given in table 2. Comparing with the lattice constants for hexagonal ZnO crystal given in JCPDS standard data file a = 3.2498 Å and c = 5.2066 Å [26], It is observed that the calculated values are in good agreement with the standard values for ZnO wurtzite structure.

$$a = \sqrt{\frac{1}{3}} \frac{\lambda}{\sin\theta}$$

$$c = \frac{\lambda}{\sin\theta} \quad \text{- - - (2)}$$

Table-2: Lattice constant values of ZnO thin films

Lattice Parameter	Standard value (Å)	As prepared in (Å)	At 300 ^{0}C in (Å)	At 500 ^{0}C in (Å)	At 700 ^{0}C in (Å)
a	3.2498	3.2536	3.2505	3.2545	3.2535
c	5.2066	5.2233	5.2307	5.1990	5.2087

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The size of crystallites is calculated using the well-known Scherrer's formula [27] equation (3) and calculated values are given in table 3.

$$D = \frac{0.9\lambda}{\beta\cos\theta} \qquad \text{- - - (3)}$$

where λ, β and θ are X-ray wave length (1.54059 Å), full width of half maximum of the peak and the Bragg's diffraction angle respectively.

Table-3: Variation of crystal size of ZnO with annealing temperature.

Plane (hkl)	Crystallites size of ZnO (nm)			
	As prepared	Annealed at 300 ^{0}C	Annealed at 500 ^{0}C	Annealed at 700 ^{0}C
(100)	9	23	45	57
(002)	21	38	49	71
(101)	19	31	43	68

The crystal size varies from 9 to 71 nm. It may be because at high temperature, atoms acquire more energy, so they may diffuse and occupy the correct site in the crystal lattice and grains with lower surface energy grow larger [28]. The crystal size increases as the annealing temperature increases which is well supported in literature [29]. The variation of the crystallite size along prominent diffraction planes with annealing temperature is given in Fig. 3.

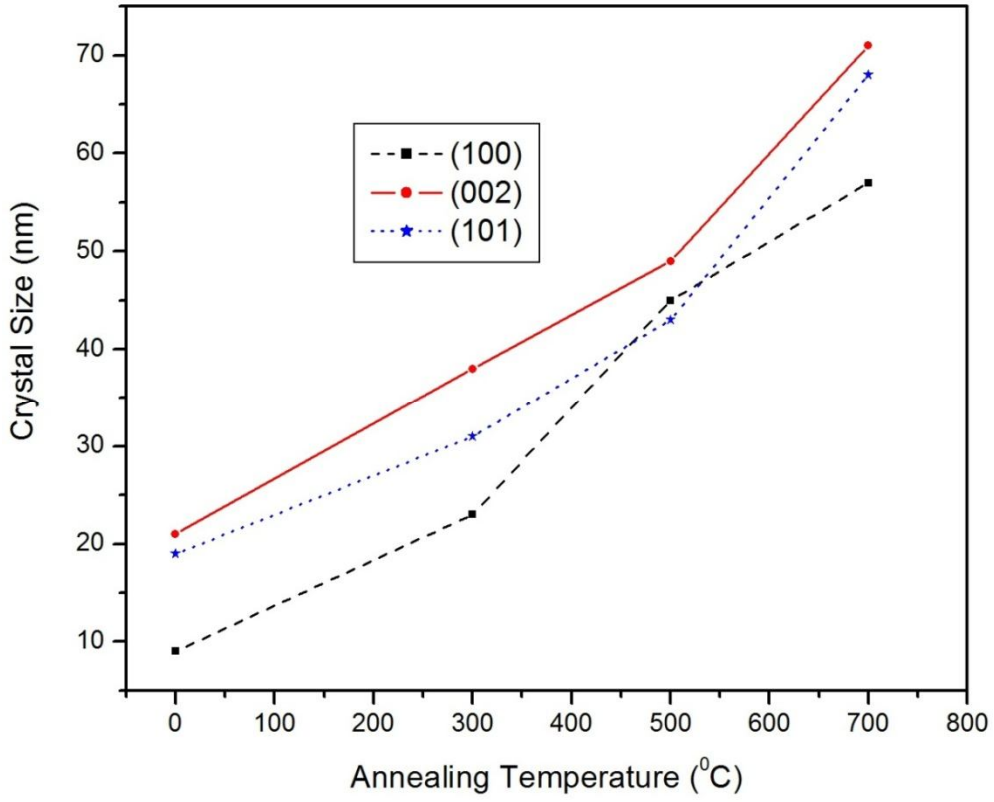

Fig-3: Variation of the crystallite size along prominent diffraction planes of as deposited and annealed ZnO films

UV-Visible Studies

Ultra violet visible spectroscopy is an important tool for optical characterization of materials. It provides useful information about the optical band gap of the semiconductors. Optical studies of the pristine and annealed ZnO thin films on quartz was carried out, transmittance and band gaps of the films have been calculated. The transmittance of pristine and annealed ZnO films at 300 ^{0}C, 500 ^{0}C and 700 ^{0}C temperatures recorded in the wavelength range 200-800 nm is shown in Fig. 4. Interference fringe pattern was observed for annealed ZnO thin films as inferred from the transmittance spectra. The appearance of interference fringes revealed the smooth

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reflecting surface of the film and low scattering loss at the surface. From spectra it was observed that all the films present a high transmittance from 85-92% before and after annealing. The transmittance of the ZnO thin films increases after heat treatment in air. This may be due to the decrease in optical scattering due to grain growth, causing a reduction in the density of grain boundaries, which plays an important role in the scattering of these photons [30].

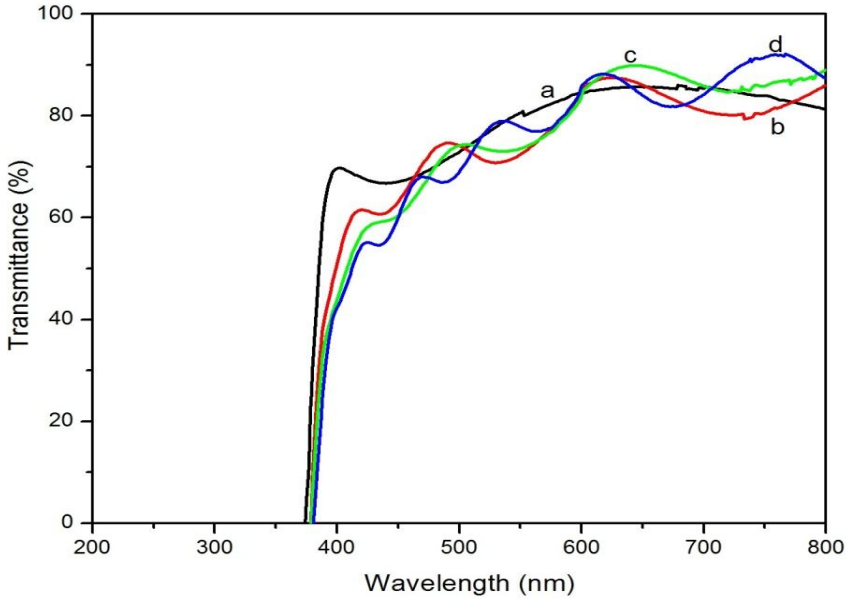

Fig-4: Optical transmittance spectra of pristine and annealed ZnO thin films (a: pristine, b: 300 ^{0}C, c: 500 ^{0}C, d: 700 ^{0}C)

It can be seen from the figure that the absorption edge shifted towards longer wavelengths with annealing temperature. The increase in optical transmittance with temperature can be attributed to the increase of structural homogeneity and crystallinity [31]. This result indicates that ZnO films deposited on quartz substrate can be used in the fabrication of transparent electrical devices. For a direct band gap semiconductor, the relation between the absorption coefficient (α) and photon energy (hυ) can be written as $\alpha h\upsilon = A(h\upsilon - E_g)^n$ where A is a constant with different values for different transitions, E_g is the band gap of the material and the exponent (n) depends on the type of transition. Here n = ½, corresponding to the allowed direct transition [32]. Fig. 5 shows the plot of $(\alpha h\upsilon)^2$ versus the photon energy (hυ) for the pristine and annealed ZnO thin films. The energy band gap was estimated using Tauc's plot by plotting $(\alpha h\upsilon)^2$ vs. hυ and extrapolating the linear portion of the absorption edge to find the intercept with energy axis.

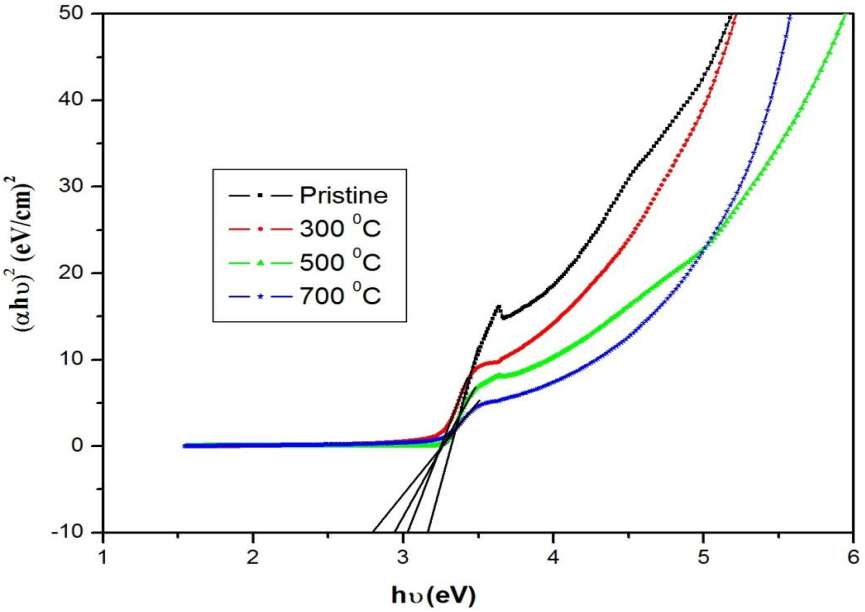

Fig-5: Plot of $(\alpha h\upsilon)^2$ versus Photon energy (hυ) for pristine and annealed ZnO thin films at different temperatures.

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The values of optical energy band gap were tuned to be 3.17 eV for pristine and 3.05 eV, 2.96 eV and 2.85 eV for annealed films at 300 ^{0}C, 500 ^{0}C and 700 ^{0}C respectively. Here, the optical band gap decreased with increase in annealing temperature. Various factors contributed to the change of band gap with increase in annealing temperature. Due to thermal expansion, the periodic potential experienced by the electrons (and hence the band gap structure and energy gap) varied with temperature. The effect of lattice vibrations on the band structure and energy gap also varies with temperature. These two effects are of comparable importance and the decrease in band gap with increase in annealing temperature is linear [33]. In addition, when ZnO thin films were annealed in air, the number of oxygen vacancies decreased and the carrier concentration in the conduction band also decreased [34]. Hence Fermi level moved down and band gap decreased. On the other hand, annealing process improve crystallinity and increase crystal size that result in decreasing defects, therefore band gap energy decreases [35]. Decrease in band gap energy can also be correlated with the XRD results.

Current –Voltage Characteristics

Electrical properties of pristine and annealed ZnO films were studied by measuring the current as the function of voltage. The plots for I-V characteristics are shown in the Fig. 6. It is found that the resistivity of the film strongly depends upon the annealing temperature. Resistivity of the films decreases with increasing the annealing temperature. The pristine film is electrically conductive which became more conductive due to annealing as inferred from I-V plots. ZnO films deposited on any substrate exhibited n-type conductivity [36], in which the electrical conductivity is due to the excess zinc presumably located interstitially within the lattice and oxygen vacancies. The variation in electrical resistivity with annealing temperature can be understood in terms of carrier concentration. It can be assumed that the reason for decrease in resistivity may be due to formation of oxygen from the surface of the films at higher temperature and thus increase the concentration of oxygen vacancies.

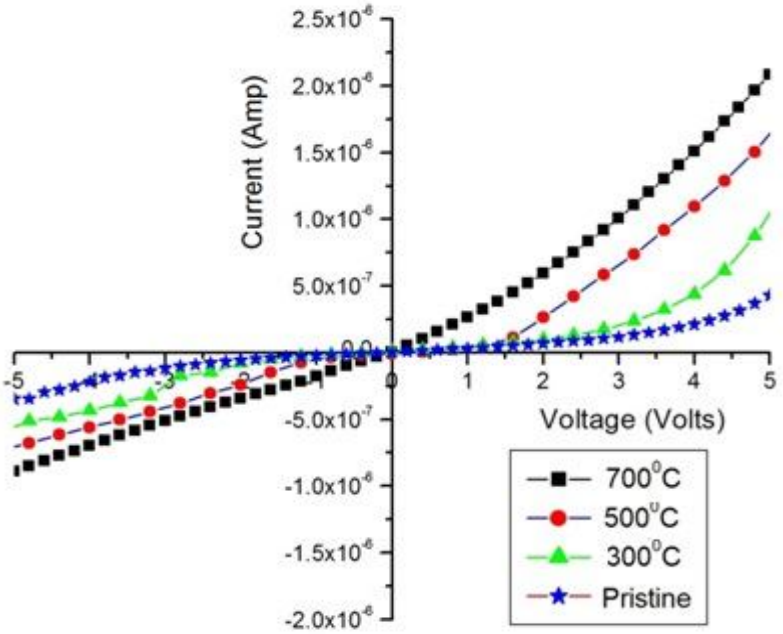

Fig-6: I-V characteristics for pristine and annealed ZnO thin films

CONCLUSION

Highly transparent ZnO thin films were successfully deposited by RF magnetron sputtering technique on Si and quartz substrates. To study the effect of annealing temperature on physical properties of ZnO thin films, the samples have been annealed in air at temperatures 300 ^{0}C, 500 ^{0}C, and 700 ^{0}C. XRD studies indicate that the crystallinity is enhanced on annealing and crystallite size increases. The lattice constants were also calculated, which agreed with that of bulk ZnO. Transmittance spectra were recorded by UV-VIS spectrophotometer. The films showed high transparency up to 92% in the visible region. The optical energy band gaps decreased from 3.17 eV to 2.85 eV as the annealing temperature was increased. Electrical conductivity of films also increases with increasing annealing temperature.

Consequently, it was seen that the effect of annealing makes a significant change on the structural, optical and electrical properties of ZnO thin films prepared by RF magnetron sputtering. These films with high transmittance are suitable for making optical devices. From the above results, it may be concluded that the ZnO thin films could be annealed at 700 ^{0}C is of good quality and it could be used for application purposes.

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"STATUS OF VARIOUS ILL EFFECTS FACED BY RESERVATION IN SCHEDULED CASTES AND OTHER BACKWARD CLASSES IN GOVERNMENT JOBS"

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In India, the controversy in favor and opposition of implementing the recommendations of the Mandal Commission these days has caught a lot of emphasis in all the small states. The debate in the Supreme Court continues. Every organization, party and institution in this country is expressing its opinion in favor and opposition. This is what most people discuss. That there is a serious problem in government jobs. Reservation in India is applicable at the following levels.

(1) On the basis of population in the Lok Sabha and the assemblies reserved for scheduled and scheduled castes

(2) Reservation for scheduled castes and scheduled castes in central and state government jobs.

(3) Reservation for backward classes in state government jobs

(4) Reservation in promotion

(5) Reservation for enrollment in educational institutions.

Reservation policy started in the last phase of British rule. In fact, the reservation policy is the product of Indian politics. Sn 1905 AD A Muslim League was established in the Muslim League under the leadership of Sir Aga Khan and met the then Governor General and Viceroy Lord Minto. In 1909, a separate constituency was accepted for Muslims in the center and the state, after 15 August 1947, reservation was provided for ten years.

Reservation in government jobs has become an important question for India today. Generally, the meaning of reservation is that a post in the future for a particular class already shows that the appointment of posts in state jobs There will be equality of opportunity for all citizens in the Yadav government, in the government order of August 20, 1977, reservation for category 1 and 2 services under Article 16 (4) The Minister following system

Scheduled Castes 18

Scheduled castes 02

Wiklang 02:

Dependents of freedom fighters 05:

Past Ex-Serviceman Officer 08

Other Backward Castes 15

All 50 percent

But even then, the issue of getting benefited from reservation is continuous.

Uttar Pradesh 1994: Current status of reservation as per Act-4: -

Scheduled Castes 21:

20: to scheduled tribes

Other Backward Classes 27:

Regardless, the problem of its reservation remains the same as scheduled and other backward class people are greedily agitated in their own interest.

Even in UP, the poor of the general class will get reservation from 14 January to 10: (Amar Ujala 19 January 2019) Newspaper Agra Sanskrit Uttar Pradesh Yogi Cabinet's seal will enter the entry in the jobs-teaching institutes

This effect when the decision is implemented

(1) The department, selection commission, recruitment board or outsourcing level will get benefit in recruitment.

(2) Opportunities for admission in educational institutions of higher education, vocational education, technical education, and medical education etc.

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(3) Departments will have to amend their rules to give the benefit of 10 percent reservation to the general poor.

The Indian quadratic system is generally divided into two parts by the increase of economic inequality. Whereas according to Babasaheb Dr. Bhimrao Ambedkar, there should be no 'anomaly' among the citizens for the success of democracy, but it was considered necessary to provide equal opportunities and equal rights to all. That is why Indians wanted to see the constitutional democracy. Dr. Bhimrao Ambedkar conceived moral and social justice as the basis for this and enacted laws for the practice of going to work and for the betterment of weaker sections and established Articles 15 (4) and 16 (4) in the Constitution. Article 14 stated the context of the right to equality before law and the rendering of social justice. That "the State shall not deprive any person in the territories of India equitably before the law, equal protection of the laws". Article 15 states. That the state will not discriminate against any citizen on the basis of religion, origin, caste, clan, sex, place of birth or any of them. Thus Baba Saheb Dr. Bhimrao Ambedkar made the Indian Constitution a sacred document of social justice. It is mentioned that "justice means equality but its distribution is always unequal which generates mutual disputes." (Aristotle) It is undeniably and undeniable that 'reservation' on Scheduled Castes, Tribes and Other Backward Classes is variously positive. Has an effect. But following the recommendations of the Mandal Commission, 'Reservation Implementation' has led to continuous incessant sabotage, hazing, arson, ethnic tensions and conflicts and communal riots in various provinces of the nation. Which along with creating mutual fight fights, jealousies, differences between various caste communities, as well as national unity, equality-unevenness, equality, social development, social organization and control, territorial and national politics, national upliftment nationalism, And they have been affecting the democratic system and ultimately democracy in some form or the other.

The following table throws a brief light on the ill effects of reservation in national context.

Table No. 8 (1): Opinion of the informers against the ill effects of reservation in national context /

Sr. No.	Various bookmarks related to reservation in national context	Notice of Counsel (Frequency / percentage)				All (Percent)
		Yes	Noa	Disinterested	Unanswered	
1ñ	Nationalism has been affected	273 ¼91Û 00½	& ¼00 Û00 ½	21 ¼07Û00½	06 ¼02Û00½	300 ¼100Û00 ½
2ñ	National unity has been hindered	267 ¼89Û 00½	& ¼00 Û00 ½	24 ¼08Û00½	09 ¼03Û00½	300 ¼100Û00 ½
3ñ	There has been a hindrance in the national rise	264 ¼88Û 00½	09 ¼03 Û00 ½	16 ¼05Û33½	23 ¼07Û67½	300 ¼100Û00 ½

Table No. 8 (1): Opinions / views of informers about the ill effects of reservation in national context

Sr. No.	Caste-based reservation effects in the context of caste	Admitted to (Frequencies / percentage)				All Percent
		Yes	Noa	Disinterested	Unanswered	
1-	The varna system has been affected.	300 ¼100Û0 0½	& ¼00Û00 ½	& ¼00Û00½	& ¼00Û00½	300 ¼100Û00½
2-	Jati hatred has increased in casteism and caste strife and conflicts.	270 ¼90Û00 ½	& ¼00Û00 ½	21 ¼07Û00½	09 ¼03Û00½	300 ¼100Û00½
3-	Social and ethnic tensions have increased.	216 ¼72Û00 ½	20 ¼06Û67 ½	64 ¼21Û33½	& ¼00Û00½	300 ¼100Û00½
4-	Zoroastrianism is a hindrance to democracy.	198 ¼66Û00 ½	33 ¼11Û00 ½	64 ¼21Û33½	& ¼00Û00½	300 ¼100Û00½
5-	Jatiya has become a vote bank of political parties.	261 ¼87Û00 ½	15 ¼05Û00 ½	18 ¼18Û00½	06 ¼02Û00½	300 ¼100Û00½

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Table No. 8 (2) Opinion / misconceptions of information against the ill effects of caste based reservation

The following table throws a brief light on the number 8 (6) of the various ill effects that are currently being provided to Scheduled Castes and Other Backward Classes from caste reservation.

Table No. 8 (6): Opinions / responses of the informers against various side effects arising out of reservation based on caste based Scheduled Castes and Other Backward Classes.

Sr. No.	Opinions / responses of informers facing reservation based on caste-based reservation to scheduled castes and other backward classes	Reported frequency / percentage of informers				All Percent
		Yes	Noa	Disinterested	Unanswered	
1.	There is a barrier between equality and harmony.	219 ¼73Û00½	21 ¼07Û00½	40 ¼13Û33½	20 ¼06Û67½	300 ¼100Û00½
2.	Has hindered the economic development of the nation.	179 ¼59Û67½	15 ¼05Û00½	75 ¼25Û00½	31 ¼10Û00½	300 ¼100Û00½
3.	Clean and transparent is a hindrance in politics.	198 ¼66Û00½	30 ¼10Û00½	40 ¼13Û00½	32 ¼10Û67½	300 ¼100Û00½
4.	Educated unemployed is fatal to the fate of upper caste youth.	276 ¼92Û00½	& ¼00Û00½	20 ¼06Û67½	04 ¼01Û33½	300 ¼100Û00½
5.	There is a barrier in social organization and social control.	189 ¼63Û00½	36 ¼12Û00½	48 ¼16Û00½	27 ¼09Û00½	300 ¼100Û00½
6.	It is a hindrance to the future of future generations.	181 ¼60Û33½	30 ¼10Û00½	89 ¼29Û67½	& ¼00Û00½	300 ¼100Û00½
7.	There has been an increase in mass attacks and violent movements.	261 ¼27Û00½	& ¼00Û00½	30 ¼10Û00½	09 ¼03Û00½	300 ¼100Û00½
8.	There has been an increase in protests against protests.	189 ¼63Û00½	21 ¼07Û00½	66 ¼22Û00½	24 ¼08Û00½	300 ¼100Û00½
9.	There has been an increase in pressure by different castes to bring the government to the reserved category, which is unfair.	209 ¼69Û67½	139 ¼04Û33½	75 ¼25Û00½	03 ¼01Û00½	300 ¼100Û00½
10.	There has been an increase in the despair of widespread despair of inclusion of other backward classes among the powerful castes.	186 ¼62Û00½	24 ¼08Û00½	73 ¼24Û33½	17 ¼05Û67½	300 ¼100Û00½
11.	Non-reserved castes feel the negative pressure of reservation schemes.	201 ¼67Û00½	32 ¼10Û67½	52 ¼17Û33½	15 ¼05Û00½	300 ¼100Û00½

A. Violent protest; The method of caste struggle should be a part of the general structure of those caste conflicts which are constantly increasing in the country. There are ongoing conflicts among different castes and groups regarding the single issue of reservation of places and posts.

B. In some states, it may be possible that the struggles may not be on the matter of reservation of posts and places, but their form can be particularly violent / non-violent.

C. Reservation struggle; Consequences of political gains.

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D. Generally (first of all), in proportion to the population of castes, reserved positions in government posts, and educational institutions.

E. "Socially and educationally backward classes" sentence; The root cause of political disputes and conflicts. And also an important component of competitors; Has taken violent form due to which

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(3) Amar Ujala January 19, 2019, Newspaper No.01, Agra edition: Yogi cabinet seal in Uttar Pradesh: In UP, even the poor of general category will get reservation from January 14 to 10 in admission in government jobs and educational institutions.

(4) Dr. Bhimrao Ambedkar wanted to see Indian constitutional democracy in real terms

(5) Reservation struggle: Consequences of political gains.

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UTILIZATION OF HUMAN RIGHT LAW

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INTRODUCTION

Human Rights Are Moral Principles Or Norms That Are Describe In Certain Standards Of Human Behaviour And Are Regularly Protected As Legal In Municipal And International Law.They Are Commonly Understood As Inalienable Fundamental Rights "To Which A Person Is Inherently Entitled Simply Because She Or He Is A Human Being" And Which Are "Inherent In All Human Beings",Regardless Of Their Nation, Location, Language, Religion, Ethnic Origin, Or Any Other Status. They Are Applicable Everywhere And At Every Time In The Sense Of Being Universal And They Are Egalitarian In The Sense Of Being The Same For Everyone. They Are Regarded As Requiring Empathy And The Rule Of Law And Imposing An Obligation On Persons To Respect The Human Rights Of Others And It Is Generally Considered That They Should Not Be Taken Away Except As A Result Of Due Process Based On Specific Circumstances. For Example, Human Rightsmay Include Freedom From Unlawful Imprisonment, Torture, And Execution.

MAIN CONTENT

The United Nations **Human Rights Council**, created at the 2005 World Summit to replace the United Nations Commission on Human Rights, has a mandate to investigate violations of human rights The Human Rights Council is a subsidiary body of the General Assembly and reports directly to it. It ranks below the Security Council, which is the final authority for the interpretation of the United Nations Charter Forty-seven of the one hundred ninety-one member states sit on the council, elected by simple majority in a secret ballot of the United Nations General Assembly. Members serve a maximum of six years and may have their membership suspended for gross human rights abuses. The Council is based in Geneva, and meets three times a year; with additional meetings to respond to urgent situationsIndependent experts (*rapporteurs*) are retained by theCouncil to investigate alleged human rights abuses and to provide the Council with reports.

The Human Rights Council may request that the Security Council refer cases to the International Criminal Court (ICC) even if the issue being referred is outside the normal jurisdiction of the ICC.

UN TREATY BODIES

In addition to the political bodies whose mandate flows from the UN charter, the UN has set up a number of *treaty-based* bodies, comprising committees of independent experts who monitor compliance with human rights standards and norms flowing from the core international human rights treaties. They are supported by and are created by the treaty that they monitor, With the exception of the CESCR, which was established under a resolution of the Economic and Social Council to carry out the monitoring functions originally assigned to that body under the Covenant, they are technically autonomous bodies, established by the treaties that they monitor and accountable to the state parties of those treaties – rather than subsidiary to the United Nations, though in practice they are closely intertwined with the United Nations system and are supported by the UN High Commissioner for Human Rights (UNHCHR) and the UN Centre for Human Rights.

- The *Human Rights Committee* promotes participation with the standards of the ICCPR. The members of the committee express opinions on member countries and make judgments on individual complaints against countries which have ratified an Optional Protocol to the treaty. The judgments, termed "views", are not legally binding. The member of the committee meets around three times a year to hold sessions
- The *Committee on Economic, Social and Cultural Rights* monitors the ICESCR and makes general comments on ratifying countries performance. It will have the power to receive complaints against the countries that opted into the Optional Protocol once it has come into force. It is important to note that unlike the other treaty bodies, the economic committee is not an autonomous body responsible to the treaty parties, but directly responsible to the Economic and Social Council and ultimately to the General Assembly. This means that the Economic Committee faces particular difficulties at its disposal only relatively "weak" means of implementation in comparison to other treaty bodies Particular difficulties noted by commentators include: perceived vagueness of the principles of the treaty, relative lack of legal texts and decisions, ambivalence of many states in addressing economic, social and cultural rights, comparatively few non-governmental organisations focused on the area and problems with obtaining relevant and precise information.

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- The *Committee on the Elimination of Racial Discrimination* monitors the CERD and conducts regular reviews of countries' performance. It can make judgments on complaints against member states allowing it, but these are not legally binding. It issues warnings to attempt to prevent serious contraventions of the convention.
- The *Committee on the Elimination of Discrimination against Women* monitors the CEDAW. It receives states' reports on their performance and comments on them, and can make judgments on complaints against countries which have opted into the 1999 Optional Protocol.
- The *Committee Against Torture* monitors the CAT and receives states' reports on their performance every four years and comments on them. Its subcommittee may visit and inspect countries which have opted into the Optional Protocol.
- The *Committee on the Rights of the Child* monitors the CRC and makes comments on reports submitted by states every five years. It does not have the power to receive complaints.
- The *Committee on Migrant Workers* was established in 2004 and monitors the ICRMW and makes comments on reports submitted by states every five years. It will have the power to receive complaints of specific violations only once ten member states allow it.
- The *Committee on the Rights of Persons with Disabilities* was established in 2008 to monitor the Convention on the Rights of Persons with Disabilities. It has the power to receive complaints against the countries which have opted into the Optional Protocol to the Convention on the Rights of Persons with Disabilities.
- The *Committee on Enforced Disappearances* monitors the ICPPED. All States parties are obliged to submit reports to the Committee on how the rights are being implemented. The Committee examines each report and addresses its concerns and recommendations to the State party in the form of "concluding observations".

Each treaty body receives secretariat support from the Human Rights Council and Treaties Division of Office of the High Commissioner on Human Rights (OHCHR) in Geneva except CEDAW, which is supported by the Division for the Advancement of Women (DAW). CEDAW formerly held all its sessions at United Nations headquarters in New York but now frequently meets at the United Nations Office in Geneva; the other treaty bodies meet in Geneva. The Human Rights Committee usually holds its March session in New York City.

Several theoretical approaches have been advanced to explain how and why human rights become part of social expectations.

One of the oldest Western philosophies on human rights is that they are a product of a natural law, stemming from different philosophical or religious grounds.

Other theories hold that human rights codify moral behavior which is a human social product developed by a process of biological and social evolution (associated with Hume). Human rights are also described as a sociological pattern of rule setting (as in the sociological theory of law and the work of Weber). These approaches include the notion that individuals in a society accept rules from legitimate authority in exchange for security and economic advantage (as in Rawls) – a social contract.

NATURAL RIGHTS

Natural law theories base human rights on a "natural" moral, religious or even biological order which is independent of transitory human laws or traditions.

Socrates and his philosophic heirs, Plato and Aristotle, posited the existence of natural justice or natural right (*dikaion physikon*, *δικαιον φυσικον*, Latin *ius naturale*). Of these, Aristotle is often said to be the father of natural law although evidence for this is due largely to the interpretations of his work of Thomas Aquinas

The development of this tradition of natural justice into one of natural law is usually attributed to the Stoics

Some of the early Church fathers sought to incorporate the until then pagan concept of natural law into Christianity. Natural law theories have featured greatly in philosophies of Thomas Aquinas, Francisco Suárez, Richard Hooker, Thomas Hobbes, Hugo Grotius, Samuel von Pufendorf, and John Locke.

In the Seventeenth Century Thomas Hobbes founded a contractualist theory of legal positivism on what all men could agree upon: what they sought (happiness) was subject to contention, but a broad consensus could form around what they feared (violent death at the hands of another). The natural law was how a rational human being, seeking to survive and prosper, would act. It was discovered by considering humankind's natural rights, whereas previously it could be said that natural rights were discovered by considering the natural law. In

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Hobbes' opinion, the only way natural law could prevail was for men to submit to the commands of the sovereign. In this lay the foundations of the theory of a social contract between the governed and the governor.

Hugo Grotius based his philosophy of international law on natural law. He wrote that "even the will of an omnipotent being cannot change or abrogate" natural law, which "would maintain its objective validity even if we should assume the impossible, that there is no God or that he does not care for human affairs." (*De iure belli ac pacis*, Prolegomeni XI). This is the famous argument *etiamsi daremus* (*non-esse Deum*), that made natural law no longer dependent on theology.

John Locke incorporated natural law into many of his theories and philosophy, especially in *Two Treatises of Government*. Locke turned Hobbes' prescription around, saying that if the ruler went against natural law and failed to protect "life, liberty, and property," people could justifiably overthrow the existing state and create a new one.

The Belgian philosopher of law Frank van Dun is one among those who are elaborating a secular conception[61] of natural law in the liberal tradition. There are also emerging and secular forms of natural law theory that define human rights as derivative of the notion of universal human dignity.

The term "human rights" has replaced the term "natural rights" in popularity, because the rights are less and less frequently seen as requiring natural law for their existence.

OTHER THEORIES OF HUMAN RIGHTS

The philosopher John Finnis argues that human rights are justifiable on the grounds of their instrumental value in creating the necessary conditions for human well-being. Interest theories highlight the duty to respect the rights of other individuals on grounds of self-interest:

Human rights law, applied to a State's own citizens serves the interest of states, by, for example, minimizing the risk of violent resistance and protest and by keeping the level of dissatisfaction with the government manageable

— *Niraj Nathwani in Rethinking refugee*

The biological theory considers the comparative reproductive advantage of human social behavior based on empathy and altruism in the context of natural selection

INDIVISIBILITY AND CATEGORIZATION OF RIGHTS

The most common categorization of human rights is to split them into civil and political rights, and economic, social and cultural rights.

Civil and political rights are enshrined in articles 3 to 21 of the Universal Declaration of Human Rights and in the ICCPR. Economic, social and cultural rights are enshrined in articles 22 to 28 of the Universal Declaration of Human Rights and in the ICESCR. The UDHR included both economic, social and cultural rights and civil and political rights because it was based on the principle that the different rights could only successfully exist in combination:

The ideal of free human beings enjoying civil and political freedom and freedom from fear and want can only be achieved if conditions are created whereby everyone may enjoy his civil and political rights, as well as his social, economic and cultural rights

— *International Covenant on Civil and Political Rights and the International Covenant on Economic Social and Cultural Rights, 1966*

This is held to be true because without civil and political rights the public cannot assert their economic, social and cultural rights. Similarly, without livelihoods and a working society, the public cannot assert or make use of civil or political rights (known as the *full belly thesis*)

Although accepted by the signaturies to the UDHR, most of them do not in practice give equal weight to the different types of rights. Western cultures have often given priority to civil and political rights, sometimes at the expense of economic and social rights such as the right to work, to education, health and housing. For example, in the United States there is no universal access to healthcare free at the point of use That is not to say that Western cultures have overlooked these rights entirely (the welfare states that exist in Western Europe are evidence of this). Similarly the ex Soviet bloc countries and Asian countries have tended to give priority to economic, social and cultural rights, but have often failed to provide civil and political rights.

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Another categorization, offered by Karel Vasak, is that there are *three generations of human rights*: first-generation civil and political rights (right to life and political participation), second-generation economic, social and cultural rights (right to subsistence) and third-generation solidarity rights (right to peace, right to clean environment). Out of these generations, the third generation is the most debated and lacks both legal and political recognition. This categorisation is at odds with the indivisibility of rights, as it implicitly states that some rights can exist without others. Prioritisation of rights for pragmatic reasons is however a widely accepted necessity. Human rights expert Philip Alston argues:

If every possible human rights element is deemed to be essential or necessary, then nothing will be treated as though it is truly important.

— *Philip Alston*

He, and others, urge caution with prioritisation of rights:

...the call for prioritizing is not to suggest that any obvious violations of rights can be ignored.

— *Philip Alston*

Priorities, where necessary, should adhere to core concepts (such as reasonable attempts at progressive realization) and principles (such as non-discrimination, equality and participation.

— *Olivia Ball, Paul Gready*

Some human rights are said to be "inalienable rights." The term inalienable rights (or unalienable rights) refers to "a set of human rights that are fundamental, are not awarded by human power, and cannot be surrendered."

The adherence to the principle of indivisibility by the international community was reaffirmed in 1995:

All human rights are universal, indivisible and interdependent and related. The international community must treat human rights globally in a fair and equal manner, on the same footing, and with the same emphasis.

— *Vienna Declaration and Program of Action, World Conference on Human Rights, 1995*

This statement was again endorsed at the 2005 World Summit in New York.

CONCLUSION

Human rights are moral principles or norms that describe certain standards of human behaviour and are regularly protected as natural and legal rights in municipal and international law.Human rights are the basic rights and freedoms that belong to every person in the world, from birth until death.

They apply regardless of where you are from, what you believe or how you choose to live your life.

They can never be taken away, although they can sometimes be restricted – for example if a person breaks the law, or in the interests of national security.

These basic rights are based on shared values like dignity, fairness, equality, respect and independence.

These values are defined and protected by law.

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RIGHTS OF WOMEN PRISONERS IN INDIA

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ABCTRACT
Indian society offers a status that is respected by women. She plays an important part in the division. The important role she plays in the power of motherhood. The Indian Constitution gives women equal access to the Indian population. It also places an obligation on the Government to protect women's rights and fulfill the requirements of international conventions on women's rights. But the reality is that women in prisons face many problems. Even his basic rights are ignored even though there are several guidelines from the Supreme Court, high courts and recommendations of various Committees. There are difficulties for them in prison that require special attention and that need to be removed. Female prisoners in Indian prisons have been reduced in number by men. It may be the cause of the neglect of the rights of female prisoners. The main purpose of this research paper is to highlight the problems of incarcerated women, human rights violations of female prisoners, the status of women's prisons, human rights and women's statements rights and to propose necessary changes to Indian prisons Act 1894.

Keywords: Prisoners' rights, Women Prisoners, Legal analysis, Constitutional Protection, human rights

INTRODUCTION

Apart from basic human needs, which have been incorporated into the rights of life under the Constitution of India due to the outstanding humanitarian judgments of the Supreme Court, the right to life also enables one to obtain a guarantee of protection from criminal cases. This human-centered approach has not only emerged from basic health needs such as the right to dignity, the right to education, health, and welfare and so on, but it has also highlighted some of the important rights of living a decent life. The right to life includes the right to justice which includes trial. The human rights granted to a particular person are not something that they do for themselves but are a matter of general public acceptance (Verma, 2004).

Under our constitution the deprivation of personal liberty as a penal policy is objective because the detention of a criminal as sentenced is a form of public protection and individual rehabilitation. The focus of the enjoyable texts is on the individual and the purpose saves him / her from society (Sirohi, 2004). This study extends rights around female inmates, under trial and perpetrators in a life warrant.

The rights of prisoners in India

The basic right to live a secure life in India is guaranteed by Art 21, the target of this study and that "no person can be guaranteed freedom of liberty without the legality of Procurer solid life law" Articles 21 and Art 22 of the Indian constitution indicate six types of rights guaranteed in

PRISONERS AS A WHOLE. THESE ARE BRIEFLY DISCUSSED BELOW

1. Convict's rights

In D. Bkgvan Mokan Patnaik v¸ State of AP[1], it has been held that even convicts are credited to the precious right guaranteed by Article 21. They will not be deprived of life and personal liberty except according to the procedure established by law. The Government cannot resort to oppressive measures to curb the political beliefs of a convict. However, they have no fundamental right to escape from lawful custody. However, posting of police guards without jails and installation of high voltage live-wire on jail walls are not violate of Article 21.

2. Prisoners' rights

Is the Prisoner also entitle to invoke Article 21? The aforesaid question and a series of other issues came up before the Supreme Court recently in Sgnil Batra v¸ Delki Abministration[2] This case originated, epistolary fashion, in a letter by a prisoner, Batra, to a judge of the Supreme Court complaining of a brutal assault (insertion of a stick in the anus resulting in tears of anus and bleeding) by a Head Murder on another prisoner Prem Chand who was undergoing a life sentence. The prisoner's explanation for the anal rupture was stated to be an unfulfilled demand for money, alleged a general practice. Batra was not afraid of the consequences of jail indignation and brought the incident to the Court's knowledge, resulting in these proceedings which, though not strictly traditional, were clearly in the nature of habeas corpus writ and, therefore, within the broad sweep of

[1] AIR 1974 SC 2092

[2] AIR 1980 SC 1579

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Article 21. The protection of Article 21 is available even to convicts in jails. The convicts are not the only reason for their conviction deprived of all fundamental rights, which they otherwise possess. Following the conviction of a convict is to put into jail he may be deprived of fundamental freedoms such as the right to move freely throughout the territory of India or the right to "practice" a profession. However, the Constitution guarantees to them other freedoms such as the right to acquire, hold, and dispose of property for the existence of which detention may be impediment. After all, a convict is referred to as a valuable right guaranteed by Article 21 and shall not be deprived of his life or personal liberty except according to the procedure established by law.

Personal liberty of an accused or convict is fundamental and can be taken away only in accordance with the procedure established by law. Therefore, deprivation of personal liberty must be based on the most serious consideration relevant to the welfare of the society specified in the Constitution. In the circumstances of the case, the Court held that subject to certain safeguards, the appellants were called to be released on bail.

It was observed that a significant number of prisoners are under-trial[1] who have to face their cases in court and are presumably innocent until convicted. How cruel it would be when one goes to the hospital for a checkup and by being kept accompanied by contagious cases coming home with a few diseases. Prison reform is now a constitutional compulsion and its neglect may lead to drastic court action[2].

To clinch the issue, the Supreme Court issued as many as six directions (Mandates) to the States and Prison Staff, and concluded as follows:

"…. The prisoner's rights shall be protected by the GOVT by its writ jurisdiction place contempt power¸ To make this jurisdiction viable, free legal services to the prisoner programme shall be prompted by professional organizations recognized by the GOVTT SGCK as Free Legal Aid District Bar shall, we recommend, keep a cell for prisoner relief "[3]

3. Rights against inhuman torture and custodial deaths

In the landmark judgment D.K. Basu v. State of West Bengal6[4] the Supreme Court held that custodial torture is a naked violation of human rights, dignity and degradation, which destroys, to a very large extent the individual personality. It is a calculated assault on human dignity and whenever human dignity is wounded, civilization takes a step backward — the flag of humility must on such occasions fly half-mast.

In this respect, the Supreme Court further observed that the police with their wide powers are apt to use strong arms against those who happen to fall under their secluded jurisdiction. That tendency and the temptation must with great zeal for justice be drawn up in the bud. "The dignity of human is a clear constitution figure not to be overlooked by prison officials," Justice Krishna Iyer said. As well as the abuse and ill treatment of women suspects in police detention centers has been arrested as a violation of Article 21 of the Constitution. The court has given detailed instructions to the concerned authorities to provide security and security at police detention centers especially for female victims. Female suspects should be kept at different police key locations and not the same where male suspects have been arrested and should be monitored by female police officers. The court ordered the Inspector General of Prisons and the State Board of Legal Aid Advice Committee to provide legal assistance to the poor and poor (male and female) whether they were being tried or imprisoned or found guilty.

Courts have recently viewed third-degree methods and death of prisoners at police stations as serious violations of human rights and constitutional principles of the right to life and liberty[5]. In the case of Smt. Nilabati vs. State of Orissa[6], the Supreme Court is held liable for death sustained by assistants and termed human rights violations and the basic rights guaranteed in the constitution, is an approved way of protecting such rights, and then ordered the State to pay Rs 1.5 compensation in death penalty payments held for his 22-year-old son.

The right to protection from torture, referred to in Article 5 of the Universal Declaration[7] and guaranteed by Article 7 of the International Co Convention on Civil and Political rights (1976)[1], has been read into the

[1] Sunl Batra v. Delhi Administration

[2] AIR 1980SC 2579

[3] ibid p. 106G

[4] JT 1997 (1) SC 1

[5] ibid

[6] 199G 2SCC 746

[7] Universal Declaration of Human Rights

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Constitution by the Supreme Court and different courts. The Government of India has signed a UN treaty on torture and other cruel, inhuman or abusive punishment (1987)[2] on the recommendation of the Human Rights Commission[3]. Indian law has denied the use of collateral violence in uncontested terms. Under sections 330 and 331 of the Indian Penal Code (IPC) 1860, it is a criminal offense to intentionally injure or otherwise damage the issuance of a permit or force the return of property. The punishment is too great. In the case of an offense committed under section 330, IPC. Term definitions that can be up to seven years old and good. In the case of an offense committed under section 331, IPC. Imprisonment for up to 10 years Imprisonment and a fine.

The Code of Criminal Procedure, 1973 empowered the Magistrate to investigate the matter in which a person dies in a police cell. Section 176 of the Code applies. The Indian Evidence Act (1872) also prohibits the use of confessions made in the presence of a police officer or police officer and one found to lure, threaten or promise, in criminal cases. These provisions are set out in sections 24, 25, and 26 of the Evidence Act, 1872. In the case of a defendant involved in the Terrorism Protection Act, 2002, this confession before the police Superintendent may be disallowed if other security measures are followed.

The Constitution of India grants a fundamental right of a citizen not to be compelled to be an opposing witness. Section 20 (3) of the Constitution states that no person accused of any offense is forced to testify against him. In addition section 315 of the Code of Criminal Procedure, 1973, in proviso (a) provides that a defendant shall not be called as a witness without his written request. Proviso (b) further defends his interests by providing that his failure to give evidence will not cause him to give his opinion to any party or court or lead him or her to another or another person charged in the same case.

A minimum ten-year fine is imposed under section 376 (2) of Penal Code[4] for rape committed in police custody of a woman or under the boundaries of a designated police station or on the premises of any station house if it is not in or out of the designated police station or of a woman in her hand or in the custody of a police officer.

The Indian Police Act, 1861[5] under which every police organization in India finds its legitimacy with the police in force and prohibits unlawful police violence against any person in police custody. There are disciplinary procedures for both administrative and justice, if there are complaints of police violence against employees. On January 18, 1996 the Supreme Court ruled and sentenced the IPS chief executive of Haryana that sentenced a senior IPS officer of Haryana, to imprisonment for 18 months for a perjury and contempt of court in case of illegal detention and abduction of two children from Agra in 1992. Besides, in another case on 9th May 1996, the High Court sentenced another IPS officer of Assam to three months for concealing the unintentional killing of an undercover prisoner three years ago. In another case reported in 'The Times of India, May 14, 1996, acting in a CBI report, SC ordered the Punjab State to pay Rs.10 core compensation to parents for kidnapping and murdering Advocate, his wife and two-year-old child -an age and lied to an innocent person, and also pay Rs. 2 lakhs to the last as compensation for the suffering inflicted on him as a result of false appearance and imprisonment since 1993.

Despite the above violations of human rights and the constitution and sentence and convictions passed by the Supreme Court and other courts, nothing can be dispensed with the illegal detention of innocent people in police

[1] The International Covenant on Civil and Political Rights is a United Nations Charter based on the Universal Declaration of Human Rights, It was created in 1966 and came into effect on 2 March 1976.

[2] The United Nations Convention against Abuse and Other Abuse, Abuse or Abuse or Punishment (UNCAT) is a worldwide human rights instrument, organized by the United Nations and aims to prevent torture and other similar activities. It

Founded the UN Committee on Torture, which focuses on the activities of world leaders in the role of prevention. UNCAT came into effect in June 1987 and so far 141 countries have been part of it, and 10 others have signed but not yet ratified.

[3] The National Human Rights Commission of India was established under the Human Rights Act, 1991.The Indian Evidence Act, passed by the British parliament in 1872, contains a series of laws and related issues that govern the admissibility of any evidence in the Indian courts.

[4] Indian Indian Penal Code, 1860

[5] The 1861 police law remains the leading line of laws governing all aspects of policing in India. The 1861 Act was enacted directly after the Indian Mutiny of 1857. The beginning of Indian freedom is changing the political system, but the police system is kept under its colonial rule and the Police Act of 1861 has not been replaced.

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stations and concentration camps, the use of third-degree methods during investigations that led to the death of suspects in police custody. According to figures released by the National Human Rights Commission for the year 2003-2004 (NHRC, 2005)[1], 162 people died in police custody and 1300 deaths in court cells except those held in Para military cells - totaling 1463 troops compared to the total death toll of 1340 persons in 2002-2003 (183 in police custody and 1157 in court custody) It was seen that there has been a decrease in the death toll reported to the Commission in police cells and an increase in the death toll in the judicial cell compared to the previous year. The judicial cell should be considered in terms of the number of prison inmates at this given time and most of the deaths are due to illness and natural causes. Almost 80% of the deaths in Judicial Custody are due to natural causes. 217 deaths - 18 in police custody and 1991 in custody cases. The National Human Rights Commission recommended compensation for the victim's family to recover from police disagree with other legal measures.

4. Imprisonment of suspects

Whether it is violate of article 21? This question came before the Supreme Court of Jolly George Varghese v. Bank of Cochin[2], even if the arrest and detention of a prisoner under Section 151 of a debtor who had no means to repay this debt, was in breach of Article 11 of the law. International Convention on Political and Political Rights and Article 21 of the Constitution? Hosted below:

"Equally striking is the introduction of Section 21 of the Constitution with regard to the payment of arrears. The high value of human dignity, and the human value enshrined in Article 21, read with Articles 14 and 19, force the State to exclude itself from a just, just and reasonable law by following its procedure. The case of Maneka Ganbki (1978) 1 SCC 494, Sita Ram v. State of UP (1979) 2 SCR 1085 and Sunil Batra v. Delhi Administration, decided on December 20, 1979 (SC) put down this proposal. It is very clear that it requires a greater understanding that a person can be imprisoned for their poverty and his inability to deal with his debt is staggering. To be poor, in this country Daridra Narayana (a country of poverty) is no crime and to repay debts through the process of imprisonment is a violation of Article 21 unless there is evidence of petty wrongdoing by failing to pay without his adequate means and the absence of his most compelling applications by his means such as paying medical bills cancer or other serious illness.

5. Rights of solitary confinement

In Sunil Batra (No¸1) v. Delhi Administration[3], an important question raised before the Supreme Court was whether 'solitary confinement[4] detained inmates who were sentenced to death sentence violates Articles 14, 19, 20 and 21 of the Constitution. In this case, the two prisoners were detained in Tihar Central Jail and filed two complaints under Article 31, challenging the legality of section 30 and section 56 of the Prison Act. Sunil Batra, the accused, was sentenced by the District and Stage Courts and his sentence was handed down for verification by the High Court and the appeal to the High Court. Batra complained that since the day of his sentencing by the Session Judge on July 6, 1976, he was kept in solitary confinement until he finally entered the High Court on February 24, 1978.

Charls Sobhraj[5], a convicted prisoner challenging the Superintendent's Jail action Bar holes. He was arrested on July 6, 1976, under section 3 of the MISA. From the time he was put in jail he was put in concrete pants without the recommendation of a prison doctor to remove the holes. It was argued that section 30 does not authorize prison authorities to impose the sentence of solitary confinement. The Supreme Court welcomed the applicants' objections and held that section 30 of the Prison Act did not authorize the prison authorities to reduce the

[1] figures from the Annual Report of the National Human Rights Commission (200G-2004). You are the most recent report.

[2] AIR 1980 sc 470

[3] 1979 (SC)

[4] A solitary confinement, called a "hole" alone, is a punishment when a prisoner is refused contact with other people, except guards and doctors.

[5] Charles Sobhraj (born April 6, 1944 in Saigon, also accepted as French) is a serial killer attacking Western tourists throughout Southeast Asia in the 1970s. Called the "Serpent" for his skill in deceiving and evading, he was said to have killed at least 12 people and was hanged in India from 1976 to 1997, but managed to make a living for himself in prison. He retired as a celebrity in Paris, then returned to Nepal unexpectedly, where he was arrested and sentenced to life on August 12, 2004.

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prisoner to solitary confinement. Under section 73 and section 78 of the IPC, solitary confinement is a severe punishment that can be imposed by a court of law. It will not be left inside the prison authorities. The court held that the expression "prisoner under the death penalty" in terms of S.30 (2) could simply mean that prisoners who imposed death sentences and could not be terminated or violated by a judicial or constitutional process. Therefore, the prisoner was not subject to the death penalty until he had the right to ask for mercy. If kept in solitary confinement there is a complete severance of the camaraderie (friendship) between the inmates who talk and talk and talk with each other, which would be offensive to Article 21 of the Constitution. Freedom of movement, mixing, mingling, talking, joining companies and prisoners if not greatly reduced would be a violation of Article 21 unless the funding reduction is supported by law. Although detention alone should have violated Article 21, section 30 should have been effective because the procedure under which the prisoner's deprivation was prohibited, was appropriate and within the meaning of Article 21. Of personal liberty without legal authority. In the case of Charles Sobhraj it was argued that Section 56 of the Prison Act allowed him to put him in a rubbish bin. The appellant argued that Article 56 conflicts with Article 14 and 21, as the power of the Superintendent is not intended to be disassociated and put the prisoner in jail. The court held that by continuing to keep the prisoner in chains day and night reduced the prisoners from person to animal and this treatment was so cruel and unusual that the use of chains was in violation of the spirit of the Constitution. Section 56 sets out certain conditions where applicable. As these cases were not in a state of emergency then setting the bar fetter would be pointless. Article 56 however applies. Their requests were then dismissed.

6. Rights to resist excessive imprisonment (Art 22)

Art 22 guarantees four basic rights for persons detained under the common law. These are: 1. the right to be informed promptly of the reasons for the arrest 2. The right to be consulted and represented by a lawyer of his choice 3. The right to be produced in the presence of a magistrate within 24 hours 4. To be released from detention at the time specified without the order of a magistrate. According to Art 21 no person may be deprived of his life or liberty without the procedure established by law. This means that a person may be deprived of their health or personal liberty if their improvement is due to a legal process. Art 22 defines those procedural requirements that must be adopted and incorporated into any process enacted by the legislature. If these procedures are not complied with, that will be deprived of personal freedom that does not conform to the procedures established by law. Art 22 deals with two different matters: (a). Persons detained under common criminal law and (b). Persons incarcerated under detention. The first two sections deal with incarceration under the common criminal law and the third, fourth and sixth are detained under the detention laws.

Art 22 is thus a real fulfillment in the discussion of the administration of justice in India. It was once thought that Art 22 is a complete code in terms of the laws that provide for incarceration and that the validity of the detention order must be strictly determined in terms of the four-point meaning of Art 22 (Pandey, 2003). It was held in the Gopalan case[1] that the detent would not seek relief guaranteed by article 19

(1) d if it has been violated by his confinement, and the fact that the law of detention should not be tried with due regard to the limits of the limits imposed on his freedom of movement or on the ground that his personal right to liberty has been violated under Art 21 other wisdom which has been subject to the procedure prescribed by law.

This review has now been shown to be inappropriate for R.C. Kapoor vs¸ Union of India[2]. Although the case is referred to in Art 31 (2) but in the case of Manaka Gandhi[3] the court has used it in relation to art 21. According to this view, the law relating to the detained detention must not only fulfill the requirements of Art 22 but also the requirements of Art 21. In other words the procedures imposed under the detention should be reasonable and fair and just under Art14, 19 and 21 of the Constitution.

Clauses 1 and 2 of Art 22 give a person the four rights held and the following:

1. He will be detained immediately without being informed of the reasons for his arrest.

2. You will have the right to consult and be represented by a lawyer of your choice.

3. The right to be produced within 24 hours to the nearest magistrate.

4. The right not to be detained for more than 24 hours in custody without the court's authority.

[1] AIR 1950 SC 27

[2] AIR 1970 SC 564

[3] AIR 1978 SC 597

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However was it held in the Province of U.P. vs. Abdus samad[1], that after 24 hours have passed without complying with the requirement of clause, the detainee has the right to be released? In State of M.P. vs. Shobharam[2], the Supreme Court stated that this production rule within 24 hours should be brought with it if the detainee was granted bail.

The guaranteed rights discussed above apply equally to abusive women. But unfortunately the fate of women's sentencing has never been highlighted before. In the next chapter we discuss the problems that female abusers face and the solutions proposed by legal enlighteners

THE POSITION OF FEMALE PRISONERS

Although the right to life under the Constitution of India is wide enough to include the rights of many prison inmates, an unfortunate situation exists in women's prisons. Prison law and prison laws address the segregation of inmates on the basis of sex and certain rights to the accused, but this area requires special attention. Most women with children are not available to their children after they are six years old when they are sent to government homes for the remainder of their mother's sentence, in case the father or other family members are unable to care. Studies have shown that these children often fall for petty gangs.

The position of victims who happen to be women or children does not require due attention in the process (Muralidhar, 2005). Protection under Sec.160 Cr.Pc that "no man under the age of 15 or women shall be asked to move anywhere other than the place where the man or woman resides" does not apply to the woman or woman the child is considered to be a suspect[3]. Justice VR Krishna Iyer in his prison report Women (1997) has produced this lacuna. His suggestions are most notable for improving the existing situation:

l. Policy guidelines must be developed, inter alia, for the arrest, interrogation, search and imprisonment of women, bail and sentencing, pre-sentencing investigations, the use of legal and legal advice, psychological services and the separation of science in trial and sentencing process, the presence of women's legal cells in them all police districts, diversity of transgender women to diversify and deal with special decision-making processes and non-institutional options, a coalition of volunteers and volunteer organizations working in the field of women development in investigations and case studies and case studies, etc.

2. The formulation and adoption of the National Policy on the Justification of the Use of Free Services in mothered.

The creation of an independent body to be designated as the National Authority on Custodial Justice to women (NACJM) which should have an introduction to every part of the criminal justice system namely judges, law, legal aid, police, prisons, cases and social care, as well as social welfare and childcare centers psychology. It should also include medical representatives, law schools, social work schools, women's groups, human rights and social rights groups, the media, specialist studies and bodies for criminal and civil defense training, etc.

3. Special courts should be set up to pass justice separately and quickly to women. In addition to a separate women Court or Family Court it is recommended that the Nari Bandigriha Adalats be held in the custody of the court of the portable court as an immediate change of imprisoned women. Such camps and courts should be held promptly and routinely for health and mental well-being Surveillance centers also remove backlog pending cases, and provide immediate justice. Mobile salads must be conducted at district level or in conjunction with the installation of all prisons and non-prison facilities. Its purpose should be to provide justice immediately.

4. Prison should be brought to the Common List of this Seventh Schedule to the Constitution of India in order to strengthen the country's standard and equitable process of reform.

5. There is a need to have a comprehensive Prison and Prisoners Act which can combine in one Act several provisions promulgated in the Act.

6. An extensive code to integrate the management of all the administrative centers and the treatment of prisoners of those institutions, with special provisions for the treatment and treatment of women.

7. A critical examination of the effectiveness and importance of various laws relating to the status of women in custody and their case should be undertaken by the Law Commission.

[1] AIR 1962 SC 1506

[2] AIR 1966, SC 1910

[3] The Supreme Court emphasized the binding nature of this requirement in Nandini Satpathy v. P.L.Dani (1978) 2 SCC 424.

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8. Immediately, the relevant amendments and additional provisions should be introduced in the IPC and Cr. PC and also in the Prison Act, 1894 and the Police Act, 1861 to reflect the special needs of women in custody.

9. In terms of the Police Act, 1861, the Committee recommended replacing that by-law with a new law.

10. The rights of dependent children of custody women also need to be clearly defined in existing law.

11. The Committee would like the new Mental Health Bill to reflect some of the recommendations made by the Committee on the care and treatment of women who are innocent of crime and who have a problem with women suffering from mental illness.

12. Aside from the female employees in women's prisons, there should be women D.I.G. At the State Headquarters probably comes from prison services, mainly to look after work relating to women's prisons, female prison staff and female prisoners.

13. There should be representatives of watches and events in the year and should be responsible for collecting them rather than relying on collateral arrangements.

14. Released Prison Relief Organizations should operate in all districts that can offer one-window assistance in the monitoring and integration of free prisoners.

15. The country must agree to enforce the same prison directory. Prison resources for women and their children, as well as the rights and duties of female prisoners should be clearly indicated in a separate roll of the prison manual.

16. Various police closures should be established in consultation with the State Police. It should be compulsory at each police station to provide a secure enclosure for all agencies and segregated areas of female arrestees. Women's separate police stations where they are located should be well established with adequate training and trading tools.

17. The police model book should be included in the prison model booklet lines and should be enforced strictly and uniformly by all Americans. This booklet should contain minimum display space standards and other structures and procedures used by women while in police custody. The police should be consulted extensively when preparing this booklet.

18. A special unit called the Women's Assistance Unit (MAPU) will be formed which should be integrated with the men's and women's police forces, to specifically deal with crime and humanitarian work during detention and detention.

19. Appropriate communication must be established between the officers of the guard and the voluntary / human rights groups in protecting the rights and dignity of women not only in custody but also outside.

20. Counseling cells should be connected to all child care centers and those cells should include in-house staff.

Justice Krishna Iyer strongly argues that public participation should inspire those working with the system to better manage the system. Successful implementation of this approach should provide due recognition and greater awareness. However, some important steps are being taken by the Central Government to the Supreme Court. The Supreme Court on April 13, 2006 issued a list of guidelines for protecting the rights of prisoners and their children in prison asking the Center and state governments to change and submit new guidelines within three months. Among the important guidelines, the high court demands that authorities under probation should be taken to hospitals outside the prison area for delivery and the birth certificate should not state prison as a birthplace. To ensure that the children of female prisoners are not condemned, a bench consisting of Chief Justice YK Sabharwal, Justice CK Thakker and Justice PK Balasubramaniyan directed the administration to follow its guidelines in letter and spirit so that the basic rights of children in education and healthy living. It is broken when they are living with the mother under her charge or the mother convicted in prison (Zee News 2006).

The plight of rape victims is exacerbated by their being 'secured' in prisons or detention centers (nari niketans), on the grounds that they are required to give evidence even though incarceration is not legal[1]. The legal response to the needs of victims of rape and other cases of violence against women would all be obvious and

[1] The practice of keeping abused women imprisoned for giving testimony was severely damaged in Hussainara Khatoon v. State of Bihar (1980) 1 SCC 9G (at age 96) as "nothing in violation of the violation of freedom of law guaranteed under Article 21 Constitution."

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inadequate. In imposing severe and minor penalties[1] on the offense and on the burden of proof[2] the law fails to address the needs of the victim in order to be treated with modesty, to protect protection against intimidation, easy access to justice, legal aid and rehabilitation. Currently there is no provision in the law that mandates 'in-camera' trials, especially if the victim is a child[3]. And there is no legal system that recognizes the need for rehabilitation of rape victims (Kirchhoff, 1994). The negligence of the law and the oversight of the issue is different in response to the Supreme Court's ruling in Delhi Domestic Marking Women's vs. Union of India (1995 1SCC 14). Where the High Court ruled that legal representation and relief should be transferred to the accused at the same time, the police should be under obligation to inform the victim of his right to representation before questions are asked of him and should be financially compensated by the court.

CONCLUSION

"The right to life" under Art 21 of the Indian Constitution is a broad concept that has encompassed all the guaranteed rights of prisoners, subject to trial and trial by the courts of any democratic country. Basic life rights services in case of prison rights are guaranteed under art, 21and 22 oxygen tubes for those found guilty and victims. But a great black hole is still in the story of evildoers. Although India is a land of Shakti worshipers, from the above research, it is clear that female prisoners deserve better care. In a patriarchal society like India, female prisoners seem to be just as bad as witches. In many cases, they are denied access to their homes, families and children after their release. But undoubtedly, female inmates are particularly vulnerable, unlike their male counterparts. Broader and broader views are still needed to increase the status of female prisoners in India.

Although the right to equality is guaranteed to all citizens of India irrespective of whether they are sexually active their law must apply to security in order to be guaranteed to the perpetrators. The Indian Constitution is a thriving constitution and therefore the concept of a right to life should be amended along with a change of worldview. New amendments should be brought in the sense of prison rights under the broader scope of the Right to Life. Newly enacted laws on prison management and criminal psychology should be considered to give a broader perspective on the right to life of convicts and under successful trial of prison life in India.

[1] S.76 (2) imposes a minimum sentence of 10 years and a maximum penalty of imprisonment for certain serious offenses.

[2] Example, section 114 A, Evidence Act 1872 promotes the absence of consent when the raped woman declares in her testimony before the court that she did not consent. Recently some amendments were made to show the need for symptoms

[3] Attempts by PIL to the Supreme Court (Sakshi v. Union of India (2001) 10 SCC 7G2) to make the legislature fix this lacuna.

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A REVIEW ON SOLAR DISTILLATION IN INDIA

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ABSTRACT

The work was propelled by the expanding familiarity with the requirement for improving water supplies conspires in parched grounds including a fitting innovation for sun oriented vitality use in the desalination field in India. The crisp water emergency is now clear in many parts of India, changing in scale and power at various occasions of the year. India's quickly rising populace and changing ways of life additionally expands the requirement for crisp water. New water is progressively becoming the dominant focal point on the financial and political motivation, as an ever increasing number of questions between and inside states, areas, locales, and even at the network level emerge. The customary desalination innovations like multi stage streak, numerous impact, vapor pressure, iron trade, switch assimilation, electro dialysis are costly for the creation of limited quantity of new water, likewise utilization of ordinary vitality sources negatively affects the earth. Sun powered refining speaks to a most alluring and straightforward system among other refining procedures, and it is particularly fit to little scale units at areas where sunlight based vitality is impressive. India, being a tropical nation is honored with a lot of daylight. The normal day by day sunlight based radiation differs somewhere in the range of 4 and 7 kWh per square meter for various pieces of the nation. There are on a normal 250–300 clear radiant days in a year, therefore it gets around 5000 trillion kWh of sun based vitality in a year. Regardless of the confinements of being a weaken source and discontinuous in nature, sun oriented vitality has the potential for gathering and enhancing different vitality prerequisites. Sun based vitality frameworks being particular in nature could be introduced in any way according to the necessity. This paper comprises of a general survey and specialized evaluations of different inactive and dynamic sun powered refining advancements in India. This survey additionally suggested some exploration zones in this field prompting high effectiveness are featured.

1. INTRODUCTION

Sunlight based refining alludes to the vanishing of sea-going arrangements by methods for sun based vitality and to the synchronous buildup of the vapors, made by the action of sun oriented warm vitality. It is a straightforward system of humidification–dehumidification that happens in one and a similar gadget, called "sun based still." It is referred to from the early vestige as a physical methodology.

There exist many brief verifiable audits on sun based refining beginning from ancient times, where numerous preliminaries were performed to deliver crisp water from salty waters. A considerable lot of the depictions about desalination are flawless thoughts however the crude learning of innovation and development structures is extremely poor at the time they were communicated for accomplishing any reasonable application.

The most broad and useful works of olden times, in any case, are those of Aristotle (384–322 BC) (1962), the outstanding logician and researcher. Von Lippman (1910, 1911) and Briegel (1918) examine the desalination references by Aristotle who depicted in an astounding right manner the root and the properties of common, harsh, ocean waters, and a few different ways to desalinate salty waters.

The act of refining was created in Alexandria, Egypt, during the Hellenistic time frame and Bittel (1959) gives a detail depiction of different distillers (alembics) built up that time. There were created different kinds of alembics. The two pots alembic (Διβικος) was utilized for vapor buildup. The leader of the still in Greek was designated "ambix." This name was applied regularly to the still all in all. The Arabs named it "Al-Ambiq" from which the overall known "alembic" was created.

A few brief or increasingly broadened chronicled surveys on Solar Distillation, Solar Desalination and in Desalination by and large are accessible in the writing: Delyannis and Piperoglou (1967a) give titles and short depiction from ancient history up to 1940. Nebbia and Nebia-Menozzi (1966, 1967) give a more detail depiction on history of desalination and El-Nashar and Delyannis (eolss) portray the features of sustainable power sources for desalination applications. Belessiotis and Delyannis (2000b) and Delyannis (2003) make reference on the accomplishments on change of sun powered vitality to warm vitality lastly Birket (1984, eolss) causes a to broaden diagram on desalination history from classical times.

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2. A HISTORY OF THE SOLAR STILL

Phoenician mariners which went along the Mediterranean Sea were at that point utilizing the sun based warm radiation to change over seawater into crisp drinking water. The great Greece thinker Aristotle depicted the water cycle in nature and commented that when salt water transforms into vapor and the vapor consolidates, it does as such as sweet water. Truth be told, bubbling seawater and consolidating the vapors on wipes was one of the principal methods for desalination (Delyannis, 2003). Another was the utilization of glass containers presented legitimately to the sun radiation, which offered ascend to the idea of the alembic. During Medieval occasions, Arab chemists desalinated seawater utilizing vessels warmed with sun based radiation focused by sunken mirrors. In 1589, Della Porta makes reference to a few strategies for desalination in his book "Magiae Naturalis", including his sun oriented refining unit and a technique to acquire freshwater from the air (Delyannis, 2003). In any case, just in 1870, the main patent on sun based refining was allowed in the USA to Wheeler and Evans, depicting the fundamental activity of the sun oriented still dependent on broad test work.

In 1872, the principal huge establishment of sunlight based detached desalination was raised close to Las Salinas, in northern Chile, planned by the Swedish architect Charles Wilson. The establishment was worked to supply freshwater to the settlement related to a saltpeter mine. It was bolstered with effluents of high saltiness (140 g kg-1) and delivered about 22.7 m^3 of freshwater every day, working since 40 years. It was worked of wood darkened with logwood color and alum to retain daylight, utilizing a glass spread. It comprised of 64 sounds, with an absolute surface region of 4450 m2 covering 7896 m^2 of land. Albeit some improving gadgets were planned in the mid twentieth century to build the yield of sun based refining, fundamentally sun oriented concentrators (Delyannis and Delyannis, 1984), it was not until the World War II that examination on sun based refining was firmly elevated to supply drinking water to troops in remote detached spots.

Maria Telkes, from the Massachusetts Institute of Technology (MIT) built up a compact air expanded plastic sun powered still to be utilized in crisis life pontoons. It comprised of an inflatable gadget made of straightforward plastic with a felt cushion at the base and a connected holder for gathering the distillate. Gliding close by the pontoon, the felt cushion would immerse with seawater. Sunlight based radiation going through the straightforward plastic would warm the cushion making water vapor which would consolidate within the plastic spread and wind up sliding down to the holder (Telkes, 1945). She kept working in various structures at MIT, including the multi-impact idea (Telkes, 1953).

In 1951, the Seawater Conversion Laboratory at the University of California began its inves-tigations which prompted constructing a sun oriented refining station at the Engineering Field Station in Richmond, California (Howe and Tleimat, 1974). At about a similar time (1952), the United States Government set up the Office of Saline Water, which opened and financed a sun oriented dis-tillation program at the Daytona Beach Test Station in Florida. Numerous sorts of design of sunlight based stills were examined in Daytona, including bowl type, different impact and dynamic sun based stills (Talbert et al., 1970).

In Australia, a sun powered refining project was created at the Melbourne offices of the Commonwealth Scientific and Industrial Research Organization (CSIRO) (Wilson, 1957). A model of narrows type still secured with glass was planned and some were worked in the desert, the biggest being in Coober Pedy. In Greece, the Technical University of Athens structured some sunlight based stills for the islands. They were uneven glass-shrouded nursery type with aluminum outlines. One of them, in the island of Patmos, was the biggest at any point fabricated up until now, with limit 8640 m3 day-1 (Delyannis, 1968). In other Greek islands littler stills secured with plastic material (Tedlar) were worked from structures by Frank E. Edlin gave a shot in Daytona Beach (Eckstrom, 1965). In the previous USSR a few establishments looked into on sun oriented stills and a plant was worked in Ashkabad, Turkmenistan (Baum and Bairamov, 1966). There was research and experimentation on sunlight based stills in different nations like Spain (Barasoain and Fontan, 1960), Portugal (Madeira and Cape Verde Islands), India, Cyprus, Chile, Mexico, Egypt, Algeria and Tunisia.

The data from these analyses was condensed by Eibling et al. (1971), examining the outcomes from 27 of the biggest bowl type sun based stills working up to that minute. From the 10 years of experience, they saw that the normal productivities were for the most part a component of absolute sun oriented radiation. They evaluated the efficiency of a sun based still to be about 3.26 Lm^{-2} every day, which compares to about 1.2 m^3 m^{-2} every year. They expressed that huge strong sort, glass – secured sun powered stills would create water on a reliable, trustworthy reason for an expense somewhere in the range of 0.8 and 1.1 US$ m-3 much of the time, this range speaking to the best gauges for arranging purposes, in any event for the following quite a long while.

By the mid 1970s, the best in class of sun oriented stills was pronounced comprehended from the stand-points of thermodynamic and geometric impacts. Some changed kinds of sunlight based stills had appeared to improve

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the efficiency (tilted wicks; slanted plate; sun oriented stills with constrained convection; stills with outside buildup or numerous impact sun based stills with inactive warmth reuse), once in a while achiev-ing twice that of a basic bowl. Nonetheless, around then, none of those enhancements could be legitimized on a financial premise. Likewise, long haul testing of the materials was required and long existence with least support must be illustrated.

In the a long time from that point forward, a lot of test sunlight based stills have been developed and their exhibition adequately illustrated. Research on sunlight based stills has proceeded and just in the 21st century in excess of 200 logical papers have been distributed so far managing sun oriented stills. In spite of the fact that the fundamental information and cutting edge has not changed drastically over the most recent 40 years, there are some fascinating new plans and adjusted sunlight based stills with expanded proficiency, just as approved models of their thermodynamics and execution.

3. DEVELOPMENTS OF SOLAR DISTILLATION IN INDIA

The main biggest sunlight based refining plant was introduced by Central salt and Marine Chemical Research Institute (CSMCRI), Bhavnagar to supply savoring water Awania town and Chhachi beacon in 1978. Awania is a non charged town around 12 km from Bhavnagar with a populace around 1400. Fig. 1 (a) demonstrates the Awania plat format. It comprises of 90 stills each having dissipating surface of 20.74 m^2 similarly conveyed in 15 squares having outside measurements of 12.66 m 12.11 m with limit of 5000 L/day. G.L. Natu et al. [1] gave their activity encounters at Awania town refining plant. The locals set aside some effort to comprehend the contrast between the nature of water delivered by sun powered refining plant and water from well after that they are utilizing plant water consistently. The creators showed that, littler plants serving littler networks will be the correct use of this innovation in India.

A first twofold incline sun oriented refining unit was introduced (Fig. 1 (b)) with limit of 85 L/day at IIT, Delhi, in January 1981, to meet the necessities of the Chemistry Department. The unit comprises of 28

multi wick sun oriented stills every one of 1 m^2 successful region with four stills in a push. Each line of stills has autonomous bolstering water channels associated with a little stockpiling tank. Because of high wind speed, control lack, green growth arrangement, and so forth., the plant was destroyed in June

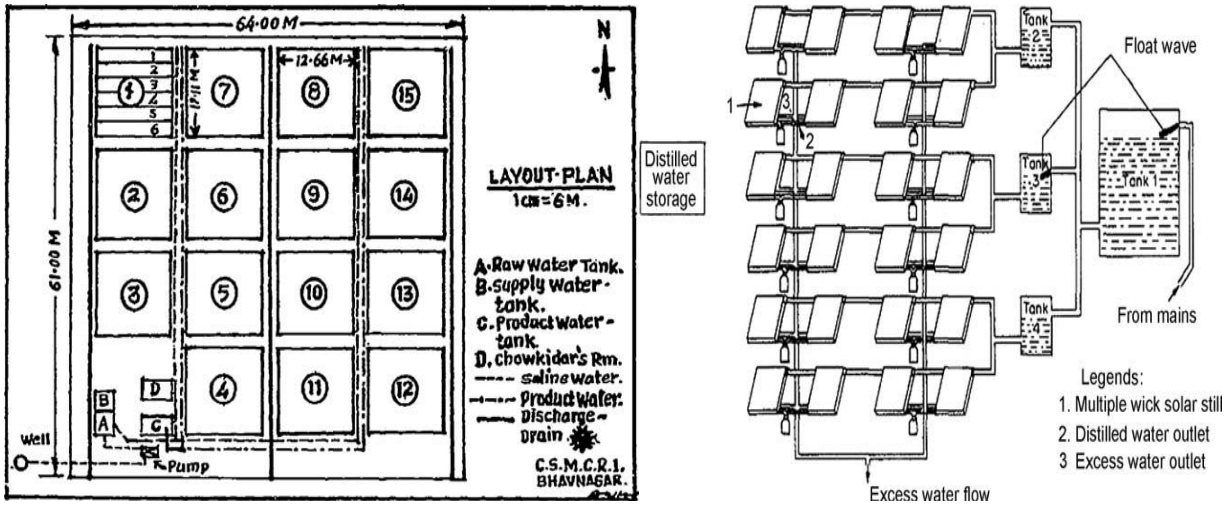

Fig.1 (a) Lay-out of solar distillation plant (b) Layout plan of solar distillation plant at IIT, Delhi

1982 and reinstalled in October 1982 with certain upgrades [2]. The exhibition and the day by day creation of the sunlight based still can be expanded by different latent techniques, for example, bringing down water limit in the bowl, including different colors in the water mass, expanding the absorbtivity by giving different retaining materials on the bowl liner, separating reflection radiation by fixing reflector on the inward divider surfaces, diminishing conductive heat misfortunes from sides, and so forth. It could likewise be improved through dynamic techniques for coordinating the still with level plate authority, heat exchanger, and so forth. The grouping of these improvement procedures addresses and abridged beneath.

4. SIMPLE SOLAR STILLS

Aloof framework in which sun oriented vitality gathered by structure components (bowl liner) itself for dissipation of saline water. The straightforward single incline sun powered still is appeared in Fig. 2. The sun's vitality in the type of short electromagnetic waves goes through a reasonable coating surface, for example, glass. After striking an obscured surface, this light changes wavelength, ending up long floods of warmth,

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which is added to the water in a shallow bowl underneath the coating. As the water warms up, it starts to dissipate. The warmed vapor ascends to a cooler region. Practically all polluting influences are abandoned on the bowl. The vapor consolidates onto the underside of the cooler coating and collects in to water beads or sheets of water. The mix of gravity and the tilted coating surfaces permits the water to rundown the spread and into a gathering trough, where it is diverted in to capacity.

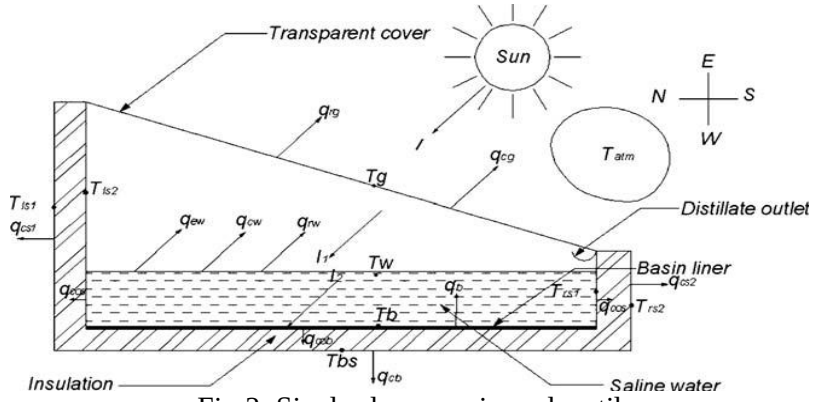

Fig-2: Single slope passive solar stil

4. LITERATURE REVIEW

Although there are many types of solar still plants which are conventional in construction as single basin still. Their yields are very less of the order of 1.5 to 4.5 liters per day per m^2 [3,4].The various design of still with respect to geographical locations where drinking water can be obtained by solar energy ,have been proposed by many investigators [3-6].Single slope still is very popular, and work on this is going on rigorously [3–11]. Alnaser had studied about the outcome and its efficiency in the context of single and double basin [8]. Alnaser did two tests one for still insulation and other has no insulation. They found that insulation gives comparatively good result to produce potable water, mainly with two basins still, which around 41% higher than single basin system [8].

The technologies are existing for water distillation used, are basically run on thermal engineering concept for distillation as phase conversion or by membrane filtration, which can include categories in two groups. In the first group which is based on thermal technology such as multi-state flashing (MSF), other as multi effective distillation (MED), vapour compression (VC) and the cheapest simple in construction still distillation (SD). The Reverse osmosis (RO) is the most popular technique, along with electro dialysis (ED) [12]. Due to the running cost of energy consumption these technique and environmental hazards as the use of fossil fuels, they need for reconsideration [13].

El-Sebaii investigated computer aided modelling of wind flow effect on still productivity daily basis ,which termed as passive solar stills , he experience that active as well as passive productivity can be enhanced by flowing wind up to a reasonable velocity [4]. Nijmeh investigate the key parameter of solar still generation ,absorptive nature of material at the bottom of basin ,how much radiation it capture which transform in to heating water ,he is mainly focussed on the different material absorption capacities with single basin system like dissolved salts, violet dye, and charcoal etc.[14]. He notified that around 25% of still water generation can be improve with salts and violet dye gives better result up to 29%.

Since the last few years of decades, thermal distillation mainly dependent on solar power has been appreciated by inventors [13]. But the performances of this type of setup required for more improvement by advancing the cooling and evaporative technology.Thermo-electric refrigeration technique can be utilized as a solid state heat pump which are based on the Peltier effect [15,16]. The main feature of this device have no moving parts, and therefore its more reliable, noiseless, compact in size, easy operation, and environmentally good [17–18]. Due to the appreciation performance of thermo-electric devices, it has become more popular one.The water level in the basin is another parameter to consider by others authors concern their research on convective heat transfer coefficient in between under glass and above water surface in the basin [20].The sponge medium inside water may contribute to enhance still water generation suggested by Abu-Hijleh and Rababa'h [21]. Single sloped solar still was recommended by some researchers with the logic that the solar radiation directly fall on the incident glass plate [6].Many researchers have focused on enhancing the performance of solar stills. Rahin et al.[22] used to support this type of techniques to improve still yield. This was done by putting away the evaporating and condensing envelopes, with the help of copper tube for condensation, while using the black aluminum plate at the basin bottom for water evaporation. The efficiency of the was increased by 31.1%. Abu-

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Arabi et al. [23] of a solar desalination design model by using double glass collector. If water and glass temperature differences are increased the productivity of distilling water will increase. This is by many people are taking an interest in the field of solar still.The performance of concave wick evaporation of solar had been studied by still Kabeel. The still produces 4.1 L/m^2 as the average daily production of his still which has 30% average efficiency. The productivity of a weir-type inclined solar still studied by Sadineni et al. [25]. This still's daily production was 5.5 L/m^2 if thin water films uses and temperature difference of evaporation and condensation increased. Phadatare et al. [26] used the same data to observe the effect of water depth. From last few years more people are coming forward to take part in improving solar still performance and to get more productivity they have made a simple still. Mirza et al. [28] proposed a design of simple basin solar still, properties were measured and its still efficiency was 30% and its daily productivity was was 3.1 L/m^2. His research said that the outcome of the solar still varies with the factor of insulation and surrounding temperature.

5. OTHER TYPE OF PASSIVE SOLAR STILL

5.1 Double condensing chamber

G.N. Tiwari et al. [29] led an exploratory examination of a new plan of twofold consolidating chamber single bowl single incline sun oriented still. The creators reasoned that, huge upgrade in day by day yield because of a most extreme vapor weight distinction between the two gathering chamber on a crisp morning, (ii) the presentation of twofold condenser chamber sunlight based still gives a higher every day yield of around 35–77% over the Conventional sunlight based still.

5.2 Wick type solar stills

A traditional bowl type sunlight based stills has a few weaknesses, (i) the flat surface of water blocks lesser sun based radiation than a tilted surface. (ii) The yield of bowl type sun powered is moreover

constrained by the huge warm limit of the water in the bowl. A multi wick sun based still (Fig. 3) is the best option for taking out the previously mentioned focuses. In which darkened wet jute material structures the fluid surface which can be situated to capture most extreme sunlight based radiation and a littler mass of water will be warmed to higher temperature and will vanish quickly. The wet surface is made by a progression of jute material bits of expanding length isolated by dainty polythene sheets, these pieces are orchestrated along a grade and the upper edges are dunked in a saline water tank. Suction by the slim activity of the fabric fiber, gives a surface of the fluid and the course of action guarantees that

all the surface, illuminated by the sun is wet consistently; the part of a bit of material, secured by the polythene sheet doesn't endure vanishing and henceforth the uncovered part of the piece holds wetness [30]. M.S. Sodha et al. [30] saw that, general productivity of numerous wick sunlight based still is 4% higher than the bowl type still. Their results likewise demonstrate that, the still cost not exactly 50% of the expense of a bowl type still of same territory and give a better return of distillate. G.N. Tiwari and H.P. Garg [31] additionally affirmed that, the numerous wick sun oriented still is the most monetary and effective among the existing sun oriented stills.

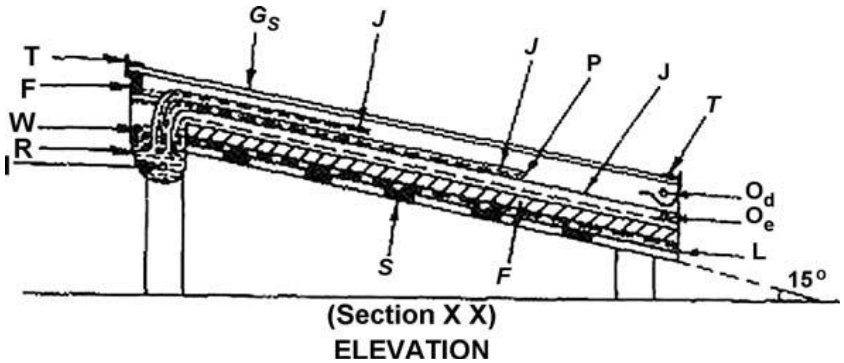

Fig-3: wick type solar still

M.S. Reddy et al. [32] demonstrated that, a numerous sun oriented still with a condenser plan gives 15–25% higher than the non-condenser type still. The overabundance vapor can be dense on the extra surface and diminish the warmth stacks on the glass spread and diminishes glass-spread temperature which thus upgrades vanishing rate. This idea has actualized by G.N. Tiwari et al. [33] on multi wick sunlight based still. The creators reasoned that, the two fold gathering, various wicks sunlight based still gives about 20% better return than the straightforward wick sunlight based still and under overcast and low force conditions the two stills show very nearly a comparative execution. N.K. Dhiman and G.N. Tiwari [34] showed that, different wick sun oriented still yield expanded by 10%, when water is streaming over the glass spread in an extremely slender layer.

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5.3 Inverted absorber solar still

The schematic outline of transformed safeguard sunlight based still is appeared in Fig. 4. The sun oriented radiation, after transmission through the glass spread g1, is reflected back to the altered safeguard of a sun based still. The assimilated sun based radiation is halfway convected to the water mass over the altered safeguard; while the remainder of the radiation is lost to the climate through the glass covers g1 and g2. Presently, the water gets warmed. There are radiative, convective and evaporative heat misfortunes from the water mass to the gathering spread. The vanished water is consolidated on the inward surface of the gathering spread, discharging its inactive warmth. The dense water streams down the gathering surface under gravity and is at long last gathered through waste gave at the lower end [35].

G.N. Tiwari and Sangeeta Suneja [35,36] displayed an investigation of a reversed safeguard sunlight based still. Their outcomes demonstrate that, the rearranged safeguard sun oriented still gives about twofold the yield of the customary sun oriented still, likewise the creators saw that, the evaporative warmth misfortune is a solid capacity of the working temperature. Sangeeta Suneja et al. [37] likewise saw that, an transformed safeguard sun powered still gives a higher yield than the regular twofold impact sun powered still. The general day by day yield in the instance of the transformed triple impact safeguard sun powered still is 30% higher than the regular triple impact sun powered still [38]. Sangeeta Suneja furthermore, G.N. Tiwari [39], improving the quantity of impact on the multi bowl sun based still. They found that the yield from upset safeguard sun based stills increments as the quantity of bowls expanded advertisement arrives at an ideal worth when the quantity of bowl is seven. The activity and support costs of modified twofold bowl sun based still are little contrasted and the ordinary close planetary system [40].

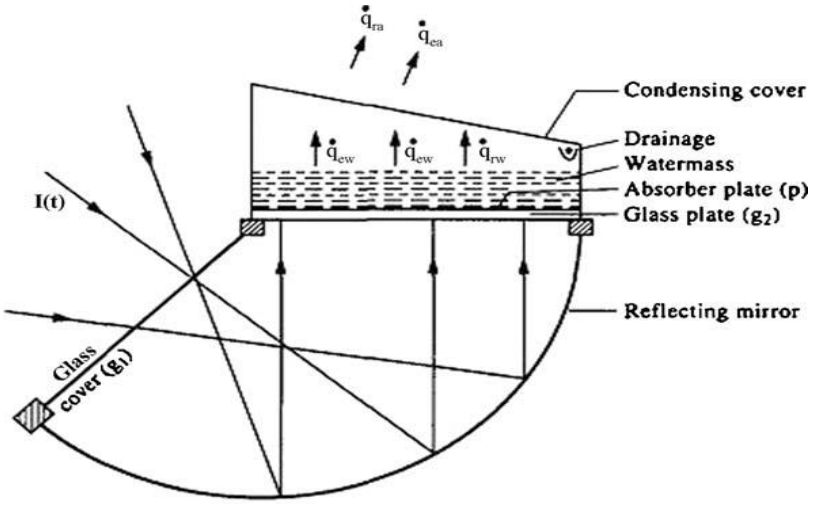

Fig-4: inverted absorber solar still

CONCLUSION

Based on exchange in different segments, the accompanying ends can be deduced:

(i) Solar vitality is bottomless, failing to last, accessible on location with free of expense and contamination free vitality;

(ii) Solar refining is the best answer for remote regions and little networks in dry and semi-parched areas with absence of water; Sensible possibilities for achievement of full use of sunlight based stills exist in spots where (a) the unit is appropriate with respect to water assets, (b) there is a general inclusion of clients in the activity and support and (3) great social and political hierarchical structure for working, keeping up and fix exist.

(iii) Solar stills have a decent possibility of accomplishment in India for lower limits which are in excess of 20 km away from the wellspring of new water and where the TDS of saline water is finished 10,000 ppm;

(iv) A solitary inclined sun oriented still gets more radiation than a twofold inclined sun oriented still at low and high height stations;

(v) The impact of water stream over the glass spread has a huge impact everywhere heat limit of water mass in the bowl.

(vi) The twofold consolidating, various wicks sunlight based still gives about 20% better return than the basic wick sun based still;

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GLASS CEILING EFFECT IN PSU

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ABSTRACT
The term "Glass ceiling" refers to "the unseen, yet unreachable barrier that restrains women from rising to the upper step of the corporate ladder, regardless of their qualifications or attainments". To be more specific, it is one of the most captivating metaphors for analyzing inequalities between men and women in the workplace. "Ceiling" stresses the limitation of upward progress of women is subjected to and "Glass" refers to the fact that through the limitation is apparently not written in any rule book, it is nevertheless a defeated fact understood by both the sexes. The glass ceiling metaphor has often been used to describe invisible barriers ("glass") through which women can see elite positions but cannot reach them ("ceiling"). These barriers prevent large numbers of women and ethnic minorities from obtaining and securing the most powerful, prestigious, and highest-grossing jobs in the workforce (wiki, 2015).

The present study is an attempt to investigate the presence of glass ceiling in the Public sector undertakings of India and what are the real factors behind this glass ceiling to exist because it is not about only employing the women workforce, it is about giving them an opportunity to lead, it is about promoting them to the top where they can put into use their natural ability to coordinate. This is what the current study focuses upon.

Keywords: Glass ceiling,barrier,Public sector undertakings

INTRODUCTION
In today's modern era of globalization women have made massive progress, but they still lack representation at the senior management level in all sectors. They persistently face barriers to their advancement due to hostile work environments, gender biasness, and numerous other barriers. Invariably, a lot of conflict, counter attack and struggle are to be faced with the social change and to achieve relative gender balance in the organizations, significant change in talent management and leadership management practices is required. Gender diversity cannot be promoted in isolation by the businesses. It has to be a joint effort of governments, local communities, customers, employees, and other stakeholders to gain the support and knowledge organizations need to promote gender equality, erase gender stereotyping, and sustains long term change.

The main objective of the present study was to cogitate whether there exist Glass ceiling in Indian public sector undertakings.

Gender inequality is well recognized with regards to women's advancement in the workplace. The PSUs, the single largest organized sector in India, can become model employers by taking some proactive steps that promotes and encourages women employees, by ensuring gender equal and not gender neutral opportunities. 14 PSUs that were part of the FGD and KII process cited adopting forward looking innovative policies that are helping women to overcome difficulties they may face in their careers. This has included introducing (as per government rules) child-care leave, maternity leave, recruiting at least one woman to the company's board of directors, and setting up internal committees to address sexual harassment at workplace. PSUs have also initiated special skill development programmes and trainings for women employees, besides showing sporadic need-based considerations as and when required (especially to enable women to meet their family commitments). Much done, much more needs to be done in a robust manner. For the obvious reason that women are still highly underrepresented at senior and top levels. Also, a number of challenges continue to plague women's career advancement. These need priority redressal. This chapter summarizes some of the common challenges globally acknowledged as well as highlights some specific challenges that the SCOPE-ILO study identified. Identifying challenges has led to determining some of the influential and enabling factors – that have the potential to enhance women's career advancement. These enabling factors have guided the proposed recommendations in the way forward (chapter 7). The recommendations will help SCOPE to dialogue with its member organizations, also relevant ministry. In so doing, it can facilitate the process of encouraging and promoting more women in leadership and senior management positions within India's public sector enterprises.

GLASS CEILING:AN INTRODUCTION
The phrase "glass ceiling" refers to an invisible barrier that prevents someone from achieving further success. It is most often heard in the context of women who cannot advance to the highest levels of power in the workplace. The glass ceiling is a way of describing whatever keeps women from achieving power and success equal to that of men. The metaphor comments on an employee's rise up the ranks of a hierarchical organization.

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Workers climb higher as they get promotions, pay raises, and other opportunities. In theory, nothing prevents women from rising as high as men. After the Women's Liberation Movement and Civil Rights legislation of the 1960s, many people feel that discrimination is all in the past. However, in practice, there are still barriers.

A ceiling made of glass would be see-through. A woman can clearly see those above her who are more powerful. Instead of being able to achieve the same success, she is stopped by invisible forces that prevent her from rising further.

INVISIBLE FORCES AND BARRIERS

A global report by the ILO - Bureau for Employers' Activities (ACT/EMP) 2015 has aptly summarized almost two dozen barriers to women's leadership. These were found common in almost all settings. The barriers include:

1. Women have more family responsibilities than men
2. Roles assigned by society to men and women
3. Masculine corporate culture
4. Women with insufficient general or line management experience
5. Few role models for women
6. Men not encouraged to take leave for family responsibilities
7. Lack of company equality policy and programmes
8. Stereotypes against women
9. Lack of leadership training for women
10. Lack of flexible work solutions
11. Lack of strategy for retention of skilled women
12. Inherent gender bias in recruitment and promotion
13. Management generally viewed as a man's job
14. Gender equality policies in place but not implemented
15. Inadequate labour and non-discrimination laws

Added to the above list, are other prominent barriers. For example, workplace harassment is one key issue. Also, lack of mentoring, networking opportunities, lack of transparency in roles and expectations, absence of a clear career path, unavailability of relevant platforms to up skill their expertise, and exclusion from informal male-dominated networks. A holistic – all round – effort is needed to address the multiple barriers and challenges that limit career advancement for women, also their assuming positions of leadership. In the context of PSUs, not all barriers cited above are relevant. PSUs part of this study have clearly voiced that they have open recruitment policies; they follow government guidelines, issued from time to time; their policies (by their own submission) are gender neutral; and they have taken initiatives to encourage women to go for leadership training or other skill development programmes. Notwithstanding ongoing measures, this study brought to fore - four specific challenges.

FOUR CHALLENGES IDENTIFIED BY SCOPE-ILO

Study Echoing most but not all of the common challenges as recognized by other studies, the SCOPEILO study brought out four very specific and interrelated challenges: lack of recognition of women as a talent pool; lack of career and succession planning; lack of responsive and sensitive mechanisms; and non-recognition of gender diversity as a strategic issue.

A REVIEW OF LITERATURE

The word 'Glass Ceiling' was first used in the Wall street journal's special report on females working in the corporate sector. The term was used by Hymowitz and Schelhardt (1986) [14], they asserted that access to top for females was blocked by certain prejudices. Powell *et al.* (1995) opined that there is a single transparent invisible layer that a female faces, while on progression through the organizational hierarchy, however, in practice there have been found to be multiple layers that exist on the different levels of the organization.

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The Indian literature about the women in Management is limited but a number of studies spanning from 2002 to 2008 have a thread of commonality pointing out the stifling gender stereotypes that act as one of the main barriers in Women's growth in management. A study on Gender Stereotypes stated that stereotypes and the perception of women at workplace negatively affect the position of women managers. "This study suggests that Indian male managers are viewed, stereotypically, as working in the areas of sales, marketing and production; being good leaders, decision makers and bosses; and handling challenging assignments. On the other hand, Indian women are viewed as working in PR, HR and administrative positions at low to junior levels, and in fields such as fashion and beauty." (Rai, 2010) [26] Another study by (Budhwar, 2005) [2] of senior women in public and private sector firms found that they were receptive of differential treatment when compared with men, reinforcing the stereotype of their being inferior and thus being offered less challenging roles and not being part of important organizational issues. A research by (Bartol 2003) [3] states that "Women in senior management are numerous, but most are behind in pay, passed over for pro motions, and drop out of work for various reasons".

It is propounded in the relevant literature that the under representation of women in various organizations is attributed International Journal of Advanced Research and Development

to different constraints. These include the type of employing sector, vertical segregation, gender and corporate strategy (Sabbarwal, 2013). Though in India it is justified that with Nation's first ex – first citizen as a female, the glass ceiling has been successfully broken, but the reality is that India ranks 113th out of 157 countries in terms of Gender development. (Gender development index report, UNO 2011)

Eggins (1997) [9, 10] in her book 'Women as leaders and managers in higher education' wrote that women who serve as leaders of academic institutions confront all the issues that women working in a large and complex business organization face.

Mathur *et al.* (2006) [19] indicated that glass ceiling, considered as a myth by many does exists in real and is nurtured by organization's culture, politics and strategies besides women's own inadequacies. Only the most decentralized organization, characterized by a culture that supports females at the top positions will help in breaking down the glass ceiling, along with women's own efforts to grow, develop and empower themselves through academic and career development.

For Indian education sector, researches have done by (Sharma, Sharma and Kaushik 2011) [1] throws much light on the glass ceiling existing in the Indian education sector. The location of study was Haryana and western U.P. covering more than hundred degree colleges. The study found that glass ceiling does exist and makes a profound impact on the promotion and development of females in their teaching career. It was found that females though having the same qualification as males have to compete more. They also reached to the conclusion that females are over represented only at the bottom level. They are generally not able to reach to the top because of various reasons. (Morrison and Von Glinow 1990), Women and minorities face a "glass ceiling" that limits their advancement toward top management in organizations throughout U.S. society. This article reviews the extant literature and discusses why this is so, using theoretical constructs from psychology and other social sciences that cover both individual and systemic factors. These practices effectively create a ''hidden'' system of discrimination (Morrison and Von Glinow 1990; Riger and Galligan 1980), often called a ''glass ceiling.''These include the ''concrete ceiling'' (Ogilvie and Jones 1996) [22], ''sticky floor'' (Padavic and Reskin 2002) [24] and ''glass door'' (Cohen *et al.* 1998) [5].

(Burke and Vinnicombe, 2005) [4] In the mid-1980s, the phrase "glass ceiling" was coined and has since become an established part of our vocabulary. The glass ceiling refers to an invisible but impermeable barrier that limits the career advancement of women. During the last two decades, women have made progress: there are now more women in senior-level executive jobs, more women in "clout jobs", more women CEOs, and more women on corporate boards of directors. But real progress has been slow with only modest increases shown at these levels.

A lot of studies established the assumption of glass ceiling and pointed out that women experienced a number of barries at some stage in their pronouncement of their career pathway (Phillips & Imhoff, 1997). There are also some hidden barriers, which sustained to put a stop on woman moving up on a higher position in organizations (Lyness & Heilmen, 2006). Women experience greater barriers and they need unusual tactics to thrive than do men. These barriers can be the Societal Barriers, the Internal Structural Barriers and the Government Barriers as defined the Federal Glass Ceiling Commission.

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It is often emphasized that with the country‟s first citizen, the chief of the ruling political party and three powerful chief ministers as women, India has successfully broken the barrier of Glass ceiling. However looking at India‟s 113th rank out of 157 countries in terms of Gender Development Index (May 2010), it seems India has to go a long way to realize the dream of gender equality (Anita Sharma et al, 2011). The research shows that while there are a growing number of women opting for international assignments (IAs), they are overwhelmingly concentrated in junior and middle management positions, have less options in terms of the countries to which they can be posted and are handicapped by cultural prejudices about „proper‟ gender roles in some countries (Nick Forster, 1999).

The number of women starting and owning their own businesses has grown dramatically over the past decade. Concurrent with this trend, there has been an increase in the number of research studies focusing on or inciuding women business owners in their samples.women business owners are similar to malesacross some basic demographic factors, problems, and business characteristics, but they differ widely from male business owners across individual dimensions related to education, work experience, skills, approach to venture creation/acquisition, business goals, problems, and performance. It is suggested that the major reason for these differences is that women conceive of their businesses differently than men which in turn leads to different approaches and outcomes for performance (Candida G. Brush, 1992). A partial list of factors that may contribute to a glass ceiling includes job ladders, personnel policies, limited performance of employement laws and employment discrimination (David Cotter, 2001). Also, female managers miss out on global appointments because they lack mentors, role models, sponsorship, or access to appropriate networks – all of which are commonly available to their male counterparts (Margaret Linehan, 2008).

In other words, women efforts and competencies are not highlighted because of stereotyping behavior exists in our culture and also reflect in planning that hampered them to be get promoted (Awais Jabbar and Asma Imran, 2013). Also, the women are consistently underrepresented as potential candidates for public decision making positions, while the ratio of females elected officials is significantly lower than that of males (F.C. Macarie, 2014). There are various observations made proving a situation of a sticky floor phenomenon in India i.e. wage gaps are higher at the upper or lower ends of the wage distribution between men and women (Shantanu Khanna, 2012). The results of the study show that female expatriates are disadvantaged in their careers because of the lack of organizational support which is readily available to their male counterparts . This lack of organizational support, together with the invisible barriers which constitute the glass ceiling (Dr. Margaret 2001).

Effective leadership rewards brazenness, fierceness and sovereignty, which are usually documented as “masculine” personality. Women are projected to be cheerful, reliant and nurturing characteristics. Researchers have noted that people who are a successful manager behaves like a masculine characteristic (Burton & Parker, 2010; Frey, James, & Eitzen, 1991). Women who perform in a positive, antagonistic, self-governing mode are seen as performing outside of societal norms (Burton & Parker, 2010). Men who communicate with their subordinates as tough leaders in their organizations are often seen as being “direct,” but women who acquire the same communication style with her subordinates are seen as “punitive” (Brittany J. Galloway, 2012).

Alkadry‟s and Tower‟s (2006) performed a study based on an online survey in which an email was sent to all the employees working in the National Institute for Government Procurement (NIGP) organization. The email was sent to around 6,747 members, out of which a total of 1,673 individuals responded, resulting in a 28% response rate. The results indicated female executives earned 86.5% of their male counterparts, female managers earned 87.3% of their male counterparts, female buyers earned 87.2% of their male counterparts and female technicians earned 86.6% of their male counterparts.

The Labor Department study showed 6.6 percent of the corporate executives were women while the Feminist Majority Foundation reported 2.6 percent of 6,500 corporate officers in the Fortune 500 companies were women. Women have been significantly more representative in the state local government rather than in the private sector.

In the countries like Kuwaiti, Emirati and Qatari the main barrires for the female managers were found to be formal and informal gender-discrimination practices, trivialization of female skills and scholarship, difficulty in accessing certain professions and cross-gender social network and support (abdalla, 2014). Whereas among French and Turkish mid-level women managers Women consistently report to have lower salaries and lower levels of satisfaction than their male colleagues, and in academia they are less likely to be tenured or on the tenure track. Although respondents from both sexes respond positively to their work, indicating that it is intellectually challenging and provide a desirable level of autonomy in decision making, women report fewer opportunities for promotion and indicate more often than men that they would not recommend their career path

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to younger students (Akpinar, 2013). Pay disparities between men and women persist in the U.S. workforce despite comparable pay legislation, advocacy, and social change (Alkadry, 2006). In jordan also the impact of the glass ceiling is more significant than the impact of family and social commitments on women career progress (Al Manasra, 2013). Women middle managers in Singapore organizations face a glass ceiling in their working environment which, for example, inhibits the promotion of female managers, and entails a barrier to the career development opportunities of women presents that women do not have enough organizational support, including networking, mentoring, and family friendly initiatives (Dimovski, 2010). Results from analyses of a large Swedish longitudinal data set suggest that men who work in typically female occupations have substantially better internal promotion chances than have equally qualified women in such occupations. Furthermore, the results indicate that men and women have equal internal career chances in male-dominated occupations. Hence, the common assumption that obstacles to women‟s internal career growth are especially severe in male-dominated fields of work obtains no support. (Hultin, 2003). Individual barriers and sociocultural barriers were identified as stronger barriers to women than men, and organizational barriers were identified as stronger barriers to men than women in Sri lanka Jaffacna district (Kolade, 2013). It is evident from the extant research that women are not progressing to senior international management positions at comparable rates to their male counterparts. Previous research has estimated that only 3 percent of expatriate managers are women (Linehan, 1999,2001).

Results reveal that gender plays a hidden role in influencing compensation levels by shifting the chain of authority given to executives as they build a career portfolio (Alkadry 2011). It is evident that certain elements of the glass ceiling existed in the research done. Situational factors emerged as clear barriers to the progress of women which included gender discrimination, lack of respect from male colleagues and insensitive handling of the multiple roles played by women. Social roles such as family commitment and relocation also inhibited the growth of the respondents. At a personal level, the respondents were all confident, emotionally suited to progress, competitive and enjoyed the confidence of their subordinates. Enid Kiaye, R.,2013. Also, impact of culture and family on the strategies, opportunities, and barriers to growth for women entrepreneurs from Romania, Poland, and America.(Gundry L.K 1998).

Recent global statistics showed that women continue to increase their share of managerial positions, but the rate of progress is slow, uneven and sometimes discouraging for women (Dan R. Dalton &Catherine M. Dalton (2009). Although the number of women in middle management has grown quite rapidly in the last two decades, the number of female CEOs in large corporations remains extremely low (Oakley, 2000). Catalysts (2010) survey revealed that women, who represent46.4 percent of the fortune 500 workforce, occupied only 25.9 per cent of senior officers andmanagers, 15.2 per cent of board positions, 13.5 per cent executive officers. Only 13 CEOpositions (2.6 percent) out of 500 were occupied by women.In India, women are given equal education rights in a true sense only afterindependence by the constitution of India. From there, a literacy rate of Indian girl isincreasing. Now, Indian women have started to attend universities and business schools forprofessional education. While female students securing engineering and business degreeswith honors from excellent institutes, still most top positions is India are held by men. (GuptaA., Koshal M., & Koshal R. K., 1998).

Women just aren‟t making it to the very top. Despite making gains in middle and senior management, they hold just 3 percent of Fortune 500 CEO positions. In the C-suite, they‟re outnumbered four to one. They account for less than 16 percent of all corporate officers, and comprise only 7.6 percent of Fortune 500 top earner positions (Hewlett, 2010)

The corporate glass ceiling continues to be a challenge for many organizations. However, women executives may be facing a second pane of obstruction – an expatriate glass ceiling – that prevents them from receiving the foreign management assignments and experience that is becoming increasing critical for promotion to upper management. (Insch, 2008). While Indian men are in denial about the existence of a glass ceiling, the underlying stereotypes are pretty well-embedded. (Jain N., 2010). The participation rate of women at the top of companies and on boards of directors has been resistant to change and organizations continue to struggle to help women move into senior leadership roles and to fill their leadership pipeline with diverse talent. (Kulkarni, N., 2011). Results showed that the mean numbers of women were significantly lower than the mean numbers of men at each hierarchical level. There was a drop in the proportion of women as the level in the organizational hierarchy increased (Morrison A.M., 1986).

Women are consistently underrepresented as potential candidates for public decision making positions, while the ratio of females elected officials in public sector is significantly lower than that of males (Macarie F. C., 2014). Indian organizations do not often engage in diversity training, especially as it relates to women, because much fear exists around the way men, and even some women, might react negatively to it (Nath, 2000).

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Research has shown that women commonly hold positions of leadership within nonprofit organizations, while men typically hold the leadership positions within for-profit organizations (Nozawa, 2010).

The empirical survey showed the results of the effect of glass ceiling on female career advancement in the Nigeria Police Force (NPF). The statistical analysis was based on 198 respondents in the NPF indicating cultural role expected of the female gender makes a significant predictor of the female career advancement. Also, career plan and higher education make significant contributions to the studied dependent construct. The effect of counterproductive male behaviour contributed positively but did not make significant statistical contribution to the prediction of the survey dependent construct. However, it is therefore recommended that organizations (both private & public) embark on enlightenment campaign and also incorporate equal opportunity employment policy in their company or organizational policies (Osibanjo, 2013).The study revealed that during a period of overall stock-market decline those companies who appointed women to their boards were more likely to have experienced consistently bad performance in the preceding five months than those who appointed men. These results expose an additional, largely invisible, hurdle that women need to overcome in the workplace. (Ryan, 2005). The findings of the study highlight that the level of glass ceiling for women still continues to exist in the modern Indian society. Further, age, education, position, and income were found to make no difference in the perceptions of the female staff members regarding predominance of glass ceiling (Sharma, S., 2014). The results reveal that sticky floors are more pronounced than glass ceilings over the years. Further, for the years 2008, 2010 and 2012, it is noted that at the 75th quantiles, the gender wage differentials started to rise showing glass ceiling effects. The combination of both sticky floors and glass ceilings are characterised by the unexplained factors providing evidence for gender discrimination in the Mauritian labour market. (Tandrayen-Ragoobur, 2015).

Women in the workforce earning wages or a salary are part of a modern phenomenon, one that developed at the same time as the growth of paid employment for men; yet women have been challenged by inequality in the workforce (N. Andal 2002). Nowadays, women are trying to participate in the public domain and progressing towards managerial ranks or higher level of management of their participating organization. But the career path does not welcome women with red carpet. In spite of these positive changes, women still have to face intangible barriers in climbing up the corporate ladder. Along with “glass ceiling”, women, in the leadership position, may have to face the metaphors like “glass elevators” and “glass cliffs” which refer to greater scrutiny and criticism (Ryan and Haslam,2005). Eagly and Carly(2003) have suggested another metaphor of the “labyrinth” which suggests that a woman accepts many obstacles for her career progression. Despite of all these obstacles, women are trying to put strong foothold in corporate in India but the percentage of women in senior management position in India is roughly 3%-6%. which is still very low. Women middle managers not only in India but in Singapore organizations also face a glass ceiling in their working environment which, for example, inhibits the promotion of female managers, and entails a barrier to the career development opportunities of women presents that women do not have enough organizational support, including networking, mentoring, and family friendly initiatives (Dimovski, 2010).

Women in recent years have, undoubtedly, proved themselves in all walks of life. However, women executives still have to cover a lot of ground. As per the report of Catalyst, the leading research and advocacy organization for corporate women, it will take 47 years to attain parity as corporate officers of Fortune 500 companies (UK Rai, 2013).

CONCLUSION

Though the study does not aim to make sweeping conclusions in favour of a particular working segment or against a particular working segment, yet it is clear after conducting the study that an invisible

‘Glass Ceiling’ exists in a strong way in the public sector undertakings. It can therefore be concluded that we still have to go a long way before the principle of ‘equality’ is truly practiced in the PSU. The conclusions of the study can be applied to other areas as well.

The study makes the following conclusions about the ‘Glass Ceiling’:

- Strong existence of glass ceiling at various levels of the PSU.
- Not enough chances being offered to females for growth, development, promotion and to move up the organizational hierarchy.
- Restricting females only to lower and middle level positions due to perception errors of stereotyping.
- Virtual non-existence of independent decision making for females in professional educational institutes.

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- Over representation in the lower level of organizational hierarchy of PSU whereas under representation of females in the top order.
- Societal Factors, Internal Structural Factors, Governmental Factors are the main factors behind the glass ceiling effect in professional/higher education sector.
- It is difficult for the female employees to overcome this glass ceiling without the active role of the management

If organizations are serious about furthering gender diversity in their workplaces – and taking advantage of the many skilled and talented women – then real, actionable steps need to be put in place.

Taking into account the above challenges and enabling factors can facilitate many PSUs aiming to promote gender diversity within their organizations, to reorient themselves.

No change however can be achieved overnight or by a quick fix solution (such as reserving a few seats at the top levels and nominating one woman board member). Promoting and encouraging women's career advancement goes beyond increasing a few statistical numbers. It much depends on crafting the "right messages", drawing the "right attention", taking "practical steps", and creating "conducive women friendly work environment" that together helps to build a strong gender-balanced talent pipelines; as well as establish the fact: "organizations with the most gender diversity outperform those with the least"!

A credible effort towards creating a conducive women friendly work environment could be creating a body of champions, both women and men, who have been successful in overcoming barriers or who are known for their exemplary performance. Organizations can train these champions. Following their training, they will become a task force that conducts gender training and sensitization sessions focusing on equal opportunities in PSUs.

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UNSTEADY MHD FLOW THROUGH POROUS MEDIUM OVER MOVING INFINITE VERTICAL PLATE IN THE PRESENCE OF CHEMICAL REACTION WITH HALL CURRENT AND RADIATION

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ABSTRACT
Aim of this paper is investigate the effect of radiation on unsteady MHD free convective flow through porous medium over a moving vertical plate in the presence of chemical reaction of first order with hall current. The fluid considered here is a gray, absorbing-emitting radiation but a non-scattering porous medium. The temperature as well as concentration is raised linearly with respect to time. The dimensionless governing equations are solved using the finite difference technique. The velocity, temperature and concentration profile are discussed graphically for different parameters like the magnetic field parameter, porosity parameter, hall current parameter, radiation parameter, chemical reaction parameter and heat source.

Keywords: gray radiation; magnetic field; porosity parameter; hall current parameter; chemical reaction; vertical plate.

INTRODUCTION
Magneto convection plays an important role in various industrial applications. Examples include magnetic control of molten iron flow in the steel industry, liquid metal cooling in nuclear reactors and magnetic suppression of molten semi-conducting materials. It is of importance in connection with many engineering problems, such as sustained plasma confinement for controlled thermonuclear fusion and electromagnetic casting of metals. The effects of transversely applied magnetic field, on the flow of an electrically conducting fluid past an impulsively started infinite isothermal vertical plate was studied by Soundalgekar et al. [8].

MHD effects on impulsively started vertical infinite plate with variable temperature in the presence of transverse magnetic field were studied by Soundalgekar et al. [9]. The dimensionless governing equations were solved using Laplace transform technique.

Radiative convective flow are encountered in countless industrial and environment processes e.g. heating and cooling chambers, fossil fuel combustion energy processes, evaporation from large open water reservoirs, astrophysical flows, solar power technology and space vehicle re-entry. Radiative heat and mass transfer play an important role in manufacturing industries for the design of reliable equipment. England and emery [5] have studied the thermal radiation effects of a optically thin gray gas bounded by a stationary vertical plate. Soundalgekar and Takhar [7] have considered the radiative free convective flow of an optically thin gray gas past a semi-infinite vertical plate. Radiation effect on mixed convection along a isothermal vertical plate were studied by Hossain and Takhar [6] in all above studies, the stationary vertical plate is considered. Das et al. [3] have analyzed radiation effects on flow past an impulsively started infinite isothermal vertical plate. The governing equations were solved by the Laplace transform technique. Diffusion rates can be altered tremendously by chemical reactions. The effects of a chemical reaction depend whether the reaction is homogeneous or heterogeneous. This depends on whether they occur at an interface or as a single phase volume reaction. In well-mixed systems the reaction is heterogeneous, if it takes place at an interface and homogeneous, if it takes place in solution. Chamber and young [2] have analyzed a first order chemical reaction in the neighborhood of a horizontal plate. Apelblat [1] studied analytical solution for mass with a chemical reaction of first order. Das et al. [4] have studied the effect of homogeneous first order chemical reaction on the flow past an impulsively started infinite vertical plate with uniform heat flux and mass transfer. The dimensionless governing equations were solved by the usual Laplace-transform technique. Recently, Muthucumaraswamy et al. [10] have discussed on Radiation and MHD effects on moving infinite vertical plate in the presence of chemical reaction of first order solved by the usual Laplace-transform technique.

Aim of present paper is investigate the effect of thermal radiation on unsteady MHD flow through porous medium over past an impulsively started infinite moving vertical plate with variable temperature and hall current in the presence of transverse applied magnetic field and first order chemical reaction. The governing equations are solved by the finite difference technique. The effect of velocity, temperature and concentration for different magnetic field parameter, porosity parameter, hall current parameter, chemical reaction parameter, radiation parameter and time are studied graphically.

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MATHEMATICAL ANALYSIS

We consider a two dimensional unsteady MHD flow through porous medium over past an impulsively started infinite vertical plate with variable temperature, hall current and thermal radiation in the presence of chemical reaction of first order. The *z*-axis is taken along the plate in the vertically upward direction and the y-axis is taken normal to the plate. Initially, the plate and fluid are at the same temperature and concentration. At time $t' > 0$, the plate is given an impulsive motion in the vertical direction against gravitational field with constant velocity u_0 in a fluid, in the presence of thermal radiation. At the same time, the plate temperature as well as plate concentration are raised linearly with time. A transverse magnetic field of uniform strength B_0 is assumed to applied normal to the plate. The induced magnetic field and viscous dissipation is assumed to be negligible. It is also assumed that there exists a homogeneous first order chemical reaction between the fluid and species concentration. The fluid considered here is a gray, absorbing-emitting radiation but a non-scattering porous medium. Then by usual Boussinesqs' approximation, the unsteady flow is governed by the following equations:

$$\frac{\partial u}{\partial t'} = g\beta(T - T_\infty) + g\beta^*(C' - C'_\infty) + \nu\frac{\partial^2 u}{\partial y^2} - \frac{\sigma B_0^2}{\rho(1+m^2)}u - \frac{\nu}{K'}u \qquad \ldots(1)$$

$$\frac{\partial T}{\partial t'} = \frac{k}{\rho C_P}\frac{\partial^2 T}{\partial y^2} - \frac{1}{\rho C_P}\frac{\partial q_r}{\partial y} \qquad \ldots(2)$$

$$\frac{\partial C}{\partial t'} = D\frac{\partial^2 C}{\partial y^2} - K_l' C \qquad \ldots(3)$$

In the most cases of chemical reactions, the reaction rate depends on the concentration of the species itself. A reaction is said to be of the order n, if the reaction rate if proportional to the n^{th} power of the concentration. In particular, a reaction is said to be first order, if the rate of reaction is directly proportional to concentration itself, where *m* is the hall current parameter.

With the following initial and boundary conditions:

$$\left.\begin{array}{llll} t' \le 0 : u = 0, & T = T_{\infty'} & C = C_\infty & \text{for all } y \\ t' > 0 : u = u_0, & T = T_\infty + (T_w - T_\infty)At', & C = C_\infty + (C_w - C_\infty)At' & \text{at } y = 0 \\ : u = 0, & T \to T_{\infty'} & C \to C_\infty & \text{as } y \to \infty \end{array}\right\} \qquad \ldots(4)$$

Where $A = \dfrac{u_0^2}{\nu}$

The local radiant for the case of an optically thin gray gas is expressed by

$$\frac{\partial q_r}{\partial y} = -4a^*\sigma(T_\infty^4 - T^4) \qquad \ldots(5)$$

It is assume that the temperature differences within the flow are sufficiently small such that T^4 may be expressed as a linear function of the temperature. This is accomplished by expanding T^4 in a Taylor series about T_∞ and neglecting higher-order terms, thus

$$T^4 \cong 4T_\infty^3 T - 3T_\infty^4 \qquad \ldots(6)$$

By using equations (5) and (6), equation (2) reduced to

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$$\frac{\partial T}{\partial t'} = \frac{k}{\rho C_p}\frac{\partial^2 T}{\partial y^2} + \frac{16a^*\sigma T_\infty^3}{\rho C_p}(T_\infty - T) \quad \ldots(7)$$

On introducing the following non-dimensional quantities:

$$\left.\begin{aligned} &U = \frac{u}{u_0}, \quad t = \frac{t'u_0}{\nu}, \quad Y = \frac{yu_0}{\nu}, \quad \theta = \frac{T - T_\infty}{T_w - T_\infty}, \quad \phi = \frac{C - C_\infty}{C_w - C_\infty} \\ &Gr = \frac{g\beta\nu(T_w - T_\infty)}{u_0^3}, \quad Gc = \frac{g\beta^*\nu(C_\infty - C_\infty)}{u_0^3}, \quad R = \frac{16a^*\nu^2\sigma T_\infty^3}{ku_0^2} \\ &M = \frac{\sigma B_0^2\nu}{\rho u_0^2},\ K' = \frac{\nu^2 K}{u_0^2},\ \Pr = \frac{\mu C_p}{k},\ Sc = \frac{\nu}{D},\ K_l = \frac{\nu K_l'}{u_0^2},\ Q = \frac{u_0^2 S}{\nu} \end{aligned}\right\} \quad \ldots(8)$$

In equations (1) to (4), leads to

$$\frac{\partial U}{\partial t} = Gr\theta + Gc\phi + \frac{\partial^2 U}{\partial Y^2} - \left(\frac{M}{1+m^2} + \frac{1}{K}\right)U \quad \ldots(9)$$

$$\frac{\partial \theta}{\partial t} = \frac{1}{\Pr}\frac{\partial^2 \theta}{\partial y^2} - \frac{R}{\Pr}\theta + S\theta \quad \ldots(10)$$

$$\frac{\partial \phi}{\partial t} = \frac{1}{Sc}\frac{\partial^2 \phi}{\partial y^2} - K_l\phi \quad \ldots(11)$$

The initial and boundary conditions in dimensionless from are as follows:

$$\left.\begin{aligned} &t \le 0 : U = 0, \quad \theta = 0, \quad \phi = 0 \quad for \quad all \quad Y \\ &t > 0 : U = 1, \quad \theta = t, \quad \phi = t \quad at \quad Y = 0 \\ &U \to 0, \quad \theta \to 0, \quad \phi \to 0 \quad as \quad Y \to \infty \end{aligned}\right\} \quad \ldots(12)$$

All the physical variables are defined in the nomenclature the solutions are obtained for hydro magnetic flow field in the presence of thermal radiation, hall current and chemical reaction of first order.

METHOD OF SOLUTION

The governing Equations (9), (10) and (11) are to be solved under the initial and boundary conditions of equation (12). The finite difference method is applied to solve these equations.

The equivalent finite difference scheme of equations (9), (10) and (11) are given by

$$\left[\frac{U_{i,j+1} - U_{i,j}}{\Delta t}\right] = Gr\theta_{i,j} + Gc\phi_{i,j} + \left[\frac{U_{i+1,j} - 2U_{i,j} + U_{i-1,j}}{(\Delta y)^2}\right] - \left[\frac{M}{(1+m^2)} + \frac{1}{K}\right]U_{i,j} \quad \ldots(13)$$

$$\left[\frac{\theta_{i,j+1} - \theta_{i,j}}{\Delta t}\right] = \frac{1}{\Pr}\left[\frac{\theta_{i+1,j} - 2\theta_{i,j} + \theta_{i-1,j}}{(\Delta y)^2}\right] - \frac{R}{\Pr}\theta_{i,j} \quad \ldots(14)$$

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$$\left[\frac{\phi_{i,j+1}-\phi_{i,j}}{\Delta t}\right]=\frac{1}{\Pr}\left[\frac{\phi_{i+1,j}-2\phi_{i,j}+\phi_{i-1,j}}{(\Delta y)^2}\right]-K_l\phi_{i,j} \quad \ldots(15)$$

Here, index *i* refers to *Y* and *j* to time. The mesh system is divided by taking, $\Delta y = 0.1$.

From the initial conditions in Equation (12), we have the following equivalent.

$$\left.\begin{array}{llll} u(0,0)=0, & \theta(0,0)=0, & \phi(0,0)=0 & \\ u(i,0)=0, & \theta(i,0)=0 & \text{for all } i \text{ except } & i=0 \end{array}\right\} \quad \ldots(7)$$

The boundary conditions from equation (7) are expressed in finite difference form are as follows:

$$\left.\begin{array}{llll} u(0,j)=1, & \theta(0,j)=t, & \phi(0,j)=t & \text{for all } j \\ u(1,j)=0, & \theta(1,j)=0, & \phi(1,j)=0 & \text{for all } j \end{array}\right\} \quad \ldots(8)$$

Here, infinity is taken as $y = 6$. First, the velocity profile at the end of time step namely $u(i, j+1),\ i=1$ to 10 is computed from equation (13), the temperature profile $\theta(i,j+1), i=1$ to 10 from equation (14) and wall concentration profile $\phi(i, j+1),\ i=1$ to 10 from equation (15). The procedure is repeated until $t = 1$ (i.e., $j = 800$). During computation, Δt was chosen to be 0.00125. These computations are carried out for different values of parameters *Gr*, *Gc*, Pr, *Sc*, Magnetic field parameter (*M*), hall current parameter (*m*), Porosity parameter (*K*), radiation Parameter (*R*), Chemical reaction parameter (K_l) and *t* (time). To judge the accuracy of the convergence of the finite difference scheme, the same program was run with smaller values of Δt, i.e., Δt = 0.0009, 0.001 and no significant change was observed. Hence, we conclude that the finite difference scheme is stable and convergent.

RESULTS AND DISCUSSION

The numerical values of the velocity, temperature and wall concentration profiles are computed for different parameters like as Magnetic field parameter (*M*), Porosity parameter (*K*), Hall current parameter (*m*), Radiation Parameter (*R*), Chemical reaction parameter (K_l), Grashoff number (*Gr*), Modified Grashoff number (*Gc*), Prandtl number (Pr), Schmidt number (*Sc*) and time (*t*). The purpose of the calculations given here is to study the effects of the given various parameters upon the nature of the flow and transport.

Figures-(1) to (9) illustrates the effect of the velocity profile of fluid for different parameters at time $t = 0.2$. Separately it is found that the velocity decreases continuously with increases in *Y*. Figure – (1) shows the variation of velocity *U* with magnetic parameter (*M*). It is observed that the velocity decreases as *M* increases. Figure – (2), shows the variation of velocity profile of fluid *U* with hall current parameter *m*. It is observed that the velocity increases as hall current parameter *m* increases. Figure – (3) shows that an increase in porosity parameter *K* causes an increase in velocity profile of fluid. From Figure – (4), it is observed that the velocity of fluid increases as the Grashoff number *Gr* increase. The variation of *U* with modified Grashoff number *Gc* is shown in Figure – (5). It is noticed that increase in *Gc* leads to increase in velocity of fluid. From Figure – (6) shows the variation of velocity *U* with Prandtl number Pr. It is observed that the velocity of fluid decreases as Pr increases. The variation of *U* with thermal radiation *R* is shown in Figure – (7). It is noticed that increase in *R* leads to decrease in velocity of fluid. It is observed that the velocity increases as *S* increases. The velocity profile of fluid for Schmidt number *Sc* is shown in figure – (8). It is clear that velocity of fluid *U* decreases with increasing in *Sc*. In figure – (9), the velocity profile *U* of fluid decreases due to increasing Chemical reaction parameter K_l.

Figures-(10) to (11) demonstrates the effect of the temperature profile of fluid for different parameters at time *t* = 0.2. From Figure – (10), the variation of □ with thermal radiation *R* is shown. It is noticed that increase in *R* leads to decrease in temperature profile of fluid. Figure – (11) shows that variation of θ with Prandtl number Pr, it is observed that increase in Prandtl number Pr causes decrease in temperature profile □ of fluid.

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Figures-(12) to (13) represents the effect of the concentration profile of fluid for different parameters at time t = 0.2. From Figure – (12), it is noticed that an increase in Schmidt number Sc leads to decrease in concentration profile of fluid. Figure – (13) shows that an increase in chemical reaction parameter K_l causes decrease in concentration profile of fluid.

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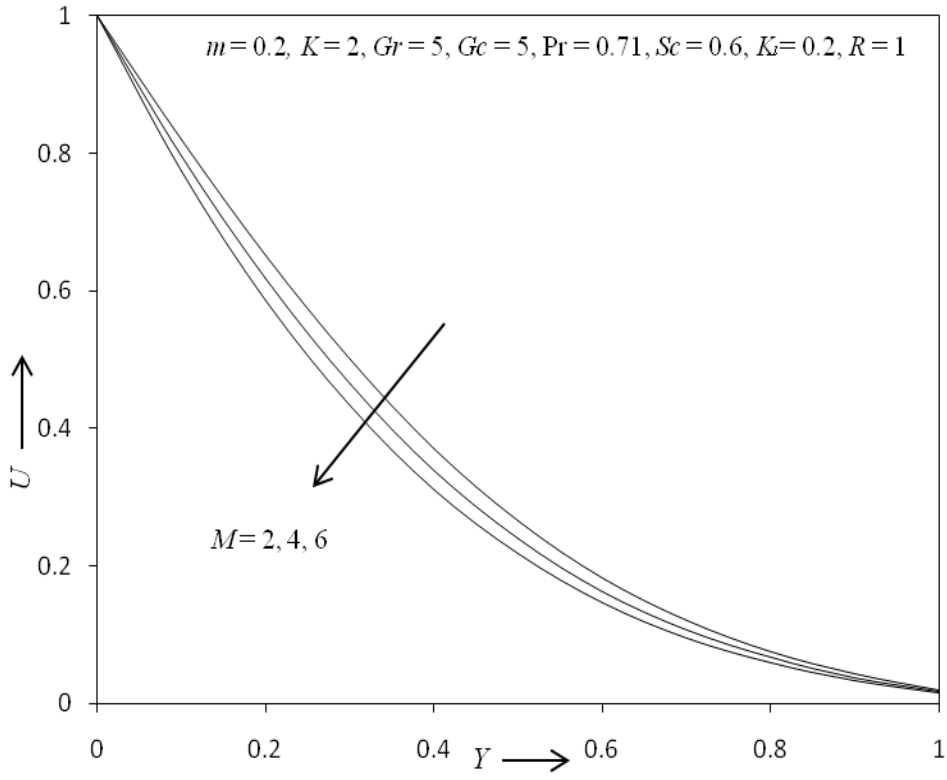

Fig. - 1: Velocity profile for the different value of M,

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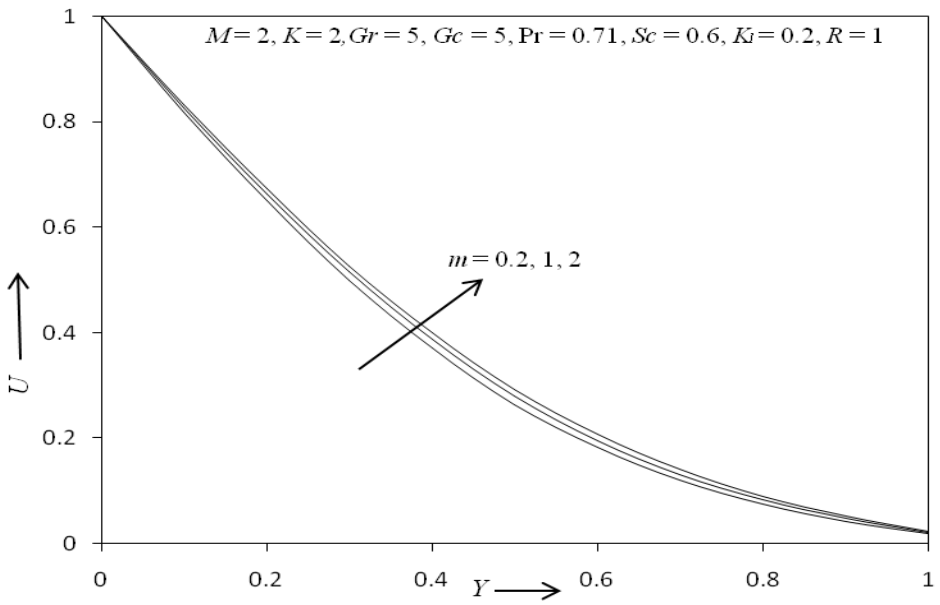

Fig. - 2: Velocity profile for the different value of m.

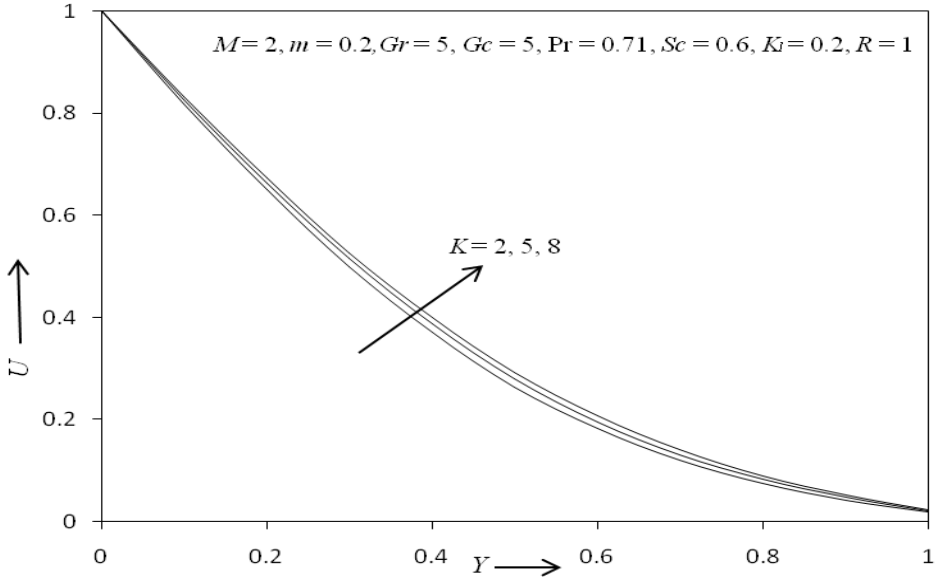

Fig. - 3: Velocity profile for the different value of K.

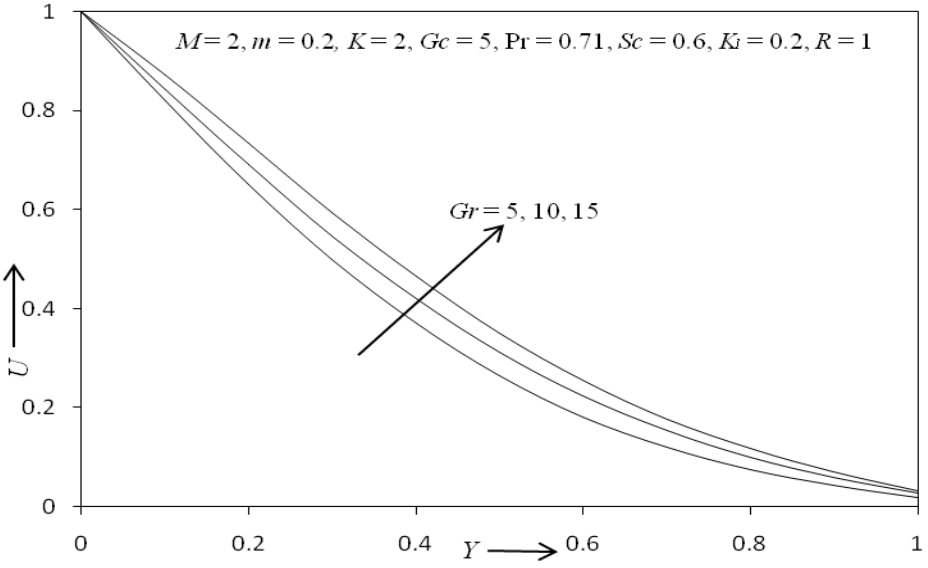

Fig. - 4: Velocity profile for the different value of Gr.

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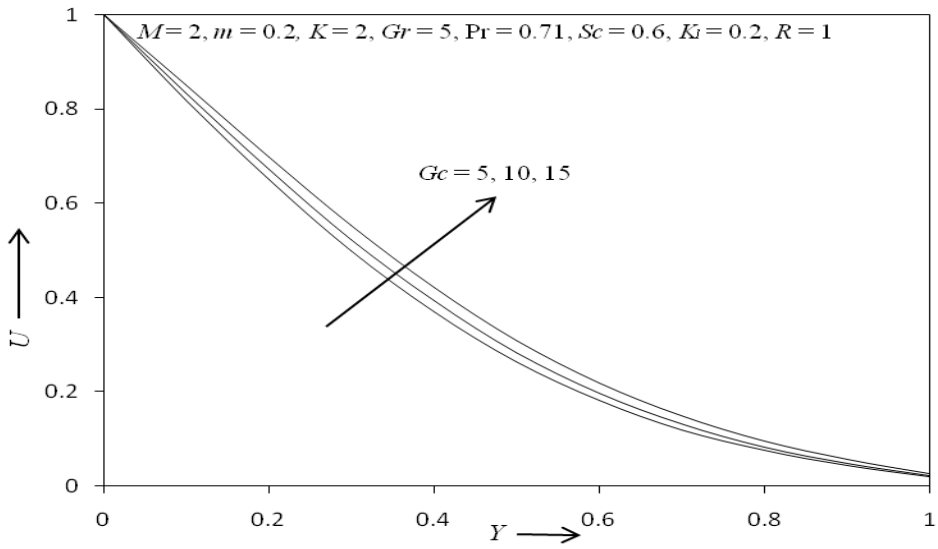

Fig. - 5: Velocity profile for the different value of *Gc*,

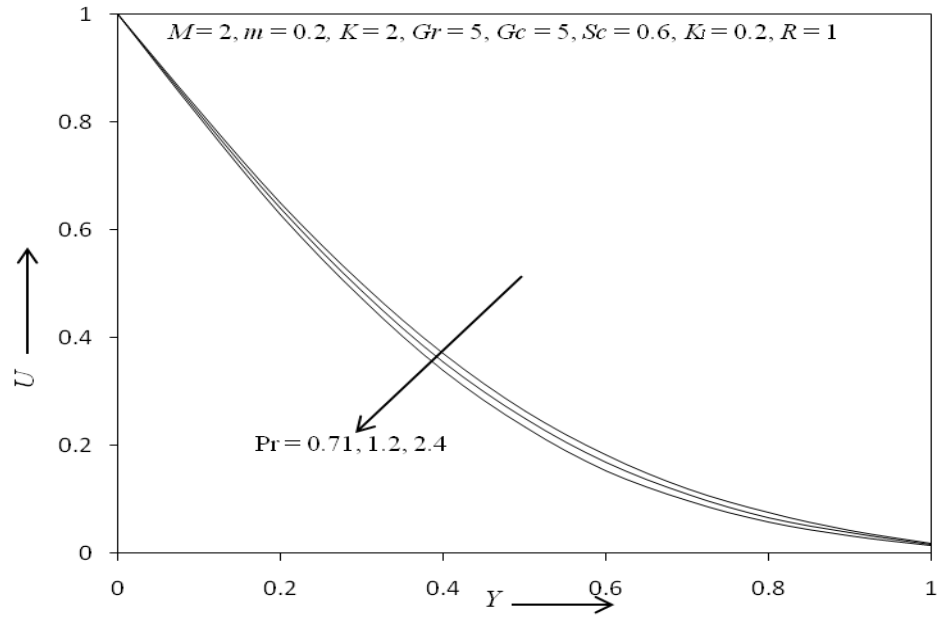

Fig. - 6: Velocity profile for the different value of Pr.

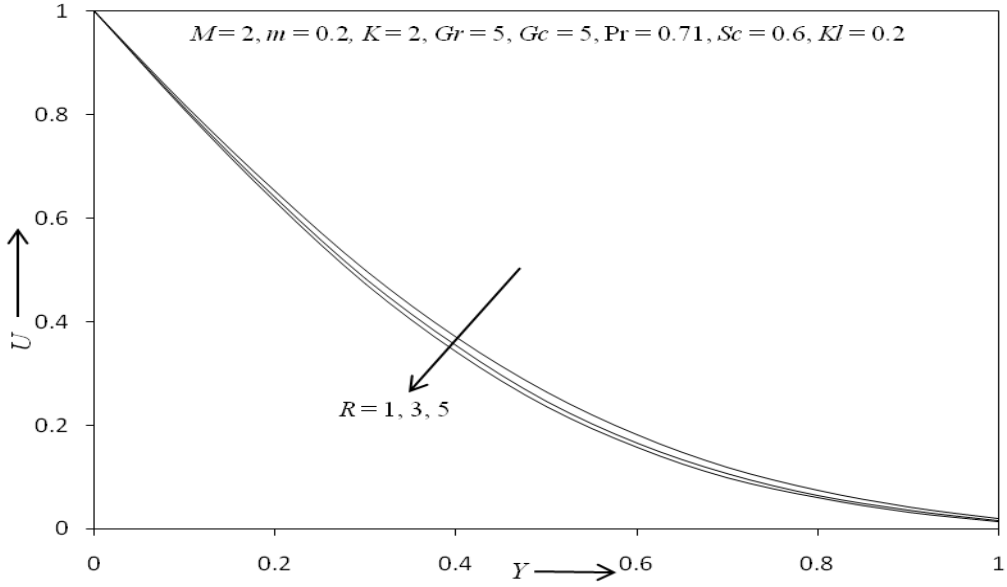

Fig. - 7: Velocity profile for the different value of *R*.

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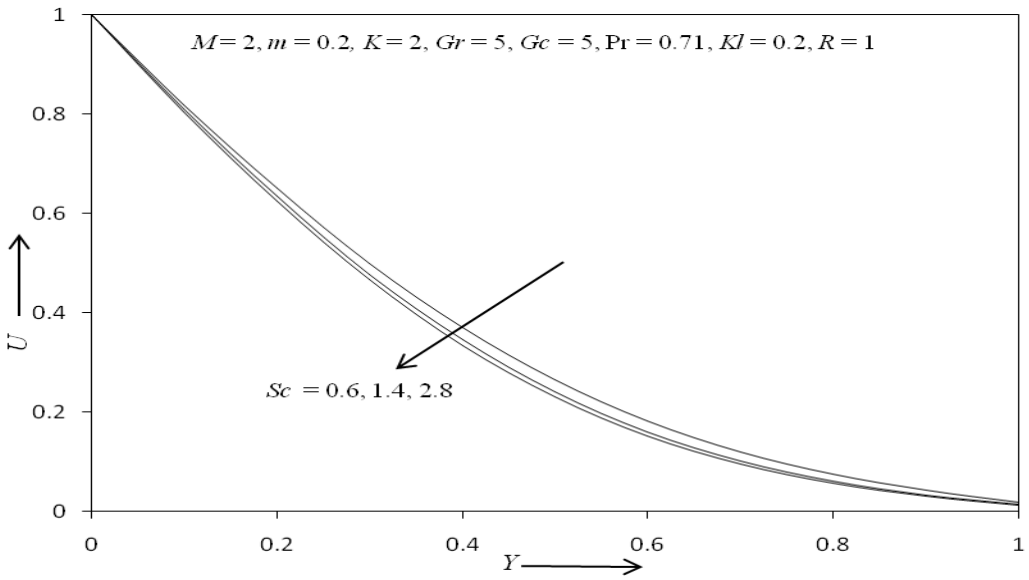

Fig. - 8: Velocity profile for the different value of Sc.

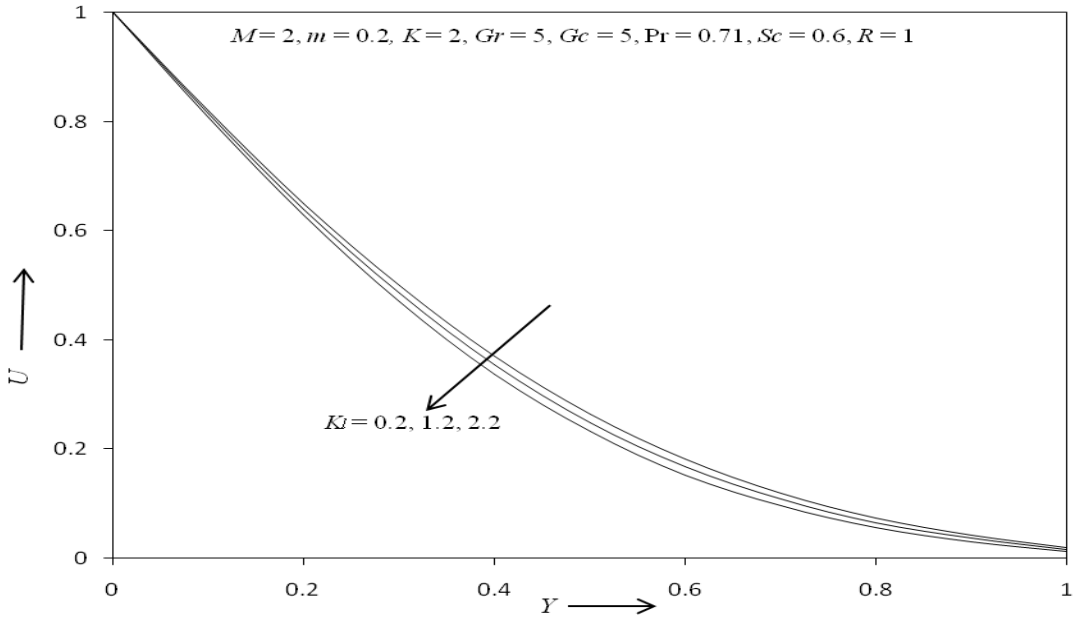

Fig. - 9: Velocity profile for the different value of Kl.

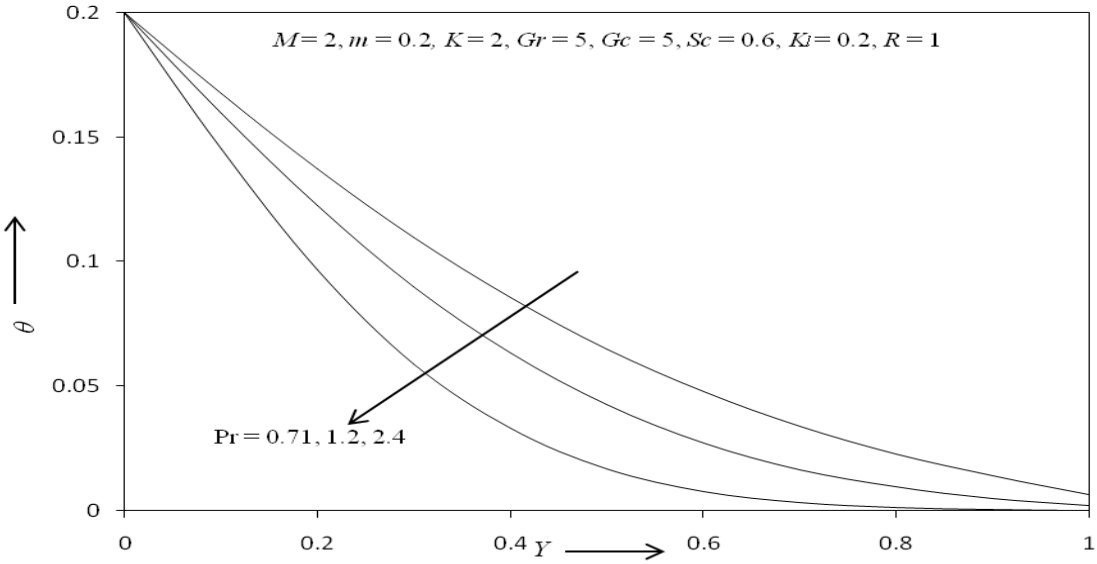

Fig. - 10: Temperature profile for the different value of Pr.

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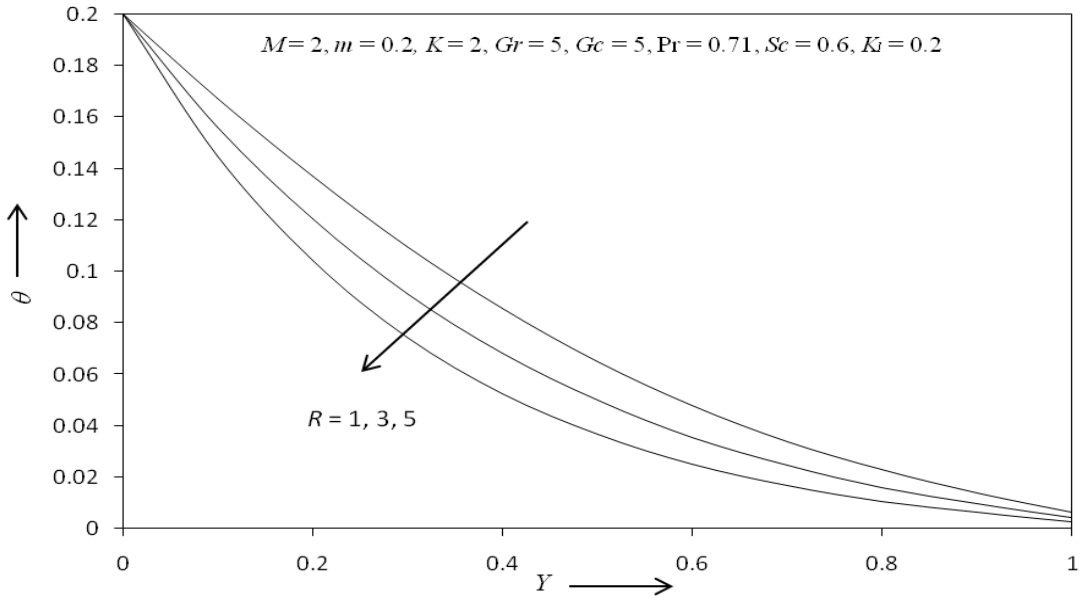

Fig. - 11: Temperature profile for the different value of R.

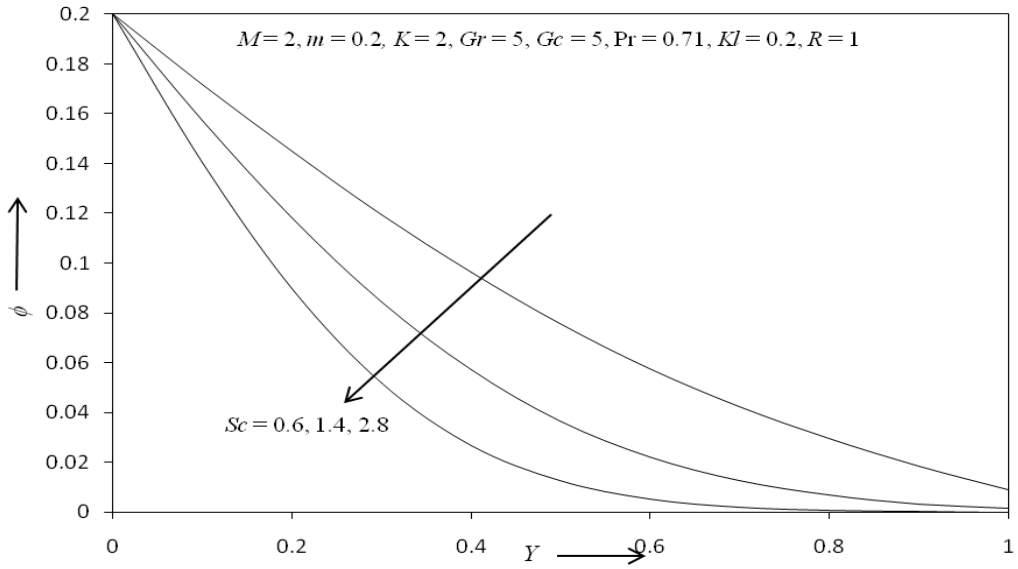

Fig. - 12: Concentration profile for the different value of Sc.

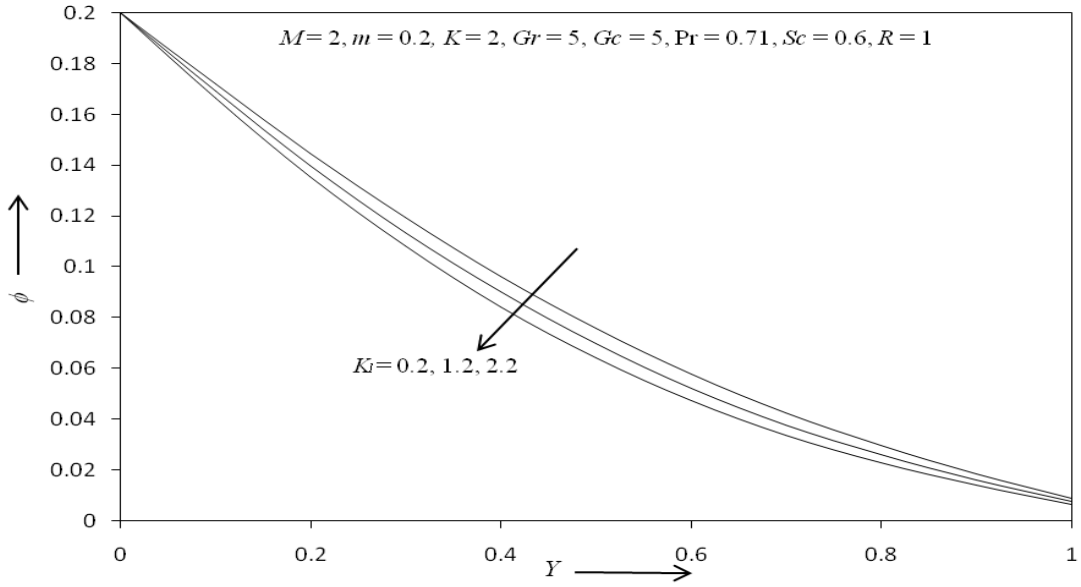

Fig. - 13: Concentration profile for the different value of Kl.

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IMPACT OF 4.0 INDUSTRIALIZATION ON SUPPLY CHAIN MANAGEMENT IN MICRO SMALL MEDIUM ENTERPRISES: A CASE STUDY

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ABSTRACT
Supply chain management will be more effective and efficient by using 4.0 industrialization technology artificial intelligence, cloud computing, cyber security, Internet of things and big data analytics etc. In the globalization world industry become more competitive and agile. To sustain market establishment industry should be adopt latest technology. Due to adoption new technology industry supply chain become more greener. Its production and maintenance cost will also reduce.4.0 industrialization capable to produce smart product and services. In this paper we discuss about effect of 4.0industrialization revolution on key perspective of supply chains.

Keywords: SCM, AI, IOT

INTRODUCTION
Supply chain management play vital role to become more competitive and agile. Supply chain management is basically flow of product and services from origin of product to end of product. Supply chain management main objective is to monitor production, distribution, shipment and service. A supply chain consists all parties involved directly or indirectly in fulfilling customer requirement. In supply chain supplier, manufacturer, distributor, retailer and shopper. Industrialization 4.0 has main objective to develop most responses regarding the customer and market demand. In 4.0 industrialization we discuss about the latest technology like as Artificial intelligence, Internet of things, cloud computing etc. Due to this critical technology industry could be easily managed inventory management, lead time, response time and better forecasting in future. Adoption of these critical technology industry would be able to maintain market share in the globalization world. Small medium enterprises is considered as engine of economic growth. It provides large scale employment. For Indian economy context it creates large scale employment after agriculture. Almost 36 million unit throughout the geographical expenses of our country. MSME contributes 6.11% of manufacturing GDP and 24.63% of GDP from service activities. MSME ministry has set to be target to increase contribution 50% of GDP when Indian economy will become 5 trillion dollar. Due to increase contribution in the GDP employability and social inequality will improve of our country. Data generated by the system become asset for industry in future.

Key issue of the Supply chain management
- Demand forecasting
- Order fulfillment
- Procurement of parts/ raw product
- Inventory management
- Material handling
- Customer service facility
- Handling of return product
- Logistic
- Management of the return product
- Radical change in the business model

Efficient manage of above these key issue make smooth the supply chain management. Industrialization 4.0 revolution improve the performance of the supply chain management.

Industry 4.0 represents a combination of
- Artificial intelligence
- Big data analytics
- IOT
- Cyber security

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- Additive manufacturing
- Cloud computing

2.1 ARTIFICIAL INTELLIGENCE

Artificial intelligence sometimes called machine intelligence, is intelligence demonstrated by machine as like as natural intelligence of human mind. Learning and problem solving capability has inherited in machine. Having intelligent work tool for building concrete plan is the most important in today globalization world. Forecasting, inventory mismanagement could be mitigate by Artificial intelligence. Due to self learning system updates its own model to improve output. Using weather data transportation planning will be improved by artificial intelligence. When there is big data of input with number of attributes then AI work very efficiently. It work best when there is feedback loop which speed learning. E-commerce like Amazon, flipkart etc efficiently use AI. AI enabled rapid decision capability mitigate disruption in the supply chain management. Most effective and efficient approach use by AI enabled system.

2.2 BIG DATA ANALYTICS

Big data is field that analyze and extract information systematically from big data. Analysis of big data correlates new relation to spot new business trends and prevent mistakes. It help to take prudential step in the emerging and ongoing business. Big data can be described by the following characteristics: volume, variety , velocity and veracity.

2.3 INTERNET OF THINGS

The internet of things is the collection of interconnected physical devices that can monitor, report on and send exchange data. IOT devices connected to the computer system via data or wi-fi. IOT also reduces the friction of the supply chain and make efficient. Optimize production of product by communication of internet of things.

2.4 CYBER SECURITY

Cyber security play key role in scm. It protect from malware software and data theft. Today digital era data act as asset for industry. Data help in the future planning and learning from past mistakes.

2.5 ADDITIVE MANUFACTURING

Additive manufacturing improve precision of the product. So that return of product drastically reduce. It also help reliability and durability of the product. Friction of supply chain reduces. In the large scale production it reduces cost of product.

2.6 CLOUD COMPUTING

Cloud play pivotal role in technology changing era. Due to cloud industry could be able to latest software on SCM. It help innovate the process of SCM. It help to sustain volatile market condition. Cloud delivered services by public or private network on pay per use basis.

3.0 MSME ROLE IN INDIAN ECONOMY

Micro, Small and Medium Enterprises (MSME) sector is the most vibrant and dynamic sector promising high growth potential for the Indian economy. There are close to 51 million MSME units in the country that employ about 117 million people across various sectors, constituting 40% of the workforce. The MSME share to the total Gross Domestic Product (GDP) is about 37% and they also contribute to 43% of exports based on the data maintained by Ministry of Commerce. MSME ministry has set to be target to increase contribution 50% of GDP when Indian economy will become 5 trillion dollar. This is possible by implement efficiently supply chain management process.

Key reason of slow adoption

- Paucity of talent
- Difference in tech adoption between vendors and manufacturers
- Complex government interface
- Abundance of cheap labour overshadowing cost of smart connected device

Paucity of talent is eradicated by to introduce courses of 4.0 Industrialization tool Artificial intelligence, big data analytics, cyber security etc in institution. Collaboration between industry and institution should be happen to create ecosystem of adoption of latest technology.

Vendors and manufacturers should be work on the same technology platform to improve communication and parallel work.

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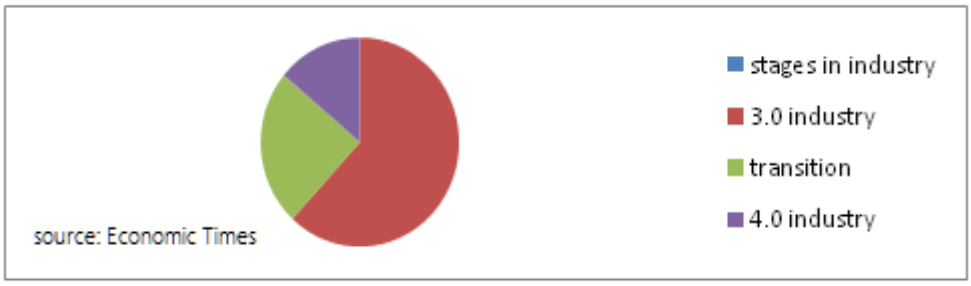
Complex government interface is eradicated to adoption E- governess. Government should adopted paperless work and various obligation of environmental clearance and tax procedure etc should be simplified.

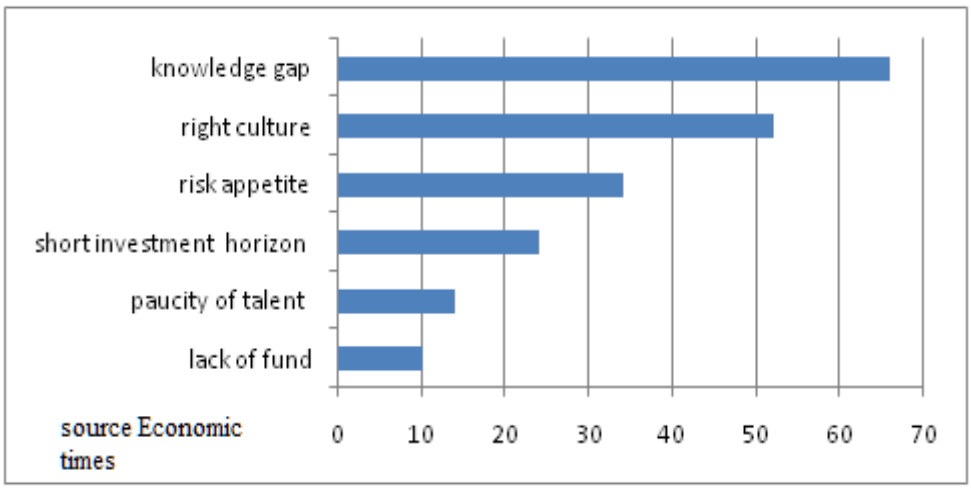
In India due to abundance of cheap labour industry do not adopt latest technology. Industry should keep future perspectives to stand in market in the globalization era.

Stage of Indian industry in industrialization version



62% Indian industry believe in 3.0 industrialization revolution, 24% in the transition phase from 3.0 to 4.0 0 industrialization revolution and 14% industry adopt 4.0 industrialization revolution.

3.1 Main challenge in driving 4.0 transformation



Over 62% Indian manufacturers, including those in labour intensive sectors like automobile, industrial goods and heavy manufacturing are still in third industry revolution in the technology terms. Indian MSME should adopt latest technology to improve performance at the global standard. Main challenge in driving transformation is the knowledge gap. This problem is eradicated by technology transfer and invest in Research & Development.

CONCLUSION

Supply chain become efficient and more agile by using 4.0 industrialization revolution technology. It help smooth mobility of goods and services from manufacturer to customer. Industry could be sustain its position in market in the changing era. It also help to reduce carbon footprint in the supply chain management. At all it reduces cost of product. Forecasting error is mitigate and also help efficient use of logistics. New business model could be easily adopted because business model change according to country and geographical position. For implement 4.0 industrialization revolution industry should adopt right culture, technology investment, training courses of employee and hiring high tech workforce etc. these technology contribute to achieve vision of 5 trillion dollar economy of India in 2025.

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OPTIMIZATION OF LOW BLOW HOLE DEFECTS IN CASTING PROCESS

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ABSTRACT
In the present worldwide competitive condition there is necessity of manufacturing industry is to give top notch casting product. In order to produce composite materials casting technique is broadly utilized. In any case, centrifugal casting technique creates some deformity in; it resembles macro-segregation and shrinkage hole, and so forth. Imperfection free casting products with least cost of production are demanded most. These imperfections rely upon the different procedure parameters of the centrifugal casting process. So for an imperfection free casting product, there is a need to improve the procedure parameter and these can be improved by different techniques of optimization. IT industry created different PC recreation programming's that are accessible which reproduces the entire casting procedure and can function as advanced techniques in the casting procedure. Industries required a specialized answer for limit the vulnerability and deformities. This paper provides a review on casting defect and gives a comprehensive survey about optimization methods for casting procedure and demonstrates the need of an examination of the procedure parameters and its optimization strategies.

Index Terms- Casting, defects, manufacturing, optimization, taguchi, grey fuzzy, Simulation software.

INTRODUCTION
A manufacturing procedure casting is where a hot liquid metal is use to filled a form box, which contains an empty cavity of the ideal shape, and afterward permitted to solidify. That solid part is known as a casting, Casting is regularly utilized for making complex shapes that would be generally troublesome or uneconomical to make by different strategies. Casting is a procedure which conveys danger of disappointment event during all the procedure of achievement of the completed item. Thus important move ought to be made while assembling of cast item with the goal that deformity free parts are gotten. During the casting process, there is constantly an opportunity where deformity will happen. Minor imperfection can be balanced effectively however high dismissed rates could prompt critical change at significant expense. Thusly it is basic for die caster to have information on the sort of deformity and have the option to distinguish the main reason behind it, and their cures. In this survey paper an attempt has been made to furnish all casting related deformity with their causes and cures. In a casting procedure, the material is first warmed to get totally liquefy and afterward filled a pit of the mold.

When the liquid metal is in the mold, it starts to cool. At the point when the temperature dips under the point of solidification (softening purpose) of the material, cementing begins.

Hardening includes a difference in period of the material and contrasts relying upon whether the material is an unadulterated component or an amalgam. An unadulterated metal solidify at a melting point.

An endeavor has been made to dissect the basic deformities and conceivable healing measures are recommended for cast experts to have sound information about such imperfections are intended to limit dismissals rates.

TYPES OF CASTING DEFECTS
An appropriately structured casting, an appropriately arranged shaped mould and accurately malted metal should bring about an imperfection free casting. Nonetheless, if appropriate control isn't practiced in the foundry-once in a while it is too costly [1]. Casting imperfection can be termed as pursues:

A. Filling related defect
1. Blowhole
Blowhole is a sort of cavities deformity, which is likewise isolated into pinhole and subsurface blowhole. Pinhole is minor gap. Subsurface blowhole just can be seen in the wake of machining. The imperfection defects are about constantly situated in the some portion of the shape in ineffectively vented pockets and undermines.

Main reasons
- Poor venting core of mould
- Excessive release of gas permissibility
- Excessive moisture absorption by the cores

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- Low pouring temperature while casting

2. Sand inclusion

Sand consideration is only a sand opening or blacking scab, it seems as though little or center holes with sand grain in the inner or on the outside of castings.

Main reasons

- Core strength is less
- Excessive mismatching of core
- Rate of Pouring too high
- Impact against mould wall surface resulting in erosion
- Pouring time too long

3. Cold lap or cold shut

A cold shut is formed at the point at which two streams while meeting in the shape of cavity don't intertwine appropriately along these lines framing an irregularity in the casting.

Main reasons

- Lack of fluidity in molten metal
- Faulty design
- Faulty gating

4. Gas porosity

Porosity in castings is because of air pockets being caught during solidifying wall, broke down gases from softening and dross or slag containing gas porosity.

Main reasons

- Metal pouring temperature too low.
- Insufficient metal fluidity
- Pouring too slowly.
- Slag on the metal surface.
- Interruption to pouring during filling of the mould.
- Metal section too thin.

B. Shape defects defect

1. Mismatch defect

Mismatch in shape deformity is a result of the moving embellishment flashes. It will cause the separation at the separating line.

Main reasons

- A confound is brought about by the cope and drag portions of the mould not staying in their appropriate position.
- This is brought about by free box pins, off base example dowel pins or recklessness in putting the cope on the drag.

2. Distortion or warp Warped Casting

Distortion because of twist age is known as warp defect

Main reason

- Distortion because of twist age can happen after some time in a casting that somewhat or totally frees remaining burdens.

C. Thermal defects

1. Cracks or tears

Cracks can show up in bite the dust castings from various causes. A few breaks are evident and can without much of a stretch be seen with the unaided eye. Different breaks are exceptionally hard to see without amplification.

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Main reasons

- Shrinkage of the casting within the die
- Undercuts or damage in die cavities
- Uneven, or excessive, ejection forces
- Thermal imbalance in the die
- Insufficient draft in sections of the die
- Excessive porosity in critical regions of the Part
- Product design not matched to the process
- Inadequate die design

2. Shrinkage

Shrinkage imperfections happen when feed metal isn't accessible to make up for shrinkage as the metal gets hard. Shrinkage imperfections can be part into two distinct sorts: open shrinkage and closed shrinkage defects.

Possible causes

- The thickness of a die casting compound in the liquid state is not as much as its thickness in the strong state. Along these lines, when a composite changes stage from the liquid state to the solid state, it generally shrivels. This shrinkage happens when the casting is setting inside a die casting die. At the focal point of thick segments of a throwing, this shrinkage can wind up the same number of little voids known as shrinkage porosity. In case that the shrinkage porosity is little in width and restricted to the focal point of thick segments it will for the most part cause no issues. In case it is bigger in size, or combined, it can seriously debilitate a casting. It is likewise a specific issue for castings which should be gas tight or water tight.

Blow hole Defect

Blow hole defect is part of the category of defects in centrifugal casting process which is most mainstream and fitting for the generation of different composite material. In metallurgical businesses outward throwing is broadly utilized for manufacture of composite materials as one of the progressed and well known casting system. Centrifugal casting procedure is a fluid stage process. Its machine comprises of high speed motor, which joined with a reasonable sample holder which turns around a similar hub of the engine. Poured metal is solidified by compressive weight applying by power of centrifugal force. [2]

Defects in Centrifugal Casting Process

There are different imperfections distinguished in casting product after the centrifugal casting process. These defects resemble

a. Micro-segregation

b. Blow holes

c. Shrinkage porosity, etc.

This profoundly influences the nature of casting item. The imperfection and nature of casting item are relying upon warm pressure and cementing of the throwing, which concentrated under the thermal analysis. The most significant minute is the point at which the molten metal solidifies, around then warm investigation is hard to comprehend what will be the result of the casting solidification and to comprehend its conduct. Throwing is likewise relying upon the different procedure parameters of the centrifugal casting process. The procedure parameter of centrifugal casting is

i. Pouring temperature

ii. mold temperature

iii. pouring speed or pouring rate

iv. speed of rotation

v. Mold wall thickness.

Through differentiating this procedure parameter of centrifugal casting one can diminish the imperfection in casting product and it can likewise help in improving the mechanical property of casting product.

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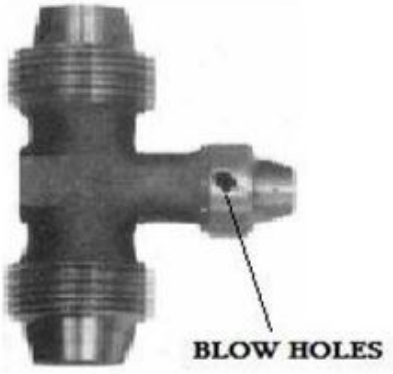
Blow hole Defect

During setting metal on surface of metal an adjusted or oval shape entire cavity on smooth or clean surface which is related with oxides. It gathers into an air pocket at the high purposes of a shape cavity and keeps the fluid metal from filling that space. Blowhole is a sort of holes deformity, which is likewise separated into pinhole and subsurface blowhole. Pinhole is little gap. Subsurface blowhole just can be seen in the wake of machining. The imperfections are almost constantly situated in cope of some portion of the mould in inadequately vented pockets and undermines.

Several techniques to minimize blow hole defect are mentioned below:

- Improve venting core of mould,
- provide venting channels,
- Reduce amounts of gas. Use slow-reacting binder
- Reduce quantity of binder.
- Use coarser sand if necessary.
- Slowing down the heating rate and reducing gas pressure.
- Reducing absorption of water.



Blow hole

Figure-1: Blow hole defect

OPTIMIZATION PROCESS

Optimization is expected to progress the casting product a role according to the business principles, to diminish the imperfection and upgrade the mechanical property. The whole procedure was numerically displayed and mimicked by computer simulation programming. Warmth flow of casting, temperature field and solidification procedure is investigated with the assistance of computer simulation software and at last casting moved towards becoming from non-unmistakable in obvious procedure. It takes out the giving imperfection such a role as such as Micro segregation, Shrinkage porosities and coarse grained zone, which can't dispense with by machining. It can break down beginning time for water cooling, Variation in form of mould, water thickness, thermal insulation criteria and coating thickness. It additionally uses to streamline the different procedure parameters of the centrifugal casting process for disposing of imperfections and better profitability. On the basis of this investigation an improved and ideal technique was discovered which lessens the scarp and defect in the assembling of casting products. [3]

Some optimization process which is used in the centrifugal casting process is as follows:

1. Taguchi method

This is a productive strategy for centrifugal casting which gives the ideal outcome in least no of preliminaries. In structuring an examination in centrifugal casting process, the most significant thing is to decide the blend of different variables like rotational speed, mold temperature, mold wall thickness, pouring temperature and so on. Furthermore, levels, which gives the ideal and defect less throwing yield. Taguchi technique is one of the way to deal with discover the task of variables in explicit symmetrical is to know the testing blend. Taguchi strategy has three principle stages:

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1. Planning stage. 2. Conducting stage. 3. Analysis stage. So as to decide the best procedure structure investigation is finished utilizing sign to commotion proportion. So this strategy is utilized to yield the ideal parameter with essentialness no of different levels by impacting factor specifically yield reaction. [4]

2. Grey fuzzy method

This technique is utilized for improving the procedure parameter of the centrifugal casting procedure to diminish the imperfection and upgrade the mechanical property. There are different arrangements of procedure parameter. The Gray fluffy technique is for various criteria i.e.; It takes care of basic leadership issue. The fuzzy structure was made by two sources that are input and one yield in the premise fuzzy standard and participation work. [5]

3. Computer simulation software

Simulation software is essentially a PC program. Through PC recreation anything become conceivable can't done by numerical demonstrating. In the centrifugal casting process, the most significant minute is the point at which the liquid metal hardens, around then warm investigation is had to recognize what will be the result of the casting solidification and to comprehend its conduct which can't just have done by machining. However, this can be effectively done by PC simulation programming. Warmth stream of throwing, temperature field and cementing procedure is investigated with the assistance of PC recreation programming lastly throwing moved toward becoming from non-noticeable in unmistakable procedure. It disposes of the giving imperfection such a role as Micro isolation, Shrinkage porosities and coarse grained zone, which can't dispense with by machining. It can break down beginning time for water cooling, Variation in form, water thickness, warm protection thermal insulation and covering thickness. [6]

LITERATURE REVIEW

In the investigation of author Rajesh Rajkolhe, J.G. Khan [7] infer that different defects are produced in casting process while fabricating, deformities may like as filling related, shape related, warm related and different imperfections by appearance. While performing different number of procedure parameters as experimentation premise they discover different difficulties and vulnerability in casting process. Such sorts of imperfections and defects are created low quality and profitability. In order to acquire high standard author discovered their solutions for limit those difficulties and vulnerability additionally dismissals. This activity may improve quality just as profitability in assembling and manufacturing industry.

During the research of Mr. Siddalingswami , S. Hiremath, dr, S.R. dulange [8] author expressed that different casting defects and their causes. Author recognizes a deformities for 4R cylinder block which they found a dismissal rate was over 40%. They additionally presume that, while generation includes different parameter like pattern making, moulding, core making, and melting. Different defects like blowhole shrinkage, gas porosity, cold shot, sand inclusion and so forth are produced while casting process. In order to enhance their casting quality, authors used product process search investigation, assessment strategy, structure of trial technique to establish out their cures in casting process.

Research work of C. M. Choudhari, B. E. Narkhede, S. K. Mahajan, [9] dealing with expressing that different casting deformities can be limit by reenactment programming premise, programming improves nature of casting procedure and parameters. Use of system which include four choice (1) direction and separating line, (2) center print plan, (3) feeder structure, and (4) gating plan. Analysis is performing for procedure by preliminary premise with assistance of simulation software which advance quicker and better outcome. It limits the bottleneck and non worth included time in giving advancement a role as it decrease the quantity of trail for throwing required on shop floor.

In the study of Dr. M. Arasu [10] provided information that each casting procedure accomplish to have cost viability and high caliber for client perspective. They implied that cost viability implies a system of usage of crude material and gear to improve finish items with great quality for deformity free casting in casting process. While in throwing procedure of ineffectively kept up gear utilized then they influence to kick the bucket just as casting parameters. So in a roundabout way it neglects to look after quality, and imperfection created on outside just as inward side on casting parts.

In the work of Malcolm Blair, Raymond Monroe, Christoph Beckermann, Rishard Hardin, Kent Carlson and Charles Monroe [11 author expressed that casting configuration depend on understanding of planner who built up the structure usage factor of security for throwing process. Additionally, uses un-quantified factor, for example, shrinkage, porosity, likewise consider in casting. Author foresees the event and nature of deformities and impact on execution of casting.

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In this investigation by Jyothi P N [4], author manufactured Za-27/Al2O3 MMC through the centrifugal casting process. Author finished this test as per the plan of investigation which was proposed by Taguchi's procedure. Author discovered the impact of liquefy temperature, rotational speed of form, wt.% of particulate, the size of particulate and the good ways from the Center of ingot on hardness and pliability. For examination of the information they utilize A L 25 symmetrical exhibit and this was finished by ANOVA and relapse condition. Author contrast the trial worth and anticipated qualities and author found that the dissolve temperature and wait.% of particulate have the most elevated impact pursued by revolution speed, particulate size and distance across from the Centre.

During the research of P. Shailesh [12] author manufactured (Al-Si) 4600 Aluminum composite in the course of the centrifugal casting process and after that concentrated the impact of procedure parameter on its miniaturized scale structure and mechanical properties. Author utilized the Taguchi technique for enhancing the procedure parameter and to lessen the deformities which prompts increment the mechanical properties of the cast compound. Author researched that expansion in pouring temperature diminishes the mechanical property while increment in die speed increment the mechanical properties and densities. So for fine grains in network, pouring temperature ought to be low while the speed of the pass on ought to be high. Through ANOVA methods, author investigated the outcome to know the rate commitment of each procedure parameter. Author likewise analyzed the microstructure which shows that Al focus is more at the external fringe.

Author Sandeep.v.Chavan [13] streamlined the casting imperfection utilizing PC supported casting simulation programming. Through this product they give appropriate sprinter and gating framework which is essential to verify great nature of throwing and furthermore it gives a homogenous form filling design. To take out the untimely solidifying of the liquid metal, author included more flood passageways toward the finishing point of the cavity. This investigation provided the conclusion to author that PC supported casting software procedure is the most proficient and exact strategy for examining imperfection like weld lines, air traps and shrinkage. Through this method, quality and output of the casting were improved in the briefest conceivable time and without doing the genuine refuse on the foundry shop floor.

In the research of author Aakanksha Suryawanshi [14] get ready Al compound by centrifugal casting procedure and afterward enhanced its procedure parameter by the gray fuzzy technique. Through this strategy they improve the nature of casting and decrease the deformity like shrinkage and blow gaps which produces during cooling process. Author’s goal was to discover an imperfection with limiting the thermal stress. Author found that at 500 and 550 RPM shape speed outwardly casting compound created less porosity. The cast microstructure contains carbide and laves stage, which viewed as the harmful to the mechanical property of the alloy.

Author Ragaie M. Rashad [15] manufactured the scientific displaying of bimetallic move created by the technique for centrifugal casting with turn of form around the flat pivot. Author tentatively found the hardest, smaller scale structure and residual stress. Author likewise recreates the entire procedure utilizing Pro-cast programming and found that the compressive extraneous pressure found at the external fringe because of this consumption impact was decreased and weakness life was expanded. Author likewise explored from a form that compressive outspread pressure was close to the interface of the two metals and it helped in diminishing the propensity of partition. The pressure was gotten by numerical arrangement technique and contrasted and the remaining worries at six estimated areas. It very well may be decreased by cooling the casting inside the mold. They likewise explored about the pouring time and found that the previous the liner layer is poured, the less are the residual stress. Residual stress can be expanded by expanding the mold speed. They likewise found that cooling with will bring about littler residual stresses.

Author ParthLakum [16] utilize Pro-cast programming for optimizing the shrinkage porosity and investigated the temperature dispersion of air cooled chamber liner square of dark cast iron. Ace cast help to comprehend the warmth stream of the throwing. Through looking at the Pro-cast result and deformities delivered in the genuine procedure. Author discovered that Pro-cast is one of the best casting reenactment programming and with the assistance of this there is no need of the genuine preliminary casting simulation software on the shop floor. It likewise helps in preheated the sum and area of porosity. Author discovered that with the assistance of Pro-cast programming, porosity sum has been seen as 2.69% in the inward bore territory which matches with the mechanical yield. They likewise found that the hardening time, which is 159.56 seconds.

CONCLUSION

All manufacturing businesses faces casting defect which is very serious issue for the industries. At the point when the casting undergoes machining in different traditional centrifugal casting machine and after machining

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finding a casting blow-hole, shrinkage gap, miniaturized scale isolation or other deformity prompts the entire casting dismissed, yet in addition there is a financial misfortune as the machining is expensive and furthermore there is wastage of time. So this imperfection requires being limited and it ought to be limited by enhancing the procedure parameter of the different optimization strategy. Optimization method decreases the deformity as well as improves the mechanical property of the casting item. In this paper there are writing reviews in regards to optimization method like Computer Aided Simulation software, Pro-cast software, Grey Fuzzy method, Taguchi method and so forth. Also, from this study, it is demonstrated that optimization strategy is the most ideal and appropriate technique for centrifugal casting procedure and its prompts the better designing of casting materials.

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IMPROVE THE MECHANICAL PROPERTIES OF AA2195 ALUMINIUM ALLOY BY EQUAL CHANNEL ANGULAR PRESSING

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ABSTRACT
Equal Channel Angular Pressing is a method of the Sever plastic deformation techniques. ECAP used for providing the strength of the AA2195 Aluminium alloy. 2195 alloy received at 250^o C with hot rolling condition and obtained approximate average mechanical strength 147MPa.After processing, the achieved bulk Ultra fined grain (UFG) with higher average strength 266MPa "through single pass". Microstructure refinement and mechanical properties were examined by optical microscopy and transmission electron microscopy for microstructure level, hardness and tensile testing.

Keyword: SPD, ECAP, UFG, grain refinement

I. INTRODUCTION
Alloy 2195 is the 2XXX Aluminium series. This series is based on the Al-Cu- Li compositions and lightest martial due to low density. This is the superlight weighted material. AA2195 alloy was third generation aluminium alloy. This alloy has contained good weld ability.

Weld ability is depending on the copper and lithium compositions range. If copper and lithium range are minimum then sacrifice the strength of this alloys and weld ability is increased. Therefore strength was increased by the Sever Plastic Deformation (SPD) techniques of AA2195 alloy.

Equal channel angular pressing method (ECAP) is new metal working process to improve mechanical strength by producing ultra-fine sub-micron grain through highly plastic straining without change in significant original dimension.

SPD technique is based on high strain rate or deformation, complex stress state or high shear, refinement of the microstructure, without any significant change in over all dimensions of the solids and induced equiaxed grain (Ultra-Fine grain)

Ultra-fine grain means, very small grains with average grains sizes less than 1μm. Bulk UFG material, there are the additional requirements of fairly homogenous equiaxed microstructures and majority of grain boundaries having high angles of mis-orientation.

II. EXPERIMENTAL PROCEDURE
To make billet or sample of ECAP method by the machining process of for the received material , length of the sample is 55mm and diameter is 10mm.

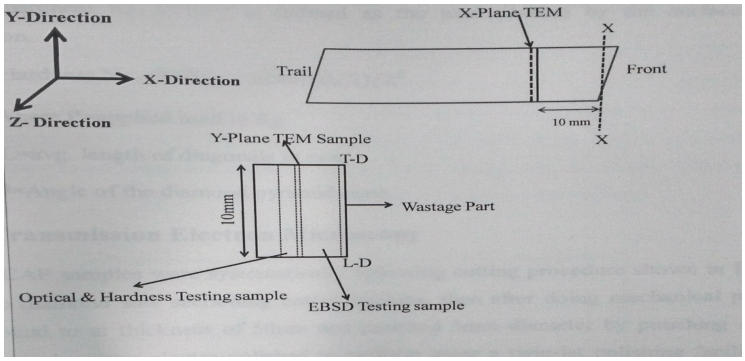

Fig-1.1: Systematic cutting process of Optical and TEM microscopy after ECAPed

III. EXPERIMENTAL PARAMETERS
Channel angle:120º

Angle of curvature: 60º

Pressing speed: 1-20 mm/sec

Pressing temperature: 150ºC

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Equal channel angular pressing principal: there are two of approaches, one is the top down approach and another is the bottom down approach. Firstly, wormed sample is inserted into top of the die inlet hole then after pressing or apply load through the help of the plunger. This sample was exit from the outlet hole of the "dies", sample is passed through channel way with induced high strain rate. After passes deformation is induced in that case dislocation density is increased and improved the mechanical properties of the materials.

Composition of AA2195 Aluminum alloy

Element	Al	Cu	Li	Mg	Ag	Ti	Zr	Ni	Fe	Cr	Si
Weight%	80.4	8.50	0.03	0.33	0.39	0.11	0.18	1.04	0.81	0.14	4.72

Operation is performed on AA2195 Aluminium alloy by Equal channel angular pressing method. For this operation following procedure are used for microstructure evolution.

- Procedure for cutting of the ECAP ed sample
- Preparing the sample from the received martial
- Preparing and evaluating the microstructure from Optical microscopy
- Preparing and evaluating the grain refinement(UFG), dislocation, sub grain formation, precipitates from TEM

Mechanical testing

- Hardness Testing(Vickers)
- Tensile Testing

IV. RESULTS AND DISCUSSION

Optical Microscopy

After ECAPed, to prepared the optical samples and examine the microstructure of received and9 passes. These optical images are takes at same magnification scale200x.In fig A shows grains are big size and fig b structure is lamented in one direction. 2195 alloy, grains are orientated in one direction or anisotropy properties, Here grain are brake in to small sub grains due to higher deformation.

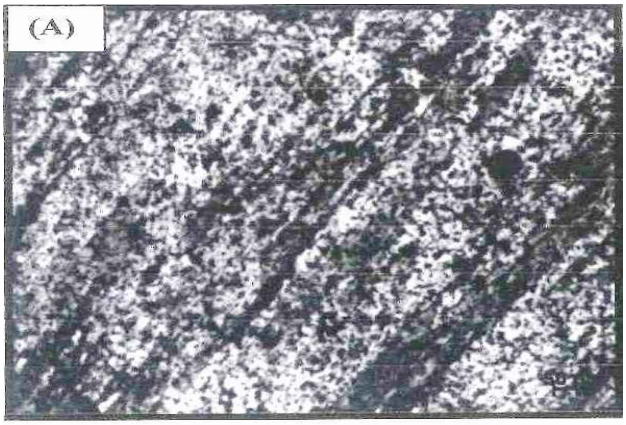

Fig-1.3: microstructure optical images

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V. TRANSMISSION ELECTRON MICROSCOPY

TEM is high magnification and resolution microscopy. TEM is help full to identify the grain refinement, density of dislocation, structure of elements, slip bands, micro bands and precipitation.

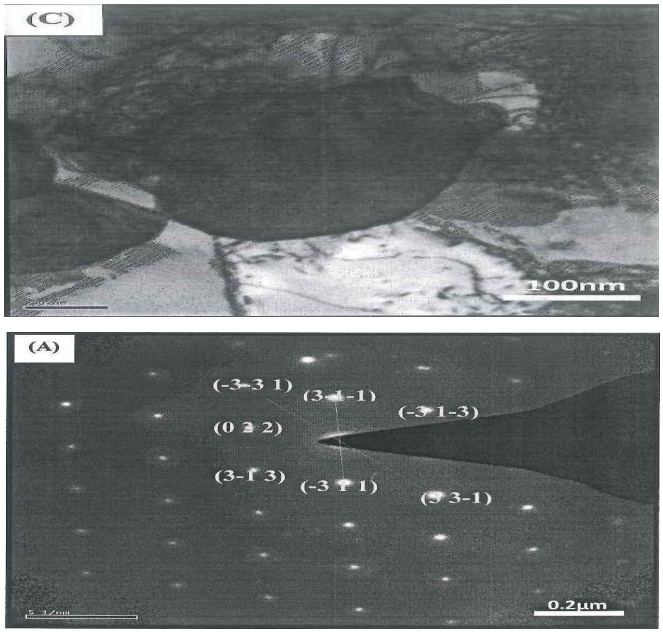

Fig-1.3: Transmission Electron Microscopy images at 9 passes

After ECAPed process shows two TEM images, one images shows grain structure, with grain boundaries, sub grain formation and other shows selected area diffraction pattern (SADP) image.

VI. MECHANICAL TESTING

Hardness Testing

Hardness value of sample in X- plane and Y- plane with respect to number of passes

Pass	Hardness (VHN) X-PLANE	Hardness (VHN) Y-PLANE
0	76.9	77.1
1	84.5	84.1
6	91.4	90.2
9	98.2	98.3

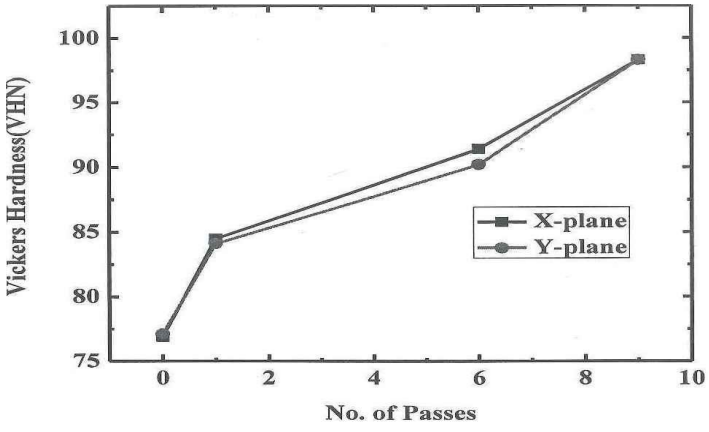

Fig-1.4: Hardness curve for different passes in X and Y plane

After the ECAP ed process, 2195Alloy decay their ductility and increased brittleness. Hardness value is continuously increased shown in above vicker's hardening curve in X, Y planes. Hardness values are increased after one pass, due to strain rate or dislocation density. And passes two to six slope of hardness value slightly decrease as compared to single pass. Finally after six passes to nine passes slope of hardness value increase rapidly.

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Tensile Testing

After ECAP method yield strength increase from 147MPa to 266MPa and ultimate tensile strength increase 204MPa to 337MPa after one passes. And other mechanical properties are also affected during analysis, as shown in above tensile curve. Here strength is increase due to strain hardening.

According to hall –Petch equation

$$\sigma_y = \sigma_0 + Kd^{-1/2}$$

Where $\sigma_y = yield\ strength, \sigma_0 = friction\ stress, d = grain\ diameter$

Sample	Yield strength	Ultimate Tensile strength(M Pa)	Uniform Elongation (%)	Total Elongation (%)
received	147	204	8.3	21
pass1	266	337	7.9	13

Equation represented as $\sigma = E\varepsilon^n$

Where: σ = tensile strength, ε = strain rate, E = modulus of elasticity or Young's modulus

n = Strain hardening coefficient

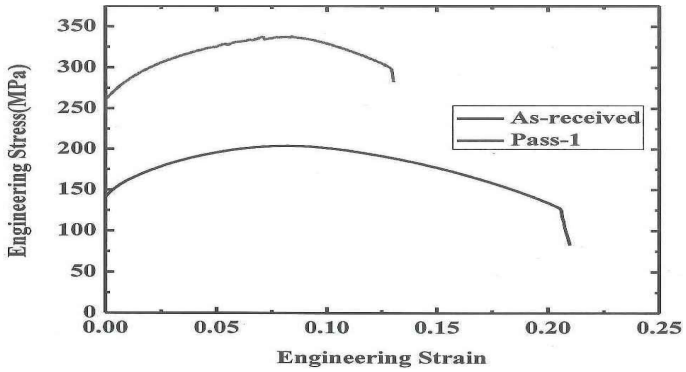

Fig-1.5: tensile testing curve of 1-pass and received alloy

According to this stress-strain equation. Strain hardening is increased due to hindrance of the dislocation; these dislocations plays major role for plastic deformation.

VII. CONCLUSION

ECAP is the special type of extrusion process to improve the mechanical properties like tensile strength, yield strength etc Mechanical properties hardness and tensile strength are improved 154VHN to 196VHN and tensile value increase from 204 MPa to 337MPa by strain hardening, precipitation hardening. Strengthening and grain refining..

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SEISMIC PERFORMANCE OF RCC BUILDING WITH SHEAR WALL & WITHOUT SHEAR WALL

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ABSTRACT
In the seismic design of buildings, reinforced concrete structural walls, or shear walls, act as major earthquake resisting members. Structural walls provide an efficient bracing system and offer great potential for lateral load resistance. The properties of these seismic shear walls dominate the response of the buildings, and therefore, it is important to evaluate the seismic response of the walls appropriately. In this present study, main focus is to determine the solution for shear wall location in multi-storey building. Effectiveness of shear wall has been studied with the help of four different models. Model one is bare frame structural system and other three models are dual type structural system.

Keywords: RC wall, masonry wall, framed structure, Seismic analysis, Shear wall

V. INTRODUCTION
This document is a template. An electronic copy can be downloaded from the journal website. For questions on paper guidelines, please contact the journal publications committee as indicated on the journal website. Information about final paper submission is available from the journal website. *Buildings engineered with structural walls are almost always stiffer than framed* structures, reducing the possibility of excessive deformation and hence damage. RC multi storied buildings are adequate for resisting both the vertical and horizontal load. When such buildings are designed without shear walls, beams and column sizes are quite heavy. Shear walls may became imperative from the point of view of economical and control large deflection. Lateral forces, that is, the forces applied horizontally to a structure derived from winds or earthquakes cause shear and overturning moments in walls. The shear forces tend to tear the wall just as if you had a piece of paper attached to a frame and changed the frame's shape from a rectangle to a Parallelogram. The changing of shape from a rectangle to parallelogram is referred to as racking. At the end of shear walls, there is a tendency for the wall to be pushed down at the end away from the force. This action provides resistance to overturning moments. Lateral loads can develop high stresses, produce sway movement or cause vibration. Therefore, it is very important to have sufficient strength for the structure against vertical loads Earthquake and wind forces are the only major lateral forces that affect the buildings. The function of lateral load resisting systems or structure form is to absorb the energy induced by these lateral forces by moving or deforming without collapse. The determination of structural form of a tall building or high rise building would perfectly involve only the arrangement of the major structural elements to resist most efficiently the various combinations of lateral loads and gravity loads. The taller and more the slender a structure, the more important the structural factors become and the more necessary it is to choose an appropriate structural form or the lateral loading system for the building. In high rise buildings which are designed for a similar purpose and of the same height and material, the efficiency of the structures can be compared by their weight per unit floor area.

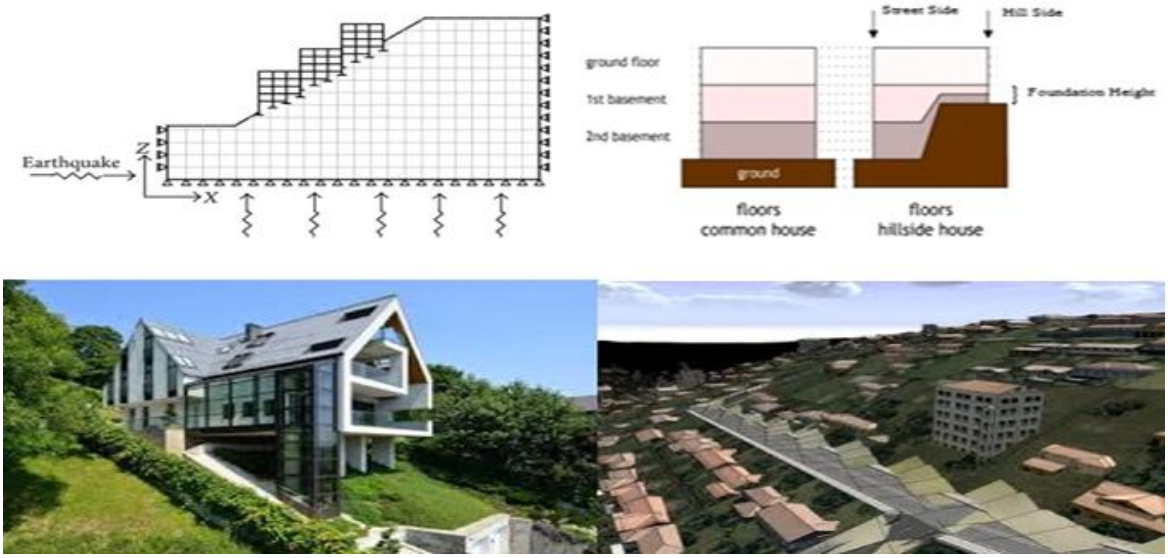

Figure-1: Buildings on sloping ground

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VI. LITERATURE SURVEY

Asnhuman et al., (2011) conducted study on research on lateral-load resisting system in high rise building. From the study, it was observed that shear wall was very high-in plane stiffness and strength, which can resist large horizontal loads and support gravity loads.

Solution for shear wall location in multi-storey building based on its both elastic and elatso-plastic behaviours was determined. Earthquake load was calculated and applied to building of 15 stories located in zone IV. Elastic and elasto-plastic analysis was performed using both STAAD pro 2004 and SAP V 10.0.5 (2000) software package. Parameters like shear forces, bending moment and storey drift were computed in both the cases and also for different location of shear wall. Dead load and live load have been taken as per IS 875 (part 1) (1987) and IS 875 (part 2) (1987) .Results showed that the top deflection had been exceeded the permissible deflection, i.e. 0.004 times the total height of building, [IS 1893 (part 1) (2002)]. Load combination was 1.5 (DL + EQ) and (0.9DL + 1.5 EQ) .Study concluded that, the top deflection was reduced and reached within the permissible deflection after providing the shear wall in any of the 6 - 7 frames and 1 -12 frames in the shorter direction.

Shaik and Vinod (2013) conducted the study on Seismic performance evaluation of multi-storied R.C framed building with shear wall. The elastic as well as in-elastic analysis were carried out for the evaluation of seismic performance on 6,12,24 and 36 storied moment resisting R.C. framed building using E TAB software. Eight models were prepared for each type of storey with plan area of 30m x 20m and height of 3m. Approximate method was used for lateral static and dynamic analysis of wall frame based on the continuum approach and one dimensional finite element method. Structure was analysed for various load combination as per I.S 1893(part-1)-2002 for seismic zone. Capacity curve was drawn based on load deformation responses. Result showed that the storey displacement for 6 and 12 storey building behave like shear building due to less height, while 24 and 36 storey building exhibit flexural behaviour as grater height than lateral dimension. Non- linear static pushover analysis showed that lateral stiffness has the least value for the model without shear wall and also influence of shear wall was quite large for shorter building. Study concluded that provision of shear wall symmetrically in the outer most moment resisting frames give better performance for regular shape building.

Chandurkar and Pajgade (2013) conducted a study on seismic analysis of RCC building with and without shear wall using software ETAB v 9.5.0. They compared parameters like lateral displacement, story drift and cost required for economy and effectiveness of shear wall. 10 story building model with 3m height for each story was studied on the software. The buildings were assumed to be fixed at the base. Four models were prepared and the models were, Model 1 was bare framed structure, Model 2 was dual system with shear wall one on each side, Model 3 was with shear wall on corner with L=4.5m and Model 4 was with shear wall on corner with L=2m. The analysis was done for zone II, III, IV and V. The results obtained were: displacement of all models for zone II, III, IV was reduced Upto 40% as compared to zone V. Story drift was maximum for Model 1 whereas it was minimum for Model 3. The corner shear wall in 2m was economical among all models. Quantity of concrete was more for model 3. After analysis it was concluded that shear wall was effective for buildings with 10+ storey and it was not effective for buildings below 10 stories. Also shear wall was proved to be effective and economical at adequate locations only.

Chaitanya and Lute (2013) studied the G+11 storey residential building with precast reinforced concrete load bearing wall. This study analysed load bearing wall and one way slab for gravity and lateral load using ETABS software. Analysis was done for various wall forces, displacement and moment which had been work out for different load combination. G+11 storey shear wall building was considered for one acre of site with 350 units. Around 400 sqft of carpet area per unit was taken with 300 units per floor. Technology used was total precast solution with load bearing RCC shear walls and slabs and the modelling was done in ETABS. Shear wall structure having G+ 11 storeys was analysed for gravity and lateral loads. The parameters like axil force, out of plane moments, lateral loads, shear force, storey drift, storey shear and tensile forces were observed for different stories. Results showed that the variation of axial force with stories was linear and the difference in maximum axial force between storey 11 and 12 was 7.26 %. Study concluded that the variation of lateral loads with stories was non- linear, the difference in maximum lateral loads between storey 11 and 12 was 0.54 % and the variation in shear force with stories was non- linear and the difference in maximum shear force between storey 11 and 12 was 19.98 %.

Lakshmi et al. (2014) studied the performance of the structures under frequently occurring earthquake ground motion resulting in structural damage as well as failure have repeatedly demonstrated the seismic vulnerability of existing buildings, due to their design based on gravity loads only or inadequate level of lateral load. The method was important to ensure strength and stability. The comparison of various parameter such as storey drift, storey shear, deflection, reinforcement requirement in columns etc., of a building under

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lateral loads based on strategic position of shear wall studied were carried out. The ETABS 9.5 and SAP 2000. V.14.1 was used for analysis. The finite element analysis software ETABS9 9.5 was used to create the 3-D model and run the linear static and dynamic analyses and pushover analysis was done in SAP 2000.V.14.1. Eight different models were considered. Result showed that base shear was the maximum expected lateral force that will occur due to seismic ground motion at the base of structure. Study conclude in medium high rise building (i.e. >10storeys) provision of shear wall was founding to be effective in enhancing the overall seismic capacity characteristics of the structure. Study also concludes that maximum reduction in drift value was obtained when shear walls were provided at corners of the building.

Tarun shrivastava et al. (2015) conducted the study on effectiveness of shear wall frame structure subjected to wind loading in multi-storey building. Different cases were prepared with different configuration of shear wall. Frames of 8 storey R.C.C. structure in medium soil with a ground plan of 20m x 18m and height of the structure is 25.6m. Assuming wind pressure of 1.5 KN/m2 and special moment resisting frame, analysis was carried out with shear wall at different location for regular shape building. Various parameters such as lateral deformation, storey drift index, maximum bending moment and shear force were calculated. Result showed that model 3 with core shear wall case is most suitable as moment percentage of moment and shear force resisted by shear wall in this case is 93.2% and 98% which was much greater than other cases. Also model 3 is stiffer against lateral loads. Study concluded that effectiveness of shear wall was not helping too much in reducing the base shear but providing more lateral stiffness and taking maximum share of the moment.

Kalyani et al. (2015) Multi-storeyed buildings with open (soft) ground floor are inherently vulnerable to collapse due to earthquake load, even then their construction is still widespread in the developing nations. An investigation has been performed to study the behaviour of the columns at ground level of multi-storeyed buildings with soft ground floor as satellite bus stop and floating columns in the upper stories subjected to earthquake loading. The structural action of masonry infill panels of upper floors has also been taken into account by modelling them as diagonal struts. Shear wall is one of the most commonly used lateral load resisting in high rise building. In this study building is modelled with different shapes of shear wall with top and bottom soft storey. Static and dynamic analysis is carried out by using ETABS 2013. The comparison of these models for different parameters like Storey drift and storey acceleration is carried out.

Patel et al. (2016) studied the optimum location and different shapes of shear walls in L shaped high rise building. Shear walls are the structural members used to increase the strength of RCC Structures. It is essential to find out the effective, efficient and ideal location of shear walls become essential to the building interior when the exterior walls cannot provide extra strength and stiffness to the building. In this study an L shaped high rise building with different locations of shear walls and with different shapes of shear walls is considered for the analysis. The high rise building is analysed using the ETABS software to determine the various parameters such as Time period, Base shear, Storey drift and Storey displacement. The results of the analysis on the various parameters are presented in the tabular form and graphical form and the results of various parameters are compared using the different methods of seismic analysis such as ESA RSA and Time history analysis.

2. SHEAR WALL IN RCC BUILDING

Shear wall is defined as vertical structural member who can resist a combination of moment, shear and axial load induced by gravity load and lateral load transfer to the wall from other structural member. RCC walls including shear walls are the usual multi- Storied Buildings requirements. Coinciding centroid and mass centre of the building during design is the ideal for a Structure. An introduction to shear wall represents a most efficient solution to stiffen a structural system of building as the main function of a shear wall is to increase the lateral load resistance. Cross-sections of Shear walls can be used are rectangular shapes to more irregular cores such as channel, T, L, barbell shape, box etc. The use of shear wall structure is gaining popularity day by day in high rise building, especially in the construction of service apartment or office/ commercial tower. It has been proved, that shear wall system is efficient structural system for multi storied building in the range of 30-35 storeys.

Shear Walls are uniquely composed structural walls incorporated in the buildings to restrict horizontal forces that are convey in the plane of the wall due to wind, earthquake and distinctive forces. They are fundamentally flexural members and normally gave in high rise structures to avoid the total fall of the tall structure under the seismic forces. Walls can be designed as plain concrete walls when there is only compression with no tension in the section. else, they should be composed as reinforced concrete walls. The value of the Shear Walls in the confining of structures has sometimes been recognized. At the point when arranged in favourable places of structures, they give a sufficient power to oppose horizontal force resisting system, while at the same time

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satisfying other functional requirements. For structures up to 20 stories the utilization of shear walls is a decisions matter. For structure is more than 30 stories, shear walls may become basic from view point of economy and avoid of lateral deflection, Because a vast part of side long force on the structure and the lateral shear force usually from it is often assigned to such structural walls is known as "Shear Walls". Shear walls are behaves like vertical oriented wide beams that convey earthquake forces downwards to the establishment. That is the reason, it is always suitable to reliable them in structure built in regions likely to earthquake of high amount of intensity or large winds.

Shear walls are provided to resist horizontal earthquake forces and to increase the rigidity of building. When shear wall has enough strength, it will transfer the horizontal forces to the next element in load path below. These elements in the load path may be another shear walls, slabs, floors, foundation walls, or footings. The stiffness of shear wall will prevent floor and roof framing members from moving off their supports. Also, buildings that are sufficiently stiff, usually suffer less non-structural damage.

Reinforced concrete (RC) buildings usually have vertical plate-like RC walls known as Shear Walls (Figure2) additionally to slabs, beams and columns. These walls typically begin at foundation level and square measure continuous throughout the building height. Their thickness will be as low as 150mm, or as high as 400mm in high rise buildings. The overwhelming success of buildings with shear walls in resisting robust earthquakes is summarised within the quote: "We cannot afford to make concrete buildings meant to resist severe earthquakes while not shear walls." Mark Fintel, a noted consulting engineer in USA.

RC shear walls give massive strength and stiffness to buildings within the direction of their orientation, which significantly reduces lateral sway of the building and thereby reduces harm to structure and its contents. Since shear walls carry massive horizontal earthquake forces, the overturning effects on them area unit massive. Shear walls in buildings should be symmetrically located in decide to cut back ill-effects of twist in buildings. They may be placed symmetrically on one or each directions in arrange. Shear walls area unit more effective.

Shear walls should give the mandatory lateral strength to resist horizontal earthquake forces. Once shear walls square measure strong enough, they'll transfer these horizontal forces to future part within the load path below them. These alternative components within the load path are also other shear walls, floors, foundation walls, slabs or footings. Shear walls additionally give lateral stiffness to prevent the roof or floor on top of from excessive side-sway. Once shear walls square measure stiff enough, they'll stop floor and roof framing members from moving off their supports. Also, buildings that are sufficiently stiff can sometimes suffer less non-functional damage.

VII. CONCLUSION

Shear wall are one of the excellent means of providing earthquake resistance to multi-storeyed reinforced concrete building. The structure is still damaged due to some or the other reason during earthquakes. Behaviour of structure during earthquake motion depends on distribution of weight, stiffness and strength in both horizontal and planes of building. To reduce the effect of earthquake reinforced concrete shear walls are used in the building. These can be used for improving seismic response of buildings. Structural design of buildings for seismic loading is primarily concerned with structural safety during major Earthquakes, in tall buildings, it is very important to ensure adequate lateral stiffness to resist lateral load. The provision of shear wall in building to achieve rigidity has been found effective and economical. When buildings are tall, beam, column sizes are quite heavy and steel required is large. So there is lot of congestion at these joint and it is difficult to place and vibrate concrete at these place and displacement is quite heavy. Shear walls are usually used in tall building to avoid collapse of buildings. When shear wall are situated in advantageous positions in the building, they can form an efficient lateral force resisting system.

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COMPARATIVE ANALYSIS OF SOFTWARE TESTING TECHNIQUES

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ABSTRACT
In today's era, software testing is not limited to only finding errors which initiates after the implementation phase but taken as a process which holds the complete development process. It is an essential part which helps in developing the product as required. In this area, the major issue is to select the most suitable test cases for testing the software. Although lots of research & improvements have been done but there is a requirement of software before it is handed over to the client. For this, there are lots of testing tools & testing techniques which have been developed to do the task. This review paper focuses on testing techniques, testing principles and the major contribution of this research paper is to represent the comparative study of existing testing techniques.

Keywords: Testing, Software testing life cycle, Testing techniques, Testing principles.

I. INTRODUCTION
Testing is an organized search activity to disclose the quality of developed software system which ensures that the product meets the client's requirement. [7] This searching activity provides the appropriate and accurate information about the software quality to the customers. Although this process does not guarantee to find all the bugs.[5] In the duration of testing process, testers should be decision making so that testers can select suitable testing technique for the faults occurred in the product. It is a step by step process and each step is tested by different persons who can be a developer, tester, SQA engineer (software quality assurance) or the end user. It is also used to check out the other product quality factors like maintainability, integrity, usability, security, capability, efficiency, portability, reliability, compatibility etc. [1]

Software testing is the most significant phase of software development life cycle. STLC (Software Testing Life Cycle is a subpart of SDLC (Software Development Life Cycle). The phases of STLC vary from project to project. The phases of software testing life cycle are shown below in the figure1.

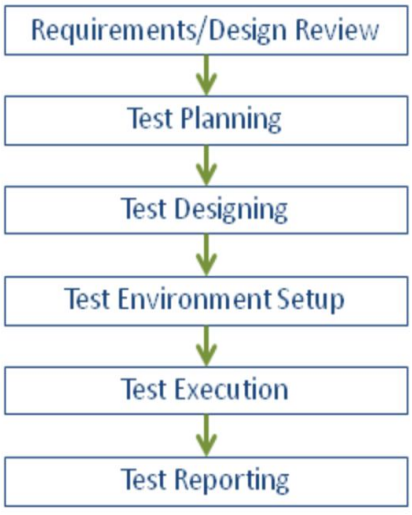

Fig-1: Software testing life cycle

The first phase reviews the requirements of software product. An accurate objective helps developer in implementation, tester to plan the scenario of testing & testing techniques. The second phase describes how to implement the product which meets the customer requirement. For this, prepare the test strategies, create test scenarios, identify test data and review all the activities and describe when to stop testing. This is done using requirement document which prepared during the first phase. In the third phase, after getting test strategy document, design the tests on the basis of information gathered from the first phase. In the fourth phase, arrange the test environment, create test cases/ script and identify test data. In the fifth phase, identify the errors by executing test cases/scripts which ensures whether the desired product is being developed. The final phase is the closure of the project means finalize the project and deliver it to the client. This paper is distributed in 4 sections: Section 1 introduces the testing of the software product, the necessity of the software testing and describes the testing principles in brief. Section 2 describes the testing techniques, Section 3 represented the comparative study of various software testing techniques. Finally, conclusion is presented in section 4.

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A. Need of Software testing

There are several reasons which tell us that what the necessity of testing is. Some reasons are described below:[6]

1) It is important because it uncovers all the errors before the deployment.
2) It is important because it ensures that right product is delivered to the customer.
3) It confirms about the quality of the product. This helps in getting customer's belief.
4) A tested software assures reliability and high performance functioning of product. It makes product user-friendly.

B. Principles of testing

There are seven principles of testing which helps testers to utilize their time and effort to make the testing process an effective one. [6] The testing principles are described below:

1) Testing shows the presence of errors
2) Early testing
3) Exhaustive testing is not possible
4) Testing is context dependent
5) Defect clustering
6) Pesticide paradox
7) Absence of error

II. TESTING TECHNIQUES

There are various types of testing techniques. Few of them are discussed below:

A. Black box & White box testing

Black box testing is also known as behavioral testing. In this method, the internal structure of the item being tested is not known to the tester. This technique tries to detect errors in data structures, performance, and external database access. [3]

White box testing is also known as glass box testing. In this testing method, the internal structure of the item being tested is known to the tester. It is done when the programmer has full knowledge of programming. This technique is used by both the developers as well as testers. [4]

B. Alpha & Beta testing

It identifies the errors before the product release to the end user. It comes under acceptance testing. The main aim is to refine the final software system by detecting/fixing the errors that were not detected through previous tests.[2]

Beta testing is considered as Pre-release testing because it is done at the time of software release. The users provide their feedback to the developer for the outcome of testing. Feedback from clients is used to improve the system/product before it is deployed to other clients. It is also sometimes referred to as user acceptance testing/ end user testing. The main aim is to evaluate the overall experience from user's point of view. [2]

C. Functional & Non-functional testing

It verifies that each function of the software application operates in conformance with the requirement specification. Like black box testing, it is not concerned about the source code. The main aim is to checking the functionalities of the software system. For this, it focuses on usability, mainline functions, error conditions and accessibility. [8]

Non-functional testing is done after functional testing. It checks the reliability, performance, scalability and other non-functional aspects of the software product. It is designed to test the readiness of the product as per non-functional parameters.

III. COMPARISON TABLE

In this section, comparison of various testing techniques are represented.

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TABLE-I: COMPARISON BETWEEN BLACK BOX TESTING AND WHITE BOX TESTING

S.no.	Black box testing	White box testing
1	The internal workings of an application are not required to be known.	Internal workings are known.
2	Performed by end users, testers and developers.	Performed by testers and developers.
3	Not suited to algorithm testing	Suited for algorithm testing
4	It is applicable on higher levels of testing like system testing, acceptance testing.	It is applicable on lower level of testing like unit testing, integration testing.
5	Granularity is low.	Granularity is high.
6	To check on what functionality is performing by the system under test.	To check on how system is performing.
7	Less expensive	More expensive

TABLE-II: COMPARISON BETWEEN ALPHA TESTING AND BETA TESTING

S.no.	Alpha testing	Beta testing
1	It validates the product in all perspective, ensure readiness for beta testing.	It receives the end user's feedback, ensure readiness for release.
2	It is done at the end of development process.	It is done after alpha testing.
3	Performed by quality assurance team and end users.	Performed by end users.
4	It discovers errors, missed features/customer's requirements.	Get ideas to improve usability, functionality.
5	Beta testing is done after this.	Gamma testing is done after this.
6	It is always performed in virtual environment.	It is always performed in real time environment.
7	It comes under the category of both black box and white box testing.	It comes under black box testing only.

TABLE-IIII: COMPARISON BETWEEN FUNCTIONAL TESTING AND NON-FUNCTIONAL TESTING

S.no.	Functional testing	Non-functional testing
1	Tester tests how well the system performs.	Tester tests how well the system responds.
2	It is based on client requirements.	It is based on client expectations.
3	This testing covers unit testing, integration testing, regression testing etc.	This testing covers performance testing, security testing, installation testing etc.
4	It is done before non-functional testing.	It is done after functional testing.
5	It can be done manually.	It is hard to do it manually.
6	Easy to execute black box test cases.	Easy to execute white box test cases.
7	Testing tools: Selenium, Ranorex etc.	Testing tools: JMeter, Load rnnner etc,.

II. CONCLUSIONS

Software testing is an organized search activity to disclose the quality of software product by finding/fixing all the bugs. To carry out software testing in a more effective & efficient manner, this paper provides a comparative study of three main techniques of software testing which are black box & white box testing, alpha & beta testing and functional & non-functional testing.

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TRANSDISCIPLINARY EDUCATIONAL APPROACH

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ABSTRACT
The methodology of transdisciplinarity is founded on three postulates: , in Nature and in our knowledge of Nature, different levels of Reality and, correspondingly, different levels of perception; the passage from one level of Reality to another is insured by the logic of the included middle; and the structure of the totality of levels of Reality or perception is a complex structure: every level is what it is because all the levels exist at the same time. After giving an exposition of these postulates the transdisciplinarity does not rest on a transfer from modern science. Instead, modern science, via its most general aspects, makes it possible to identify the postulates of transdisciplinarity. However, once they are formulated they have a much wider validity then in modern science itself, namely they could be applied in the field of education and culture.

It is argued that transdisciplinary education, founded on the transdisciplinary methodology, will allow scientists to establish links between persons, facts, images, representations, fields of knowledge and action.

Keywords: Transdisciplinarity, in vitro and in vivo knowledge, axiom of the included middle, transdisciplinary education.

1. Multi, inter and transdisciplinarity

The process of the decline of civilizations is one of enormous complexity and its roots lie deep in obscurity. Of course, one can find multiple after-the-fact explanations and rationalisations without ever successfully dissipating the feeling that there is an irrational element at work at the heart of the process. Neither the masses nor great decision makers, as actors in a well-defined civilisation, seem able to stop the decline of their civilization, even if they become more or less aware of the processes at work.

One thing is certain: this fall is always accompanied by a great unbalance between the mentalities of the actors and the inner developmental needs of a particular type of society. Although a civilization never stops proliferating new knowledge, it is as if these can never be fully

integrated within those who belong to this civilization. And it is the human being who must be placed at the centre of any civilization worthy of the name.

The unprecedented increase of knowledge in our era raises the challenging question of how to adapt our mentality to being. Mondialisation is today a potential source of a new decline. The two extreme dangers of mondialisation are, on one side, the cultural and spiritual homogenisation and, on another side, the paroxysm of ethnical and religious conflicts, as a self-defence reaction of different cultures and civilisations.

Harmony between inner being and outer knowledge presupposes that these known facts would be intelligible, comprehensible. But can such comprehension exist in the era of the disciplinary big bang and relentless specialization?

The indispensable need for bridges between the different disciplines is attested to by the emergence of multidisciplinarity and interdisciplinarity around the middle of the twentieth century.

Multidisciplinarity concerns studying a research topic not in just one discipline but in several at the same time. For example, a painting by Giotto can be studied not only within the context of art history, but also within the contexts of the history of religions, European history, or geometry. The topic in question will ultimately be enriched by incorporating the perspectives of several disciplines. Moreover, our understanding of the topic in terms of its own discipline is deepened by a fertile multidisciplinary approach. Multidisciplinarity brings a plus to the discipline in question (the history of art in our example), but we must remember that this “plus” is always in the exclusive service of the home discipline. In other words, the multidisciplinary approach overflows disciplinary boundaries while its goal remains limited to the framework of disciplinary research.

Interdisciplinarity has a different goal than multidisciplinarity. It concerns the transfer of methods from one discipline to another. One can distinguish three degrees of interdisciplinarity: (a) degree of application (for example, when the methods of nuclear physics are transferred to medicine, which leads to the appearance of new treatments for cancer); (b) epistemological degree (such as, transferring methods of formal logic to the area of general law, which generates some interesting analyses of the epistemology of law); (c) degree of the generation of new disciplines (when methods from mathematics are transferred to physics, generating

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mathematical physics, or when mathematical methods are transferred to meteorological phenomena or stock market processes, generating chaos theory; transferring methods from particle physics to astrophysics produces quantum cosmology. Like multidisciplinarity, interdisciplinarity overflows the disciplines, but its goal still remains within the framework of disciplinary research.

As the prefix “trans” indicates, transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all disciplines.1 Its goal is the understanding of the present world, of which one of the imperatives is the unity of knowledge. The word itself is quite recent: it was first introduced by Jean Piaget in 1970.

Is there something between and across the disciplines and beyond all disciplines? From the point of view of classical thought there is absolutely nothing. The space in question is empty, completely void, like the vacuum of classical physics.

In the presence of several levels of Reality, the space between disciplines and beyond disciplines is full, just as the quantum void is full of all potentialities: from the quantum particle to the galaxies, from the quark to the heavy elements that condition the appearance of life in the universe.

Transdisciplinary research is clearly distinct from disciplinary research, even while being entirely complementary. Disciplinary research concerns, at most, one and the same level of Reality; moreover, in most cases, it only concerns fragments of one level of Reality. In contrast, transdisciplinarity concerns the dynamics engendered by the action of several levels of Reality at once. The discovery of these dynamics necessarily passes through disciplinary knowledge.

Disciplinarity, multidisciplinarity, interdisciplinarity, and transdisciplinarity are like four arrows shot from but a single bow: knowledge.

The transdisciplinary knowledge TK, corresponds to a new type of knowledge - in vivo knowledge. This new knowledge is concerned with the correspondence between the external world of the Object and the internal world of the Subject. By definition, the TK knowledge includes a system of values (see Table I).

It is important to realize that the disciplinary knowledge and the transdisciplinary knowledge are not antagonist but complementary. Both their methodologies are founded on scientific attitude. The new, transdisciplinary knowledge engenders a new, transdisciplinary education. In order to explore what this means, we have to understand what could be the transdisciplinary methodology.

KNOWLEDGE DKIN VITRO	KNOWLEDGE TK IN VIVO
External world - Object	Correspondence between external world (Object) and internal world (Subject)
Knowledge	understanding
analytic intelligence	new type of intelligence - harmony between mind, feelings and body

Table-1: Comparison between disciplinary knowledge DK and transdisciplinary knowledge TK.

2. The transdisciplinary approach of Nature and knowledge

The transdisciplinary approach of Nature and knowledge can be described through the diagram shown in Fig. 1.

In the left part are symbolically drawn the levels of Reality

{ NRn, ... , NR2, NR1, NR0, NR-1, NR-2, ... , NR-n } The index n can be finite or infinite.

Here the meaning we give to the word “reality” is pragmatic and ontological at the same time.

By “Reality” we intend first of all to designate that which resists our experiences, representations, descriptions, images, or even mathematical formulations.

Insofar as Nature participates in the being of the world, one must give an ontological dimension to the concept of Reality. Reality is not merely a social construction, the consensus of a collectivity, or some intersubjective agreement. It also has a trans-subjective dimension: e.g. experimental data can ruin the most beautiful scientific theory.

Of course, one has to distinguish the word “Real” and “Reality”. Real designates that what it is, while Reality is connected to resistance in our human experience. The “Real” is, by definition, veiled for ever, while the “Reality” is accessible to our knowledge.

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Monde and later developed in other works, I designate an ensemble of systems which are invariant under certain laws: for example, quantum entities are subordinate to quantum laws, which depart radically from the laws of the physical world. That is to say that two levels of Reality are different if, while passing from one to the other, there is a break in the laws and a break in fundamental concepts (like, for example, causality).

Levels of Reality are radically different from levels of organization as these have been defined in systemic approaches. Levels of organization do not presuppose a break with fundamental concepts: several levels of organization can appear at one and the same level of Reality. The levels of organization correspond to different structures of the same fundamental laws. For example, Marxist economy and classical physics belong to one and the same level of Reality.

The emergence of at least three different levels of Reality in the study of natural systems – the macrophysical level, the microphysical level and the cyber-space-time– is a major event in the history of knowledge. It can lead us to reconsider our individual and social lives, to give a new interpretation to old knowledge, to explore the knowledge of ourselves in a different way, here and now.

The existence of different levels of Reality has been affirmed by different traditions and civilizations, but this affirmation was founded either on religious dogma or on the exploration of the interior universe only.

In our century, in an effort to question the foundations of science, Edmund Husserl6 and other scholars have detected the existence of different levels of perception by the subject–observer of Reality.

The transdisciplinary viewpoint allows us to consider a multidimensional Reality, structured by multiple levels replacing the single-level, one-dimensional reality of classical thought.

According to the transdisciplinary approach, Reality is structured via a certain number of levels. The considerations which follow do not depend on whether or not this number is finite or infinite. For the sake of clarity, let us suppose that this number is infinite (i.e. we take $n \to \infty$ in Fig. 1).

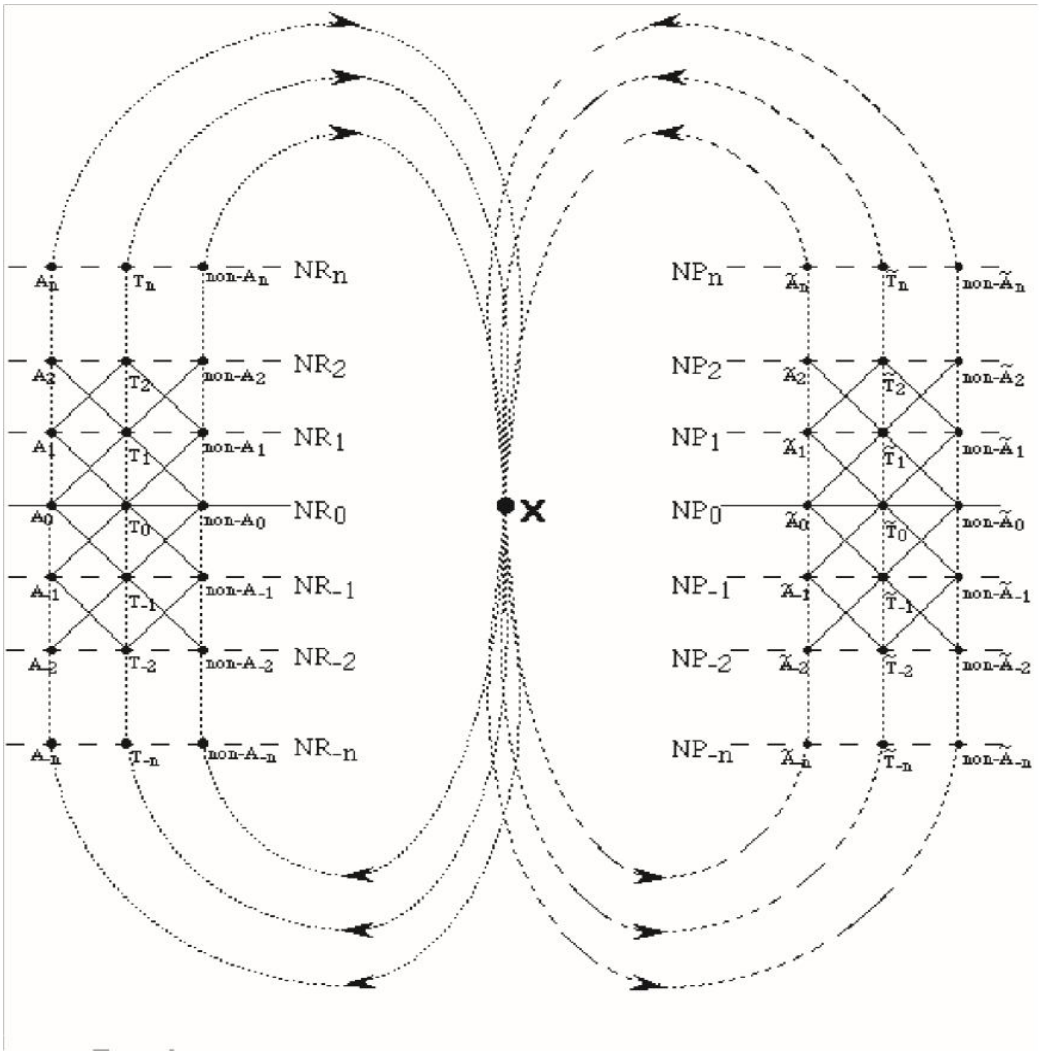

Figure-1: The transdisciplinary Object, the transdisciplinary subject and Interaction term.

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Two adjacent levels in Fig. 1 (say, NR0 and NR1) are connected by the logic of the included middle, a new logic as compared with classical logic.

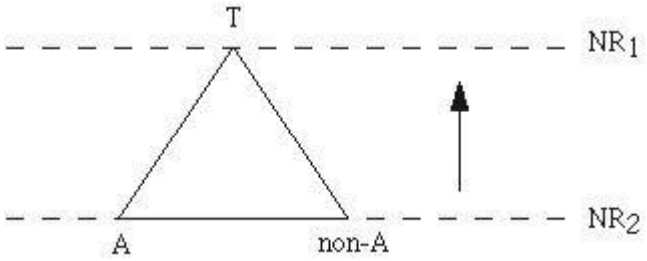
The classical logic is founded on three axioms:

1. The axiom of identity: A is A.
2. The axiom of non-contradiction: A is not non-A.

The axiom of the excluded middle: There exists no third term T ("T"from "third") which is at the same time A and non-A.Using this logic one immediately arrives at the conclusion that the pairs of contradictories advanced by quantum physics are mutually exclusive, because one cannot affirm the validity of an assertion and of its opposite at the same time: A and non-A.

Most quantum logics have modified the second axiom of classical logic — the axiom of non-contradiction — by introducing non-contradiction with several truth values in place of the binary pair (A and non-A). History will credit Stéphane Lupasco (1900-1988) with having shown that the logic of the included middle is a true logic, formalisable and formalized, multivalent (with three values: A, non-A, and T) and non-contradictory.

Our understanding of the axiom of the included middle — there exists a third term T which is at the same time A and non-A — is completely clarified once the notion of "levels of Reality" is introduced.



In order to obtain a clear image of the meaning of the included middle, we represent in Fig. 2 the three terms of the new logic — A, non-A, and T — and the dynamics associated with them by a triangle in which one of the vertices is situated at one level of Reality and the two other vertices at another level of Reality. The included middle is in fact an included third. If one remains at a single level of Reality, all manifestation appears as a struggle between two contradictory elements. The third dynamic, that of the T-state, is exercised at another level of Reality, where that which appears to be disunited is in fact united, and that which appears contradictory is perceived as non-contradictory.

It is the projection of the T-state onto the same single level of Reality which produces the appearance of mutually exclusive, antagonistic pairs (A and non-A). A single level of Reality can only create antagonistic oppo-sitions. It is inherently self-destructive if it is completely separated from all the other levels of Reality. A third term which is situated at the same level of Reality as that of the opposites A and non-A, cannot accomplish their reconciliation.

The T1-state present at the level NR1 (see Fig. 1) is connected to a pair of contradictories (A0 and non-A0) at an immediately adjacent level. The T1-state allows the unification of contradictories A0 and non-A0, but this unification takes place at a level different from the one NR0 on which A0 and non-A0 are situated. The axiom of non-contradiction is thereby respected.

There is certainly a coherence among different levels of Reality, at least in the natural world. In fact, an immense self-consistency — a cosmic bootstrap — seems to govern the evolution of the universe, from the infinitely small to the infinitely large, from the infinitely brief to the infinitely long. A flow of information is transmitted in a coherent manner from one level of Reality to another in our physical universe.

The logic of the included middle is capable of describing the coherence among these levels of Reality by an iterative process defined by the following stages: (1) A pair of contradictories (A0, non-A0) situated at a certain level NR0 of Reality is unified by a T1-state situated at a contiguous level NR1 of Reality; (2) In turn, this T1-state is linked to a couple of contradictories (A1, non-A1), situated at its own level; () The pair of contradictories (A1, non-A1) is, in its turn, unified by a T2-state situated at a third level NR2 of Reality, immediately contiguous to the level NR1 where the ternary (A1, non-A1, T1) is found. The iterative process continues to indefinitely until all the levels of Reality, known or conceivable, are exhausted.

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In other words, the action of the logic of the included middle on the different levels of Reality induces an open structure of the unity of levels of Reality. This structure has considerable consequences for the theory of knowledge because it implies the impossibility of a self-enclosed complete theory. Knowledge is forever open.

The open structure of the unity of levels of Reality is in accord with one of the most important scientific results of the twentieth century concerning arithmetic, the theorem of Kurt Gödel,9 which states that a sufficiently rich system of axioms inevitably leads to results which are either indecisive or contradictory. The implications of Gödel's theorem have considerable importance for all modern theories of knowledge, primarily because it concerns not just the field of arithmetic, but all of mathematics which include arithmetic.

To be sure, there is a coherence of the unity of levels of Reality, but this coherence is oriented. If coherence is limited only to the levels of Reality, it stops both at the "highest" level and at the "lowest" level (see Fig. 1). If we wish to suggest the idea of a coherence which continues beyond these two limiting levels, so that there is an open unity, we must conceive the unity of levels of Reality as a unity that extends by a zone of non-resistance to our experiences, representations, descriptions, images, and mathematical formulations. This zone of non-resistance corresponds to the "veil" which Bernard d'Espagnant referred to as "the veil of the Real".2 In this zone there are no levels of Reality.

Quite simply, the non-resistance of this zone of absolute transparence is due to the limitations of our bodies and of our sense organs — limitations which apply regardless of what measuring tools are used to extend these sense organs. The zone of non-resistance corresponds to the sacred — to that which does not submit to any rationalization. It is rational but not rationalizable, a distinction often used by Edgar Morin.3

It is important to note that the three loops of coherence in Fig. 1 are situated not only in the zone where the levels of Reality are absent but also in between the levels of Reality: the zone of non-resistance of the sacred penetrates and crosses the levels of Reality. In other words, the transdisciplinary approach of Nature and knowledge offers a link between the Real and the Reality.

The unity of levels of Reality and its complementary zone of nonresistance constitutes what we call the transdisciplinary Object.

A new Principle of Relativityemerges from the coexistence between complex plurality and open unity: no level of Reality constitutes a privileged place from which one is able to understand all the other levels of Reality. A level of Reality is what it is because all the other levels exist at the same time. This Principle of Relativity is what originates a new perspective on religion, politics, art, education, and social life. And when our perspective on the world changes, the world changes. "Saying a true word is equivalent to the transformation of the world" - writes the great brazilian educator Paulo Freire in his Pedagogy of the Oppressed.4

The different levels of Reality are accessible to human knowledge thanks to the existence of different levels of perception, described diagrammatically at the right of Fig. 1. They are found in a one-to-one correspondence with levels of Reality. These levels of perception {NPn, ... , NP2, NP5, NP0, NP-1, NP-2, ... , NP-n} permit an increasingly general, unifying, encompassing vision of Reality, without ever entirely exhausting it.

As in the case of levels of Reality, the coherence of levels of perception presuppose a zone of non-resistance to perception. In this zone there are no levels of perception.

The unity of levels of perception and this complementary zone of nonresistance constitutes what we call the transdisciplinary Subject.

The two zones of non-resistance of transdisciplinary Object and Subject must be identical for the transdisciplinary Subject to communicate with the transdisciplinary Object. A flow of consciousness that coherently cuts across different levels of perception must correspond to the flow of information coherently cutting across different levels of Reality. The two flows are interrelated because they share the same zone of non-resistance.

Knowledge is neither exterior nor interior: it is simultaneously exterior and interior.

The studies of the universe and of the human being sustain one another.

The open unity between the transdisciplinary Object and the transdisciplinary Subject is conveyed by the coherent orientation of the flow of information, described by the three oriented loops in Fig. 1which cut through the levels of Reality, and of the flow of consciousness, described by the three oriented loops which cut through the levels of perception.

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The loops of information and consciousness have to meet in a least one point X in order to insure the coherent transmission of information and consciousness everywhere in the visible and invisible regions of the Universe. In some sense, the point X is the source of Reality and perception. The point X and its associated loops of information and consciousness describe the third term of the transdisciplinary knowledge: the Interaction term between the Subject and the Object, which can not be reduced neither to the Object nor to the Subject.

This ternary partition

{ Subject, Object, Interaction } is radically different from the binary partition

{ Subject, Object } which defines the modern metaphysics.

The view I am expressing here is totally conform to the one of the founders of quantum mechanics Werner Heisenberg, Wolfgang Pauli and Niels Bohr.

In fact, Werner Heisenberg came very near, in his philosophical writings, to the concept of "level of Reality". In his famous Manuscript of the year 1942 (published only in 1984) Heisenberg, who knew well Husserl, introduces the idea of three regions of reality, able to give access to the concept of "reality" itself: the first region is that of classical physics, the second - of quantum physics, biology and psychic phenomena and the third – that of the religious, philosophical and artistic experiences.6 This classification has a subtle ground: the closer and closer connectiveness between the Subject and the Object.

CONCLUSION

The methodology educational transdisciplinarity is therefore founded on three postulates:

i. There are, in Nature and in our knowledge of Nature, different levels of Reality and, correspondingly, different levels of perception.

ii. The passage from one level of Reality to another is insured by the logic of the included middle.

iii. The structure of the totality of levels of Reality or perception is a complex structure: every level is what it is because all the levels exist at the same time.78

The first two get their experimental evidence from quantum physics, while the last one has its source not only in quantum physics but also in a variety of other exact and human sciences.

It is important to note that one can assume the validity of the three postulates of transdisciplinarity independently of their historical roots in some branches of modern science. In other words transdisciplinarity does not rest on a transfer from modern science: this would be a wrong epistemological and philosophical procedure. Modern science, via its most general aspects, allowed us to identify the three postulates of transdisciplinarity, but once they are formulated they have a much wider validity then in modern science itself, namely they could be applied in the field of education and culture.

The transdisciplinary education, founded on the transdisciplinary methodology, will allow us to establish links between persons, facts, images, representations, fields of knowledge and action, to discover the Eros of learning during our entire life and to built beings in permanent questioning and permanent integration.

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THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON UNIVERSITY LIBRARY IMPROVEMENT

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Abstract
With the increasing focus in enhancing supply university library management chain through use of the rapid development of Information and Communication Technology, library professionals are seeking to develop and organize strategic, efficient and world-wide information technology resources control system for its use. In order to promote such global information technology resource control system, which are also compatible with sustainability objectives, university libraries need to develop and implement effective systems both professionally and collectively in present era. In the presented study are information communication technology has bigger impact on information technology resources from terms of efficiency, ease of accessing information and accuracy thereby affecting organizational use and performance.

Keywords: Information and communication technology, Networks, Internet, OPAC, Software, Hardware, Library Services.

Introduction

Information Technology is a generic term that completes the acquisition, processing, storage and dissemination of information. It involves the application of computers and information communication technology in the task of information handling, information and information flow from the generation to the utilization levels. It is restricted to systems dependent on microelectronics based combination of computers and telecommunication technologies. The information technology is the boon for mankind. It gives accessibility to information at fingertips. There has been discussion on Information highways and high tech libraries. The promising and diversified possibilities of information technology have reduced the space and time between the people, countries, continents and ultimately have led to the emerging concepts Global Society and Global Village. Hence it is essential to give a users eye view of information technology and its changing trends in relation to library services and information applications.

Definition of ICT

Stands for "Information and Communication Technologies." ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums. In the past few decades, information and communication technologies have provided society with a vast array of new communication capabilities. For example, people can communicate in real-time with others in different countries using technologies such as instant messaging, voice over IP (VoIP), and video-conferencing. Social networking websites like Facebook allow users from all over the world to remain in contact and communicate on a regular basis. Modern information and communication technologies have created a "global village," in which people can communicate with others across the world as if they were living next door. For this reason, ICT is often studied in the context of how modern communication technologies affect society.

Historical Background of Information Technology

Information Technology as a technical support for human thinking and communication has been evolving over thousand of years. New developments have been rapid over the last few decades. It is only recently that the term has been used as a collection term for the whole spectrum of technologies providing the ways and means to acquire, store, transmit, retrieve and process information. According to Manfred Kochen, any technology develops in three stages In the first stage, technology enables us to do things, that we have been doing, but to do them better, cheaper and faster. In the second stage, technology provides new capabilities and enables us to do things that we had not been able to do previously. And in the third stage, technology becomes an integral part of our activities; it affects the way we do things and changes our life style. Development in computer and communication technology has brought a new dimension to the program of information handling. The introduction of microprocessor and microcomputers has made thing easier. All these developments facilitate better and quicker services to the user.

The earliest form of communication was visual signaling with smoke, flags or lamps, etc. However, in the eighteenth century a revolution in communications begin with the development some crude techniques. In 1947, William Watson demonstrated that electricity could be transmitted over a two-mile wire using an electrostatic

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source. Nearly one hundred years later Wheatstone in England and Morse and Vial in USA implemented the first practical telegraph systems. Morses system becomes widely used. Underwater cables could be constructed after the discovery of Gupta-Percha and a permanent cable was laid between the USA and Great Britain in 1886.

Modern telecommunications began in 1876, with the invention of the telephone by Alexander Graham Bell crude electromagnetic devices converted voice to and from electrical signals that could be sent over copper wires from place to place. Initially human operators enabled manual selection of destinations, switching functions that become the heart of telephone network. Electromagnetic relay switches of increasing sophistication were developed, but since 1947, when Bell Telephone Laboratories invented the transistor, which in term spawned the integrated circuits, switches have become electronic with steadily increasing speed.

By the second half of the twentieth century the development of cables with substantially increased capacities and the application of fiber optics as well the microwave transmission of television signals in connection with satellite technology, meant to a wide variety of signals could be sent around the world instantaneously. In the above mentioned technologies, analog representations of information have been rapidly giving way to digital, offering higher quality and performance. A revolution is also occurring in the customer premises equipment from the simple telephone to multi-function terminals, personal computers and workstations.

Advent of Computer Technology (CT), Information Technology and communication technology has revolutionized the activities of library and information system. The hi-tech enables the user to access the required information in no time. Especially the advent of telecommunication technology and the tremendous speed, with which it is changing, require adaptability to change in present information society. Hence, it should be essential element in professional preparation of future library and information science personnel. The concept of digital library has emerged as synonymous to future library which largely works with an ever shifting arrays of parts and allies instead of acquiring large number of documents and employing people to process them.

The Internet

Internet is truncated version of internetworking, which refers to interconnecting two or more computer networks. A computer network is interconnection of autonomous computing systems through communicating systems through a communication media. The major goals of networking are to felicitate resource sharing and communication among users connected to hosts. Internet, being network of networks, has the same major goals and spans across the entire globe, compared to limited geophysical area covered by local area and wide area networks. Consequently, the Internet can be thought of as vast pool of computers, people and information spread across the entire world.

Concepts of Computer Networks

Computer networks are described and categorized many ways. One way of describing is the way computers or nodes are connected, (centralized and non-centralized networks). Another method is in terms of the physical or geographical location of the Nodes, (LANs and WANs). Networks may use circuit or message switching or both. The modem telephone network is of this kind and has been used extensively for data transmission. The network contains many switching nodes. A local switching node can connect local terminals to a local computer, thus there need not be as many computer ports as terminals. For longer distances, connections (called trunks) between switching centers can be used. Trunks may be used by many different terminals on different occasions. Transmission facilities between centers may be multiplexed, so that they can carry many simultaneous communications. One of the important methods of describing networks is in terms of the physical or geographical location of the nodes. The two basic types of such networks are known as Local Area Networks (LANs) and Wide Area Networks (WANs).

- Local Area Networks: A local area network is private communications network connecting two more computers directly by a cable within a limited local area, such as room, a building or a cluster of buildings LANs vary in the types and numbers of computers that can be connected, the speed at which data can be transferred, and types of software used to control the network. The basic benefit of a LAN is that it reduces hardware costs because several computers and uses can share peripheral devices. Users can also share data and software. The LANs have horizontal topologies in the form of star configuration, bus configuration, ring configuration etc.
- Wide Area Networks: A Wide Area Network (WAN) consists of two or more computers that are geographically located in distance places and are linked with by communication channels, such as telephone

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lines or microwave relays system. They often use vertical topologies, including the hierarchical and mesh topologies.

- Metropolitan Area Network (MAN): These Networks are used to interconnect LANs that are spread around a city. MAN is a high speed network that can carry voice data and images at up to 200 Mbps or faster over distance of up to 75km. A MAN can include one or more LAN as well as telecommunication equipment such as microwave or satellite relay station. It is smaller than WAN.
- Intranet: Intranet can be designed as a network connecting an affiliated set of clients using standard Internet protocols, especially TCP/IP and HTTP. Another definition of an Intranet would be that an IP-based network of notes behind a firewall, or behind several firewalls connected by secure, possibly virtual, networks.
- Extranet: Extranet is an acronym for extended intranet. An extranet is a network that links business partners to each other over the internet by providing access to certain area of one another corporate intranets. It can be defined as a business to business intranet that allows limited, controlled, secure access between a company's intranet and designated, authenticated users from remote locations or in other words an intranet that allows controlled access by authenticated parties.

Impact of Information Communication Technology on University Library Structure

A right type of planning is vital for the efficient working of a library. Planning of a library organizational structure requires a through understanding of need of the users, objectives and functions of a library or information center. The emergence of information technology provided greater impetus for information transfer at both inter and intra-organizational level. Organization of all types become involved with information communication technology and have implemented, Information Technology based systems. Information Technology will decrease the human work and alters the existing organization structures.

Impact of Information Technology on Technical Services

The Technological developments, which seem to have had the widest impact to date on technical services in libraries, are the growth and developments of bibliographic utilities and the more recent development of integrated automated local systems. Bibliographic utilities have prospered in large part because of the role they play in cataloguing. Automation, in the form of bibliographic utilities and MARC format, has revolutionized the practice of cataloguing. To-days librarians rely on MARC format to provide proper cataloguing services to their users. On-line Public Access Catalogue (OPAC) can substantially reduce the cost of maintaining a catalogue. Many paper files can be eliminated and decentralization is possible because, staff can access the on-line files, wherever a terminal is located. If the OPAC is integrated with other technical service files in a full function automated system, work throughout the department can be streamlined and reorganized. The impact on staff responsibilities and assignments can be significant.

Serials automation has proceeded more slowly than that of other technical services operations. The undertaking has been difficult, complex and frustrating. But after the quick proliferation of IT, successful implementation of automated serials control, including check-in, claiming, binding control and routing of materials has become more feasible. Collection development may be treated as part of public services or as part of technical services. It may be carried out within the acquisitions department or in a separate unit. Regardless of the organizational arrangements, libraries, who select materials for the collection use a variety of bibliographic tools automation has made available many of these tools in machine readable format and offered new ways of monitoring collection development and management activities. Co-operative collection development and management have become increasingly important in libraries due to tight budgets, rises prices and the information explosion. Bibliographic utilities facilitate these efforts through shared holdings, information and automated interlibrary loan subsystems to speed resource sharing.

Impact of Information Technology on Public Services OPAC

Which provided speedy on-line access to all the library's holding by means of a computer terminals, are affecting library operations as powerfully as has the appearance of bibliographic utilities and automated regional networks. OPACs serving either a single institutions are now wide spread and continue to be implemented in libraries across the country. Now optical technologies make possible and affordable the mounting of CD-ROM public catalogues at standalone microcomputer stations an operational reality in virtually any library. Advances in library automation also made possible the rapid development of union lists of serials, arranging holding information for a number of libraries. Library networks made available a central agency that could assemble, merge, and maintain the bibliographic and holding information of other libraries. The development of technology has provided significant improvements in resource sharing, especially in interlibrary loan operations.

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As in technical services, public services operation have experienced movement of the more routine functions to lower level of staff, as a result of library automation. The verification of bibliographic citations has often become routine and is handled as ready reference searching by support staff. The new emphasis on access to sophisticated information sources has placed new demands on the librarians. Therefore librarian often expected to train and advise patrons in their use.

Concepts of Hardware

Equipment that makes of the hardware of computer communication systems, are bridge, gateway, network interface card, terminals, modems or acoustic couplers, and hubs. Bridge: Consists of a computer with two or more network interface cards connecting two different types of networks. For example, one interface card might connect to an Ethernet System, while a second card connects to a Token Ring System. These two systems speak two entirely different data languages that is recognized by the other. Gateway: Is used when simply transferring data between networks is not enough. Some network systems (in particular mainframe or minicomputers- based systems) require specific instructions on how data is to be managed once it is received onto the network. A gateway is also required when connecting two or more networks that are running on top of different Operating System (OS). Network Interface Card: It is the key component of the network workstation. Its chief purpose is to send data out onto the network and receive data sent to the workstation in which it resides. Each network card is manufactured with a unique, permanent electronics address.

The licensing system allows the manufacturer to encode a unique address on the card. This licensing system ensures that no address is ever duplicated. Terminals: A device that allows users to transmit data to, and receive data from computer or other information- processing machines. Terminals designed for interactive applications can be categorized in a number of ways. With respect to their electronic circuitry, terminals can be categorized as dumb, smart, or intelligent. Modem: is an interface unit that enables a computer or a terminal to transmit and receives data using ordinary telephone lines. It stands for modulator demodulator. Two modems, one for each computer, are needed to computer communication over telephone lines. Modem changes computer or terminal generated digital signals to analog signals, so that the data can be transmitted over voice based telephone line. Electric signals generated by a terminal are modulated to make sounds similarly to those we hear on a voice telephone. After reaching its destination, the analog signal is demodulated by another modem to computer understandable digital signals. Modems are necessary only when an analog communication channel that is normal telephone lines are used. For transmission media than telephone lines, the modem is not required. There are two types of modems such as direct-connected modems and acoustic couplers. A direct connected modem is a hard-wired device that plugs directly into a modular telephone jack. Acoustic coupler modem uses a pair of rubber cups that fit over a traditional telephone handset to send and receive signals through mouth-piece and ear-piece. It changes digital signals into sounds that are emitted into a telephone receiver, cradled in rubber cups. Hubs: Are used to interconnect the terminals and servers. All the networks (Except those using coaxial cable) requires a central location to bring media segments together. These central locations are called hubs. A hub organizes the cable and relays signals to the media segments.

Conclusion

Information Communication Technology has not left any human activity untouched with its influence. The information technology (IT) tools like computers and communication have added new dimension in information handling in libraries. New technologies supplement the older ones and form together with a complex of technologies, which allows for choosing a certain technology for a certain application from a broad variety of technologies for certain application from a broad variety of technologies. The largest single factor, which has caused changes, if any in the library and information services, is Information Technology. It has made it possible to introduce new services, revolutionize many existing services by providing new media, by increasing speed and efficiency of processing and retrieval, by over coming distance and communication barriers and so on.

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COMPARATIVE STUDY OF GENERAL INTELLIGENCE AMONG STUDENTS OF TEACHER TRAINING COURSES AND UNDER GRADUATES OF FIROZABAD (UP)

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ABSTRACT
The purpose of the present study was to compare the General Intelligence among students of teacher training courses (B.ed & B.P.ed) and undergraduates of A.K.College. For the purpose of the study 30 students of teacher training courses (B.Ed & B.P.Ed) and 30 undergraduates (B.A, B.Com, B.Sc.) of A.K.College were selected randomly as subjects for this study. According to the records their age ranged between 18 to 26 years. Keeping the feasibility criterion in mind, the General Intelligence variable was selected for the present study. Test of General Intelligence for College Students by Misra and Pal was employed to conduct the study. T-test was used to analyse the data. And the level of significance was set at 0.05 level. The findings of the study showed that students of teacher training courses (B.Ed & B.P.Ed) differ significantly with respect to undergraduates as the obtained t-value is 2.87 was found statistically significant.

Keywords: General intelligence, Teacher training.

INTRODUCTION
Intelligence is the mental abilities of a person to learn from experience, adapt to new situations, understand and handle abstract concepts and use knowledge to manipulate one's environment. Man is bestowed with certain mental abilities which make him a rational being. He can reason, understand and adapt himself to new situations. Man, by using his mental power is superior to all other living beings but differences of mental powers do persists within human family. Some can grasp and learn quickly whereas others are slow in learning.

Nature of intelligence has been a great psychological scandal, psychologists try to measure intelligence and teachers try to cultivate intelligence but none seems to know precisely what intelligence is. It is a behaviour determining attribute. It is an inference drawn from the behaviour. Different psychologists have defined intelligence in different ways. Terman said that an individual is intelligent in proportion to his ability to carry on abstract thinking. According to Thorndike intelligence consists in the capacity for mere association or connection. Intelligence is not unitary but in comprises abilities.

The purpose of the present study was to derive an answer to the question whether there is any significant difference between the General Intelligence variables among students of teacher training courses (B.ed & B.P.ed) and undergraduates. The research scholar has tried to do this with the help of Test of General Intelligence for College Students by Misra and Pal.

OBJECTIVES OF STUDY
1. To study the general intelligence of degree college students.

2. To compare the general intelligence of teacher training courses and under graduates of Firozabad.

HYPOTHESES OF THE STUDY
There will be no significant mean difference in the general intelligence of teacher training courses and under graduates of Firozabad.

METHODOLOGY
For the purpose of the study, study 30 students of teacher training courses (B.Ed & B.P.Ed) and 30 undergraduates (B.A, B.Com, B.Sc.) of A.K.College were randomly selected as subjects for this study. The subjects were regular students of the college . Keeping the feasibility criterion in mind the General Intelligence variable was selected for the present study. It was assessed with the help Test of General Intelligence for College Students by Misra and Pal.

STATISTICAL ANALYSIS
To assess the general intelligence of teacher training courses and under graduates of Firozabad.; Descriptive statistics (Mean and Standard Deviation) was used and to compare the general intelligence independent t-test was used.

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FINDINGS AND CONCLUSION

The findings pertaining to descriptive statistics, t-test of general intelligence of teacher training courses and under graduates of Firozabad is presented in table no.1 and 2 respectively.

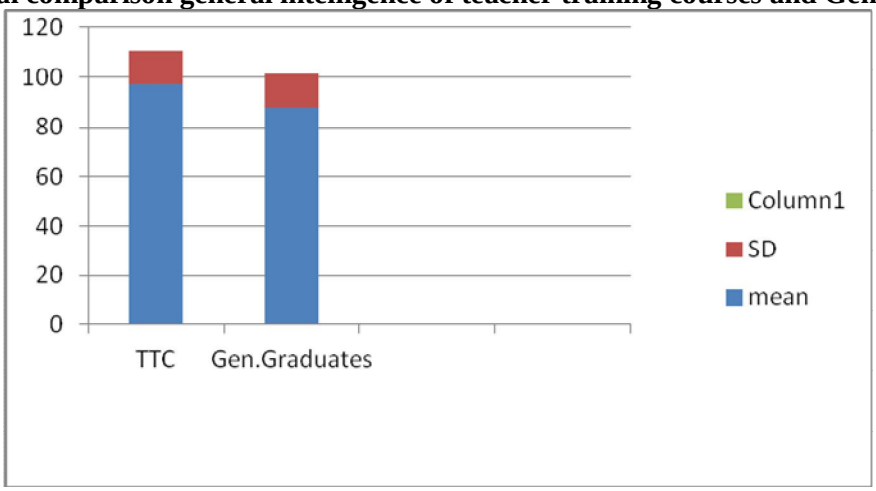
Table-1: Independent t- Table for the data on General Intelligence

Group	Means	S.D.	Mean Diff.	t-value	Sig.(2tailed)/ *p-value*	F-Value
Teacher Training courses	97.26	13.43				
			9.46	2.75	.008	0.392
General Graduates	87.80	13.19				

***significant at 0.05 level.**

- Table 1 reveals that the values of mean and standard deviation for general intelligence of teacher training courses were 97.26 + 13.43 and general graduates were 87.80 + 13.19.
- It can be also seen that the value of t- statistics was 2.75. This t- value was significant as the p- value was .008 which was less than 0.05. Thus, the null hypothesis of equality of means of two groups may be rejected.

Fig-1: Graphical comparison general intelligence of teacher training courses and General graduates.



DISCUSSION

The findings of the research paper explores the significant difference in general intelligence between students of teacher training courses and General graduates. The possible reasons for this development may be: students of teacher training courses (B.P.Ed & B.Ed) were more mature and they come through entrance process. Moreover their used to prepare for competatative exams that explore their general intelligence level too.

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ROLE OF E-COMMERCE TECHNOLOGIES IN BANKING INDUSTRY IN INDIA

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ABSTRACT
Online Banking is becoming an important aspect of worldwide commerce. Online banking is also known as e-banking, cyber banking, virtual banking, net banking & internet banking. Online banking includes various banking activities conducted from home business instead of at a physical bank location customer relationship management worked as a tool increased use of e-commerce makes CRM. Online banking is based on internet or web based integration to create a high volatile relationship in the banking sector. Questions are related to online banking in which given option are satisfied, unsatisfied, neutral, yes, no. After analysis and comparison of tradition banking of online banking it is revealed that it is quite difficult, if not impossible, to suggest that which online banking is best. Online banking provides the flexibility, efficiency of work, provide the better security of net banking than net banking increased. The future of web based e-banking in developed area appears bright but customers and merchant in developing countries face in number of barriers to successful e-banking, including less reliable telecommunication infrastructure and power supply, less access to online payment mechanism and relatively high cost. The future scope of the study of online banking is use reduce transaction cost.

RESEARCH METHODOLOGY
The study is secondary based and analytical in nature. The progress in e-banking in Indian banking industry is measured through various parameters such as computerization of branches, automated teller machines, transaction through retail electronic payment method etc.

I. INTRODUCTION OF E-COMMERCE
E-COMMERCE (ELECTRONIC COMMERCE OR EC) IS THE BUYING AND SELLING OF GOODS AND SERVICES, OR THE TRANSMITTING OF FUNDS OR DATA, OVER AN ELECTRONIC NETWORK, PRIMARILY THE INTERNET. THESE BUSINESS TRANSACTIONS OCCUR EITHER AS BUSINESS-TO-BUSINESS, BUSINESS-TO-CONSUMER, CONSUMER-TO-CONSUMER OR CONSUMER-TO-BUSINESS. THE TERMS E-COMMERCE AND E-BUSINESS ARE OFTEN USED INTERCHANGEABLY. THE TERM E-TAIL IS ALSO SOMETIMES USED IN REFERENCE TO TRANSACTIONAL PROCESSES FOR ONLINE SHOPPING.

ELECTRONIC COMMERCE (E-COMMERCE OR EC) IS AN EMERGING CONCEPT THAT DESCRIBES THE PROCESS OF BUYING AND SELLING OR EXCHANGING OF PRODUCTS, SERVICES, AND INFORMATION VIA COMPUTER NETWORKS INCLUDING THE INTERNET. 1 IT IS THE USE OF THE INTERNET AND THE WEB TO TRANSACT BUSINESS. DOING BUSINESS ONLINE, TYPICALLY VIA THE WEB. IT IS ALSO CALLED "E-BUSINESS," "E-TAILING" AND "I-COMMERCE." ALTHOUGH IN MOST CASES E-COMMERCE AND E-BUSINESS ARE SYNONYMOUS, E-COMMERCE IMPLIES THAT GOODS AND SERVICES CAN BE PURCHASED ONLINE, WHEREAS E-BUSINESS MIGHT BE USED AS MORE OF AN UMBRELLA TERM FOR A TOTAL PRESENCE ON THE WEB, WHICH WOULD NATURALLY INCLUDE E-COMMERCE (SHOPPING) COMPONENT. E-COMMERCE MAY ALSO REFER TO ELECTRONIC DATA INTERCHANGE (EDI), IN WHICH ONE COMPANY'S COMPUTER QUERIES AND TRANSMITS PURCHASE ORDERS TO ANOTHER COMPANY'S COMPUTERS.

THE STATE-OWNED VIDESH SANCHAR NIGAM LIMITED (VSNL) LAUNCHED INTERNET SERVICES IN INDIA IN AUGUST 1995. FOR THE FIRST FOUR YEARS, VSNL WAS THE SOLE PROVIDER OF INTERNET SERVICES IN THE COUNTRY. IN THE FIRST YEARS, BROADBAND USAGE IN INDIA WAS GROWING 20% PER MONTH, ACCORDING TO THE INTERNET SERVICE PROVIDERS ASSOCIATION OF INDIA (ISPAI). THANKS TO THE PROGRESS IN THE PENETRATION OF ICT AND ESPECIALLY, THE BROADBAND POLICY ANNOUNCED IN 1995, THE TERM "BROADBAND" ENTERED THE MASS LEXICON AND MOST INTERNET USERS WERE AWARE OF FASTER INTERNET SPEEDS. IN NOVEMBER 1998, THE GOVERNMENT ENDED VSNL'S MONOPOLY AND ALLOWED PROVISIONING OF INTERNET SERVICES BY PRIVATE OPERATORS. THE TERMS AND CONDITIONS OF THE ISP'S LICENSE WERE UNUSUALLY LIBERAL WITH NO LICENSE FEE AND ALLOWED UNLIMITED NUMBER OF PLAYERS.3 ISPS COULD SET THEIR OWN TARIFFS AND EVEN THEIR OWN INTERNATIONAL GATEWAYS. ACCORDING TO INTERNET AND

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MOBILE ASSOCIATION OF INDIA (IAMAI), A TRADE ASSOCIATION THAT PRESENTS THE ONLINE CONTENT AND ADVERTISING, E-COMMERCE AND MOBILE CONTENT AND ADVERTISING INDUSTRY, INDIAN CITIZENS USE INTERNET FOR A NUMBER OF ACTIVITIES INCLUDING E-MAIL AND IM - 98%, JOB SEARCH - 51%, E-BANKING - 32%, BILL PAYMENT -18%, STOCK TRADING - 15%, AND MATRIMONIAL SEARCH - 15%.

II

A. E-COMMERCE NETWORK MODALS

E-commerce comprises a host of techniques designed to make business more efficient and effective. These techniques provide Banks with a suite of methods which enable them to; improve the conduct of improve relationship with customers business, globally or in new money and capital markets.12 E-commerce and a new term E-business are often used interchangeably and for on line Banking, the term e-tailing is sometimes used. Benefits of E-Commerce to the Bank and its customers –

- Enable companies to reach customers all over the world.
- Enable companies to expand their business as well as increases profits.
- Enable to do business at a low overhead cost4.
- Provides the customers with access to the service 24 hours per day, seven days a week anywhere in the world.
- Enable companies to conduct an auction online business activities are conducted through following methods under the E-commerce13 –

1. Business to Business (B2B)
2. Business to Customers (B2C)
3. Consumer to Business (C2B)
4. Consumer to Customer (C2C)

TRANSACTIONAL WEBSITES

1. Transactional websites provide customers with the ability to conduct transactions through the financial institution's website by initiating banking transactions or buying products and services. Banking transactions can range from something as basic as a retail account balance inquiry to a large business-to-business funds transfer. E-banking services, like those delivered through other delivery channels, are typically classified based on the type of customer they support. The following table lists some of the common retail and wholesale e-banking services offered by financial institutions.

Retail Services	Wholesale Services
Account management	Account management
Bill payment and presentment	Cash management
New account opening	Small business loan applications, approvals, or advances
Consumer wire transfers	
Investment/Brokerage services	Commercial wire transfers
Loan application and approval	Business-to-business payments
Account aggregation	Employee benefits/pension administration

Since transactional websites typically enable the electronic exchange of confidential customer information and the transfer of funds, services provided through these websites expose a financial institution to higher risk than basic informational websites. Wholesale e-banking systems typically expose financial institutions to the highest risk per transaction, since commercial transactions usually involve larger dollar amounts. In addition to the risk issues associated with informational websites, examiners reviewing transactional e-banking services.

COLLECTION OF DATA

Data can be defined as the quantitative or qualitative values of a variable. Data is plural of Datum which literally means to give or something given. Data is thought to be the lowest unit of information from which other measurements and analysis can be done. Data can be numbers, images, words, figures, facts or ideas. Data in itself cannot be understood and to get information from the data one must interpret it into meaningful information. There are various methods of interpreting data. Data sources are broadly classified into primary and secondary data.

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TYPES OF DATA

- **Primary Data**

Data that has been collected from first-hand-experience is known as primary data. Primary data has not been published yet and is more reliable, authentic and objective. Primary data has not been changed or altered by human beings; therefore its validity is greater than secondary data.

- **Secondary Data**

Data collected from a source that has already been published in any form is called as secondary data. The review of literature in this research is based on secondary data. Mostly from books, journals and periodicals.

E- BANKING IN INDIA : AN OVERVIEW

Information Technology has become a necessary tool in today's organizations. Banks today operate in a highly globalized, liberalized, privatized and a competitive environment. In order to survive in this environment banks have to use IT. IT has introduced new business paradigm.1 It is increasingly playing a significant role in improving the services in the banking industry. Indian banking industry has witnessed a tremendous developments due to sweeping changes that are taking place in the information technology. Electronic banking has emerged from such an innovative development. Modern technology is seen as a panacea for most of the ills that the banking sector faces today. Even at present, India is a relative unbanked country as the credit-to-GDP ratio is one of the lowest in the developing economies. So banks are facing the dual challenge of increasing penetration and high growth trajectory.2 The banking industry can kill two birds with one stone that is with help of technology. Tremendous progress took place in the field of technology which has reduced the world to a global village and it has brought remarkable changes in the banking industry. Branch banking in the brick and mortar mode has been transformed into click and order channel mode.

- **E-Banking**

E-banking is the term that signifies and encompasses the entire sphere of technology initiatives that have taken place in the banking industry. E-banking is a generic term making use of electronic channels through telephone, mobile phones, internet etc. for delivery of banking services and products. The concept and scope of e-banking is still in the transitional stage. E-banking has broken the barriers of branch banking.

- **Evolution of e-banking**

E-banking came into being in UK and USA in 1920s. It became prominently popular during 1960s through electronic funds transfers and credit cards.3 The concept of web-based banking came into existence in Europe and USA in the beginning of 1980s. It has been estimated that around 40 percent of banking transaction would be done through Net.

- **E-Banking in India**

In India e-banking is of fairly recent origin. The traditional model for banking has been through branch banking. Only in the early 1990s there has been start of non-branch banking services. The good old manual systems on which Indian Banking depended upon for centuries seem to have no place today. The credit of launching internet banking in India goes to ICICI Bank. Citibank and HDFC Bank followed with internet banking services in 1999.4 Several initiatives have been taken by the Government of India as well as the Reserve Bank to facilitate the development of e-banking in India. The Government of India enacted the IT Act, 2000 with effect from October 17, 2000 which provided legal recognition to electronic transactions and other means of electronic commerce. The Reserve Bank is monitoring and reviewing the legal and other requirements of e-banking on a continuous basis to ensure that e-banking would develop on sound lines and e-banking related challenges would not pose a threat to financial stability. 5

A high level Committee under chairmanship of Dr. K.C. Chakrabarty and members from IIT, IIM, IDRBT, Banks and the Reserve Bank prepared the „IT Vision Document- 2011-17", for the Reserve Bank and banks which provides an indicative road map for enhanced usage of IT in the banking sector.

To cope with the pressure of growing competition, Indian commercial banks have adopted several initiatives and e-banking is one of them.6 The competition has been especially tough for the public sector banks, as the newly established private sector and foreign banks are leaders in the adoption of e-banking. Indian banks offer to their customers following e-banking products and services:

- Automated Teller Machines (ATMs)
- Internet Banking
- Mobile Banking

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- Phone Banking
- Telebanking
- Electronic Clearing Services
- Electronic Clearing Cards
- Smart Cards
- Door Step Banking
- Electronic Fund Transfer

The three broad facilities that e-banking offers are:

- Convenience- Complete your banking at your convenience in the comfort of your home.
- No more Qs- There are no queues at an online bank
- 24x7 service- Bank online services is provided 24 hours a day, 7 days a week and 52 weeks a year.

RECOMMENDATIONS

I. E-banks should create awareness among people about e-banking product & services. Customer should be made literate about the use of e-banking product & services.

II. Special arrangements should be made by banks to ensure full security of customer's funds. Technical defaults should be avoided by employing well trend and expert technicians in field of computer, so that loss of data can be avoided.

III. Employees of banks should be given special technical training for the use of e-banking so that they can further encourage customers to use to same.

IV. Seminar and workshops should be organized on healthy usage of e-banking for specially those who are ATM or computer illiterate.

V. E-banking services should be customizing on basis of age, gender, occupation etc. so that needs and requirements of people are met accordingly.

CONCLUSIONS

The study reviles that there is not much awareness in Indian customers regarding use of e-banking services. But the guidance and persuasion by bankers does promote the use of such services amongst the customers. In order to make e-banking more popular, banks must separates there customers based on demographic priority (i.e. age, gender, occupation etc) and customised e-banking services as per their needs and requirements. Banks are making sincere efforts to popularise the e-banking services and products. Younger generations are beginning to see the convenience and benefits if e-banking. In years to come e-banking will not only be acceptable mode of banking but will be preferred mode of banking.

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2. Book review must contain the name of the author and the book reviewed, the place of publication and publisher, date of publication, number of pages and price.
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EXAMPLES OF REFERENCES

All references must be arranged first alphabetically and then it may be further sorted chronologically also.

- **Single author journal article:**

Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

Bateson, C. D.,(2006), 'Doing Business after the Fall: The Virtue of Moral Hypocrisy', Journal of Business Ethics, 66: 321 – 335

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Raine, A. (Ed.). (2006). *Crime and schizophrenia: Causes and cures.* New York: Nova Science.

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- **Chapter in edited book having one editor:**

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- **Electronic sources should include the URL of the website at which they may be found, as shown:**

Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap

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Uddin, K. (2000). A Study of Corporate Governance in a Developing Country: A Case of Bangladesh (Unpublished Dissertation). Lingnan University, Hong Kong.

- **Article in newspaper:**

Yunus, M. (2005, March 23). Micro Credit and Poverty Alleviation in Bangladesh. *The Bangladesh Observer*, p. 9.

- **Article in magazine:**

Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

- **Website of any institution:**

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