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MODELING ULTRASONIC VELOCITY OF SOME ORGANIC LIQUIDS USING TOPOLOGICAL AND PHYSICO-CHEMICAL DESCRIPTORS

Arvind Kumar*, Vijay K. Agrawal

Abstract:

In this work an attempt has been made to model ultrasonic velocity of 20 organic liquids which are industrially important. In fact physical, thermodynamic, chemical, thermo-acoustical parameters of liquids and liquid mixtures are very important for industry purposes. Therefore, we tried to model the ultrasonic velocity of a set of 20 liquids using physicochemical and topological parameters and found that excellent results are obtained. A four-parametric model containing IR, ST, $^{\circ}\chi$, $2\chi^v$ has been found to be the best and statistically most significant. The model was validated using cross validated parameters and VIF plot.

Keywords: *QSPR Study, Ultrasonic Velocity, Topological modelling, Connectivity indices, Physico-chemical parameters, Organic liquids.*

Introduction:

Ultrasound is a term used for sound waves having frequencies higher than the upper audible limit of human hearing. Therefore, it may be assumed that ultrasound is not different from "normal" (audible) sound in its physical properties, except that without any aid we cannot hear it. In fact ultrasound devices operate with frequencies from 20 kHz up to several gigahertz. Because of its penetrating power it is used to detect objects and measure distances. In medical field it is a powerful tool in diagnostics. Ultrasound imaging or Sonography is a common term, we know. Industrial application of ultrasound is helping in the non-destructive testing of products and structures. It is very effectively used in detecting invisible flaws. It is also used for cleaning, mixing, and accelerating chemical processes. The interesting thing of ultrasonic measurements is that it is one of the simplest and easy method of calculating properties of liquids viz. internal pressure, compressibility etc[1]

Intermolecular reactions are very important in the chemical sciences. Therefore, researches in this area are being conducted successfully. The ultrasonic velocity being one of the important properties of organic liquids, it has wide application in the society and its theoretical estimation may help in the study of organic reactions and properties without performing experiments.

Pandey and co-workers[2-5] have worked on the

theoretical aspect of organic liquid mixtures in the estimation of thermodynamic properties. They have theoretically predicted the change in excess volume of ionic liquids. The study is not limited to single organic molecules rather they have considered the binary, tertiary, ternary ionic mixtures at different temperatures for the study of thermodynamic properties of ionic liquids. .

On the other hand, physico-chemical parameters and other properties of organic molecules have been measured experimentally, as they are very useful to study the reactions. However, it has been found that many physicochemical parameters are inter-correlated. If one is altered the other gets affected [6].

Theoretical chemists and physicists tried to model some of very important properties of organic liquids using mathematical correlations. They were successful in giving excellent models. One of the most commonly modelled property was boiling points of alkanes [7]. The normal boiling point is very important in characterization and identifying organic compounds.

Topological descriptors are very useful in modelling of various properties of organic molecules. They are very simple to calculate. They are associated with atom connectivities and Graph Theory is applied for calculation of various indices [8]. Milan Randic suggested connectivity index for modelling the boiling points long back and since then the Randic indices are being used in modelling various properties of molecules[9]. Similarly Wiener [10], Kier and Hall [11-12], Balaban indices[13,14] are used in combination for obtaining the best mathematical models. They have been found excellent descriptors for theoretical modelling of various properties of organic molecules[15-16].

Agrawal and co-workers have also very successfully modeled some other properties of organic molecules viz, NMR Chemical Shift, estimation of proton-ligand formation constants, estimation of Chromatographic Capacity Factor(Ki), estimation of log P (Lipophilicity), estimation of the edge-shift in X-ray absorption discontinuity by the Hary index(H), binding affinity, prediction of Aqueous Solubility, estimating enthalpy of formation of hydrocarbons[17- 27] etc.

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On the basis of some work already done in the field of theoretical prediction of properties, we have decided to work on the modelling of ultrasonic velocity (UV) of some organic liquids. For this, work we have selected 20 organic compound from the work of Ramdas et al[28].

Methodology Used:

The Mathematical modelling of any property can be theoretically explained if one can get a correlation between the property and calculated descriptors. One can understand this by taking a simple example of straight line equation:

$$Y = mX + C$$

Here, if Y is property and X is a descriptor, the equation is said to be a mathematical linear relationship. Hansch[29] has used this idea while correlating the activity of drug molecules using Hammett and Taft constants as predictors or parameters.

Softwares Used: We have used Chemsketch software from ACD Labs [30] for drawing of structure of molecules. This software also calculates few physicochemical properties which have been used in modelling the ultrasonic velocity of present set of organic compounds.

Dragon: Dragon software[31] has been used for calculating the topological indices of the organic compounds using mol file obtained from Chemsketch Software. This calculates thousands of such descriptors and one has to select some of them as per the suitability of study. Here, the researcher has to use his intuitions also while selecting the descriptors for regression analysis.

NCSS: For obtaining the mathematical models we have used NCSS software[32]. This is a software which is very effectively used in obtaining regression models. The software suggests models, derived on the basis of certain statistical parameters. The models obtained were also tested using the cross-validated parameters.

Results and Discussion:

The experimental value for the ultrasonic velocity at room temperature of various organic compounds are listed in Table 1. Calculated physical chemical parameters using Chemsketch software are reported in Table 2. The physicochemical parameters which are reported in this table are Molecular weight (MW), molar refractivity (MR), molar volume (MV) paracore (PC), Index of refraction (IR), Surface tension (ST), density (D) and polarizability (Pol).

As mentioned earlier, the topological descriptors were calculated using Dragon software and we have chosen Wiener index, Balaban index and Balaban type index along with connectivity indices for calculation for regression analysis. These topological descriptors are calculated from the distance matrix using specific mathematical formulae for different descriptors. The details for calculation of these descriptors are given in the literature [33].

The calculated values are presented in Table 3 (a). The connectivity indices values have also been calculated and they are reported in Table 3(b).

The data was subjected to regression analysis using NCSS software. We have also calculated the correlation matrix for the inter-correlation of the parameters and their correlation with ultrasonic velocity. The same are reported in Table 4. We observed that out of many physicochemical parameters and connectivity indices values only few are effective in modelling the ultrasonic velocity of present set of compounds.

Based on the correlation matrix conclusion may be drawn as below:

(a) A close look at Table 4 reveals that surface tension (ST) is the best correlating parameter for modelling ultrasonic velocity of present set of compounds.

(b) Autocorrelation exists among following set of parameters:

Jhete-Jhetz, Jhete-Jhetm, Jhetm-Jjhetz, Jhetp-Jhetp, Jhetp- $^2\chi^v$, Jhetv- $^2\chi^v$, IR-ST, IR-D, D-ST, $^1\chi^v-^0\chi$, $^1\chi^v-^2\chi^v$. Therefore, their simultaneous use in multivariate modeling is not permitted. Doing so may cause serious defect of chance in the model. However, Randic recommends [34] their simultaneous use as each parameter contains different information content hence, if any one of them is discarded the information contents will also be discarded. He, however, suggested to verify the defect by other methods. Therefore, we followed the Randic recommendation and tested the model as discussed elsewhere.

One-parametric model:

Out of 12 one-parametric model one which gave statistically best value, contains ST as parameter. The R^2 value for this model comes out to be 0.8204.

$$UV = 18.4823(\pm 2.0385)ST + 66.8607 \dots \dots \dots (1)$$

$$N=20, Se = 0.856, R^2 = 0.8204, Adj R^2 = 0.8104,$$

$$F\text{-ratio } 82.207, Q = 10.5813$$

Here and hereafter N is number of compounds, Se is error of estimation, R^2 is square value of correlation coefficient, Adj R^2 is adjusted R^2 , Q is Pogliani's Quality Factor[35,36] which is ratio of R/Se. Higher the value of Q better will be the proposed model.

Two-parametric model:

To obtain better R^2 value, two-parametric models were tried by adding one more parameter in the above model. Better values were observed with D, IR, Jhetz and Jhetm. But on the basis of highest R^2 value and adjusted R^2 we obtained the best two-parametric model containing Jhetm and ST as correlating parameter. The model is as below:

$$\begin{aligned} UV &= -57.6916(\pm 20.7898) J_{hetm} \\ &+ 19.4583(\pm 1.7753) ST + 73.941 \dots \dots \dots (2) \\ N &= 20, Se = 0.0731, R^2 = 0.8764, \\ Adj R^2 &= 0.8618, F\text{-ratio } 60.255, Q = 12.8066 \end{aligned}$$

Addition of J_{hetm} to ST gives better value of R^2 . The value changes from 0.8204 to 0.8764. The value of $Adj R^2$ also shows a drastic improvement (changes from 0.8104 to 0.8618 which clearly indicates that the addition of J_{hetm} parameter is justified.

To obtain a better model, we have tried three-parametric model by adding one more parameter into two-parametric model.

Three-parametric model:

In doing so, we obtained three sets of models with improved R^2 values. One contains J_{hetp} , J_{hetv} , ST as correlating parameters, the other contains D , J , J_{hetz} and the third contains D , J , J_{hetm} . Interestingly the best three-parametric model retained only J_{hetm} . Though the model with ST is giving better value of R^2 as compared to two-parametric model but out of three the best model contains D , J and J_{hetm} as correlating parameter. The value of R^2 changes from 0.8764 to 0.9206 which is very significant improvement. Similarly, $Adj R^2$ changes from 0.8618 to 0.9057 showing that the three-parametric model is certainly better than two-parametric model and the parameters associated with this model have their fair share in the model.

On the basis of statistical parameters the best three parametric model is as below:

$$\begin{aligned} UV &= 1437.7082(\pm 115.0670) D \\ &+ 288.7921(\pm 48.0726) J - 278.8093 \\ &+ 25.8385 J_{hetm} + 18.5572 \dots \dots \dots (3) \\ N &= 20, Se = 0.0604, R^2 = 0.9206, Adj R^2 = 0.9057, \\ F\text{-ratio } &61.817, Q = 15.8854 \end{aligned}$$

The Q value also changes from 12.8066 to 15.8854. This also shows that the quality of model is improved.

Four-parametric model:

To still obtain a better model, we tried four-parametric model. The regression analysis resulted 4 such models in which R^2 value shows significant improvement. All these models are given in Table 4. When IR , ST , ${}^0\chi$, ${}^2\chi^v$ have been taken together a four-parametric model with $R^2 = 0.9509$ is obtained which is better than all the four parametric models tried.

The R^2 value changes from 0.9203 to 0.9509 clearly shows that the model below is the best among all the models obtained during the study. The model is reported below:

$$\begin{aligned} UV &= 19.5838(\pm 1.8426) ST - 1417.6647(\pm 395.1336) IR \\ &+ 119.6131(\pm 24.4546) {}^0\chi - 184.1020(\pm 39.8729) \\ &{}^2\chi^v + 493.2593 \dots \dots \dots (4) \\ N &= 20, Se = 0.049, R^2 = 0.9509, Adj R^2 = 0.9378, \\ F\text{-ratio } &72.593, Q = 19.9008 \end{aligned}$$

Since, the number of compounds in the study are

limited to 20, no higher parametric model is allowed as per Rule of Thumb. Therefore, we did not attempt higher parametric models.

On the basis of statistical parameters the four-parametric model containing ST , IR , ${}^0\chi$, ${}^2\chi^v$ is the best among all the models.

To establish this fact we have estimated ultrasonic velocity values employing model 4 for the compounds used in the present study. The observed and estimated values obtained using this model are presented in Table 7. The estimated values are in good agreement with the observed values showing that the Model 4 can be used for estimating the Ultrasonic Velocity of present set of compounds.

A graph is plotted between observed and estimated values which is presented in Fig1, The quality of this model is studied with the trend line in this graph which has a R^2 value equal to 0.950 showing that 95% variance is explained by the proposed model 4.

The model is free from the defect of collinearity:

The proposed model is free from the defect of collinearity [37] has to be established. For this purpose VIF (variance inflation factor) plays an important role. If the value of VIF is more than 10 that means the model suffers from the defect of collinearity. In Table 8 we have summarized all the values calculated for this factor. For the model proposed the value of VIF is less than 10 which means that proposed model is free from the defect of collinearity.

Likewise, if Eigen values λ is greater than 5 then model suffers from collinearity. For this also, we observed that the values are less than 5. Another test for collinearity is condition number(k). If its value comes out to be more than 100 then the collinearity exists, but the values reported in this table indicates that the values are always less than 100. The tolerance value (T) equal to 1 or less indicates absence of collinearity. The Ridge trace and VIF trace also show that the model 4 is free from the defect of collinearity. Therefore, we conclude that the proposed model is free from any defect of collinearity .

Cross validated parameters:

Cross-validation provides the values of PRESS, SSY, S_{PRESS} , R^2_{CV} and PSE from which we can investigate the predictive power of the proposed model. It is argued that PRESS is a good estimate of the real prediction error of the model and if it is smaller than SSY the model predicts better than chance and can be considered "statistically" significant. Furthermore, the ratio PRESS/SSY can be used to calculate approximate confidence intervals of prediction. To be a reasonable QSPR model PRESS/SSY should be smaller than 0.4 and the value of this ratio smaller than 0.1 indicates an excellent model. Also, if PRESS value is

transformed in a dimension less term by relating it to the initial sum of squares, one obtain R^2_{CV} i.e. the complement to the traces of unexplained variance over the total variance. Thus, PRESS and R^2_{CV} have good properties.

We have also calculated the cross validated parameters [38,39] for the proposed models which are reported in Table 6.

For the best model(IR, ST, ${}^0\chi$, ${}^2\chi^v$) the cross validated parameters comes out to be PRESS/SSY=0.0588, R^2_{CV} =0.9412, SPRESS=67.9486 and PSE=58.8452. Hence, This model is having highest R^2_{CV} value among all the proposed models and also all other parameters are in favour of this model. Hence, this model is the best model for modeling the Ultrasonic velocity of present set of organic compounds.

Table 1. Compounds used in the present study and their Ultrasonic velocity.

Sl. No	Name of Compd.	Ultrasonic Velocity (UV) in M/Sec.(at room temp.)
1	Methanol	1143
2	Ethylene Glycol	1644
3	Heptane	1138
4	Glycerine	1904
5	Octane	1171
6	Phenol	1274
7	Acetic acid	1584
8	Acetone	1190
9	Chloroform	0995
10	Pentane	1044
11	Ethanol	1144
12	Benzene	1295
13	Toluene	1275
14	Glycerine	1904
15	Butanol	1228
16	Pentanol	1256
17	Methyl propanol	1110
18	Heptanol	1305
19	Propanol	1190
20	Hexanol	1283

Conclusions: We draw following conclusions from this study

1. The ultrasonic velocity can be modeled using physicochemical and topological parameters for the compounds under present study.
2. The IR and ${}^2\chi^v$ have negative coefficients showing that they play negative role towards Ultrasonic Velocity(UV)
3. The coefficients of ST and ${}^0\chi$ are positive thus they have positive role towards ultrasound velocity.

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Table 2 : Values of calculated physico-chemical descriptors for the compounds used in the present study.

S. No.	MW	MR	MV	PC	IR	ST	D	POL
1	32.041	8.21	42.53	88.64	1.31	18.83	0.753	3.25
2	62.067	14.38	56.53	145.14	1.422	43.43	1.097	5.7
3	100.2	34.47	144.03	310.64	1.394	21.63	0.695	13.66
4	92.093	20.51	70.93	199.04	1.489	61.93	1.298	8.13
5	114.23	39.11	160.53	350.44	1.402	22.63	0.711	15.5
6	94.111	28.13	87.83	222.24	1.553	40.93	1.071	11.15
7	74.078	17.51	72.63	173.34	1.397	32.33	1.019	6.94
8	58.079	15.97	75.13	156.54	1.345	18.83	0.772	6.3005
9	119.38	21.18	79.53	184.64	1.445	28.93	1.5	8.39
10	72.148	25.21	111.03	231.04	1.371	18.73	0.649	9.99
11	46.068	12.84	59.03	128.4	1.354	22.33	0.78	5.09
12	78.111	26.25	89.43	207.24	1.498	28.83	0.873	10.4
13	92.138	31.07	105.73	244.94	1.499	28.83	0.871	12.32
14	92.093	20.51	70.93	199.04	1.489	61.93	1.298	8.13
15	74.121	22.11	92.03	208.04	1.395	26.03	0.805	8.76
16	88.148	26.74	108.53	247.84	1.407	27.13	0.811	10.6
17	74.121	22.07	92.43	205.44	1.393	24.33	0.801	8.75
18	116.2	36.01	141.53	327.34	1.422	28.53	0.82	14.271
19	60.095	17.48	75.53	168.24	1.379	24.53	0.795	6.9305
20	102.17	31.38	125.03	287.54	1.415	27.93	0.816	12.44

Table3(a) : Values of calculated topological descriptors for the compounds used in the present study.

S. No.	W	J	JhetZ	Jhetm	Jhetv	Jhete	Jhetp
1	1	1	1.333	1.332	0.512	1.327	0.455
2	10	1.975	2.291	2.29	1.296	2.286	1.19
3	56	2.447	2.447	2.447	2.447	2.447	2.447
4	31	2.754	3.088	3.087	1.958	3.083	1.823
5	84	2.53	2.53	2.53	2.53	2.53	2.53
6	42	2.123	3.141	3.141	2.651	3.14	2.571
7	18	2.54	3.129	3.129	2.136	3.125	2.009
8	9	2.324	2.963	2.962	2.342	2.96	2.249
9	9	2.324	6.584	6.859	2.324	2.941	2.878
10	20	2.191	2.191	2.191	2.191	2.191	2.191
11	4	1.633	1.868	1.867	1.111	1.864	1.027
12	31	2.754	3.088	3.087	1.958	3.083	1.823
13	42	2.123	3.021	3.021	3.021	3.021	3.021
14	18	2.54	3.006	3.005	1.6	2.999	1.461
15	20	2.191	2.29	2.29	1.886	2.289	1.822
16	35	2.339	2.411	2.411	2.106	2.41	2.055
17	18	2.54	2.674	2.673	2.141	2.672	2.059
18	84	2.53	2.572	2.572	2.385	2.572	2.351
19	10	1.975	2.122	2.122	1.57	2.12	1.492
20	56	2.447	2.501	2.501	2.266	2.501	2.224

Table3(b) : Values of calculated topological descriptors for the compounds used in the present study.

S. No.	${}^0\chi$	${}^1\chi$	${}^2\chi$	${}^3\chi$	${}^0\chi^v$	${}^1\chi^v$	${}^2\chi^v$	${}^3\chi^v$
1	2	1	0	0	1.447	0.447	0	0
2	3.414	1.914	1	0.5	2.309	1.132	0.447	0.1
3	5.536	3.414	2.061	1.207	5.536	3.414	2.061	1.207
4	4.992	2.808	1.922	1.394	3.333	1.707	1.019	0.421
5	6.243	3.914	2.414	1.457	6.243	3.914	2.414	1.457
6	5.113	3.394	2.743	1.894	3.834	2.134	1.336	0.756
7	4.284	2.27	1.802	0.816	3.063	1.488	0.747	0.302
8	3.577	1.732	1.732	0	2.908	1.204	0.908	0
9	3.577	1.732	1.732	0	3.979	1.964	2.227	0
10	4.121	2.414	1.354	0.707	4.121	2.414	1.354	0.707
11	2.707	1.414	0.707	0	2.154	1.023	0.316	0
12	4.992	2.808	1.922	1.394	3.333	1.707	1.019	0.421
13	5.113	3.394	2.743	1.894	4.387	2.411	1.655	0.94
14	4.284	2.27	1.802	0.816	2.626	1.241	0.663	0.163
15	4.121	2.414	1.354	0.707	3.569	2.023	1.077	0.512
16	4.828	2.914	1.707	0.957	4.276	2.523	1.431	0.762
17	4.284	2.27	1.802	0.816	3.732	1.879	1.576	0.365
18	6.243	3.914	2.414	1.457	5.69	3.523	2.138	1.262
19	3.414	1.914	1	0.5	2.861	1.523	0.724	0.224
20	5.536	3.414	2.061	1.207	4.983	3.023	1.784	1.012

Table 4. Correlation matrix for the inter correlation of the structural descriptors and their correlation with ultrasonic velocity (UV).

	UV	Jhete	IR	D	ST	JhetZ	Jhetm	Jhetv	Jhetp	J	${}^0\chi$	${}^1\chi^v$	${}^2\chi^v$
UV	1												
Jhete	0.4693	1											
IR	0.5994	0.6914	1										
D	0.6436	0.6129	0.7949	1									
ST	0.7642	0.6273	0.8475	0.9586	1								
JhetZ	0.3346	0.9564	0.7057	0.6851	0.6461	1							
Jhetm	0.3287	0.9575	0.7018	0.6793	0.6395	0.9996	1						
Jhetv	-0.1449	0.5034	0.3399	-0.0568	-0.0256	0.5199	0.5224	1					
Jhetp	-0.2345	0.4703	0.3594	0.0117	-0.0015	0.5455	0.5480	0.9744	1				
J	0.3721	0.6284	0.3631	0.2965	0.3507	0.5816	0.5848	0.2281	0.1850	1			
${}^0\chi$	0.2883	0.5030	0.5414	0.0767	0.2215	0.4290	0.4322	0.7281	0.6458	0.5815	1		
${}^1\chi^v$	-0.1336	0.1136	0.2781	-0.1900	-0.0956	0.1272	0.1340	0.7336	0.7231	0.2961	0.8202	1	
${}^2\chi^v$	-0.2766	0.2280	0.2917	-0.0704	-0.0633	0.3273	0.3327	0.8074	0.8525	0.3459	0.7296	0.9067	1

Table5. Quality of statistical parameters for different models obtained for the present set of compounds..

S. No.	Parameters	Ai	B	Se	R ²	R ² Adj	F Ratio	Q= R/Se
1	Jhete	209.2643 (±114.7773)	300.805	0.1855	0.1559	0.109	3.324	2.1285
2	IR	1890.0074 (±894.7795)	1270.741	0.1808	0.1986	0.1541	4.462	2.4649
3	D	613.3804 (±219.7030)	206.2633	0.1687	0.3022	0.2634	7.794	3.2586
4	ST	18.4823 (±2.0385)	66.8607	0.0856	0.8204	0.8104	82.207	10.5813
5	JhetZ	-9.5728 (±59.3950)	174.099	0.2018	0.0014	0	0.026	0.1854
6	Jhetm	-12.5469 (±56.2453)	166.8314	0.2017	0.0028	0	0.05	0.2623
7	Jhetv	-70.6245 (±103.3492)	216.8603	0.1994	0.0253	0	0.467	0.7978
8	Jhetp	-104.2089 (±92.7778)	192.6601	0.1952	0.0655	0.0136	1.262	1.3111
9	J	207.6153 (±140.2112)	322.2682	0.1907	0.1086	0.0591	2.193	1.7281
10	⁰ t	26.8649 (±54.0721)	245.9929	0.2006	0.0135	0	0.247	0.5792
11	¹ t ^v	-72.9067 (±64.3120)	142.6829	0.1951	0.0666	0.0148	1.285	1.3228
12	² t ^v	-134.7585 (±84.1488)	118.3475	0.1889	0.1247	0.0761	2.565	1.8694
13	D	-357.5742 (±152.8456)	95.88	0.0766	0.8641	0.8481	54.054	12.1354
	ST	23.4365 (±2.7951)						
14	IR	-1217.4489 (±505.6776)	670.7278	0.0761	0.866	0.8503	54.954	12.2285
	ST	22.3938 (±2.4332)						
15	JhetZ	-60.2963 (±22.0766)	75.7762	0.0734	0.8752	0.8605	59.584	12.7455
	ST	19.5114 (±1.7888)						
16	Jhetm	-57.6916 (±20.7898)	73.941	0.0731	0.8764	0.8618	60.255	12.8066
	ST	19.4583 (±1.7753)						
17	Jhetp	-480.9466 (±145.2580)	91.2849	0.0675	0.9006	0.882	48.346	14.0593
	Jhetv	460.5078 (±157.8606)						
	ST	17.1952 (±1.6484)						
18	D	1444.8119 (±119.2236)	121.9986	0.0622	0.9158	0.9	57.994	15.3854
	J	304.3778 (±49.9989)						
	JhetZ	-296.9190 (±28.4535)						
19	D	1437.7082 (±115.0670)	118.5572	0.0604	0.9206	0.9057	61.817	15.8854
	J	288.7921 (±48.0726)						
	Jhetm	-278.8093 (±25.8385)						
20	IR	-1700.0516 (±477.6601)	572.4076	0.0548	0.9387	0.9224	57.431	17.68
	ST	21.5955 (±1.7668)						
	Jhete	191.4203 (±57.6034)						
	Jhetm	-73.8361 (±19.1813)						
21	IR	-1700.4892 (±477.6510)	572.3932	0.0548	0.9387	0.9224	57.433	17.68
	ST	21.5983 (±1.7666)						
	Jhete	197.0029 (±58.2953)						
	JhetZ	-79.4184 (±20.6309)						
22	IR	-2233.6473 (±436.6313)	533.2897	0.0521	0.9445	0.9297	63.816	18.6536
	ST	19.6025 (±1.9766)						
	⁰ t	213.9916 (±46.6171)						
	¹ t ^v	-220.3386 (±53.2163)						
23	IR	-1417.6647 (±395.1336)	493.2593	0.049	0.9509	0.9378	72.593	19.9008
	ST	19.5838 (±1.8426)						
	⁰ t	119.6131 (±24.4546)						
	² t ^v	-184.1020 (±39.8729)						

Table 6. Cross validated parameter for the models

S.No.	Parameters	PRESS/SSY	R ² CV	SPRESS	PSE
1	Jhetm	0.1411	0.8589	92.5758	87.8251
	ST				
2	D	0.0863	0.9137	78.7029	70.394
	J				
3	Jhetm	0.0653	0.9347	71.4063	61.8397
	IR				
	ST				
	Jhete				
4	Jhetm	0.0653	0.9347	71.4054	61.8389
	IR				
	ST				
	Jhete				
5	JhetZ	0.0588	0.9412	67.9486	58.8452
	IR				
	ST				
	Jhete				
6	JhetZ	0.0517	0.9483	63.9234	55.3593
	IR				
	ST				
	Jhete				

Table 7. Observed and estimated values for the present set of compounds using best model (S.No.6, Table 6)

S.No.	Observed UV	Estimated UV	Residual
1	1143	1170.964	-27.964
2	1644	1580.787	63.213
3	1138	1150.233	-12.233
4	1904	1931.548	-27.548
5	1171	1178.054	-7.054
6	1274	1385.67	-111.67
7	1584	1447.681	136.319
8	1190	1142.811	47.189
9	995	956.011	38.989
10	1044	1086.953	-42.953
11	1144	1203.521	-59.521
12	1295	1270.564	24.436
13	1275	1166.531	108.469
14	1904	1912.402	-8.402
15	1228	1246.888	-18.888
16	1256	1270.812	-14.812
17	1110	1144.061	-34.061
18	1305	1316.057	-11.057
19	1190	1220.616	-30.616
20	1283	1294.836	-11.836

Table 8. Ridge Regression parameters for the best obtained model-4. (Sl.No.6 Table 6)

Model No.	Parameters Used	VIF	T	λi	k
6 (Table 6)	IR	2.6512	0.3772	2.14802	1.00
	ST	2.4899	0.4016	1.46596	1.47
	o	3.4231	0.2921	0.229681	9.35
	² χ ^v	3.3341	.2999	0.15633	13.74

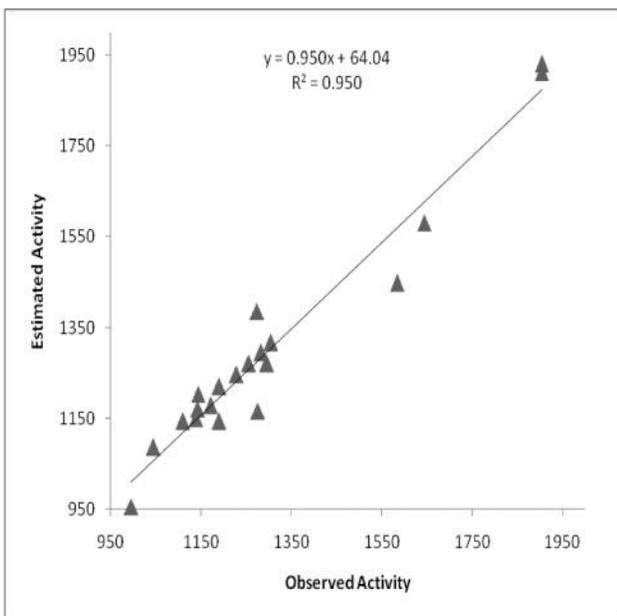


Fig 1 : Correlation between observed and estimated activity using best model.

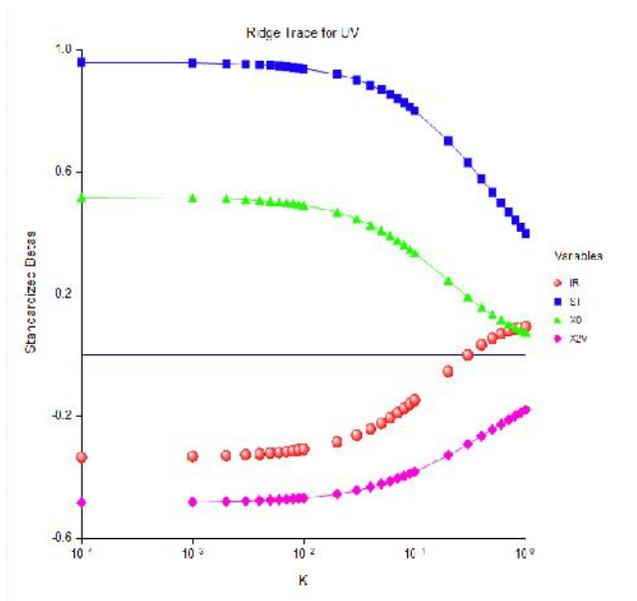


Fig.2: Ridge plot for UV

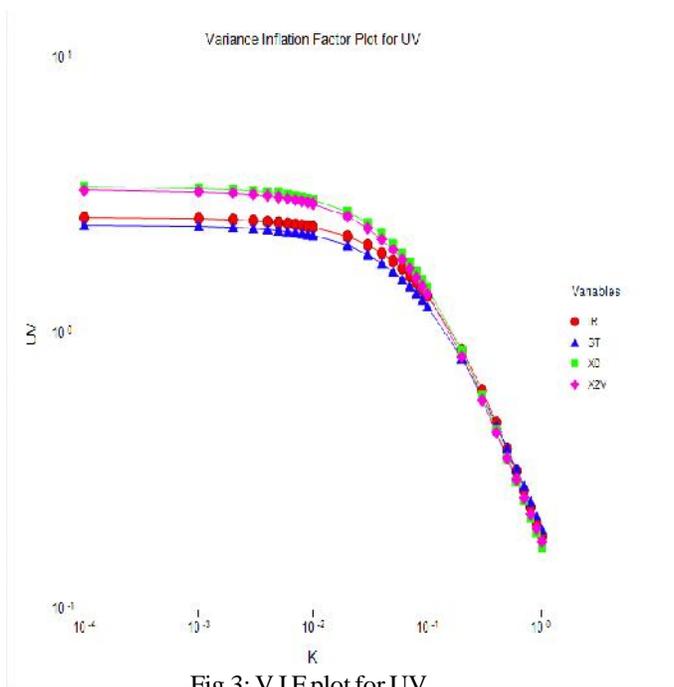


Fig.3: VIF plot for UV

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IMPROVEMENTS IN SEARCH ENGINE ACTIVITIES TO DEAL WITH EPIDEMICS LIKE COVID-19

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1. Introduction

At present, the whole world is facing an epidemic named Covid-19. According to the statista website, 68 crore people in India use the Internet. Total population of India is around 138 crores. That is, about 49 percent of the people use internet in India. Similarly, 59 percent of the people in the whole world use the Internet. Internet is a door to know the world. That is why the responsibility of the Internet increases when the whole world is fighting the epidemic. In this episode, the year 2020 is a year in which almost the whole world has stopped due to corona virus. The economy and education have suffered the most due to this epidemic. The world has faced many types of epidemics, but perhaps this epidemic named Covid-19 has proved to be the most damaging epidemic ever.[2]

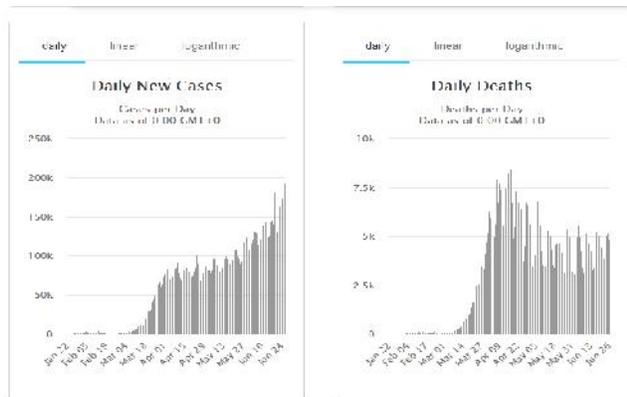


Fig 1: Graph of population affected by corona
[2]

If we extract the figures of Covid-19, then it is known that about 1 crore people have been infected by this epidemic. In this, 4 Lakh people have lost their lives and it is still going on. India is also badly affected by this, the number of people affected by this epidemic in India is 5 Lakh, out of which 16,000 people have lost their lives and these figures are still growing.[2]

With the help of internet, any information from one corner of the world can be reached to the other corner of the world very fast. Users rely on the search engine to send

information in the Internet. This search engine is a directory that keeps information about all the websites around the world. At present, it is very difficult to send information without a search engine. For this reason, the search engine is the backbone of the Internet and in such a situation the search engine cannot be ignited whenever it comes to using information technology to solve a problem.

2. Search Engine Role to Fight against Epidemic

This epidemic, with seasonal cold, is a very serious disease for the whole world. Because of this, millions of people have problems in breathing. Around 250000 to 500000 people are killed all over the world. Sometimes this flu spreads very fast, which takes a very poor form. This type of flu takes the form of an epidemic when it spreads from human to human. It spreads through touching and sneezing by humans. Early studies of this type of infection have shown that due to immediate response, the effects of the epidemic can be reduced and can be controlled at times. Internet technology can prove to be very effective in the initial search to deal with the epidemic. For this, search engine vigilance will be required. People search many questions on the Internet to know about or avoid the epidemic in the era of Internet. Search engines simply have to list these questions. And these questions have to be made available in the public forum. People search in Google about common diseases. When people search for common diseases, then it will be common to ask questions related to major epidemics in Google. These questions will have to be listed with the help of special type of arrangement. With the help of these questions, scientists and researchers will be able to understand the problems caused by the epidemic. This will allow researchers to recognize different symptoms of the epidemic. The order and speed of its occurrence and spread can be easily understood. [4]

Scientific models, for example, those that gauge the spread of scourges or anticipate the climate, must defeat the difficulties of coordinating inadequate and wrong information in PC recreations, evaluating the likelihood of numerous potential situations, fusing changes in human conduct and additionally the pathogen, and natural variables. In the previous 3 decades, the climate anticipating network has made huge advances in information assortment, absorbing heterogeneous information streams

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into models and imparting the vulnerability of their forecasts to the overall population. Plague modelers are battling with these equivalent issues in gauging the spread of developing maladies, for example, Zika infection contamination and Ebola infection illness. While climate models depend on physical frameworks, information from satellites, and climate stations, plague models depend on human collaborations, various information sources, for example, clinical reconnaissance and Internet information, and ecological or organic factors that can change the pathogen elements. We portray some of similitudes and contrasts between these 2 fields and how the pandemic demonstrating network is adapting to the situation presented by determining to help foresee and manage the relief of pestilences. We reason that a portion of the central contrasts between these 2 fields, for example, human conduct, make infection gauging more testing than climate estimating. [5]

Google Flu Trends can identify provincial episodes of flu 7–10 days before customary Centers for Disease Control and Prevention observation frameworks. We portray the Google Trends apparatus, clarify how the information are prepared, present models, and talk about its qualities and restrictions. Google Trends shows extraordinary guarantee as an ideal, vigorous, and touchy observation framework. It is best utilized for reconnaissance of pestilences and illnesses with high prevalences and is right now more qualified to follow infection action in created nations, on the grounds that to be best, it requires enormous populaces of Web search clients. Spikes in search volume are right now difficult to decipher however have the advantage of expanding cautiousness. Google should work with general medicinal services professionals to create specific instruments, utilizing Google Flu Trends as an outline, to follow irresistible sicknesses. Reasonable web look question intermediaries for maladies should be built up for specific devices or syndromic reconnaissance. This one of a kind and inventive innovation makes us one stride nearer to genuine continuous flare-up reconnaissance. [3]

In case of pandemic, it is necessary that accurate and correct information is easily available to the people; it is the fundamental right of the citizens. The biggest reason for the spread of corona is that the right information is not available. The WHO is an organization that undertakes health guidelines and standards. WHO could not reveal the information related to Corona in the right time, because of which the world did not take Corona seriously in the initial phase, and allowed it to spread. On 26 February 2020, the WHO declared a terrible disease named corona as an epidemic. We have used 3 tools, which have collected information related to corona in 3 different languages. All this information was specially indexed, many sources had to be used to get these information, such as from governmental organizations, media and private organizations

etc. Web crawlers are used to retrieve data from all over the Internet, but there are some flaws in their technology, such that after several attempts to get data from the same source, it is found that there is an uncertainty in the data. [6]

3. Tool of Web scraping to collect data of all Epidemic from Internet

Web crawlers are being used in almost every area today, web crawling collects data from different sources and collects it at one place. Web crawlers are also known by many different names, such as - web information extraction, web scratching, screen scratching. Without web crawler, fetching data was very difficult and lengthy work, because without web crawler, fetching the data is done manually. Manually fetching data is a complex task, because in this, the person has to go to each site and copy the data himself and feed it to the indexing database. This work takes a lot of time. Institutions that fetch data of large size created web crawlers to collect data. The job of this web crawler is to automatically fetch data from the site link. [8]

3.1- Octoparse

Octoparse is a crawler program that fetches data from sites, and collects them in one place. This web crawler can fetch all types of data in the Internet. Anyone can use this program, and can pull the information from the mentioned site and submit it at one place. There are two modes of working of this web crawler - Task Template Mode and Advanced Mode. This web crawler is very easy to use and does not require any programming knowledge. This is user friendly and all the operations are done with mouse. We can get fetched data in any file format we want, like excel, txt, html etc. or if we want to store the fetched information in our database, then that is also possible. [8]

3.2- Cyotek Web Copy

Its working can be easily understood by looking at the name of WebCopy. Web copy is made up of two words, one is the web, which means the pages of the website in the Internet and the other is the word copy, which means making duplicate of the data and store it in the desired place. This web crawler is absolutely free, anyone can use it and no fee will have to be paid to use it.[8]

3.3- HTTrack

HTTrack is a web crawler software, which is used to fetch data from other sites and store it at the desired location. There is no fee to use this web crawler, as it is free. HTTrack copies all the data from the mentioned site and downloads it to our computer. We can use it from any operating system computer, such as windows, linux, unix etc. The specialty of HTTrack is that it can fetch multiple sites simultaneously. [8]

3.4 - Scrapper

Scrapper is a Chrome expansion with restricted information extraction included, however it's useful for making on the web research. It likewise permits sending out the information to Google Spreadsheets. This instrument is expected for fledglings and specialists. [8]

3.5- WebHarvy

WebHarvy is a point-and-snap web scratching programming. It's intended for non-software engineers. WebHarvy can naturally scratch Text, Images, URLs and Emails from sites, and spare the scratched content in different organizations. [8]

4. Required augmentation in Search engines to fight against Epidemic

Most search engines have gathered some information of need by bringing it to one place, such as photos, news, books etc. But there is no such system regarding the epidemic. Presently, the world is suffering from an epidemic named Corona, so almost all search engines have done the work of collecting information about Corona. However this is not enough. They have some drawbacks. Right now most search engines are only sharing information related to infection and save, but the work of collecting information from different research labs at one place is still not done. Scientists have to obtain information from the laboratories website to gather information related to the corona, that too by visiting itself. Therefore, we must also add epidemic in order of development of search engine. It should be kept in mind that all kinds of epidemic information should be found at one place. If any research related to an epidemic is done in a lab in America, then its information should be collected in the central system through a search engine. With the centralization of information, it can be obtained and time will improve to get the information. [9]

But it has to be kept in mind that the researchers do not have difficulty in getting the information, the information should be obtained easily, and that information can be easily seen in all kinds of electronic devices. New information related to epidemic should be updated as soon as possible and brought to the central system of search engines.

In this type of platform, if someone wants to search for information related to the epidemic, then he should be provided with new information, for this new algorithm like Facebook algorithms should be used which gives priority to new information. [1]

Before crawling the information related to the epidemic from worldwide websites, it is also necessary to know whether those sources are reliable or not. Only then will the trust of researchers doing research against the epidemic on this central system of search engines be strengthened. [7]

5. Conclusion

Presently, Internet is a very powerful tool, which has strengthened its hold in every field. Because of this, we can do any work sitting at home with the help of our computer. We can fight a war, teach our child from home. We can control a vehicle called MANGALYAN that goes in the direction of Mars. So why not deal with the epidemic with the help of internet. And work is being done on it, information is being shared, but the present system of information sharing is insufficient. They are complicated and takes a lot of time to extract the required information. Those who have researched in this field have believed that there is a possibility of improvement in the search engine. In particular, search engines give insufficient information to deal with epidemics. A lot of hard work has to be done to gather enough information.

Although search engines for the epidemic called Corona have gathered information at one place, but it can only be used to fight an epidemic like Corona, have search engines created any central system for the Ebola epidemic? The answer is no. That is why it is necessary to build a central server in the search engine. In which information related to all types of epidemics present in the world can be collected. All medical experts, scientists, institutes and government can easily access these information. It can help in controlling the epidemic in time. But the thing to note here is that reliable sources have to be used to gather information. There is no confusion about the epidemic using reliable sources, and it can be dealt with in time. Corona is an example before us, in which there is a lack of initial information, due to which the world also suffered.

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TECHNIQUES & TOOLS TO AVOID SUPPLY CHAIN DISRUPTION DURING COVID-19 PANDEMIC

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Keywords: Supply Chain Management, Demand Forecasting, Optimization model, Inventory Optimization, Distribution, Last-mile delivery, OR Model, AI, Machine Learning, Deep Learning

1. Introduction

This paper describes how the technology helps us to manage the current situation of Covid-19 pandemic, how the tools and algorithms help to manage the critical bottlenecks and overcome the balance of demand and supply with other operational constraints like limited resource utilization, balancing the inventory levels and avoid the shortage/ market out condition. COVID-19 pandemic has disrupted the operations due to resource complexity and other interrelated activities from raw material procurement from supplier to managing the transporter and highly unpredictable demand.

In the highly unpredictable situation, the traditional model may not be useful even as historical data are not sufficient and irrelevant for forecasting with the current models and algorithms. This pandemic outbreak impacted the supply chain in many levels like increase in demand of the essential item like medical equipment and related items supply to fight the virus, shortage of supply for the parts and raw material from suppliers, and due to prevention mechanism of Lockdown entire distribution part got impacted and supplies are held at many places.

Here we now realize the use of technology to find out the solution like how to balance my inventory, where is the source for supply, how to work in a volatile market and fulfil the market demand. The new era of technology AI, ML, and optimization techniques help companies to smoothen their operation and manage the resource-efficient in this pandemic situation.

The most important point in the analysis is data available with us and the data source to collect the data crucial for analysis like manufacturing, logistics, and demand in real-time with visibility of capacities, Inventory levels, and supply capabilities, etc.

The team can model a variety of scenarios to evaluate and handle the crisis.

2. The technique can be used

There are several options and techniques are available to handle this kind of situation. In the past 12 years of consulting and system development, and implementation experience, I have realized a difference in understanding the use of the Operation Research (OR) technique for business decisions. Businesses who realize the use of OR Model in evaluating the business scenario must have the capability of handling the crisis and able to make the decision based on the multiple what-if scenario in the condition of Supply plan, production plan, logistics capability management, and inventory management.

Business is unclear on the supply chain volatility for the certain peak in demand or deep of demand and manage the supply and aligning the production to satisfy the demand whether the current inventory levels are at the optimal level to serve the demand and optimal holding cost, which should not pinch the capital blocked. Due to many block geography where either the production stopped or the supply stopped, in either case, what is another optimal route which will be the second cost-effective route.

3. How to use OR models to handle these problems

OR model can be used for near term planning or the execution level planning, Mid-term planning for an immediate action plan for production, logistics allocation, and route planning, and long term planning or strategic planning.

Execution planning or the last mile delivery planning using the OR-based model along with the route restriction and the vehicle capacities and some other delivery constraints. This kind of tool optimally assigns customer orders to vehicles and plan routes for the vehicles in a dynamic manner to meet customer orders in time, maximize utilization of vehicles, and minimize the cost of transportation. It creates value in the supply chain by synchronizing all your critical transportation processes.

Mathematical optimization model with objective function is to minimize the total transport cost of the fleet subject to vehicle capacity constraints, minimum utilization limits, and serviceability time commitments and time windows based delivery and entry restrictions. Key benefits of such kind of tool yield on the short term or real - time

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basis like route planning and objective to minimum cost to serve, maximum resource utilization and timely customer serviceability, Order fulfilment with resource assignments, multi-point delivery milk-run deliveries and direct courier delivery dispatches based on OR optimization model, another feature of Considers multiple customer orders, locations, vehicles, multiple cost structures, distances, travel times, fuel consumption, capacities, serviceability constraints, etc. Real-time tracking of the vehicle will help to alert the consumer and companies. This will store the data points and ease to handle the operation.

In the current situation, data plays a major role in any analytical analysis and planning. Businesses need to store as much data as they can retrieve from their own and other sources/competitor in the same segment. Then, apply modeling techniques or AI, ML to that data points in a way that explains the hidden features that help businesses to manage the situation and positively grow the business in any kind of crisis.

Supply chain transactional data of any organization can be stored in a data repository and number of key indicators can be derived from that data like, how much demand fulfilled in the current situation and ratio of optimally supplied and sub-optimal supplies, their losses, and potential could be saved by better planning for future. How much of particular product need to produced and how optimally the demand product is being served in the market, whether the demand and supply are matching of any mismatch in demand and supply then how the gap will be fulfilled in such a way that the company should not lose the market and at the same time company should lose their contribution from the high contributing market? Minimum market fulfilment is the constraint to balance the mismatch in demand and supply.

The above planning techniques and OR model yield the result which revolutionizes the operations. Throughout the pandemic situation companies can make better, quicker decisions to manage their supply chain and able to save the cost and serve the customer efficiently along with manage the production and logistics operations.

Another midterm planning benefit with the OR model for the Supply chain domain is managing the network planning and design. Mid-term planning like monthly planning or planning where the planning horizon maybe a week, fortnight, or a month of a rolling plan of the quarter are considered as midterm planning. In the current pandemic, the shorter planning horizon will help to take the quick and dynamic decision which can be changed as the situations in the particular geographical area as per feed from the Centres for Disease Control and Prevention.

A model can help the organization to evaluate the multiple what-if scenario for managing the supply chain.

There are few major key areas to evaluate to balance supply chain like:

Production planning and scheduling: to balance the production to fulfil the demand and manage optimal inventory levels, Inventory visibility: to manage the optimal inventory level. Supply prediction: to manage the logistics operation and able to reach the market for demand fulfilment.

The system provides flexibility to adapt dynamic decisions of the analysis provided by the model. These model results are data-centric and help businesses to take the right decision at the right time. At the pandemic period, the main focus should be on the machines and model running daily execution with the managerial team intervention basis on their experiences.

An OR-based mathematical optimization modeling based solutions that help an organization to undertake optimal planning of manufacturing and logistics allocations. It helps to meet the demand of all products in all markets in the maximum contribution or least cost way while satisfying the service level targets and capacity constraints at various stages in the supply chain. Such kind of model help organization to build the "What If" scenarios for production and logistics planning, generate the report of all alternative supply paths and their costs so that the manager can decide on the optimal or second optimal path. The model helps to delivers KPI's reports and actual vs. planned compliance reports to track the deviation and health of the plan and their execution at the granular level. Provides optimum allocation of products from plants to depots to markets, production-mix at plants, transport mode-mix, and inventory plan based on the data at any particular time. A constraint may be applied to handle the crisis condition in the pandemic.

Mid-term allocation and distribution planning include production planning, outbound logistics allocation planning, transport mode-mix selection, and end-of-period inventory build-up for a single period or multi-period horizon. In the above case, the solution uses a large scale mixed-integer linear programming model that maximizes total contribution margin or minimizes total cost to serve while meeting projected demands and satisfying constraints of capacity, availability, and minimum economic utilization of resources, etc.

Long-term planning is also known as strategic planning. This will require to manage the business post-pandemic, May the current strategies are not suitable for the future scenario of businesses. Network design is required as the strategic decision, which may be good for a long term basis or how the business will be after the pandemic. The way of doing business may change after the crisis. A network footprint design may be part of the strategic analysis. Network footprint design includes the

roadmap for investment in locations and capacities of plants, warehouses, and depots to create a new supply chain network or to expand or modify the existing network.

Monitoring of deviations and compliances are the main focus to learn and control the situations. In the pandemic period, many such unplanned incidents will occur which will force to deviate from the optimal plan, hence the monitoring will be a good method to control them. Overall compliance index which measures the difference between actual and optimal plan and the key element causing the deviations. Take away from those deviations are helps to identify the bottleneck and prioritize them for control in the future. After the crisis, we may need to relax a few operational constraints which relaxation may result in a large gain for the company.

4. How to prepare your supply chain during the Covid-19 pandemic:

During the coronavirus pandemic, the organization should understand the risk of a pandemic and the impact of the situation. This risk evaluation will help companies to make an effective plan for unexpected circumstances. In the Supply chain, there is a certain focus part where the risks are high and the contingency plans need to prepare. The major part for risk to be evaluated in the below section.

a. Demand volatility:

Demand is very volatile in the crisis condition, few essential products may face panic buying which will result in the peak in demand and the non-essential goods may face the deep in demand. Managing both the condition is difficult for the business. This will also be on the geographically spread hence the supply to fulfil the demand may also a big challenge.

b. Production and Supply:

Similar to the demand volatility the production and supply may also face the challenges in the business. Production cannot be continuous if there is no demand. We cannot pile up more inventory as the situations also are not so clear about the pandemic.

The model will help businesses to manage such critical condition and save from the losses and manage the continuous business. Balancing the supply chain is very essential in the current situation and these tools are very effective to handle the condition by creating the many what-if scenario for all the cases. Model work on the most updated and latest data as we covered that this pandemic situation is not a regular crisis and no one knows about the end of this and what all the impact at the end of this.

Several other technologies can be used for demand planning resource management. Apart from the OR based model, we can use the more data-driven model in AI and ML.

“Technologies that provide inventory visibility across the distribution network (e.g. distribution centres, stores, vendors, third-party providers, and wholesale inventory) offer major benefits for flexibility and transparency to serve customers in the best way possible given supply limitation,” Anderson said.

5. Technological Support in Demand Planning

Demand disruption during the COVID-19 is a much-known issue and disruption in demand impact the entire supply chain. COVID-19 pandemic has disrupted operations by impacting the resources in an interconnected manner from supplier to transportation and very rise in demand or a deep decline in demand in almost all the businesses.

It will be impossible to forecast or predict all the impact of COVID-19 pandemic, evaluating, analysing, and adopting the frequently changing business scenario is difficult but possible to mitigate the risk of downfall in business. We need to make some quick changes in the business processes by adopting the process level changes. Currently, available technology will help us to make this process possible and can be implemented seamlessly within the organization. Building a collaborative platform and AI, ML and IoT is the key to the system. We can categories the process in the below-mentioned categories.

Customer Profiling

Organizations should know their customer at the most granular level. To get the bottom channel data, we can collect data with the help of IoT implementation at the POS to know the buying pattern of the customer. Segmentation of sales by country, region, or state and evaluate the impact of COVID-19. Analyze the sales in COVID-19 impacted area and compare with the non-impacted or less impacted area and get the insight of sale pattern and end customer response. AI and ML will help us to do such kind of analysis. Monitor the impact and changes in the sales behaviour on a short term basis and long term basis.

Using the statistical technique we can segment our customer and product by sales volume respect to the COVID-19. AI can help in pattern recognition for close to accurate segmentation of customers and products. Businesses should prioritize the high-value products sale to more valuable customer segment and AI and ML can help to generate the forecast for products.

We should flexible enough the regenerate the forecast as the new data come from the bottom channel and other IT system. It will help us to quickly change the plan and act on the changes. Organizations should put the proper review mechanism to analyses the changes in the forecast from time to time.

With the help of a collaborative platform, we need to set up a war room to align all the departments like sales and marketing, logistics, production, finance, and other departments to adjust the plan and make a contingency plan as the forecast changes. Make the consensus between the teams and take quick action in terms of mid-term and long term implications on those decisions.

There will much other causal data that arises in this scenario. Organizations need to incorporate those internal and external causal data in their forecast, this will help to increase the forecast accuracy.

6. Conclusion

Leveraging the technology in supply chain planning and execution provide better control in any situation and support to handle the crisis. OR modeling, machine learning, and deep learning models are helpful to take the decision and provide the more accurate forecasting as well as the optimal plan to cater to the demand, balance the supply and inventory level at the stocking unit. These techniques help to do the analysis, stock out, and high stock conditions and other learning to get a deeper understanding to manage the supply chain of the organization. These platforms provide the option to evaluate the multiple what-if scenario and build the proactive informed contingency plan. To avoid this pandemic crisis, building scenarios are a good option to know the potential impact of unavoidable short-term or mid-term changes in the supply chain. The current open platform enables us to know the highly infected areas so that organizations can build a realistic scenario and identify the high infected area and build the scenario to increase the supply chain flexibility.

Organizations have to use this pandemic as a case study and learn the lesson from it to improve the system level capability to manage the crisis with the help of technology. Organizations need to equip with the robust technology that senses the market situation, manage the data within the organization and data from industry, and with the help of advanced techniques and algorithms, which support the multiple what-ifs and perform the granular level analysis. Organizations should start building the scenarios and analyze the impact of it. This will help to reduce the response time in any crisis.

However it is difficult to predict the crisis and disruption in the supply chain, but take an approach to prepare and respond, the organization can handle better such kind of situation. Organizations need to exploit those technologies and can better position themselves.

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DIMENSIONS OF EXPERT SYSTEM IN RELATION TO STRENGTHENING OF DECISION SUPPORT SYSTEM AMONG FARMERS AND EXTENSION PROFESSIONALS

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ABSTRACT

In view of rapid technological advancement and its application in field, farmers require advance or experts technological opinion to take decision during soil preparation, seed selection, fertilizer management, pesticide management, water scheduling, weed management etc, so that to get higher returns. Realizing this need expert system has been considered as most powerful and appropriate extension approach that stimulates human knowledge from an expert in certain domain for facilitate farmer to make decision at a level of or greater than human expert. Expert system helps to farmers in making economically viable and environmentally strong decision related to crop management. After considering success of expert system, various expert systems have been developed in agriculture. Farming solutions which are AI powered enables a farmer to do more with less, enhancing the quality, also ensuring market led extension strategy for crops. The present paper highlights necessity of expert system in agriculture sector and review of various expert systems in agriculture. In agriculture such system integrate the accumulated expertise of various discipline such as entomology, horticulture, soil management into a framework that best address the specific problems and onsite needs of the Indian farmers. The present study which was also conducted to assess the effectiveness of expert system revealed that majority of the respondents including extension personnel, agricultural experts and farmers perceived that effectiveness index of expert system applications in agriculture was moderate. On the basis of literature available cited by researchers the present study suggests the agricultural development agencies have to make efforts to develop such an expert system which will guide to farmers to adopt decision into different aspects of crop management like soil preparation, seed and variety selection, pest management, nutrients management, weed management, water management, live stock management, weather advisory services etc.

Keywords: Effectiveness index, Farming, Expert system, Decision Support System

Introduction

The Present scenario of Agricultural production system is complex one, requiring the huge amount of current knowledge in the relevant field in integrated from many

diverse sources. With a view to remain competitive, the progressive farmer often relies on agricultural specialists and advisors to get information for decision making. Unfortunately services of the agricultural experts are not always available as per the requirement of the farmers. The agricultural production system now a days requires not merely the expert technical advice as per need but importance is of its availability at once. Keeping in view the present study is under taken to elaborate the role of e-agriculture for combating the problems of agro-climatic change full farming system. In order to alleviate this problem, expert systems have been identified as a powerful tool with extensive potential of technology diffusion in agriculture. An Expert System (ES), also called a Knowledge Based System (KBS), is a computer program planned and systematically designed to stimulate the problem-solving behavior of an expert in a specific domain or discipline. The expert system could be developed for decision-making and need based location specific technology dissemination approach.

Meaning and Scope of Expert system

Meaning

According to Russell & Norvig (2003) Artificial intelligence (AI) or Expert system is the intelligence exhibited by machines or software, and the branch of computer science that develops machines and software with intelligence. Major AI researchers and textbooks define the field as "the study and design of intelligent agents", where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. An Expert System is a computer program that stimulates the judgment and behavior of a human (or) an organization that has expert knowledge and experience in a particular field. It is called as knowledge based system which is designed to simulate the problem solving behavior or decision making of an expert in a specific domain or discipline.

Scope of Expert System in agriculture

The severe problems related to agricultural production faced by the farmers are soil fertility deterioration, yield loses, soil erosion, crop & variety selection, increasing doses of pesticides cost, pest resistance,

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diminishing market prices from competition and socio economic barriers hindering utilization of farming technologies.

Expert System are computer program that are different from conventional computer programs as they solve problems and help in decision making process by optimizing human reasoning process, relying on logic, belief, rules of thumb opinion and practical experiences.

In India agriculture Expert System are considered very efficient and capable of integrating or converging the perspectives of major agricultural disciplines such as crop production, plant pathology, entomology, horticulture, soil science, live stock management and agricultural meteorology into a framework that absolutely address the type of ad-hoc decision making required of progressive farmers. Expert system can be one of the most useful tools for accomplishing the task of linking farmers with regular and location specific integrated decision support needed to enhance and sustain their crop productivity.

Steps in Expert System Development in Agriculture

i. Designing of content

The appropriate and relevant contents on the respective agricultural and allied activities are the first step for developing expert system using the appropriate software and need based location specific technical information. Realizing this fact, the contents on paddy, sugarcane, banana under precision system, Coconut, Ragi, Cattle & Buffalo, Sheep & Goat and Poultry were developed from the State Agricultural Universities namely Tamil Nadu Agricultural University and its research centres, University of Agricultural Sciences, Bangalore & Dharwad, University of Horticultural Sciences, Bagalkot, University of Veterinary Sciences, Karnataka, Kerala Agricultural University and all KVKs coming under Zone VIII.

The contents were obtained directly from the agricultural scientists, extension workers and other stakeholders through direct contact methods, group discussion, interactive meeting, social media and internet.

The images, text, audio and videos contents were gathered from the universities, research stations, farmers; field and other recognized research institutions during critical stages of crop growth period. All the images captured from direct field and research plots.

ii. Validation of content

Validation of Content is most important and crucial process for any content development and necessary content authorization for uploading the same into any website or ICT platform. It is therefore, a detailed and in depth exercise have been undertaken to validate the selected contents with help of concerned experts and scientists of SAUs and other stakeholders. The contents validation team is formulated

on the basis of the concern scientists and subject matter specialists particularly to assess and validate the contents, photos, text, audio and videos for getting authentic, relevant and reliable contents. The content validation for English is developed at TNAU, SBI Coimbatore, NRCB, Trichy, KAU, Thrissur, UAS Bangalore and ATARI, Zone VIII Bangalore. The Tamil content is validated at TNAU and KVKs of Tamil Nadu. The ATARI, Zone 8 has undertaken the content validation work for the Kannada languages with collaboration of KVKs, UAS Bangalore and Dharwad and UHS, Bagalkot.

iii. Appropriate content translations

The Content Translation tool facilitates users to create translations right next to the original article and deletes the irrelevant matter; copying text across browser tabs, looking for corresponding links and categories, etc. Content Translation brings together specific tools to be required such as dictionaries or machine translation services. The C-DAC, Hyderabad has identified as content translators for Tamil, Malayalam and Kannada languages for designing of Expert system.

Constituents of agricultural Expert system

The home page of the agricultural expert system consists of three important components viz., Information System, Decision Support System, Diagnosing System (Crop Doctor)

A. Information System

Information system is called as web based static information and facts pertaining to a specific agricultural sector. Under this system all the up to date location specific and need based technological and scientific information related to selected field are collected, pooled, edited and uploaded. It is a ready reckoner and user-friendly navigation with text and image based presentation, up scaling and updating the content as needed by the users. The static information system is of great importance for the extension personnel, scientists, policy makers and administrators concerned with the farming sector.

B. Decision Support System

Decision support system is a computer-based information system including knowledge based system that supports and facilitates decision making process. A decision is a choice from alternatives available in existing conditions based on estimates of the worth of those alternatives

Accordingly, the Decision Support System has been contemplated and designed to obtain best possible course of action and decision by farmers themselves which is required for performing regular agricultural operational work. Customized tools such as Menus, Pop-up Windows, Drop down Boxes or inter-related Multiple Combo Boxes, Video Plug-ins etc., were inserted using Dot net programme.

The Decision Support System is consisting of details related to Season, Climate, Variety, Sowing Methods, Nutrient Management, Nursery Management, Water Management, Crop Protection, Farm Machineries, Post Harvest Technology, Marketing, Institutions, Schemes and FAQ.s.

C. Crop Doctor

Crop doctor is an indispensable component of the Agricultural expert system which works as artificial intelligence. It is based on picture and image processing and then rule-based programme which has written applying Dot net programme. It is concern with diagnosing the specific pest, disease and nutritional disorders affecting adversely the specific crops. The first obvious sign is assigned as thumbnail images in the Key Visual Symptoms (Primary Symptom) with multiple sub levels (Secondary Symptoms). After identifying and matching symptoms related to their field problems, the farmers may be able to draw appropriate conclusion on the causes for the damage by pest/ diseases, identification of pest or microbes, nutritional disorders and integrated control measures to be required in the field condition.

Review of Literature

Jha et. al (2019) found that there are some areas which are causing the problems to agriculture field like crop diseases, lack of storage management, pesticide control, weed management, lack of irrigation and water management and all this problems can be solved by abovementioned different techniques. Today, there is an urgent need to decipher the issues like use of harmful pesticides, controlled irrigation, control on pollution and effects of environment in agricultural practice. Automation of farming practices has proved to increase the gain from the soil and also has strengthened the soil fertility. This paper surveys the work of many researchers to get a brief overview about the current implementation of automation in agriculture.

Tian, et. al (2019) found that there are still major challenges. First, the technology will continue to expand into new application areas in the future, and there will be more technological issues that need to be overcome. It is essential to build large-scale data sets. Second, with the rapid development of agricultural automation, the demand for professionals will continue to grow. Finally, the robust performance of related technologies in various complex environments will also face challenges. Through analysis and discussion, we believe that in the future, computer vision technology will be combined with intelligent technology such as deep learning technology, be applied to every aspect of agricultural production management based on large-scale datasets, be more widely used to solve the current agricultural problems.

Jha et. al (2017) reported in their study that the superiority of ANN over linear model methodology has been

demonstrated using monthly wholesale price series of soybean and rapeseed-mustard. The empirical analysis has indicated that ANN models are able to capture a significant number of directions of monthly price change as compared to linear models. The present study has aimed at developing a user-friendly ANN based decision support system by integrating linear and nonlinear forecasting methodologies.

Khandelwal et. al (2019) found that a direct application of AI (Artificial Intelligence) or machine intelligence across the farming sector could act to be an epitome of shift in how farming is practiced today. Farming solutions which are AI powered enables a farmer to do more with less, enhancing the quality, also ensuring a quick GTM (go-to-market strategy) strategy for crops. The current paper throws a vision of how the diverse sectors of agriculture can be fuelled using AI. It also investigates the AI powered ideas in for future and the challenges anticipated in future.

Thankanchan et. al (2014) indicated that the level of awareness is less such that there is a need for e-agriculture for their support. E-Agriculture is a platform for supporting marketing of agricultural products

Thankanchan et. al (2014) found that the development of agriculture has been on under development for the past few years due to lack of agriculture knowledge and environmental changes. The main aim of this paper is to reach farmers for their awareness, usage and perception in e-Agriculture. The results obtained indicated the level of awareness is less such that there is a need for e-agriculture for their support. e-Agriculture is a platform for supporting marketing of agricultural products.

Ganesan et. al (2013), found that accessing information through mobile phone is easy and convenient. Although there were perceived benefits by farmers, the quality of information, timeliness of information and reliability of information were the three important aspects that have to be considered seriously to meet their requirements and prospects in the coming years. Correlation analysis proved that irrespective of the socio-economic characteristics, farmers were utilizing the mobile multimedia agricultural advisory system.

Alreshidi Eissa (2019) reported that Internet of Things (IoT) and Artificial Intelligence (AI) have been employed in agriculture over a long period of time, alongside other advanced computing technologies. The emergence of new advanced IoT technologies has the potential to monitor the agricultural environment to ensure high-quality products. However, there remains a lack of research and development in relation to Smart Sustainable Agriculture (SSA), accompanied by complex obstacles arising from the fragmentation of agricultural processes, i.e. the control and operation of IoT/AI machines; data

sharing and management; interoperability; and large amounts of data analysis and storage.

Liakos et. al (2018) found that machine learning has emerged with big data technologies and high-performance computing to create new opportunities for data intensive science in the multi-disciplinary agri-technologies domain. By applying machine learning to sensor data, farm management systems are evolving into real time artificial intelligence enabled programs that provide rich recommendations and insights for farmer decision support and action.

Dharmaraj et. al (2018) found that a direct application of AI (Artificial Intelligence) or machine intelligence across the farming sector could act to be an epitome of shift in how farming is practiced today. Farming solutions which are AI powered enables a farmer to do more with less, enhancing the quality, also ensuring a quick GTM (go-to-market strategy) strategy for crops. The current paper throws a vision of how the diverse sectors of agriculture can be fuelled using AI. It also investigates the AI powered ideas in for future and the challenges anticipated in future.

Banarjee et.al (2018) found that domain of agriculture faces many challenges such as disease and pest infestation, improper soil treatment, inadequate drainage and irrigation, and many more. They found field of artificial intelligence with its rigorous learning capabilities have become a key technique for solving different agriculture related problems. Systems are being developed to assist the agricultural experts for better solutions throughout the world. This literature survey covers 100 important contributions where artificial intelligent techniques were employed to encounter the challenges related to agriculture. This paper addresses the application of artificial intelligent techniques in the major sub domain of agriculture so that the readers are able to capture the multidimensional development of agro-intelligent systems during last 34 years, from 1983 to 2017.

Chirmade et. al (2015) observed that the advisory system will enable its users to receive real-time and interactive advices and alerts on crop. Different alerts will be provided for plantation, insects, diseases and nutrition. Farmers will also receive regular pest, disease alerts and market price information to support on-farm decision making.

Yelapure et. al (2012) found that expert system is now being using into agriculture sector. Expert system is most powerful approach that simulates human knowledge from an expert in certain domain for assist human to make decision at a level of or greater than human expert. Expert system helps to Growers in making economically viable and environmentally strong decision related to crop management. After considering success of expert system various expert systems were developed in agriculture. This paper explains need of expert system in agriculture and review of various expert systems in agriculture.

Shahjadi et. al (2016) found that most of the farmers are unaware of the technology and latest practices, many expert systems have been developed in the world to facilitate the farmers. However, these expert systems rely on the stored knowledge base. We propose an expert system based on the Internet of Things (IoT) that will use the input data collected in real time. It will help to take proactive and preventive actions to minimize the losses due to diseases and insects/pests.

The present research work and its findings

With a view to assess the effectiveness/ importance of expert system in Rewa district of M.P. a research work was conducted during 2019-2020 among three targeted segments of extension professionals and members of FPOs in the Rewa district of M.P. The sample of the study constituted 100 respondents with 40 extension professionals (Agricultural Officers), 20 front line Scientists of KVKs / JNKVV, 20 members of FPOs and 20 progressive farmers actively involved in the field of agriculture. The respondents were selected purposively who were mainly dealing with the expert system namely Rice Expert System developed by TNAU/Indian Council of Agricultural Research New Delhi. Effectiveness Index was developed for the study and standardized using the dimensions such as quick availability and opportunity of the expert system to programme itself, expert systems ability to exploit a considerable amount of knowledge, reliability, scalability, pedagogy, expert systems ability on preservation and improvement of knowledge and expert systems ability to address the new areas neglected by conventional computing based on the relevant review of literature and discussion with experts of Department of Agriculture and JNKVV.

It may be concluded from the findings of present study that majority of the respondents perceived that effectiveness index of expert system applications in agriculture was moderate. This finding derives support from the results of Helen (2008) that expert system usage among extension professional was medium. It was found that the respondents among all categories perceived that rice based expert system has been found to be effective and able to provide distant users with scientific information timely.

Conclusion

It is evident from the earlier research work conducted by various researchers that AI solutions have emerged as a viable solution required for utilization of location specific agricultural technologies by the farming community in desired and efficient manner. If the AI cognitive solutions are offered in an open source platform that would make the solutions more economically viable, which eventually will lead to enhanced utilization of

specific technologies and greater insight among the concerned farmers. Expert systems obviously require continuous feeding/ uploading of relevant technological information/ facts and enhancing the magnitude of information in the back end databases used for performing tasks with desired accuracy, including mapping the history of and guiding the predictions from such systems. Expert system based deep learning has tremendous potential and its use in agriculture. It has been found very useful in objective of benefitting of the farmers from technological advancement. The careful designing, development and logical use of Agricultural Expert System can help a lot to bridge the gap among researchers, stakeholders and farmers. The study conducted in Rewa district to assess the effectiveness of expert system particularly revealed that the respondents among all categories (extension personnel, agricultural experts, NGOs and farmers) perceived that rice based expert system as moderately effective and able to equip distant users with scientific information timely.

However, extension personnel and farming community should be given orientation training about applications of expert system to enhance effectiveness of expert systems. On the basis of literature available cited by researchers the present study suggests the agricultural development agencies have to make efforts to develop such an expert system which will guide to farmers to adopt decision into different aspects of crop management like soil preparation, seed and variety selection, pest management, nutrients management, weed management, water management, live stock management, weather advisory services etc.

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EFFECT OF DEMOGRAPHIC FACTORS ON CUSTOMERS' SATISFACTION TOWARDS HOTEL SERVICES IN M.P

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Abstract :

The Indian hotel industry has developed as one of the key drivers of growth among the services sectors. The hotel industry has been one of the most competitive industries especially in the 21st century. For this reason, enhancing customer satisfaction is one of the key aspects of achieving competitive edge for Hotel marketers. One of the biggest contemporary challenges of management in Hotel industry is providing and maintaining customer satisfaction. This study, therefore, sought to explore the factors influencing customer satisfaction and to examine the role of demographic factors in customer satisfaction among hotels in MP. For the purpose of this paper, empirical survey was conducted and the results of the research were analyzed by statistical methods. The study includes 300 respondents to collect data for the purpose of investigation using convenience sampling technique. The t, test ANOVA, Eta square and Cronbach Alpha have been used for data analysis. Cleanliness, safety and security, services of staff, physical facilities, and Food quality are vital factors for customer satisfaction.

1. Introduction

The Indian Hotel Industry is growing at a fast pace. This is due to the intervention by Government of India to facilitate the business through economic reforms, changes in different taxation policy, allowing foreign direct investment etc. The hotel industry, at all times ready with innovative business plans and the spirited management plotting the right strategies, contributes its capacity to improve the position of the economy. Hence, the role of hotels and their contribution to the economy is noteworthy. Now a days one of the principle challenges of the hotel industry is to provide and sustain customer satisfaction. Hotels those are competent to provide guests a product where the service is consistent and of a level required by the target market, will only continue to exist.

Ever expanding domestic tourism, increasing foreign tourist arrivals, forex earnings growth, high airline passenger numbers and muted supply growth has put the Indian hotels industry on an upswing. The recent trends and statistics of the industry as well as improving domestic macroeconomic

data suggest the road ahead will bring higher room revenues and profit margins for the hotels industry in the country.

If customers are satisfied with products or brands, they most likely become loyal customers and keep spreading good word about the hotel. High level of competitiveness in the marketplace in which hotel operates such as hotels function has been one of the main reasons why service quality and customer satisfaction have become of great importance. During the past few decades, factors affecting customer satisfaction towards hotel services have become a major area of attention to practitioners and academic researchers. The hotel's top management's main objective therefore, is on how to maximize customer satisfaction.

The purpose of this paper is to analyze the relationship between customer satisfaction and factors of hotel services that lead to customer satisfaction. In addition, this paper has examined if the satisfaction of the customer depends on the customers' demographic characteristics such as age, gender, education and income.

1.1 Hotel Industry in India: An Overview

Hotel is an integral part of tourists visit to a place. Within the aim of providing standardized, world class services to the tourists, the Govt. of India, department of tourism has voluntary scheme for classification of fully operational Hotels in the Star Hotels and Heritage Hotels. Currently there are 8707 Hotels functioning across the categories but 83.29% of Hotels have been unclassified. Nearly 4% of the hotel come under star categories and 2.8% of Heritage Hotels. In the present scenario(2018), India has 2, 32,885 hotel rooms spread across hotel categories and guest houses. In Financial year 2017-18 the number of rooms increased by 23% compared to financial year 2015-16.

According to the market reports Indian hotel industry was able to overthrow the 65% occupancy rates threshold last year (2019). The yearly report titled 'Hotels in India Trends & Opportunities' by the global hospitality consulting firm HVS suggests that branded hotels in India touched the occupancy rate of 65.6 per cent in financial year 2019, as against 63.3 per cent in the previous year.

According to the Indian Hotel Industry Survey

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2016-17, compiled by Hotelivate in association with the Federation of Hotel & Restaurant Associations of India (FHRAI), the Indian hotel industry is estimated to expand to be at 13 billion U.S. dollars by 2020. Certainly, the future shows good weather sign for the industry.

The Indian Hotel Industry has seen a significant growth in room inventory across categories from upscale luxury to limited services and boutique and budget Hotels. The occupancy and the room rates have seen continued gains both from the domestic and international traveler in both the business and leisure segment. The deepening penetration of internet usage and smartphones in India has led to increased booking of hotels through online portals and applications in recent times. While online travel agents like Makemytrip, Clear trip, Yatra and Goibibo continue to dominate the travel bookings industry on the internet, online accommodation reservation services like Oyo Rooms, are gaining popularity. In addition, Meta search engines like Trip Advisor and Kayak, that operate like travel discovery platforms have been able to establish presence in the Indian market and this segment is also expected to attract competition in coming times

1.2 Customer satisfaction:

Customer satisfaction is the key driver for any organization to sustain in current competitive era. Service providers need to understand their customers and design their services in such a way that maximum possible satisfaction is attained by the customer. Customer satisfaction is a growing concern within the hotel industry and a number of studies have been carried out in the same context by different researchers. Customer satisfaction has become a significant performance indicator for the hospitality industry/business, as it indicates the strength of relationship between the customer and the service provider.

Customer Satisfaction is defined as "The number of customers or percentage of total customers whose reported experience with a firm, its products or its services exceed specified satisfaction goals." Customer satisfaction in other words is the customers experience with the product and its usefulness with the passage of time and reliability of the product is the only way which makes customers peace of mind where the service and reliability is high which directly improves the customer satisfaction, however, customers satisfaction is the only way which results in the form of survival and progress, growth of the company (Vyas, 2000)

2. Literature review

According to Ashok Kumar (2006), customers are satisfied when their judgment of the service they have received equals or exceeds what they expected. If performance matches, the customer is satisfied and, if it exceeds expectations, even delighted. If the performances fall short of expectations, the customer is dissatisfied.

Francis, A. (2001), studied customer satisfaction among four star hotels in Spain, Germany and England. The results revealed that many customers were satisfied with the ability of staff to speak a foreign language, friendliness of staff, and condition of premise, room comfort and the ease of obtaining information.

McKinney V (2009) conducted a customer satisfaction survey in hotels in Cape Town. The research identified areas of satisfaction as, wellness/spa experience, guest entertainment, maintenance of grounds and swimming pool experience. Areas of dissatisfaction were identified as delivery of luggage, switch board and message service, attention to special requests and dinner experience.

According to Bhattacharya (2011), customer satisfaction has become an important aspect of the hotel industry. Unlike other industries, the hotel industry prospers due to customers' retention. It is only through customer satisfaction that a hotel can retain its customers. Basically, customers' loyalty is dependent on the quality of the services that they get in a hotel. Moreover, the hospitality industry has experienced the entrance of many investors who are willing to meet all the needs of their customers. Therefore, if customers are not satisfied by the services they receive in one hotel, they will look for better services elsewhere.

A few studies uncovered that customer loyalty is the main reason as to why some brands of hotels prosper while other lag behind. One key factor in customer retention is to guarantee quality services. In hotel industry customer loyalty is an element that shows the effectiveness of the management and all the stakeholders. A management approach focused on customer loyalty can improve the competitiveness of the hotel (Tsiotsou & Goldsmith, 2012).

Nam et al (2016), comments that food and beverages play a very important role in the hotel industry. The availability of multi-cuisines, tasty food in reasonable price attracts customer to a hotel and as such the food and beverage dimensions is an indicator of overall customer satisfaction.

By Thuyarut (2008), Customer satisfaction has been investigated from different perspectives and one of these is through service quality. Previous studies suggest that there are a number of factors can affect service quality. These include staff service, hotel Image, guest' room facilities location of the hotel staff knowledge and skills.

Zang H. et al. (2014), concluded that there exists a strong relationship between guests' characteristics and their impressions about Hotel service. Specific customers' characteristics such as their cultural background, personality and their gender have significant effect on their impressions of provided hotel services. For example, female

guests gave higher marks for service quality than male guests did.

Jung et al. (2015), have recognized food quality, service quality and price as important determinants, too. Food, physical evidence and service provided by the restaurant staff are considered as key components that directly influence the guest's perception of the restaurant quality.

Lai, (2015), found that Guests' characteristics such as age, gender, education, employment, material status etc. play a significant role in measuring guest satisfaction. Several authors have agreed that demographic characteristics, for example, age, income, and education have an effect on guests' decision to visit particular hotel. In his study conducted in Hong Kong the author has investigated the effects of the demographics variables - gender, age, income and education on customer satisfaction with restaurant quality. The results showed that gender has no significant effect, but age, income and education have a moderate effect on customer satisfaction.

3. RESEARCH METHODOLOGY

The Descriptive research design method has been used in this research. For the purpose of this paper empirical survey was conducted depending on primary data collected from consumers, who have already used the services of different Hotels in Madhya Pradesh. The primary data has been collected through a well structured questionnaire to investigate customer satisfaction towards hotel services provided by hotels in Madhya Pradesh.

Two stage sampling method has been used to collect data. In first stage 6 cities and tourist destination of Madhya Pradesh viz. Bhopal, Indore, Jabalpur, Pachmarhi, Khajuraho and Bandhavgarh have been selected. In the second stage 10 hotels and 50 respondents were chosen from each destination on the basis of convenient sampling. Thus in this way a total of 300 respondents were considered as sample size for this study. The collected data were analyzed with SPSS (version 22). ANOVA tests were used for testing hypotheses.

3.1 Objectives of the Study

1. To identify factors that affect the level of customer's satisfaction towards Hotel services in MP.
2. To examine the role of demographic characteristics of customers on their satisfaction level towards Hotel services.

4. Analysis and findings

A total of 300 questionnaires were responded by 184 males (62%) and 116 females (38%). The respondents age group included a majority of 36% (n=108) between the age range of 20-30 years, 28% (n=84) between the age range of

30 to 40 years; and 17% (n=52) between the age range of 40 to 50 years followed by 10% (n=32) in age group of 50 to 60 years and last 8% (n=24) in age group of above 60 years. 28% (n=85) of the respondents are students

20% (n=62) are in Gov. Services, 26% (n=78) are in Pvt Services followed by 13% (n=39) are in business occupation while 8% (n=24) are housewife and 4% (n=12) are professionals by occupation. 21% (n=65) of the respondents fall in the income group of Less than Rs 30,000, 19% (n=59) fall in the income group of Rs 30- 60,000 and 35% (n=107) of the respondents fall in the income group of Rs 60- 1,00,000 group and 14% (n=44) fall in the income group of Rs. 1,00,000-1,50,000 followed by 8% (n=25) of the respondents fall in the income group of above Rs 1,50,000. Majority of the respondents are postgraduate degree 49% (n=147) followed by respondents holding bachelor degree 34% (n=102) while 14% (n=44) are above post graduates.

Majority 47% (n=142) of the respondents has the length of stay for 3 to 6 days in hotel, followed by 25% (n=76) of the respondents normally stay in hotel for less than 3 days while 23% (n=70) of the respondents has the length of stay for 1 week in hotel.

The respondents were asked to state their level of satisfaction in terms of services provided to them during their stay at hotel by responding the statements which made an attempt to find out the satisfaction level of respondents towards hotel services. The respondents were asked to rate satisfaction level on a 5-point scale where rating 1 meant "Strongly Disagree" and rating 5 meant "Strongly Agree."

4.1 Reliability Test

Table 1 : Reliability Statistics of Customer Satisfaction towards Hotel Services

Construct	Cronbach's Alpha	N of Items
Customer Satisfaction	.800	11

The Reliability test gives us the confidence of the construct used in this study. As it can be seen from the reliability test table 1 shown above the satisfaction level of respondents is measured through 11 items having Cronbach's Alpha value 0.80 that is good enough. Thus all variables in the constructs carry alpha within the acceptable range.

Further an attempt was made to know which element of Hotel services contributed positively in Customer's satisfaction. The majority of previous studies show that satisfaction with hotel services is most often conditioned to more different elements, among which some stand out: quality of food, kind and professional staff, physical environment and ambience.

Table:2 : Level of Customer Satisfaction towards Hotel Services

SN	Factors of Customer Satisfaction towards Hotel Services	Mean	Std. Deviation
1	I am satisfied with the Cleanliness of this hotel.	3.58	.074
2	I am satisfied with the safety and security system of this hotel	3.92	.870
3	I am satisfied with the services of staff of this hotel	3.51	.959
4	I am satisfied with the behaviour of employees of hotel	3.26	1.130
5	I am satisfied with the physical facilities available in this hotel	3.61	.751
6	I am satisfied with the tariff charges of hotel.	3.25	.910
7	I am satisfied with the Food Quality of hotel	3.55	.070
8	I am overall satisfied in dealing with this hotel	3.35	1.003
9	I would recommend this hotel to other people	3.30	1.000
10	I would consider this hotel as my first choice when I need a hotel service	3.28	1.080
11	I would like to try other hotels	3.19	1.071

As it can be observed from the table 2 results, we got confirm that customer's satisfaction with hotel services greatly depends on those factors where mean score is more than 3.50 i.e experiences of respondents towards the satisfaction level lie on the Agree side of the Scale. The factors which are found able to satisfy customers towards Hotel Services are as follows: Cleanliness (Mean = 3.58, SD = .074), Safety and Security (Mean = 3.92, SD = .87), Services of Staff (Mean = 3.51, SD = .95) Physical Facilities of Hotel (Mean = 3.61, SD = .75), and Food Quality (Mean = 3.55, SD = .07). Since Standard Deviation (SD) of these factors are below 1 which indicates responses are within the interval range limit and hence shows the consistency of factors in measuring satisfaction of customers towards Hotel Services.

While the remaining factors such as behavioural training of employees, Tariff charges, etc. have Mean score less than 3.50 and Standard Deviation greater than 1 and that is why these factors are not considered as suitable factor for providing satisfaction to hotel guests regarding the services of Hotel.

Therefore, it can be inferred from the results that factors like

Cleanliness, safety and security, services of staff, physical facilities, and Food quality are vital for customer satisfaction that hotels can use to gain competitive advantage in today's competitive situation.

4.2 ANOVA and tests on Demographic Information for Total Customer Satisfaction

The purpose of this paper is to examine if the satisfaction of the hotel customers depends on their demographic characteristics: age, gender, education and income etc.

Thus, further analysis was conducted to determine factors that affects customer satisfaction based on the demographic information of the respondents. Using ANOVA we have examined the effect of demographic factors such as: age, income, occupation, purpose of visit, number of days spent on overall / total customer satisfaction. Write t test has beenin cace of gender. The total satisfaction of the customers towards hotel services depends on sum of multiple factors and hence obtained the Total Satisfaction construct comprising all factors of satisfaction.

Table 3: Construct for Total Customer Satisfaction

Factors of Customer Satisfaction towards Hotel Services	Mean	Construct	Overall Mean
I am satisfied with the cleanliness of this hotel	3.58	Total Satisfaction	3.58
I am satisfied with the safety and security of this hotel	3.92		
I am satisfied with the services of staff of this hotel	3.51		
I am satisfied with the behaviour of employees of hotel	3.26		
I am satisfied with the physical facilities in this hotel	3.61		
I am satisfied with the tariff charges of hotel	3.25		
I am satisfied with the Food quality of this hotel	3.55		
I am overall satisfied in dealing with this hotel	3.35		

H01: Demographic characteristics of hotel customers such as gender, age, education and income does not affect Total Customer Satisfaction.

Table 4: ANOVA t value on Demographic information for Total Satisfaction

		Sum of Squares	df	Mean Square	F	Sig.
Total Satisfaction * Age	Between Groups	2.591	4	.648	1.642	.164
	Within Groups	116.414	295	.395		
Total Satisfaction * Education	Between Groups	.529	3	.176	.440	.724
	Within Groups	118.476	296	.400		
Total Satisfaction * Gender	Between Groups	.884	1	.884	2.230	.036
	Within Groups	118.121	298	.396		
Total Satisfaction * Occupation	Between Groups	18.927	5	3.785	11.120	.000
	Within Groups	100.078	294	.340		
Total Satisfaction * Monthly Income	Between Groups	5.642	4	1.411	3.671	.006
	Within Groups	113.363	295	.384		
Total Satisfaction * Average number of days spend in Hotel	Between Groups	16.927	4	4.232	12.230	.000
	Within Groups	102.078	295	.346		
Total Satisfaction * Purpose of Travel	Between Groups	4.506	4	1.126	2.902	.022
	Within Groups	114.499	295	.388		

The statistical analysis based on the findings of the test shows that for demographic factors Age ($p = .164$, $F = 1.64$) and Education ($p = .724$, $F = .440$), p value of the test is greater than α value (critical value) of test i.e. 0.05 at 5 % level of significance ($p > 0.05$) thus for Age and Education hypothesis is accepted. Therefore, Age and education level of customers does not affect their perception towards Total satisfaction.

While, p value of demographic factors like Gender ($p = .03$, $F = 2.23$), Occupation ($p = .000$, $F = 11.12$), Monthly Income ($p = .006$, $F = 3.61$), Average spend days ($p = .000$, $F = 12.23$) and Purpose of travel ($p = .022$, $F = 2.9$) is less than α value (critical value) of test i.e 0.05 at 5 % level of significance ($p < 0.05$) thus for these demographic factors the null hypothesis is rejected. Therefore Gender, Occupation, Income and Purpose of travel of respondents affect their total satisfaction level towards hotel services.

An attempt has also been made to determine the intercity of effect of the independent variables on the dependent one. For this purpose Eta square has been used to show the effect of the independent variables on the dependent one Cohen (1988) gives guidelines for the interpretation of the Eta square value: 0.01 to 0.05 = minor

effect, 0.06 to 0.10 = moderate effect, 0.11 and above = major effect. We can see from the table below that the value of Eta square means to measure the effect of the independent variables on the dependent one.

Table 5: Measures of Association

	Eta	Eta Squared
Total Satisfaction * Age	.148	.022
Total Satisfaction * Education	.067	.004
Total Satisfaction * Gender	.086	.007
Total Satisfaction * Occupation	.399	.159
Total Satisfaction * Monthly Income	.218	.047
Total Satisfaction * Average days spend in Hotel	.377	.152
Total Satisfaction * Purpose of Travel	.195	.038

As it can be seen from the above table that Eta Square value of Occupation (0.159) and Average days spend in hotel (0.152) shows that the major effect of these two demographic factors on Total Customer Satisfaction is high. On the other hand, Eta Square value of Age (.022), Education (.004) Gender (.007), Monthly Income (.04) and purpose of travel (.03) shows the minor effect on Total customer satisfaction.

To summarize, it can be concluded that total customer satisfaction greatly depends on occupation of customer and average days he / she spend in hotel. However, total satisfaction does not depend on age and education but it partially depends on income and purpose of travel of customer.

5. Conclusion

Customer satisfaction is equally important in service businesses particularly in hotel industry this is why this industry wants to keep their customer satisfied and always try to not only to satisfy them but also make them delighted. Therefore, this study sheds light on the most important factors of customer satisfaction.

The study concludes that in hotel industry of Madhya Pradesh hotel's service factors like cleanliness, safety and security, services of staff, physical facilities, and Food quality are important to provide satisfaction to customers. With a better understanding of these factors hotel marketers can determine the actions required to meet the customers' expectations towards Hotel services.

It is also found in the study that the demographic variables like Gender, occupation, Income have a significant role in determining the customer satisfaction in the hotel industry. Whereas, age and education level of customers does not affect the satisfaction level of customers

towards hotel services. The association of demographic characteristics of customers with their satisfaction level is found high in occupation of customer and average days he / she spend in hotel. The managers may apply this study and devise such a strategy which can satisfy their customers. Once they become successful to satisfy the customer they can not only retain the customer in terms of the customer loyalty but can also get the positive word of mouth publicity from the satisfied customers.

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HOW TECHNOLOGY & NEW MEDICAL SYSTEM HELPS IN THE FIGHT AGAINST COVID-19 ERA

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Abstract: The Covid-19 pandemic has disrupted life and lifestyles of people across the globe. Government has enforced lockdowns to curb the spread of the deadly virus. Work from home is the new reality for many businesses as they struggle to operate during these uncertain times. School, Colleges and Universities are conducting online classes to complete their syllabus; social distancing is the new norm in grocery stores and E-commerce companies are making Covid-safe deliveries to their customers. The COVID-19 pandemic has strained the healthcare system not only in India but worldwide. There is no way hospitals can go back to functioning how they used to. A lot of changes will have to happen on the administrative and clinical level to adapt to the paradigm shift that this pandemic has created. Here we focus that how technology and new medical systems are helping to us against COVID-19 viral infections disease with new technological and medical approach for well being of human's life.

Index terms: New technological trends, new medical system (telemedicine & AI- health care system), 3D printed images.

Introduction: The development and implementation of technology and medical system solutions aimed at combating the COVID-19 outbreak are rapidly taking shape around the world. Governments, Venture Capitalists, Academic Institutions, Incubators, Startups, and businesses large and small are all doing their part to deploy new innovative solutions as quickly as possible. Governments are developing and modifying policies old and new to promote the rapid development of technologies that can help eliminate the Coronavirus. The Ministry of Corporate Affairs (MCA), for now allows companies to channel their mandatory Corporate Social Responsibility (CSR) spending towards helping fund new innovative technologies and medical system that will aid in the fight against the COVID-19 pandemic. The United States has, another example, enacted the Emergency Use Authorization (EUA), allowing the Food and Drug Administration (FDA) to expedite the use of new medical devices during public health emergencies. This is now enabling companies to deploy medical devices to market at a rapid and much needed pace. Abbott Laboratories recently developed a portable 5-minute

COVID-19 test kit the size of a toaster. The test kit, which received Emergency Use Authorization (EUA), is now being used across the U.S. and production will ramp to 50,000 tests a day by the second week of April. This crucial innovation will help clear the huge backlog of untested patients and doctors, giving health officials a chance to finally get ahead of the virus. Despite these difficulties, startups are still making an impact in the fight, especially in the ventilator product space. With the global demand for ventilators skyrocketing, AgVa Healthcare, an innovative Indian startup building cost-effective portable ventilators, is working to manufacture 20,000 ventilators over the coming month. Isinnova, an Italian based startup, designed a 3D-printed valve that turns snorkeling masks into ventilators and shared their 3D-printing designs online for free. Other startups, such as Carbon Health and Baby Scripts, are working to disseminate credible, trustworthy, and relevant information about COVID-19 to individuals, to families, and even to expecting mothers. In this new reality, communication technology offers solutions to overcome some of the challenges thrown up by the pandemic. The recent defiant spread of Covid-19 has spurred many jokes and memes on the internet. But the one which shows us the harsh reality is the hidden message alongside the content. Mankind harps on how its superior brain power has led to advancements in technology connecting people around the world (even in space). The novel coronavirus is subjecting this claim to a rigorous test, as increasing connectivity is proving a boon to its spread. Covid-19 first appeared in China in January 2020, and has now spread over 215 countries with around 8,408,203 lakh reported cases and nearly 451,463 lakh deaths. It has virtually 'locked down' the world. Despite the advances that mankind has achieved in medical science, the only potent measure against the virus as of now is do all work online and work from home. There are a few of the technology trends in the field of communication which are poised to redefine a post Covid-19 world.

New Technological Trends that will define the Post Pandemic World:

1. **Virtual Biometrics:** Facial and iris recognition solutions integrated with infra-red thermometers are increasingly being used for screening. The

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government and many private companies in India have suspended contact-based biometric time and attendance systems. These can also be used to track the movement of suspected infected persons and to quarantine them.

2. **Virtual Meetings:** With lockdowns, and travel restrictions, face-to-face meetings and 'huddles' will need to be redefined. Industry will experience an increase in virtual meetings. Already, applications like Google Meet and Zoom have been a sudden spurt in users. From meetings with only 4-5 participants, to huge international seminars and conferences with thousands of participants all have already moved online. This trend is likely to continue in the post Covid world as people maintain social distancing etiquette.
3. **Online Education:** Post the lockdown, a large chunk of academia has gone online. Schools, Colleges, University and Coaching Centers are conducting online classes via video conferencing. Dedicated education apps have witnessed a huge spurt in growth as students are learning concepts on their mobile phones. A few colleges have also conducted tests / Examination online. It is expected that some of these trends will continue in the post Covid period as well. Many Universities and school education boards have recommended that schools and colleges should attempt to complete some portion of the curriculum online, even after the situation becomes normal.
4. **5G:** With the increasing demand for faster and higher bandwidth networks, due to remote working, 5G which is the next generation network designed with "Service Based" architecture might get adopted faster. 5G provides greater quality of service based on the network 'Slice", which caters to a particular service type, such as IoT, Low latency applications etc. For example, for a remote surgery use case, where low latency is a critical parameter, 5G can perform better than the current networking solutions.
5. **Shared Spectrum:** Technology trends make it clear that in a post Covid world, more content will be watched and consumed on mobile devices, be it in form of video conferencing for a meeting, an online class, or Video for entertainment. Even before the pandemic, video occupied over 70 percent of the content transmitted over the mobile network. This will risk exponentially in the post Covid world and will overburden mobile networks which are not designed to handle such load. To prevent network congestion and improve user experience, the communication companies will use "Shared"

spectrum. There are various types of shared spectrum options. Dynamic shared spectrum such as TVWS, CBRS give additional coverage and capacity to provide connectivity to unconnected population. We can also have sharing of spectrum between two different networks such as Broadband and Broadcast networks. One such example of a shared spectrum is Saankhya Lab's 5G broadcast. This is a 5th generation data transmission innovation which is a convergence of Broadcast and Broadband spectrum.

6. **AI/ML based Communication:** Artificial Intelligence and Machine Learning (AI/ML) will be playing an increased role in the communication solutions of the future. When communications is being done using shared spectrum AI/ ML systems will be continuously monitoring the load on the various networks. Based on the data type, network load and number of users the AI / ML system can help networks make a decision to choose the most optimum parameters to deliver content- for example: networks can make a decision to switch the transmission from one spectrum to other on a real time basis. These systems will help greatly improve the user experience.
7. **Virtualization:** With more data being transmitted the mobile operators would have to ramp up the network infrastructure in order to support this large volume of data. Ramping up physical infrastructure is very costly so many operators will opt for virtualization to reduce the capex and opex. For example, RAN virtualization is adopted by many network operators which separate the network functions from the hardware. This gives scalability, elasticity and lead to a more flexible, agile and cost-effective network. Virtualization also will lead to disaggregation and open network architectures. This also gives way for innovation and newer players to provide cutting edge technology to better manage the network.
8. **Rural Broadband:** Covid-19 has changed the demographics of cities. The lock down followed by the loss of jobs triggered a reverse migration from cities to villages. It is not certain how many of them will chose to return once the pandemic scare has passed. However, it is envisaged that the migrant population will take back some city amenities, such as 24-hour internet connectivity. Mobile internet connectivity and the world of opportunities that it opens up will lead to a greater demand for high speed internet connectivity in rural areas as well-for everything, from govt.services to tele-education, tele-medicine to e commerce. Many innovative

wireless technologies can provide faster and cost effective alternatives to current optical network solution to rapidly deploy connectivity across the country. One such example is IEEE802.22 based Fixed Wireless Access technology which utilizes unused UHF spectrum and can be used for middle mile and last mile network coverage.

9. **IoT Solutions:** There has been a rapid proliferation of "smart" devices which are connected to the internet. Post Covid-19, as a result of social distancing norms, there will be a larger growth in such devices. We will see the use of "smart" devices in "smart" homes. For example, "smart" refrigerators will take stock and order groceries online. Such "smart" devices will require regular software upgrades which will be transmitted via the internet. Companies could use 5G broadcast to broadcast a software upgrade patch to all their devices, making it cost effective while also reducing congestion in the mobile network.
10. **Remote Sensors and Monitoring Solutions:** Slowdown in travel will ultimately lead to proliferation of remote sensors and monitoring solutions. These sensors and monitors will be installed in remote areas like agriculture fields, oil rigs, remote factories and warehouses, mines etc. They could be controlled and monitored from a central location. Fixed Wireless Access solutions can be used to provide connectivity between the central location and the remote locations.
11. **Satellite based asset tracking solutions:** In many places across the country where mobile network connectivity is patchy, there will be an increase in remote asset tracking solutions. This is because movable assets such as trains, trucks, fishing boats, etc continuously move in these areas. In the absence of mobile network connectivity, satellite connectivity will be used to send and receive data from a central control location.
12. **Contactless Working:** To avoid physical contact, paperless working is being encouraged in offices. On 16, June, 2020 JNU announced they are doing Ph.D. examination / Viva voce or Ph.D. thesis will go paperless. The apex bank in India has advocated digital transactions over physical exchange of currency to prevent spread of the virus. Delhi Metro has recommended use of contactless metro cards for travelling. Delhi Metro driving start-up Neolix to deliver supplies and food to big hospitals in Beijing. It has made its micro-car kits and autonomous driving cloud services available for free to companies fighting the virus.

13. **CCTVs:** When a family of three in Kerala's Pathanamthitta district (India) tested positive for Covid-19 after returning from Italy, local authorities realized the family had visited several places and met many people for a week before they were quarantined. Reviewing CCTV footage from the areas they had been to was one of the methods the local administration used to track down 900 people the family could have potentially infected. South Korea and Singapore, too, have used CCTVs extensively in contact-tracing.
14. **Video Conferencing:** Apps like Zoom and Skype shall be used for any meeting to avoid close gatherings at one place. These apps may be uploaded on desktops / laptops / mobile phones of the employees.
15. **Work from Home:** Alibaba and Baidu instructed their employees in China to work from home after the Lunar New Year (January 25, 2020). Since the wife of Canadian Prime Minister tested positive for coronavirus, he is under self-quarantine and undertaking tele-governance to perform his administrative responsibilities. Today, you only need a laptop and a good internet connection to access your office server, work on your project and deliver the desired outcomes. One can use online services like Team Viewer for remote access, desktop sharing, online meetings, web conferencing and file transfer between computers. Working from home is the future, as it will help to save costly office space, reduce transport expenditures and increase employee productivity.

New Medical Trends that will define the Post Pandemic World:

1. **Artificial Intelligence (AI):** AI is lending a hand in diagnosis and developing a cure for the illness. Several hospitals in China are using AI-based software from the company infer vision to scan through CT images of patients lungs to look for signs of infection. The cloud computing resources and supercomputers of several major tech companies such as Tencent, DiDi, and Huawei are being used to fast-track the development of a cure or vaccine for the virus. Several drug companies are using AI-powered drug discovery platforms or are mining through databases of already-approved drugs (for other illnesses) to find a cure.
2. **Tele-medicine:** This technology is being used by large hospitals across the US to safely screen and treat patients from remote places. The Rush University Medical Center in Chicago recently set up a virtual medical line to help screen patients for coronavirus.

3. Autonomous vehicles and drones: These are being used to deliver essential goods like medicines and foodstuffs. China's largest private courier, SF Express, is using them to transport medical supplies to Wuhan Jinyintan Hospital in China's Hubei province. Drones are also being used to patrol public spaces, track non-compliance to quarantine mandates and for thermal imaging. Apollo, Baidu's autonomous vehicle platform, has joined hands with self-driving start-up Neolix to deliver supplies and food to a big hospital in productivity.
4. Robotics: Robots may be deployed to take care of patients in isolation wards by serving them food, medicines etc. In China, a robot named Little Peanut transports food to patients quarantined in a hotel. In one Chinese hospital, patients hand over trash and bed sheets to robots. In the US, one patient in the state of Washington is being treated by a robot named Vici, through which he communicates with his care team. The WHO chatbots are being used to keep travellers updated on the latest travel procedures and disruptions. The WHO chatbot operates on the Whatsapp platform, which belongs Facebook.
5. Breathing more easily with 3D Printers: Ventilators have become essential equipment for providing treatment to the most severe cases of COVID-19. But the health system is facing a shortage of supplies. To address this problem, different groups of 'makers' around the world have set up network communication platforms and channels, using technology like Telegram, where they share information about open-source design for manufacturing ventilators with 3D printers. Anyone with a 3D printer can collaborate by printing the necessary respirator components. The goal is to make them available to health care services. The project is yielding fast results: in just a few days, members of one of the groups in Spain (Reesistencia Team) were able to build an open-source respirator prototype, which has already been successfully tested on a pig at the Central University Hospital of Asturias in northern Spain.
6. Smart Imaging: In an effort to enable contactless and rapid temperature detection, China is using AI-powered thermal cameras to identify those in a crowd who have a fever. The country is also deploying facial-recognition systems to identify those not wearing masks.
7. Mobile Apps: A startup in the UK recently launched an app for people to self-report their symptoms. C-19 Covid Symptom Tracker, which was downloaded 7.5

lakh times in three days, helps identify high-risk areas, among other things. South Korea has an app called Corona 100m that has mapped the locations of Covid-19 patients and alerts users if they come within 100 meters of an infected person. India is also set to launch an app called (Aarogya Setu) that will tell users if they came in contact with someone who later tested positive for Covid-19, as reported by ET on March 26, 2020. The app will be based on location data obtained from the infected person's smartphone. The Ministry of Electronics and IT, has launched the Covid - 19 tracking mobile app, Aarogya Setu, which is available in 11 languages, and can easily be downloaded on smart phones on Android. This is to inform that Aarogya Setu App has been developed to fight against Covid - 19. At present 13.04 Crore Indians are using Aarogya Setu App. It will also use short-distance Bluetooth signals between phones, like Singapore's Trace Together app, which helps authorities trace contacts of a patient. In China, apps developed by Alibaba and Tencent give people a colour code based on their health condition and travel history. This code, decided by a big data -driven algorithm, will determine whether a person gains entry into a mall or a subway station, or can travel between cities. Possibly the most commonly used technology by governments, tracking people's whereabouts through the location information provided by their phones has been crucial to identifying where an infected person went before being quarantined and how many people were in close proximity to the patient. Israel has allowed its internal security agency the use of its citizen's location data for 30 days. South Korea, China and Taiwan have also used location-tracking widely to limit the transmission of the virus. However, in Europe, which has stricter laws on data protection, Germany and Italy are using anonymised location data to identify public spaces where people are gathering in groups by defying lockdowns.

Conclusion: On 16 June 2020, according to WHO "The virus risk cannot be zero in any Environment", so seeing this current situation of the world, we finally concluded that the problem of coronavirus disease can be minimized or reduced by using the our new technological and medical trends like all communication systems, online education, work from home and illness problems of coronavirus disease can be solved by AI- based software. By using all these current trends of the technology we can achieve the minimum infection rate. Now all these trends clearly indicate that communication technology will play a crucial role in reshaping a post Covid-19 world.

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CONSUMERS ATTITUDE TOWARDS ORGANISED AND UNORGANISED READYMADE GARMENT INDUSTRY IN REWA CITY

Harshit Pratap Singh

Abstract

Readymade clothes area unit a district and parcel of textile trade and accounts for concerning half exports. Indian Textiles trade plays a polar role on second largest employment supplier once the agriculture and exchange jobholder for the country. At this juncture, a study on consumers attitude towards organized and unorganized readymade garment vision on characteristic the hidden variable that facilitates the expansion of this sector generally, clothes trade particularly. In India hr of the entire population is in between the age bracket of 20- 40. Middle financial gain teams are bit by bit increasing in India. Each primary and secondary information area used and acceptably applied, math tools are applied to draw a possible conclusion.

Key words: Brand awareness, Readymade Garments, Consumer attitude, Organized and Unorganized.

Introduction:

The Indian economy has been witnessing a huge amendment for the last one decade attributable to the assorted dynamics of the business. significantly the business sectors like share market, retailing, BPO, property etc. square measure growing speedily. The Indian merchandising trade is moving towards the section of organized merchandising from the section of unorganized merchandising. Over the past few years, the retail sales in Asian country square measure hovering around 33-35 per cent of value as compared to around twenty per cent within the America. in keeping with a survey conducted by business practice Technopak Advisors, the country's retail market is anticipated to the touch 620 billion euros by 2021 at a combined annual rate of growth (CAGR) of quite twenty five per cent. robust underlying economic process, population enlargement, the increasing wealth of people and also the fast construction of organized retail infrastructure square measure key factors behind the forecast.

At an equivalent time the competition is additionally growing among the trade attributable to the massive variety of players coming into the markets each from national and international levels. These changes within the business atmosphere directly influence the mode perspective of the folks. The changes within the perspective of shoppers successively have impact on the trade directly or indirectly. so as to draw in and retain customers the businesses need

to return up with varied business ways. To arrange a triple-crown business strategy, it's pretty much necessary to know the factual dynamical patterns of the buyer perspective. The attire and consumer goods trade being positioned initially place and additionally the defrayment on attire and clothing among the shoppers have gotten increased, it's vital to review the dynamical perspective of shoppers. the aim of this study is to expand the data of attire shopping for perspective of Indian shoppers and in a very sensible sense understanding factors that influence attire shopping for perspective is extraordinarily unjust for attire retailers seeking to standardize or adapt their strategy for the Indian shoppers.

Literature Review:

1) Lakshminarayana. K and Dr. Sreenivas (2017) conducted a study in the main to understand concerning the patron shopping for behavior towards branded apparels in Bangalore town. The study reveals that there's heaps of scope for brand new entrants during this field, the makers and marketers of branded wears ought to focus on creating new shopper instead of holding recent one. the amount of individuals visiting the salesroom with a complete in mind, in same because the range of individuals visiting the salesroom with no complete in mind. Most of the time patrons visit the salesroom of branded wears with the aim of searching but compared to ladies, male shopper visit the salesroom for passing time, advertisement, promotional schemes and different factors influence the shopper to buy. Among the varied promotional schemes and promotional measures discounts, buy2 get1 free schemes have most influence on purchase call of a specific complete. With the effective selling combine and methods will extend the property growth during this business.

2) Sandeep Kumar, Prasanna Kumar, Srinivasa Narayana (2016) conducted a study in the main to understand concerning the patron perception, behavior, life vogue towards the attire brands. To assess the importance of various factors in complete retention from the study, it's recommended that the attire corporations ought to focus additional on client retention. this may be achieved by keeping the costs affordable, maintaining quality in vesture, asserting loyal programs in special periods, providing good client services, advertising additional on net, newspapers, social-media and tele-media.

Objectives:

The major objective this research:

1. To study factors responsible in deciding the purchase of readymade garments from organized and unorganized retail stores.

Research Methodology:

This study tries to research the factors touching shopper perspective towards organized and unorganized clothes retailers, A structured questionnaire was designed for organized and unorganized shops, the customers were asked regarding the criteria's that they take into account once creating a procurement for various things. Responses of two hundred customers were taken on the finalized form through a scientist controlled sampling technique.

Analysis & Interpretation:

Factors which are responsible in deciding the purchase of readymade garments.

Variables	N/%	Very high	High	Neutral	Low	Very Low	Total	Mean	Std.dev.
Fashion	Frequency	38	61	31	42	28	200	2.775	1.33163
	Percent	19	30.5	15.5	21	14	100		
Uniqueness	Frequency	34	69	39	37	21	200	2.71	1.24646
	Percent	17	34.5	19.5	18.5	10.5	100		
Brand	Frequency	38	71	33	32	26	200	2.6850	1.30549
	Percent	19	35.5	16.5	16	13	100		
Colour	Frequency	42	62	32	27	37	200	2.7750	1.40865
	Percent	21	31	16	13.5	18.5	100		
Comfort	Frequency	44	58	34	25	39	200	2.7850	1.42793
	Percent	22	29	17	12.5	19.5	100		
Climate Suitability	Frequency	36	66	36	28	34	200	2.7900	1.35465
	Percent	18	33	18	14	17	100		

As per the above table it is found that 99 (49.5%) respondents agreed that fashion is one of the factors responsible for the purchase of readymade garments, whereas 103 (68%) respondents agreed to the uniqueness of the respective garment is another very appreciated factor for the purchase of readymade garments. According to 109 (54.5%) of respondents brand is quite responsible for the purchase of the readymade garments. As per 104 (52%) respondents, they look for color whenever they choose to purchase clothing from any organized retail store. 102(51%) respondents comfort regarding the garments as well as place of purchasing is also crucial for them to purchase clothing from any organized retail store. 102(51%) respondents once again indicated suitability of the climate as an influencing factor for purchasing the readymade garments from organized retail stores.

Findings:

It is found that the issues that area unit liable for the buyer shopping for deciding in industry and to see the importance of every factor that helps the purchasers in choosing the attire from these organized retail stores. The info analyzed has portrayed those factors like fashion, uniqueness, comfort, brand, color, etc. area unit vital factors that have an effect on their shopping for behavior. The factors that area unit ascertained within the study will be utilized by the retailers in developing their promoting methods during a higher means. With its facilitate the retailers has a chance to convert their potential customers to actual customers, apparels retailers desires heap of improvement in their atmosphere and placement, brands offered, costs offered, discounts offered, services provided among the shop similarly as when sale service so as to spice up their demand.

Conclusion

This analysis can facilitate the unorganized retailers to retain their share within the overall market. It'll conjointly facilitate them to provide powerful competition to organized selling by distinguishing parameters that are unit necessary for patrons. The study can facilitate the foreign & domestic investors in grabbing the most effective investment opportunities by giving them a deeper insight regarding client preferences in each tier one & tier cities. Marketers, through this study would be ready to determine varied parameters and their impact on client preferences.

Limitations and Suggestions for Future Research:

The analysis contains a variety of limitations that should be acknowledged. principally this study was conducted in one town and with restricted variety of respondents. the information assortment was supported the opinion of the respondents and it should modification from time to time. Some customers were reluctant in responsive the queries. The sample size is incredibly restricted thanks to time constraint. Future researchers might take up different quite product like branded cloths, fruits and vegetables etc. Allot of sample are often taken in future studies. Additional

comparison are often drawn among client happiness to completely different cities and their preference for organized and unorganized shops stores.

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ROLE OF CORPORATE SOCIAL REASONABILITY PRACTICES ON EMPLOYEE SATISFACTION IN CEMENT INDUSTRY: A STUDY OF SELECTED CEMENT UNITS OF VINDHYA REGION

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ABSTRACT

This study seeks to examine the role of CSR on employee satisfaction. The study is based on primary data collected from 300 respondents of 5 cement manufacturing companies of Vindhya Region. The data was collected through a well-structured close ended questionnaire and analysed with percentage, mean and One Way ANOVA for testing the hypothesis. The results of this study revealed that CSR practices of the cement companies have significant role on employee satisfaction.

Key Words: Corporate Social Responsibility (CSR), employee satisfaction, stakeholders.

INTRODUCTION

Radical changes in business environment and strategy in past few decades have triggered the corporate strategists to act responsibly not only towards shareholders but other stakeholders too. Among various stakeholders, employees are the key stakeholders and one of the most valuable assets of any company. In recent times, the importance of human assets in the performance of the organisation has become pivotal. Thus, satisfaction of these human assets is now considered as a critical determinant for firm's performance which causes increase in customer service ratings, product quality, team performance, workers' productivity and stock price. While their dissatisfaction causes increase in employee turnover, reduced workers' productivity & profit margin, poor customer service, inferior product quality and increase in the cost of capital. Therefore, it is required for managers to understand how a firm's policies can affect employee satisfaction. CSR activities of the firm do significantly affect the employee satisfaction and in turn affect firm's performance. Though companies spend on CSR for various reasons, employee satisfaction is the third-most-cited reason by managers for engaging in CSR (KPMG, 2011). The association between CSR and employee satisfaction is complex by the fact that CSR is multidimensional that includes social, environmental as well as governance components. Although CSR has been defined in a number of ways, the recent empirical work has inclined to focus on a set of dimensions described on stakeholder needs: environmental performance, employee relations, corporate governance, community relations, human rights, and

product-related issues. Thus, it is not clear that which components of CSR are most likely to relate to employee satisfaction. This study tests the relationship between the CSR initiatives and employee satisfaction and addresses the research question whether CSR play a vital role in employee satisfaction or not?

LITERATURE REVIEW

Bhattacharya et al. (2008) carried out a study to understand when, how and why employees react to CSR and indicated that when personal needs of employees are fulfilled at work, they are likely to recognise with the company. He stated that if employees are satisfied and attached to the company, they recommend their company to friends and family as a good employer.

Stancu et al. (2011), in their paper "The Impact of Corporate Social Responsibility on Employees" found that work place safety, fair wages, healthy work environment and development opportunities to the employees are some of the aspects of company's responsibility towards employees which they keep in mind at the time of forming image of the company where they work. These activities create good working environment which stimulate productivity and develop satisfaction among employees.

Dhanesh G. S. (2014) in his article "CSR as Organization-Employee Relationship Management Strategy: A Case Study of Socially Responsible Information Technology Companies in India" expressed that active participation of employees in CSR activities gives them the sense of collaboration and feeling that their views are taken into consideration thus increasing their thought of control over their relationship with organisation.

Anggusti, M., Nasution, B., Tabalujan, B. Siregar, M., Juwana, H., Kamello, Suhaidi T. (2015) in their paper on corporate governance for employee welfare concluded that if the company guarantee the well-being of the employees and their family, the output becomes good resulting into uninterrupted work and desired outcomes.

Raihan, Tarik and Karim, Al Rashed (2017) in their empirical study on Corporate Social Responsibility and employee job satisfaction examined the link between CSR

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and employee job satisfaction in MNCs of Bangladesh. The results inferred when companies make a decision to develop and implement social activities, the employees of that company get recognition and this develops job satisfaction among them. As a result of this they exhibit greater work performance.

OBJECTIVE

To examine the role of CSR practices of cement companies on employee satisfaction.

HYPOTHESIS

1. There is no significant role of CSR practices of cement companies on employee satisfaction w.r.t. organisation.
2. There is no significant role of CSR practices of cement companies on employee satisfaction w.r.t. designation.

RESEARCH METHODOLOGY

Sample Design: 300 respondents have been taken as the sample for this study taking 60 respondents from each company and 100 from each level. Five cement manufacturing companies of the Vindhya Region namely JP Cement Rewa (JRC), Prism Johnson Limited (Prism Cement) Satna, Satna Cement Works (SCW) of Birla Corporation, ACC Cement Works, Kymore and Maihar Cement were selected for data collection. While three different levels of employee; Executive level (GM, DGM, AGM), Managerial level (Managers, Deputy Managers, Assistant Managers) and Non-executive level (Sr. Engineer, engineer) have been taken giving equal representation.

Data Collection & Analyses: Primary data was collected through close ended well structured questionnaire using 5 point Likert scale type statements with answers ranging from 'strongly disagree' to 'strongly agree'. The data was analysed and tested using Descriptive Statistics (Percentage, Mean and Standard Deviation) and One-Way ANOVA for testing the hypothesis through SPSS (version 21.0).

RESEARCH FINDINGS AND DISCUSSION

To measure the role CSR practices on employees' satisfaction 6 parameters were identified which include-safe and healthy work environment, respecting the rights of employee, development of quality of life of employee, transparency in communication, non-discrimination at workplace and fair wages and benefit packages. The responses of the employees in the Cement Industry are classified in the following table.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Company provides safe and healthy work environment	0	0	1.0%	27.3%	71.7%
Company respects the rights of employees	0	0.3%	5.3%	38.0%	56.3%
Company helps in developing quality of life of employees	0.3%	0.3%	13.7%	42.7%	43.0%
Company keeps transparency in communication with employees	0	0.7%	8.7%	47%	43.7%
Company ensures non-discrimination in employment	0	0	5.0%	48.3%	46.7%
Company provides fair wages and benefit packages	0	0.7%	8.0%	36.0%	55.3%

- * Study shows that 99% respondents feel that their company provides safe and healthy work environment, by either agreeing or strongly agreeing with the statement.
- * 94.3% respondents either agreed or strongly agreed that their company respects the rights of employees.
- * 85.7% respondents opine that their company helps in developing quality of life of employees.
- * 90.7% respondents feel that their company keeps transparency in communication with employees either agreeing or strongly agreeing with the statement.
- * 95% respondents were in favour of the statement indicating that their company ensures non- discrimination in employment.
- * 91.3% respondents agreed that their company provides fair wages and benefit packages.

Organisation wise and Designation wise responses have been classified in the following tables analyse the impact of these variables on employees satisfaction towards CSR activities in cement industry:

Table 2: Organisation wise Employee Satisfaction with CSR Practices

Organisation	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
					JRC	60		
PRISM JOHNSON	60	4.57	.446	.058	4.46	4.69	3	5
BIRLA CORPORATION	60	4.46	.512	.066	4.33	4.59	3	5
ACC KYMORE	60	4.64	.454	.059	4.52	4.76	3	5
MAIHAR CEMENT	60	4.36	.436	.056	4.25	4.47	3	5
Total	300	4.45	.507	.029	4.39	4.51	3	5

Table 3: Designation wise Employee Satisfaction with CSR Practices

Designation	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Executives	100	4.41	.508	.051	4.31	4.51	3	5
Managers	100	4.41	.526	.053	4.31	4.52	3	5
Non- Executives	100	4.53	.483	.048	4.43	4.63	3	5
Total	300	4.45	.507	.029	4.39	4.51	3	5

One-Way ANOVA test has been applied to find out the significant role of CSR practices of cement companies upon employee satisfaction with respect to organisation and designation on above data to test the results of following hypotheses:

H01: There is no significant difference in the role of CSR practices on employee satisfaction w.r.t. organisation.

Table 4: ANOVA Test Statistics for Employee Satisfaction with CSR Practices w.r.t. Organisation

Table 4: ANOVA Test Statistics for Employee Satisfaction with CSR Practices w.r.t. Organisation

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	6.879	4	1.720	7.238	.000
Within Groups	70.094	295	.238		
Total	76.972	299			

The significance value (p value) of ANOVA test is 0.000 (table 4) which is less than 0.05 (α value) at 5% level of significance. Since results of test ($p < \alpha$) does not support the assumption the calculated value of F is 7.238 which is greater than the critical value of F 2.37 at 5% level of significance for $V1=4$ and $V2=295$ degree of freedom. Hence, the null hypothesis is not accepted. Therefore, the statistical test indicates that there is a significant role of the organisation in the CSR activities towards employee satisfaction. Further, the higher mean values in the table 3 indicate that most of the employees across organisations are highly satisfied with the CSR activities pertaining to them in the enterprise. But, employees are comparatively more satisfied in ACC and Prism Johnson and comparatively less satisfied in Maihar Cements and Jaypee Cement.

H02: There is no significant difference in the role of CSR practices of cement companies on employee satisfaction w.r.t. designation.

Table 5: ANOVA Test Statistics for Employee Satisfaction with CSR Practices w.r.t. designation

From table 5 it is clear that the significance value (p

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.962	2	.481	1.880	.154
Within Groups	76.010	297	.256		
Total	76.972	299			

value) is .154 which is greater than 0.05 (α value) at 5% level of significance. Since the result of the test ($p > \alpha$) supports the assumption and also the calculated value of F

test is 1.880 which is less than critical value of F 2.99 at 5% level of significance for $V1=2$ and $V2=297$ degree of freedom hence the null hypothesis is accepted that there is no significant difference in the opinion of employees towards CSR practices of cement companies upon employee satisfaction. Therefore, the statistical test indicates that designation wise respondents' attitude do not differ regarding the role of CSR on employee satisfaction. Further, the higher mean values in the table 3 indicate that most of the employees across designations are highly satisfied with the CSR activities pertaining to them in the enterprise.

CONCLUSION

Though employee satisfaction is not the prime motivation for instituting CSR in cement companies but employees are those primary and very important stakeholders who have bearing on the business. The results of this study reveal that CSR activities directed towards employees play a vital role in employees' satisfaction. From examined data it can be concluded that CSR practices which include employees' issues such as healthy work environment, transparency, non- discrimination and fair wages make employees feel that organisational authorities treat them fairly and respect their rights; this develops a sense of belongingness and satisfaction among the employee. So we can suggest in the words of Jeroen van der Veer (Chairman of Philips and former CEO of Shell), "The successful companies of the future will be those that integrate business and employees' personal values. The best people want to do work that contributes to society with a company whose values they share, where their actions count and their views matter." Employees who believe that management treat them as a whole person not just as an employee, are more productive, more satisfied and more fulfilled. Satisfied employees mean satisfied customers, which leads to profitability. Thus, company's CSR oriented activities lead to a better organizational image, which in turn lead to greater employee satisfaction.

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CHALLENGES & STRATEGIES IN BUSINESS MANAGEMENT: POST COVID ERA

Gunjan Shukla

1. Current Scenario

The COVID-19 pandemic is posing an existential threat to the humanity in the history of mankind. COVID-19 is growing exponentially as within four months, the virus has spread all around the world and imperilled not just our health and well-being but has also negatively affected on social and economic level too. Now, this post COVID era is an "era of radical uncertainty". In which, we are working hard to embrace ourselves not just to secure safe health responses for all but also ensuring that means livelihoods are well protected. The pandemic has exposed fault lines globally and national borders are no defence against threats from nature. The collective global action is needed and at national level the government and private players are required to come together to combat this pandemic crisis.

The most important and daunting task is to protect the lives of most vulnerable people at the bottom of pyramid, in relation to their health, livelihood & safety. Much more is needed to be done and much more is expected.

In the context of India, where economy and resources were already strained enough the sudden onslaught of COVID 19 has pushed the economy towards recessionary trend with contraction in growth in near future with dire consequences. Organization still had no clue that worst was yet to come in the form of pandemic 2019. This disruption has changed the concept of new normal.

Changing Face and Catalyst Role of Corporate Social Responsibility in COVID- 19

1. CSR - Introduction & Enacted provision in Companies Act 2013

1.1. Meaning

United Nations Industrial Development organization (UNIDO) has defined the CSR as a way through which a company achieves a balance of economic, Environmental and social imperatives ("Triple Bottom Line Approach") at the same time addressing the expectations of shareholders and stakeholders.

1.2. Legal provisions

India is a first country in the world to make corporate Social Responsibility (CSR) mandatory, following an amendment in the Companies Act 2013. As stipulated in the section 135 of the Companies Act 2013, who fulfils the monetary threshold limit criteria given under sub section 1 of the section 135, in a given financial year are required to

spend 2 % of their average Net Profit (of previous 3 years) on CSR programs & activities. Detailed list of activities related to "CSR policy" are clearly provided under the Schedule VII of the Companies Act 2013.

1.3. For Whom It is Applicable- Monetary Threshold Limits

As per sub section 1 of Section 135 of the Companies Act 2013, the companies

- * Having net worth of INR 500 crore or more; OR
- * Turnover of INR 1000 Crore or more; OR
- * Net Profit of 5 Crore or more.

2. Government Guidelines

In the wake of the world Health Organization declaring COVID-19 a pandemic on March 11, 2020 and rise of reported COVID cases within India, the Government of India's response has been immediate with declaring COVID-19 as "Notified Disaster". In the series of measures taken by GOI, one such measure has been to notify assistance towards COVID-19 aid under the purview of CSR activities. This announcement by GOI has been welcomed by corporate houses which enable them to provide aid and succour for COVID-19 and its "related activities" measure can be undertaken to promote health care and sanitation, rehabilitation and reconstruction activities etc. Thus, it is making corporate India a crucial partner in the war against pandemic crisis.

3. Corporate Social Responsibility as an Opportunity

Hit by the COVID-19 slumps followed by social distancing & nationwide lockdown, this pandemic caught every one unaware and unprepared. It halted the global economy which resulted in a businesses all over the world are experiencing the major economic impacts. It has threatened the survival of all in the era of uncertainty. Government at national level is battling this outbreak crisis with support of private partners and business organization with hand in hand. The companies must strive to use this crisis as an opportunity to increase their CSR foot print. By using CSR networking it can reach out to all the weaker section of community by channelizing their resources in most effective way. All eyes are on CSR teams to drive relief and rehabilitation for those affected by the covid-19. In times of crisis people are appreciating those who have sacrificed their short term gain in order to serve greatest good by serving the community and public at large. By

assessing the risks spread across the social value chain, from employee's protection to customer support and supply management to privacy concern, companies are positioning themselves as a responsible and valuable corporate citizen.

This is a difficult time but companies by thinking out of the box can reap the benefit of CSR as a tool to mitigate the crisis and ensure their survival in the coming future. Companies can make it happen by embedding following points in their business plan.

- * policy dialogue with government and partners.
- * By forging with new NGO partners.
- * By donation towards health care and industry and sanitization i.e. providing PPE kits ,mask, beds in hospitals ,advanced health equipment to hospitals, safety kits to vulnerable or those can't afford the same.
- * By running awareness programmes regarding COVID 19 threats and precautionary measure to avoid the infection.
- * By providing better work environment to employees and workforce ensuring their safety and health followed by fulfilling financial commitments at the time of crisis.

4. Need of time

The ministry of corporate affairs has declared the pandemic a notified disaster and has begun to accept CSR support from corporates under schedule VII of company Act 2013 as preventive healthcare and disaster management areas. The government is also seeking support for PPE kits, N95 Mask, Ventilators pumps, beds & medicines in large volumes. This collaborative approach and initiative will ensure make it through this crisis.

Corporate social responsibility is a self-regulating business model in which the company interact with its stakeholders and public at large where it creates a scenario of being socially responsible citizen.

Here comes the pivotal role of corporate social responsibility in the age of this pandemic COVID-19 crisis, where everyone is doing their best to get through the tremendous challenging time. Simultaneously it has also exposed the various lacunae in our preparation to fight this battle such as safety and protection of under privileged communities, incapacity in the safe health infrastructure, outdated equipment and lack of beds in hospitals etc.

It calls for a multipronged response to fill this gap .Companies following the hybrid approach setting a good example others to follow. They have proactively lent their support to the government in manufacturing PPE kits and face masks. Defence public sector units are building isolation wards and supplying N95 masks, sanitizers etc. to front line workers.

Many private companies have already teamed up with the NGO 's to reach out the people who needs the best support by providing daily food , ration and safety kits and are doing exceptional work to complement the efforts of government.

COVID-19 is ushering in a new era of social enterprise, where how the companies respond is going to define their brand for decades.

5.CSR - Challenges Ahead

Business will rethink this strategy of focussing on sales without profitability& profitability growth in post COVID. Business need to assess their essential functions and the resilience that other and community have on their service & products. Businesses are preparing themselves to sustain in this new post COVID reality by restructuring new roles and financial prioritization.

In the post COVID world business will become more accountable for their action on the climate and society. Corporate houses will have to redirect their finances to include more benefit primarily for the health and wellbeing. Corporate social innovative strategy can provide a positive impact on society and business bottom line.

This contagious disease tremendously disrupted the socio economic circumstances of the whole world. Most of the companies in India are playing significant role in creating awareness through CSR activities, brand name and by involving in policy dialogue with government to mitigate the spread of this deadly infection.

A strong understanding in cultural management will play a key role in navigating through complete ethical issues.

A CSR is not only simply community and philanthropy engagement .it is how companies identify and manage the most material, salient human rights, social, environmental and governance , risk and opportunity for their business. This is a core business issues.

If the problem is mammoth then the task of getting out of this problem will also be onerous one.

- * Responsible companies are doing great work by counterfeiting challenges to this humanitarian and economic crisis. The main priority is right now to protect the lives and the health and safety of employees, customers and other core stake holders impacted by the company's operations.
- * Next, there is a focus simultaneously on business continuity, supply chain resilience, financial liquidity and overall resilience.
- * Leading companies are taking very thoughtful look at who are most vulnerable among their employees, workers, small business partners, customer and community they operate.

Companies are explaining how to support those who are most vulnerable by borrowing core business capabilities as well as corporate philanthropy and community engagement through partnership with government and NGOs.

For Example, health care and biotech companies are working collaboratively with research institutes to develop testing diagnostic, therapeutics & vaccines, private labs are working with government for testing covid-19 infection, IT and mobile operators are working with government to develop contact tracing platform and more reliable and affordable internet access.

6. Problem in Implementing CSR Activities

"CSR programs can be a powerful force for organizations to create a positive impact on society, transform communities and deliver long term value to stakeholders. Any gaps, inadequacies or compliance lapses in the CSR efforts defeat its true purpose and significance, particularly during times of crises which have far reaching implication" Arpinder Singh Partner and Head - India and emerging markets, forensic & Integrity services, said.

Problems prevails both ways, one is related to compliance, transparency, due diligence, sustainable reporting, weak governance, fraud in CSR programmes, lack of policy to address ethical lapses. And the other one is related to shutdown effect due to lockdown of months.

Because of the perceptible slowdown in economic growth, there already talks about scaling down the CSR spend. CSR is directly linked to revenue generation & profit, when the net profits shrink so does the CSR kitty. It is foregone conclusion that it will be steep struggle for India Inc. to maintain its growth projection. We can't expect corporates to be as committed to CSR beyond the immediate relief and rescues.

Given the crippling effects that covid-19 will have on the economy, this bridge can be crossed after seeing how many companies would even qualify as per CSR monetary threshold for the next few financial years.

7. Recent Developments in CSR Post COVID Era- Governments Notifications & Circulars

1. Draft companies (CSR policy) Amendment Rules 2020, for a comment, Dated -13/03/2020, via notification
2. Spending of CSR funds for COVID 19 is eligible CSR activity-MCA, General Circular, Dated - 23/03/2020.
3. Contribution to PM CARES Fund shall qualify a CSR Expenditure, Dated -23/03/2020.(clarification)
4. COVID-19 related FAQ on CSR by Ministry of Corporate Affairs, General Circular, Dated - 10/04/ 2020.

5. MCA includes PM CARES Fund in CSR Schedule VII vide Gazette Notification ,Dated -26/05/2020 and included PM Citizen Situations Fund in CSR activities under section 135 of Companies Act 2013.
8. How the Companies using CSR Policy to Fight COVID- 19

Tata chemicals

- * Supplied sodium hypochlorite for spraying over 1.1 million lives in Gujarat & 420000 litre to BMC, Mumbai
- * Producing 60000 litre of hand sanitizer in akola&Ankleshwanto use in various states of India
- * Augmenting capacity of Mithapur Hospitals by setting up temporary additional facilities
- * Making Mask priority making 87000 masks supporting livelihood of women.
- * Providing food kit by helping over 29000 people acrossGujarat, Tamil Nadu, Andhra Pradesh & Telangana.
- * Ensuring food security by distributing seeds kits for kitchen gardening.
- * Making public space safe by disinfecting nearby villages.
- * Encourage safe behaviour by posters and & videos campaign in 43 villages.

IITC Group

- * Created 150 crore COVID contingency fund created
- * Pledges 100 crore to PM CARES fund
- * Making sure in reaching essential products across India.
- * SAVLON brand is working tirelessly to enhance awareness about the importance of hand
- * Hygiene through campaign.
- * Collaborating with NGO's to supply essentials to Elderly & Children
- * Helping small scale business to survive this tough time.

Vedanta Group

- * Enables Maximum Production of PPE kits& Ventilators
- * Donated 201 crore to fight COVID -19
- * Meals for stray animals by partnering with NGO YODA
- * Meals for all with NGO Partner Akshay Patra

List is long, the companies are doing their best to fight this COVID 19 and helping out the Government at state and central level to make it through this and come out as a joint winner. The companies are ensuring long

term survival by resilience and being sensitive towards their community and environmental concern and responding by allocating resources in the innovative way.

9. Conclusion

We all are facing the greatest challenge one of its kind in the form of COVID -19 outbreaks which has created the atmosphere of the panic and chaos. Given the scale & urgency of the situation companies are doing commendable jobs by coming together with common vision and aligned CSR mandate to spur collaboration for deeper & accelerate community transformation. The recent recognition of COVID-19 under CSR mandate by Government has further catalysed the response intensity. Therefore companies must utilise this opportunity to leverage CSR obligation in boosting the social response credential and making the task easier by creative deployment of CSR funds. This may not be easy for the companies & may face challenges in implementing CSR activities, but refusing to this challenge will bring them more closely to extinction.

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A STUDY ON THE IMPACT OF CUSTOMER SATISFACTION ON MOBILE NETWORK SERVICE PROVIDERS IN PRAKSAM DIST

Isac Gunday

Abstract: Mobile services in India being increased day by day with the participation of innumerable companies in the way of promoting their products and services in the market, the customer perspective in line with satisfaction level is to be focused for the gravity is found lucrative for the technological developments for the providers. This study has analyzed the two dimensions of service quality and its factors discriminate the demographics of the users. Five dimensions with process quality, service competitiveness, service reliability, network performance and supporting services, distinguish between satisfied and dissatisfied users of mobile phones.

Key words: Customer satisfaction, Cellular users, Prakasam district, Mobile Network and Mobile service.

INTRODUCTION: Usage of mobiles being trending at present in India, the user rate is increasing fast and the services are bound to improve the quality for the updated customers to be satisfied, though a lot of new and qualitative services are implemented, the demographical desires of users are still required to be delighted with the services with additional features and quality. Service environment requires the driving satisfaction factors which is personified by service quality with respect to the customer satisfaction as another antecedent or consequence. As addressed by one school of thought, SERQUAL as a global assessment and further the satisfaction of the users soon decays into one's overall attitude. From this perspective, service quality could be viewed as the whole family picture album, while customer satisfaction is just one snapshot. Recently, however, it has been argued that while the two concepts have things in common, "satisfaction is generally viewed as a broader concept . . . service quality is a component of satisfaction. Because satisfaction derives from various sources, Bitner and Hubbert (1994) propose two ways of viewing satisfaction: service encounter satisfaction (i.e. satisfaction or dissatisfaction with specific service encounters) and overall satisfaction (based on multiple encounters or experiences). In other words, little satisfactions based on each service encounter lead to overall satisfaction with the service.

Prakasam district is located on the East-side of Bay of Bengal North side is Guntur district, and South Western side of Kurnool and Y.S.R.Kadapa district and South side of Nellore district.

Prakasam district was formed with parts from Kurnool, Guntur and Nellore districts on 2.2.1970. In 1985, the then existing 17 talukas were re-organized into 56 Mandals. The 56 Mandals were organized into 3 Revenue Divisions i.e., Ongole, Kandukur and Markapur and remained undisturbed till date.

Mandals & map of prakasam dist



OBJECTIVES OF THE STUDY

1. To examine the usage pattern among mobile phone users with respect to various services
2. To know the customers' overall satisfaction towards mobile operators.
3. To offer appropriate suggestion to the service providers for improvement in their services.

Hypothesis of the study

Ho1: There is no significant difference between respondent's opinion on tariff charges and age, occupation and income of the respondent.

Ho2: There is no significant difference between customer's satisfaction and age, occupation income of the respondent and service provider.

METHODOLOGY

Selection of sample:

For the study 100 members of customers were selected to collect data for the selected mobile operators. The customers are 18 to 50 years of age group.

Selection of Sample

Convince sampling method selected for selection of a sample. The total numbers of villages in 56Mandals were 1081. Hence, the total sample was 100(1081 villages @ 1respondent from each village) it was approximately covering all villages in prakasam district.

Collection of Primary Data

The Primary data for the study are collected by using pre tested (pilot study) elaborate questionnaire to the customers. The aspects on which the data are sought to be collected from the sample respondents, socio-economic profile of the respondent, usage pattern among mobile phone users, network quality, tariffs, value addedservices, data services, customer service, advertisement/promotion, purchase decision, factors affecting on customer loyalty and the over customer satisfaction towards service operators.

Collection of Secondary Data

The process of gathering reliable and meaningful information is the cardinal aspect of the questionnaire. The principal sources of information of the present study are TRAI reports, various published books, journals, bulletins and internet.

Reliability of the data

Reliability as a model of internal consistency is given in the table below:

S.No	α level	Conclusion
1	α	> .9 Excellent
2	α	> .8 Good
3	α	> .7 Acceptable
4	α	> .6 Questionable
5	α	> .5 Poor
6	α	< .5 Unacceptable

The data of this research were analyzed and summarized with SPSS package and the reliability of 30 items in the interview schedule was tested and found 0.970 as Cranach's Alpha for 30 sample size which exceeds the suggested level of 0.70 (Nunnaly, 1978) It suggests that tool is having reliability and can be used for further analysis.

The table given below is the reliability statistics table of this research that provides the actual value for Cronbach's Alpha.

Reliability Statistics

Cronbach's Alpha	No. of Items
.970	30

Source: Primary Data

It is concluded that Cranach's Alpha level is above 0.90 which indicates that an excellent level of internal

consistency for our scale with this specific sample.

Statistical Tools Used

The primary data have been interpreted with the help of simple statistical tools such as Simple percentages, Mean, Standard Deviation.

ANALYSIS OF THE DATA

Table no. 1. Age of the respondent

Age	No of Respondents	Per cent
Below 20 years	10	10
21-30 years	16	16
31-40 years	20	20
41-50 years	20	20
Above 50 years	34	34
Total	100	100

Age of the respondent is presented in Table no.1. It is observed from the above table that out of the 100 sample respondents 10 per cent of the respondents are below 20 years of age group, followed by 16 per cent of the respondents are between 21-30 years of age group, 20 per cent of the respondents are between 31-40 years of age group, 20 per cent of the respondents are between 41-50 of age group and 34 per cent of the respondents are above 50 years of age group. It is concluded from the above table that most of the respondent's age group is above 50 years.

Table no.2. Gender of the respondent

Gender	No of Respondents	Per cent
Male	63	63
Female	37	37
Total	100	100

Gender of the respondents is explained in table no.2. It shows that out of 100 sample respondents 63 per cent of the respondents are male and the remaining 37 per cent of the respondents are female respondents.

Table no. 3 Educational Qualification of the respondent

Educational Qualification	No of Respondents	Per cent
Illiterate	3	3
SSC	12	12
Intermediate	16	16
Graduation	15	15
Post-Graduation	29	29
Others	25	25
Total	100	100

Table no.3 gives a picture on respondent's educational qualification. It is observed that major group of the respondent's educational qualification is post graduate followed by 29 per cent, the respondents of graduates are 15 per cent, the respondent are having intermediate

qualification is 16 per cent, the respondent of S.S.C is 12 per cent, the respondents are illiterates and a least percentage of 3 per cent of the respondents are having other qualifications (like Diploma, Ph.D. etc.,). It infers from the above table that most of the respondent's educational qualification is post graduation.

Table no. 4. Occupation of the respondent

Occupation	No of Respondents	Per cent
Student	9	9
Business	25	25
Government Employee	33	33
Private Employee	32	32
Others	1	1
Total	100	100

Occupation of the respondent is presented in table no.4. It shows that 33 per cent of the respondents are working in the Government organizations, the respondents are working in the private sector 32 per cent of the respondents are students 9 per cent the respondents are doing business 25 other works like professionals, daily labor, agricultural workers, house wives etc 1 percent. It may be concluded that most of the respondents are Government employees.

Respondent's usage pattern

Table no.5. Type of mobile used the respondent

Type of mobile	No of Respondents	Per cent
Single SIM	23	23
Dual SIM	77	77
Total	100	100

Type of mobile used by the respondents is revealed in table no. 5. It shows that a highest majority of the respondents are using dual sim mobile (i.e 77per cent) and the remaining 23 per cent of the respondents are using single sim mobile. It is concluded nowadays most of the people are using dual sim mobiles. In the present study also reveals that 77 per cent of the respondents are using dual sim mobile phones.

Table no. 6. Name of the service provider

Service Provider	No of Respondents	Per cent
BSNL	26	26
Airtel	23	23
Vodafone	16	16
Idea	14	14
Jio	12	12
Others	9	9
Total	100	100

Table no 6 presents the name of network service provider used by the respondent. It is observed that 26 per cent of the respondents are using BSNL network, followed by 23 per cent of the respondents are using Airtel network, 16 per cent of the respondents are using Vodafone network, 14 per cent of the respondents are using Idea network, 12 per cent of the respondents are using Jio and the remaining 9 per cent of the respondents are using other networks like Reliance, Telenor etc., It is concluded from the above table that major group of the respondents are using BSNL (26) and Airtel (23) networks in the selected sample.

Table no.7. Type of mobile connection

Type of connection	No of Respondents	Per cent
Pre-paid	63	63
Post paid	37	37
Total	100	100

Table no.7 explained the respondent's type of mobile connection. According to the above table majority of 63 per cent of the respondents are taking pre-paid connection and remaining respondents 37 per cent of the respondents are using post-paid connection. It infers from the above table that nowadays majority of public prefer prepaid connection, the same thing reveals in the present study about 63 per cent of the respondents are using prepaid connection.

Table no. 8. Respondent's monthly mobile bill

Monthly bill	No of Respondents	Per cent
Rs.101 - Rs.200	16	16
Rs. 201 - Rs.300	42	42
Rs.301- Rs.400	31	31
More than Rs.400	11	11
Total	100	100

Respondent's monthly mobile bill is presented in table no.8. It is noted that 42 per cent of the respondent's monthly mobile is between Rs.201-300, followed by 31 per cent of the respondent's monthly mobile bill is between Rs.301-400, 16 per cent of the respondent's monthly mobile bill is between Rs.101-200, and the remaining 11 per cent of the respondents monthly bill is more than Rs.400. It is concluded that most of the respondent's average monthly mobile bill is between Rs.201-300.

Table no.9 Respondent's opinion on usage of mobile

S.No	Features	Yes	No	Total
a	Incoming/Outgoing Calls	100 (100)	0 (0)	100 (100)
b	SMS/MMS	89 (89)	11 (11)	100 (100)

c	Internet Browsing	70 (60)	30 (30)	100 (100)
d	Video Calling	83 (83)	17 (17)	100 (100)
e	Voice mail	82 (82)	18 (18)	100 (100)
f	Call Forwarding	69 (69)	31 (31)	100 (100)
g	Download Songs / Software/Apps	89 (89)	11 (11)	100 (100)
h	Mobile Gaming	78 (78)	22 (22)	100 (100)
i	Caller Tunes	50 (50)	50 (50)	100 (100)
j	Cricket/Sports Commentary	89 (89)	11 (11)	100 (100)
k	Astrology	70 (70)	30 (30)	100 (100)
l	Health	79 (79)	21 (21)	100 (100)
m	Jokes and Entertainment	60 (60)	40 (40)	100 (100)
n	Quotations	51 (51)	49 (49)	100 (100)
o	Dictionary Services	62 (62)	38 (38)	100 (100)
p	News Updates/ Headlines	92 (92)	8 (8)	100 (100)
q	Weather Forecasts	53 (53)	47 (47)	100 (100)
r	Enquiry Services (train, bus etc.,)	62 (62)	38 (38)	100 (100)

Table no. 9 gives a picture on respondent's opinion on usage of mobile. According to the above table cent per cent of the respondents are using the mobile for calls. Out of the total sample respondents whopping percentage of 89 percent of the respondents are using SMS/MMS and a negligible percentage of 11 per cent of the respondents is not using the SMS/MMS. Regarding internet browsing a highest majority of 70 per cent of the respondents are using internet and only 30 per cent of the respondents are not using internet. Whereas, video calling about 83 per cent of the respondents are not using video calling and 17 per cent of the respondents are using video calling. For voice mail 82

per cent of the respondents are not using and only 18 per cent of the respondents are using voice mail. Regarding call forwarding option 69 per cent of the respondents are not using this option, 31 per cent of the respondents are using. Out of the total 100 sample respondents 89 respondents are download the songs/software and apps 11 per cent of them are not go for any downloads, because of lack of knowledge on it and not interested on it. Regarding mobile gaming 78 per cent of the respondents are playing with the mobile and 22 per cent of the respondents are not playing the games with the mobile. Whopping percentage of 50 per cent of the respondents are set caller tunes for their mobiles and a least percentage of 50 per cent of the respondents are not set. Majority of 89 per cent of the respondents are listening and receive the cricket/sport commentary and 11 per cent of the respondents are not using this option. Regarding astrology a highest majority 70 per cent of the respondents receive or not subscribed, 30 per cent of the respondents are not subscribed for astrology. Out of the total sample respondents 79 per cent of the respondents subscribed for health tips, only 21 per cent of the respondents are not subscribed for the health tips. 60 per cent of the respondents are subscribed and 40 per cent of the respondents are not subscribed for jokes and entertainment. 51 per cent of them are subscribed and 49 per cent of them are not subscribed for quotations. For dictionary services 62 per cent of them are subscribed and 38 per cent of them are not subscribed. For news updates/headlines 92 per cent of the respondents are subscribed and 8 per cent of the respondents are not subscribed. Regarding weather forecast 53 per cent of the respondents are subscribed and 47 per cent of the respondents are not subscribed. For enquiry services 62 per cent of the respondents are using and 38 per cent of the respondents are not using this option.

DISCUSSIONS:

While significant findings are obtained from the present study, certain limitations are inherent, which may provide extension for future exploration. Some of the key areas for future research include the following:

The present research work is based on the data collected from the respondents residing in the Prakasam district only. Thus, there is need to explore these results for mobile telephony customers of other States as well. This may provide comprehensive understanding of the customers' perception towards service quality across different States of India.

This study has been done with the help of the cross sectional data. However, for future studies, the longitudinal research design can be used in order to have more insightful understanding of the customers' perception towards service quality in mobile telephony. Now, the mobile number portability (MNP) facility has been allowed all over the

India, so one can get detailed and better results by undertaking the longitudinal studies. Further, the mobile service providers also need to do regular surveys on the basis of longitudinal research design to bring out certain changes in the customers' perception towards service quality in mobile telephony.

The study can be further extended to investigate the causal relationship between service quality and customer satisfaction. Such a research would be worthwhile to explore the customer satisfaction and service quality over the time in order to study the dynamics of customers' patronage behavior.

With the advent of 4G service, a comparative study of 2G, 3G and 4G (whenever launched) service quality and usage pattern can be carried out as it will provide useful insights to device marketing strategies.

Finally, the present research work is an attempt to contribute to theoretically available literature while also proposing a tool for mobile service providers that can be used for monitoring and improving the customers' perception towards service quality. It is hoped that the present study would stimulate future research focusing on service quality and its impact on competitiveness for cellular mobile service providers.

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PROCUREMENT PROCESS WITH LEAST MANPOWER STEEL AUTHORITY OF INDIA LIMITED, ROURKELA, ODISHA

Sushma Tiwari* & Sunil Kumar Tiwari**

Abstract:

HR managers plays a major role in creating a positive & dynamic management photocopy in any organisation and it always attaches with goals & objectives of overall management. One of the HR function is procurement .The main objective of this paper is procurement process and it can be done with least manpower. Procurement is the act of buying and selling of goods and services. The finding are E-tendering should be the mode of evaluation and the purchase procedure is a very long process it requires many people to complete this process.

Keywords: Procurement, Tendering, Bidders, Manpower, Price Negotiation

Introduction:

Procurement process is often part of company's strategies because it will determine certain materials and it is used to ensure the buyers receives goods, services or works at the best possible price when aspects such as quality, quantity, time, location are compared. Procurement has already transformed into a concept combine with technologies, marketing and business strategies.

The broader concepts of procurement are sourcing and acquisition.

Literature Review

Bell and Stukhart (1987) defined Integration and co-ordination are defined in procurement. The material management system which includes materials take off, purchasing, expediting, receiving, warehousing and distribution and even contract administration.

Veeramani et al.(2002), specified that the potentials of e-commerce technologies applications in construction industry include E-service, E-collaborations, E-finance, E-customer services and relation

Research Methodology

Objective of the study

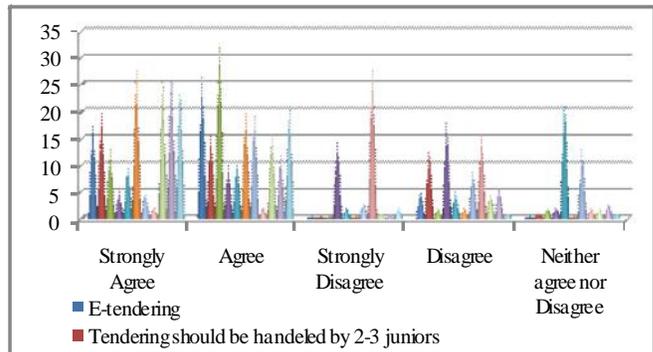
- * Procurement process can be done with least manpower
- * Eligibility Criteria for bidders
- * Committee formation for approval of cases
- " Price Negotiation

Method of data collection-Primary and Secondary

- * Sample size-50
- * Sampling method-Random sampling method
- * Scale-Likert five point scale
- * Method of data analysis-Percentage analysis
- * Sample Area-Steel Authority Of India Limited, Rourkela, Odisha

DATA ANALYSIS

Items	Strongly Agree	Agree	Strongly Disagree	Disagree	Neither agree nor Disagree	Total
E-tendering	18	27	0	5	0	50
Tendering should be handled by 2-3 juniors	20	16	0	13	1	50
Price discovery should be through reverse auction(online bidding)	13	33	0	2	2	50
Cost of tender document	5	10	15	18	2	50
Price negotiation after price discovery	10	11	2	5	22	50
Bidders should be called for Techno-Commercial discussion	28	20	0	2	0	50
All cases should be procured through open tendering	5	20	3	9	13	50
Eligibility Criteria	2	2	28	16	2	50
Earnest Money deposit	26	16	1	5	2	50
Integrity Pact in tender equity	28	12	1	6	3	50
Tenders should be finalized within 60 days of opening of offers	25	21	2	1	1	50



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Findings

- * Maximum number of respondent are agree for the E-tendering as a mode of evaluation for tendering & only 10% are disagree.
- * Most of the respondents are agree in that the tendering should be handled by 2-3 juniors and by one experienced senior 26% are disagree and remaining 2% are neither agree nor disagree.
- * Maximum respondents are agreeing that price discovery should be through online bidding and only 4% is disagreeing on this and remaining 4% are neither agree nor disagree.
- * Maximum respondent are disagree on the point that cost of tender document should be charged from the bidders and 30% are disagree and remaining 4% are neither agree nor disagree.
- * Maximum respondents 44% are neither agree nor disagree on the point of that there should be a price negotiation after price discovery,42% are agree and remaining 14% are disagree.
- * 96% of respondents are agreeing that bidders should be called for Techno-Commercial discussion and remaining 4% are disagreeing.
- * 50% of respondents are agreeing on open tendering, 24% of respondents are disagree and 26% of respondents are neither agree nor disagree.
- * Most of the respondents 88% are disagree they believe that there should be a eligibility criteria for the bidders ,8% respondents are agree and remaining 4% are neither agree nor disagree.
- * Maximum respondents 84% are on point that there should be an Earnest Money Deposit which a bidders have to pay at the time of tendering 12% of respondents disagree and remaining 4% of respondents are neither agree nor disagree.
- * Maximum number of respondents are agree that there should be an integrity pact , Minimum number of respondents are disagree .

- * Maximum respondents are agree that tender should be finalized within 60 days of opening of offers and Minimum respondents are disagree.

Conclusion

The purchase procedure is very long process. It requires many peoples to complete this process. But currently this process is done by only 15-18 employees. To manage this process with least manpower Material management Department go through E-purchasing, it save time as well as manpower and also cost. For example in conventional tendering the process of tendering was done manually all the procedure was done on papers, previously bidders were asked to submit their offers in hard copy in multiple sets like 5-10 copy each which require many peoples to collect, to check it, to take action on it but now for submission of standard bidding document bidders download the document from the websites of RSP and then submit it the e mail id in multiple set with password so it takes less paperwork and least manpower.

Now bidding is done through RA (reverse auction) where all process is done through m-junction, everything is online .So all these processes are done with least manpower which is better through conventional tendering.

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COVI19: IMPACT AND CHALLENGES IN INDIAN CARPET INDUSTRY

Suresh Kumar Pandey

Abstract:

India is a famous country for being largest producer of fine quality handmade carpet in the international market. Carpet industry in India is one of the fast growing cottage industries and it is totally based on labour/artisans. Carpet manufacturing is spread over in various states such as Uttar Pradesh, Rajasthan, Haryana, Punjab, Uttarakhand, Jammu & Kashmir, Gujarat, Kerala, Odisa, Jharkhand, Noth-East region. Indian Handmade Carpet Industry is highly labour intensive and provides employment to over 20 Lakh workers/ artisans especially women directly or indirectly in the rural areas. Most of the artisans/ weavers employed are from the weaker section of the Society and this trade provides extra and alternate occupation to them including farmers and others at their homes. Export carpot has increased from Rs. 4.42 Crores in 1961- 62 to Rs. 10207.91(Prov.) Crores in 2018-19. Industry has also been playing vital role to stop migration of rural people to other places for earning their livings. The COVID-19 has created a new challenge for the carpet industry in particular and for the labour community in general. This pandemic has created a big question for earning the bread & butter for the entire community engaged in the sector as the carpet manufacturing is totally stopped due to non-availability of orders from the foreign countries.

Introduction

Carpet weaving had been started way back in 16th century in Mughal era. Initially the Persian Carpets were manufacture which were used by the Mughals in their palaces for decoration. Persian carpets are high density and fine quality hand knotted carpets. Initially it was manufactured in Bhadohi-Mirzapur districts of Uttar Pradesh and now it is manufactured in various states known as carpet clusters given below:

- * Jammu & Kashmir
- * Gujarat
- * Rajasthan
- * Odisa
- * Jharkhand
- * Himanchal Pradesh
- * Punjab
- * Haryana
- * Kerala
- * Uttarakhand
- * NER

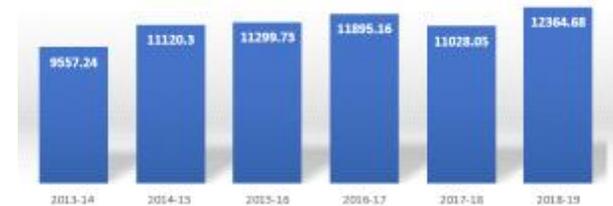


Types of carpets manufactured in India are:

- * Hand knotted (Persian, Tibetan, Loom)
- * Tufted
- * Durry
- * Saggy
- * Soumak

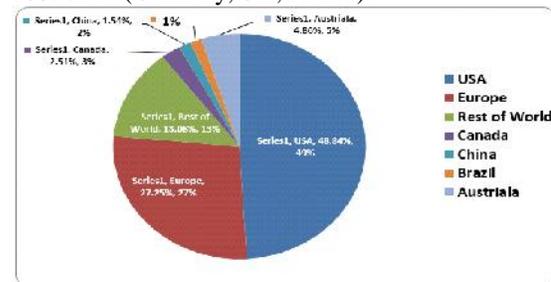
India has become a global leader in the international market for handmade carpets. India's heritage of handmade carpets has been recognized worldwide with a commending share in global exports, for its subtle elegance, eco-friendliness and exquisite vibrant color craftsmanship with a human touch.

Total Exports in Rupees Crores



Key Potential Market

India is exporting to more than 70 countries in the world, mainly to the USA, Germany, Canada, U.K., Australia, South Africa, France, Italy, Brazil, etc. Started exporting +to China. USA with 48.84% share followed by Europe with 27.25% share (Germany, UK, France):



Government of India has also recognised the carpet industry as handicrafts industry under the ministry of textiles. Carpet Export Promotion Council (CEPC) has been set up by the government under the Ministry of Textiles to provide a platform to the manufactures/exporters for the growth of their business. The Council organises International Carpet Fairs in India (Varanasi, Delhi, Jaipur, etc) and abroad (Germany, USA, China, etc) as the common platforms for Indian carpet manufactures to exhibit their products to the global buyers.

Carpet buyers are invited from the all over the world to

visit the event to have a choice of rich collection of carpets of various categories at one platform. Kashmiri Silk carpets are one of the luxurious products and highly demanded in the international market. Wool is one of the essential raw materials for the carpets. In India wool is produced in Kashmir and Rajasthan but due to limited production of Indian wool, almost all manufactures need to import the wool from the country like Australia, New Zealand, etc. There is an exclusive organisation "Wool Research Association" in Mumbai for innovation, development and research on wool. Government of India has also set up an exclusive institute "Indian Institute of Carpet Technology" in the carpet hub Bhadohi in Uttar Pradesh to provide all possible technical support to the carpet industry. Other fibre used in hand knotted carpet is Silk which is mostly in Kashmir for carpets. Today, more than 3 million artisans/craftsmen have been engaged in the industry in direct and indirect manner and continue to fascinate the consumers throughout the world. Carpet industry has been playing a significant role in generating employment and earning foreign currency.

The carpet industry provides livelihood to the millions of artisans belonging to the rural areas of above mentioned areas of the country. It contributes to the national economy in several ways and provides employment to the rural poor & economically weaker sections of the society at their doorsteps. A major portion of the weavers belongs to the backward classes and minority

IMPACT OF COVID-19 ON CARPET INDUSTRY

The coronavirus COVID-19 pandemic has created global health crisis of our time and it is the greatest challenge that we have faced since World War-II. Since its emergence in Asia late last year, the virus has spread to almost every continent. To prevent the lives from such pandemic COVID-19 the lockdown has been announced in the entire world. The pandemic is much more than a health crisis, it's also an unprecedented socio-economic crisis. Stressing each & every country it touches; it has the potential to create devastating social, economic and political effects that will leave deep and longstanding scars.

Every day, people are losing jobs and income, with no way of knowing when normality will return. Small island nations, heavily dependent on tourism, have empty hotels and deserted beaches. The International Labour Organization estimates that 195 million jobs could be lost. The World Bank projects a US\$110 billion decline in remittances this year, which could mean 800 million people will not be able to meet their basic needs.

India Carpet Expo, one of the largest carpets' show in Asia, which was slated to be held from March 28 to March 31 in New Delhi stands cancelled as of now as many buyers have dropped out from the event following the coronavirus threat.

Over 200 buyers from across the world had already registered

for the expo. Most of them were from the United States who buy Indian carpets in bulk.

Over 400 exporters across India were supposed to attend this expo to showcase their contemporary and innovative designs, many of them were from Uttar Pradesh. Most of them have dropped out from the expo now anticipating a washout following recent visa restrictions imposed by India and other countries including US.

Indian economy has been hit hard by the on-going Coronavirus pandemic-driven global crisis. Orders given by buyers are getting cancelled, shipments are delayed indefinitely, payments for supplied shipment are missed and consignments stuck at ports.

- * Order of Approx. 2,000 crore for handmade carpets have been cancelled.
- * Around 30% of orders of labour-intensive sectors have got cancelled, as per information from the Federation of Indian Export Organisations (FIEO).
- * All National/International Trade Fairs have been cancelled.
- * Carpet industry is fully dependent on artisans/weavers who have been migrated to their home.

CHALLENGES FACED BY THE CARPET INDUSTRY

Indian carpet industry has been facing lot of challenges in carpet manufacturing as well as export due to COVID-19 pandemic. The major challenges which are to be resolved to save the industry as well as artisans associated are as under:

- To complete the export order in hand.
- To recall the artisans/weavers who have migrated to their homes.
- To make arrangements for clearance of pending shipments at various ports.
- Ensuring the safe and timely delivery of the export goods on the way to the respective ports.
- Recovery of payments from buyers.
- Manufacturing carpets by maintaining social distancing.

CONCLUSION & SUGGESTIONS

The economic impact of the 2020 coronavirus pandemic in India has been largely disruptive. India's growth in the fourth quarter of the fiscal year 2020 went down to 3.1% according to the Ministry of Statistics. Notably India had also been witnessing a pre-pandemic slowdown, and according to the World Bank, the current pandemic has "magnified pre-existing risks to India's economic outlook".

Unemployment rose from 6.7% on 15 March to 26% on 19 April and then back down to pre-lockdown levels by

mid-June. During the lockdown, an estimated 14 crore (140 million) people lost employment while salaries were cut for many others. More than 45% of households across the nation have reported an income drop as compared to the previous year.

The challenges being faced by the industry may be converted into opportunities by adopting the guidelines of health department and following suggestions may be considered to re-start the business:

- Local artisans/Weaver's may be utilized to complete the order in hand. To maintain social distancing, number of Weaver's may be reduced and number of looms/tools may be increased. It may cost high but this is need of the day.
- Carpet stakeholders should approach to concerned department through associations/council to clear their shipments stucked at ports.
- DGFT and other concerned department which are registered buyers may ensure payment against shipment done or order being executed.

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SOCIAL WORK IN NEW NORMAL POST COVID PANDEMIC: CHALLENGE OR OPPORTUNITY

***Banshi Dhar Pandey & **Abhishek Mishra**

Abstract: The entire world is struck hard by the Covid-19 pandemic which has brought societies, economies and societies at standstill. While the after effects of the global pandemic are yet to be assessed in appropriate terms, graver crisis looms ahead as we get ready to make an adjustment with the 'new normal' which is lies ahead when all sets to be normal. With massive transformations bound to take place at societal, economic, political, technological and legal level, it will be a herculean task to help disadvantaged people make an adjustment with the new normal. The present paper discusses the role of social work in 'new normal' world post pandemic. The author contends that the present crisis offers social work an opportunity to deliver its best to the benefit of the society. Social work can leverage on the opportunity to set its foot firm as an academic discipline and as a profession as well.

Key words: Covid-19, new normal, social work.

Introduction: It was on 12 January 2020 when the World Health Organization confirmed for the first that a novel corona virus was the reason behind respiratory disease in the city of Wuhan, China which later on brought the entire human civilization under the threat of mass annihilation (European Heart Journal, 2020, p.1). The spread of the disease was so much fast and exhaustive that not a single country or region was left unaffected by its mall effects. The global pandemic had an all round impact upon the different nations and the societies. Economies have been shattered, employed have been left unemployed, educational institutions closed, countries restricting movement of people, and what not. The list of after effect is too exhaustive to discuss. While the after effects of the global pandemic are yet to be assessed in appropriate terms, the real problem will be to combat the newly emerging 'new normal' scenario as we learn to live with this novel corona virus in the upcoming future. The 'new normal' will reshape the existing norms and decorum of the society. While the privileged class may remain elusive of most of the challenges, the real issues will be faced by the underprivileged or the weaker section of the society as they are less privileged to have access to all the resources that helps one to sustain even in adversities. The preventive measures like quarantining people, social distancing and the lockdown imposed will have serious implications upon the mental and physical health of a large number of people round the globe. The

implications will be greater in the underdeveloped and developing countries as the countries lack government apparatus to fight the issues concerning mental and physical health. Under these considerations, the social workers can a play a very critical and dominant in helping societies cope with the newly emerging 'new normal' during post Covid-19 crisis. Social work professionals, well equipped with different behavioural, physical and psychological interventions under their belt can turn around the present critical period into opportunity and help in building a society where people from all walks of the society can adjust with the 'new normal' arising out of the global pandemic crisis.

The Background: On 24 March 2020, the Government of India implemented a complete lockdown to prevent the outbreak of novel corona virus in the country. Though initially implemented for 21 days, the lockdown continued for more than ninety days and is still going on in some parts of the country. Movement of people and economy were restricted at a single call. With factories closed, trains stopped, transportation and logistics coming to a standstill, the entire mankind went into a sort of hibernation for a significant period of time. But as the time of these tight restrictions kept on expanding, the various issues, or better to say the after affects of this lockdown started surfacing. Economic crisis and recession hit the nation led by mass scale of job losses, unemployment, returning of migrant workers from different cities, black hoarding of essential goods and commodities along with several other issues concerning the economy and the society (Nicola et al., 2020). According to a survey by Azim Premji University, 67 percent of employees lost their jobs during the period of lockdown . The same survey also reported that 8 out of 10 employees have lost their jobs in the urban parts of India. The Centre for Monitoring Indian Economy in its report given in the month of April said that 27 million employees in age bracket of 20-30 years lost their jobs only in the month of April . While it is assumed that the very soon the economy will come alive on its own feet and normalcy will return, the scars left by lockdown by people who have been hit hard will keep on tearing apart the lives and souls of such people. People who have lost their jobs, the migrant workers who returned back to their homes after taking a long walk on their foots, many of them lost their loved ones during the journey, students being unaware what the future holds for them, such events will are going to have a

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serious blow on the psyche of the sufferers. Along with unemployment, job loss, high infectivity and mortality rates, the global pandemic has also caused severe psychological manifestations named as 'coronaphobia' resulting in severe panic, anxiety, compulsive behaviours, hoarding, fear, frustration, depression, and post-traumatic stress disorder across the different strata of the society (Dubey et al., 2020). People in their old age, mental patients, marginalised communities, physically challenged, little children with their usual lives getting disrupted are only some of the examples of the effects of this global pandemic (Dubey et al., 2020). The lockdown has also given the rise to several societal and family problems manifested in the form of domestic violence, child abuse, etc. According to the National Commission for Women (NCW), there has been two-fold increase in cases of gender-based violence during the lockdown period. Women are found to be under great risk under this perspective. Their health and lives are found to be under severe threat during the pandemic times, specifically in the families which are living under poor and deplorable conditions. The 'reverse migrant' crisis will be aggravating the issues as workers returning at homes will exert their frustration on the weaker, who obviously happen to be the children and the female members. The global pandemic is also going to have severe critical health related issues due to the growing feelings of social isolation and loneliness on different socio-economic groups. It is well researched fact that denying or limiting access to the normal daily activities aggravates mental and physical health concerns (Zaharieva, 2020). Thus, challenges that lay ahead are not only multifaceted and diversified in nature, but at the same time they also need serious attention to curb the issues in the best manner possible. The issues have already started raising its head and any delay in addressing them will only aggravate the problem making it difficult to contain the challenges.

However, the greatest challenge that lies ahead is the phenomenon that has been named as the 'new normal' by the experts who are deeply concerned with the global pandemic. The following section provides a conceptual overview of the 'new normal' which the world is expected to witness once normalcy pervades.

Conceptualising the 'New Normal': Debates on social media platforms, newsprints and all the communication channels are on high rise on the aspects related to the 'new normal' that will engulf the society and nations once mankind rises victorious of the present pandemic crisis and normalcy returns back. Numerous definitions and explanations have been proposed by different scholars regarding the new normal. Though the term was first proposed by Paul Grover in 2009 in the context of community development, Wikipedia widely uses the term in the context of business to mean changes in business and financial changes within the society

. Since then numerous interpretations of the term have been put forward to suit the needs of time and context in which it is used. To give it a more exhaustive meaning, the term can be accepted to mean making an alteration and adaptation to the newly emerging economic trends, societal behavioural patterns and trends, technological knowhow and innovation etc to prepare for the best in upcoming future. The term can also be interpreted to mean emergent ways of living the life, attending work life and entering into an interaction within the society (YLM, 2020). The Director-General, International Labour Organisation, Guy Ryder (2020) accepts the 'new normal' as the new ways the society will collect itself post pandemic and the ways it will have an impact upon the way a work is being performed. Ryder (2020) further illustrates how this 'new normal' will diminish social protection mechanism along with the loss of employment in different sectors, specifically the informal sector and decreasing employment security for the poor and marginalised. Thus, the new normal will make the life more difficult for people with little access to resources and privileges within the society. There is an ever increasing debate going on what will be the new normal post pandemic, how the society will make an adjustment with the newly emerging transformations within the society and who are going to be the worst hit by the crisis and emerging transformation. Also, there are some scholars who at the very outset discard the very discourse of this new normal. But the reality is that the world is going to witness radical changes from societal, economy, political, technological and legal aspect. And as academicians we must be ready to identify and address the various concerns related to the new normal so that we all are witness to new dawn of humanity in the upcoming future. Here, it would be very pertinent to discuss the role of social workers as professionals who can play a very important and critical role in helping out the society to strike a balance with the new normal. The upcoming section will highlight how social work can give a befitting reply to this global pandemic and emerge victorious amidst this challenging situation.

Social Work in New Normal: Challenge or Opportunity:

Social work as a profession has been well accepted by the history of profession where it has been marked as a dedicated vocation which works to respond to even a minor shift or change in the societal structure and framework and does its best to minimize the effects of these changes upon the 'not so fortunate' or the vulnerable class (Furman, Negi, & Salvador, 2010). Egan (1998) considered them as change agents who worked relentlessly for the welfare of the society. Social work as an academic discipline and as a profession is very diversified in nature since it is associated with a wide range of activities like counselling, supporting, advocating for the rights of the vulnerable, and many more (Jones, 1998). At the same time, its target groups range

from the youngest to the oldest, black or white, or any excluded or included class (Jones, 1998). Thus, it will apt to say that social work, similar to the medical profession has equal access to almost every aspect of man and the mankind. Social work as a discipline and as a profession was first introduced in India in the year 1930 by some professionals from America where it had been used as treatment method to take care of personal issues (Howard, 1971). Gradually, this 'treatment' method was transformed into 'practising field' with the passage of time and a good number of social work schools started in India (Howard, 1971). Thus, the profession inculcates the true values and spirit of 'field work' which remains one of its significant strengths in dealing with the societal concerns in an effective manner. There is no denying to the fact that social work is blessed enough to offer remedies to help people adjust with the new normal post global pandemic. However, things will not be easy as an environment of speculation and uncertainty has set in. One of the most important challenges faced by social work will be establishing the climate of 'trust' among the masses so that the social work professionals can extend their best possible help to the poor and needy. As adjusting with the 'new normal' will require certain changes in behaviour of an individual as well, such change can only take place when there is a 'trust relationship' between the social work professionals and the society. In simple terms, bringing the behavioural change will be the toughest task for social work post pandemic. Social work has to take the charge of giving the society lessons of safety, healthy lifestyle and sanitation. As the social work professionals have sincere access within the vulnerable class of the society, they can turn this challenge into opportunity and assist the vulnerable people to make an adjustment with the 'new normal' from behavioural and health perspective. At the same time, the knowledge of community development can also prove handy for the social work professionals to introduce appropriate interventions to help them sustain in difficult times. The social workers are working hard to help people getting access to medical facility such as tele-therapy. There is always a challenge for the social work to offer relief to the masses who are living under severe distress and anxiety under these difficult conditions. During the new normal, life followed by frustration and anxiety are going to be an important characteristic which will lead to severe psychological problems. As social workers are front lines warriors to fight to help society adjust with the new normal, the challenge for the social work will be to provide mental health care needs of individuals. At the same time they have to offer counselling services to overcome the fear of anxiety and depression. The challenge will also be at the family level to mitigate the incidents of domestic violence. Since many would not be in jobs post the pandemic, it may aggravate the incidents of domestic violence due to economic tensions.

Under these considerations, the real challenge will be to come up with appropriate interventions to address issues related to domestic violence.

Amidst all these challenges, a pool of opportunities for social work looms ahead. The social work must start pushing the government to come up with appropriate policy guidelines to include the profession in cases of public health emergency, national disaster and emergency planning. This will result in giving social work more acclimatisation not only from a policy perspective but also from societal perspective. The professional bodies like National Association of Professional Social Workers in India (NAPSWI), Indian Society of Professional Social Work (ISPSA), Association of Professional Social Workers & Development Practitioners (APSWDP) and others can offer their platforms to disseminate information to different stakeholders on 'new normal' life. Fears and false apprehensions need to be removed so that people are well prepared to live a well adjusted life with the new normal. These bodies can also play a pivotal role to push the academic institutions to introduce courses which in future can help society to be prepared in advance to fight against such contingencies. At the same time, these associations can also advocate for setting up professional counselling services for the students in academic institutions as student fraternity remains one of the worst hit populations during the pandemic. Pretty confused about future holds for them, there is an opportunity for social work to align itself with the formal education ecosystem of the country. Finding it difficult to adjust with newly emerging system of 'online education', the social work can offer the required help and training to the student community to tackle the issue in a smart manner, specifically in areas which are not so well developed. At the same time, the students are in dire need to express themselves. Considering the traditional society we live in, children usually refrain from expressing themselves to the parents. This is one of the main reasons behind students committing suicides during the pandemic period. Therefore, a mechanism to express them must be extended to the student fraternity. Talking about mental health must be openly embraced today and this can be done only by the social work profession.

Conclusion: Although we all are uncertain about how the 'new normal' will look like, the need of the hour is to prepare well in advance so that the concerns related to it can be mitigated at its earliest. Social work can and will play a vital role in communicating, counselling and catering to the physical, mental and behavioural health of the society. Reaching out and extending support and counselling services to the poor, vulnerable and destitute remains an imperative not only during the period of pandemic but also when normalcy is restored. The Indian Psychiatric Society reported that there has been 20 percent increase in mental health cases. Cases of stress and panic strokes have been

increased beyond 35 percent. Most of the cases are the manifestations of psycho-social like family, depression, sexual and physical abuse, gender based violence etc. As a nation we are very much ill-prepared to face these issues as there are only one psychiatrist for every 0.3 million population, one psychologist behind every 15,000 population and around 26,000 beds are available in the hospitals. The situation is very challenging, but there is also a silver lining. Despite lack of resources, social work professionals are playing a very positive role in present times of crisis. Social work on many occasions has witnessed crisis giving rise to opportunities to build a better future with more stable societies. This time it will also succeed. As Dr. Rory Truell, Secretary-General, International Federation of Social Worker says, "Social workers at each level have the skills and capacity to address safety and translate fear, anguish and defeat into empowerment and social revolution".

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ROLE AND APPLICATIONS OF DISRUPTIVE TECHNOLOGIES IN AQUACULTURE

Ajey Kumar Pathak

Abstract

Over the years, the application of disruptive technologies in the aquaculture industry is gaining to maximise the return through good quality produce. These technologies as an integrated solution tool are being used effectively to produce quality fish produce with less investment on resources. The success stories have evidenced that such technologies maximise the productivity and profit both. The increasing use of these technologies has encouraged many aqua entrepreneurs including culturists for decision making in fish identification, intelligent management of fish stocks of different life stages, detect the hunger level of the fish and feed accordingly and water quality management. Additionally, these are used in the marketing of the produce using the market intelligence system. Undoubtedly in the coming years, the disruptive technologies will be a key part in the aquaculture system because of its relevance and role in the different realms of the aquaculture from seed to fork. Worldwide, these technologies are being used successfully in the agriculture, food and allied sectors. The present article is a brief review on application of the eight disruptive technologies shaping the aquaculture industry and its future. The most commonly used disruptive technologies in the realm of aquaculture are drones, sensors, 3D printing, robots, artificial intelligence, augmented reality, virtual reality, block chain and connecting all these is the Internet of Things.

Keywords: Disruptive technologies; Aquaculture; Fish; Artificial intelligence; Blockchain

Introduction

Worldwide, fishing and fish aquaculture market provides protein and nutritional rich diet to the millions of people and is growing fast. Globally, the catch seems to have reached to the limit at about 80 million tons due to overexploitation (Walsh, 2011). According to NOAA, aquaculture has maintained an annual growth of 5.8% since 2005 and 13% annually within the United States making it as the fastest growing sector of food industry in the world. By 2020, the global aquaculture market is expected to be valued at USD 202.96 billion. This enormous growth is attributed to the increased investment in this sector (271% in 2016) over the previous two years (AgFunder: <https://agfundernews.com/>) and growing seafood consumption paired with rising economic importance associated with fisheries. According to a report on "Recent Technological

Innovations in Aquaculture" published by Food and Agriculture Organisation (<http://www.fao.org/tempref/docrep/fao/005/y4490E/y4490E05.pdf>), aquaculture has many challenges notably, combating diseases and epizootics, broodstock improvement and domestication, development of appropriate feeds and feeding mechanisms, hatchery and grow-out technology, as well as water-quality management. Besides these challenges, the traditional system has limitations starting from farm scale, labour cost, maintenance and management of water and aquatic resources including environment, manual control of machine and tools, untimely response to farmers and many more. These limitations are difficult to control and manage timely in the allocated space because of which the actual productivity of the aquaculture system gets weighed down. In order to overcome these limitations, many aqua culturists are shifting to the more modernised practices integrated with automated technologies. The modernisation in aquaculture and successful adoption by the aqua culturists has brought the revolution in the aquaculture industry in terms of farming types and systems in practice. Since past more than one decade mediatisation in this industry that includes cage culture, aqua phonics, recirculatory and closed recirculatory aquaculture system using oxygenated ultra fine bubbles has led the higher productivity to the farmers. These systems are ecologically safe and better. Such mediatisation and interventions of disruptive IT technologies, which are being considered to immune the agriculture and hold the power to transform every link in the food chain of the farming system from seed to fork, have culminated many aqua culturists to make their business more profitable by implementing real time monitoring and management computer based solutions. These solutions facilitate them transform the practiced aquaculture system in a more automated way in order to connect the producer directly to the consumer. Nowadays, the eight disruptive technologies combined with Internet of Things (IOT) are being used by the aqua culturists to maximise the productivity and profit both with assessment on the product quality. Among the disruptive technologies, robots, 3D printing, sensor and drones are the hardware systems and they are used as data sources to collect the data on different aspects. On the contrary, Artificial Intelligence, Virtual Reality, Augmented Reality and Block Chain are software system that provides solution by gaining

and analysing the data from these hardware devices. All these eight technologies are part of IOT and IOT works as a connectivity of machines for collecting, sharing and analyzing the data. These technologies have been successfully used in the crop and livestock disciplines both. The present paper discusses about the disruptive technologies, their role and application in the aquaculture system and also provides insights into the systems designed for the aquaculture system.

Drones

Drones are good for survey and often offer application above and below water both. Above water these devices are used for managing and monitoring the water and its quality, monitoring the off shore farms and below water used for inspecting cages by collecting information on damages and holes in cages. They have ability to collect information for fish stock analysis and environmental tracking, which could be used to monitor the production. Integrated with robotics and sensor devices, drones provide the capability to analyse the data for monitoring and decision making. Drones use sensors to collect the data on physical and chemical parameters of water like water temperature, pH, salinity, turbidity, dissolved oxygen and pollutants of different types. The drones can be used to create algorithms that further develop the technology or applications available in the production of aquaculture and offshore fish farms. For example, Saildrone (<https://www.saildrone.com>) offers data collection, fish stock analysis and environmental tracking, which can easily be applied to offshore aquaculture. This aquatic drone connects itself with a producer's tablet, smart phone or computer and allows for information to be gathered and analyzed. Besides, these devices can be used for spraying the chemicals and assist fish farmers in maintaining the nutrient and water flow and extend decisions through aerial images.

Sensors

Sensors are the most omnipresent easily affordable data collecting devices and used in the aquaculture to analyse the water quality, air, soil through infrared waves as well as detect the hunger level of fish to mange feeds for fishes. The data collected by the sensors can be viewed graphically and can be used to predict the production efficiency with the practiced technology. The wearable technologies of these devices make it capable to monitor the fish movement, stock identification and signalling to warn away predators by sensing the animal's behaviour. These devices because of delivering wide range of data and functions provide the framework for predictive analytics and enhanced data-driven decision-making. eFishery (<https://www.aqua-spark.nl/portfolioitem/efishery/>) is an integrated feeding solution for fish and shrimp farming that uses sensors to detect the hunger level of the fish automatically

and feed the fish accordingly the fish's appetite and adjust the amount of feed given with the appetite.

3D Printing

3D printing devices can be used to diagnose the fault in a machine, hatching unit and repair the faulty part. This technology can be used at home aquaculture gardens and moreover, these devices provide the ability to realise the actual structure of the aquaculture system and optimise the cost of the infrastructure development. These are well suited for labour optimisation and increasing the production efficiency by creating the suitable environment through infrastructure development for different life stage of fishes. Further this technology can be used in printing of soft fish robot which has ability to recognise the fish motions and movements. The researchers of Massachusetts Institute of Technology (MIT) (<http://news.mit.edu/2014/soft-robotic-fish-moves-like-the-real-thing-0313>) used 3D printing for printing a fish robot that almost mimics fish motions and movements. Technology like this could allow to further study and understand the natural environments of aqua-related species and aid in providing a more natural. The other very different aspect of 3D printing is the production of seaweed. The seaweed aspect of the aquaculture industry could be affected if demand increases enough to drive the need for increased production and companies involved in this business can reap the benefits.

Robots

Robots reduce the labour costs on farm and particularly used in the time consuming and repetitive tasks. Robots find more space among applications in the marine environment and these devices function automatically through a set instructions and offer assistance to the people. The robot market in agriculture is expected to grow from \$1bn/year now to \$16 bn/year by 2020 (ResearchMoz (2016): Global RFID Tag Market Outlook 2016-2021.). In aquaculture, fish farms have confined conditions that can aggravate issues such as diseases and parasites, leading to lower yields and higher production costs. The underwater robots have the ability to monitor water quality in the real time in the fish farms and such robots are equipped with an electrochemical polyaniline film pH sensor and collect acidity data. This prototype helps in minimizing the environmental disruption and fish stress. The collected data on pH can assist in knowing the swimming pattern of fish and identify the areas of irregular acidic concentration. Such control on water conditions would be helpful for the farmers to improve the health and wellness of the fish population under culture. For transportation of off-shore fish production to commercial entities, the robotic cargo ships are considered as one of the efficient and cost effective solution. Moreover, there are solar operated robots to clean up the aquatic environment by picking up the harmful

wastes and materials. A robotic fish known as Shoal (<https://www.roboshoal.com/>) uses artificial intelligence to detect the pollution under water. Such robotic fish mimic the movements of a fish that enable to monitor the habitat and manage the fishes within its habitat. In addition, robots help to navigate into the environment for surveying, net cleaning and keep watch on the farmed fishes as a spy. The robotic cage known as aquapods (<https://atlasofthefuture.org/project/aquapod-fish-farm/>) such as SeaStation by InnovaSea are used in the marine environment that accommodate several thousand of fishes and the underwater robots (<https://www.sintef.no/en/latest-news/underwater-robot-with-needle-and-thread/>) assist in examination and repairing of these aquapods providing the most effective way to manage the operation. For individual-based fish farming, iFarm system (<https://www.cermaq.com/wps/wcm/connect/cermaq/news/ifarm-cermaq-towards-individual-based-farming/>) solves many of the challenges in aqua farming by using sensors that have computer vision. This capability can actively sort sick or harmed fish as well as those that are ready for processing. In a sensor chamber, number of fish, fish size, number of sea lice, and possible signs of the disease are registered. Presently this system is being used to solve many of the challenges that currently restrict growth in salmon farming by recognising each individual based on the dot pattern of the salmon.

Artificial Intelligence (AI)

Inception of the artificial intelligence in the aquaculture industry empowers aquaculture for better management and decision making process. In aquaculture, the underwater robots included with machine vision feature facilitate for constant monitoring of the fish and habitat both. This information can then be used to reduce irregularities in growth or production before they become problems. The algorithms are being developed to identify animal behaviour and productivity on an individual basis. AI is particularly important as it can interpret information far better than humans and can be used to filter data and allow humans to only become involved when it is absolutely necessary. The Yield, an Australian company (<https://www.theyield.com/our-company/the-yield-story>) that provides technologies for all types of agriculture, uses its Sensing+Aqua technology to create predictive analytics for enhanced data-driven decision-making.

Augmented Reality (AR)

AR also known as mixed reality is the middle ground between reality and the virtual reality. It adds the information typically by sensors and computers to that of the real world. AR involves image processing techniques to provide useful information for planning and decision making. Aqua culturists can use AR to layout the pond in the area of interest and evaluate the possible impacts on the pond by

the surrounding and the environment. Though this technology is quite expensive but it is of high values and can be used for identifying the pathogenic bacteria in fish and the sea food processing industries.

Virtual Reality (VR):

It is a high implementation cost technology and adoption of this technology is in slow pace. VR empowers aqua culturists for developing the video systems for monitoring fish movements and behaviour. This system is excessively used in training and educating the farmers and other aquaculture stakeholders. This system sends data back to a computer program, which in turn constructs a visual representation of the fish schools remotely. VR has been an important teaching tool in fisheries and veterinary medicine and it is hoped that this technology is opening the eyes of the next generation to aquaculture.

BlockChain

This technology is a way of gathering, interpreting and sharing the information. In aquaculture this information goes along the food chain. This technology is highly used by the sea food processing industries to maintain an incorruptible electronic ledger which contains the information about each transaction of a food item's journey in the food chain and provides ease in tracking each transaction of the food. Farmers and producers can connect to and access the blockchain to make information more available. The fisheries sector is one of the most unorganised sectors and has biggest disconnect between producer, suppliers and retailers. Blockchain has the ability to create direct links among the participants of the supply chain thereby ensuring farmers are paid fairly and retailers receive the right products. Wal-Mart recently began testing a food chain blockchain to monitor its food procurement and sales, both in the US and China. If problems arise, Wal-Mart immediately trace the food and identify which other stores have the same item, allowing it to immediately remove it from its shelves, and there is a clear chain that will help quickly identify the source of the problem. Thus this technology has the potential to directly affect the consumer in a monumental way.

Internet of Things (IOT)

All the above technologies described so far are the part of IOT, which facilitates connectivity of machines in collecting, sharing and analysing the data. In addition to application of IOT in crop and live stock production, it can be well used in aquaculture to create an entire platform connecting the producer to the consumer directly. An IOT enabled platform can ensure an optimal feed for fish and monitoring the wellness of the fish in real time guaranteeing customers a consistent and disease free product. The aquaculture IOT system is consists of the water quality monitoring stations, meteorological station, water quality

control station, on-site and remote monitoring center and the central cloud processing platform. An IOT based knowledge based real time monitoring system for aquaculture can ensure growth and survival of aquatic life which can be transferred to the aqua farmer mobile through cloud. Eruvaka Technologies (<https://eruvaka.com/>) has developed connected devices and mobile-based decision tools for affordable monitoring and automation of aquaculture farms. These smart devices help farmers remotely for monitoring water quality and feed intake patterns. Using IoT, Eruvaka helps farmers to reduce risk and improve productivity by enabling the optimal use of feed and energy, making aquaculture farming sustainable. Thus, the increasing growth of IOT in the agriculture and allied sectors, this technology is now being referred as the Internet of Food (IOF) by some agriculturists because of its capability of providing the information regarding specific food availability to a consumer. Simply by accessing a mobile device, consumers can determine the location, growing techniques, flavour, potential allergies, shelf-life, etc. of the food they are about to purchase or eat. Non-human commerce, with 'things' doing business with each other, is evolving so quickly now it has been termed 'Digital business'.

Conclusion

Aquaculture is the fastest growing sector in the food production as Food and Agriculture Organisation anticipates an additional about 27 million tons of food production to maintain the present level of consumption in 2030. This sector has been relatively the late adopter of these disruptive technologies combined with IOT, but now growing fast in adoption and the aqua culturists are transforming their business in more profitable way by minimising the risk. It is expected that in the coming years the intervention of these technologies together with applications might drive truly massive economic transformations and disruptions. There is a need for robust applications, which should be capable

of facilitating the real time decision by handling frequent changes in the external conditions like environment, resource and policy etc. It is also hoped that in the coming year investment in the aquaculture will be at record level in order to make this business more sustainable, traceable and profitable. Efforts are being made to make the solutions more affordable in order to ensure the technology reaches to masses resulting into rapid adoption and high degree of penetration among the aqua culturists.

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CULTIVATING PEACE: CHOICE OR CHANGE*

Anjali*

ABSTRACT

Human beings want peace of mind. Ironically we have developed such conditioned behaviors that disturb it. This Pandemic COVID-19 has provided us opportunity to look within and transform our old habits of getting stressed to remain calm in difficult situations. Our ancient scriptures have invocations of peace mantra for welfare of society, ecology and whole universe. Human being is programmed for progress and evolution. We can cultivate the practice of peace to cope up with panic and fear of COVID-19 as well as in all the spheres of our life. This paper discusses certain techniques of maintaining quietude..

Key Words: Peace, Panic, Dharma

The COVID 19 Pandemic has seriously affected all aspects of our lives, personal, social, emotional, national, educational, economical and medical. I am reminded of the story of elephant and 7 blind persons who were trying to explain Brahmn. The scene all over the world regarding understanding of pandemic is something like this. Everyday some new information contradicting the previous one about this virus is floated on internet. Doctors, scientists all over the world are vehemently trying to make vaccine of this virus but they are not successful. They are treating the patients but not confident about what and why. Since the beginning of the COVID-19 outbreak, WHO has brought together the world's scientists and health professionals to accelerate understanding of the novel coronavirus and expedite research and development to find solutions to the pandemic. WHO has been gathering the latest international multilingual scientific findings and knowledge on a COVID-19 data base, and is running an international therapeutics trial - the Solidarity trial. As of 1 July 2020, nearly 5500 patients in 39 countries had been recruited into the trial. Overall, over 100 countries in all 6 WHO regions have joined or expressed an interest in joining the trial, and WHO is actively supporting them.

The movement of this virus is so unexpected and suspicious that has created tremendous amount of panic in public domain. Fear of unknown and uncertainty has prevailed. We have seen that problems of mental health are pervasive. Post lockdown when people are out in field they are sceptical about its infection. This fear is natural due to nature of this virus. Doctors suggest to take precaution but not to be panicky. According to them increasing inner strength, doing yoga, meditation may be helpful to fight with corona along with medicine. But the question is have

we ourselves learned or taught our children from very beginning to look for inner self? What to talk about inner strength. All of us have learned these reactions towards fear and anxiety since our developing age. Most of the online surveys on causes of mental health due to COVID19 have reported that the problems related to career, finance, family relationships existed earlier too and were intensified during lockdown period. Dalai Lama, a great religious leader was asked about changes observed in his life style during lockdown. He replied no change, as he was regular practitioner of doing meditation. The point I want to emphasize is that our habitual reaction cannot be changed easily. People, therefore, who are used to mostly look outward; live on surface level of consciousness find it difficult to look within.

Moreover the type of education we are receiving or giving doesn't prepare us for facing challenges of life. We have achieved tremendous progress in physical world. The science and technology has reached to its peak which claims to have found Black Hole, the origin of universe. But it has failed to create a world where human beings can live in peace and happiness. Modern education lays too much emphasis on the academic side of student but fails to nurture emotional and psychological side, as a result people don't know how to deal with their frustrations, fear anxiety, boredom and so on. This pandemic is an opportunity for humanity to do self- reflection. Our relationship with our inner self, The Supreme consciousness. "Those were saved who kept God in heart" Sri Aurobindo.

The misconception about spirituality, attaining peace; is that it is meant for retired life. Those who have suffered in life they seek Divine to get peace. Today when whole humanity is in pain shouldn't we learn to seek Divine and get peace? It should be the way of life from very beginning. It should be taught in classrooms, in families. There are four purusharth prescribed for human life in Indian scripture Dharma, Arth, Kam, Moksha. It should be first dharma, duty to know who I am?

So the pandemic has left no choice for us except to choose change. Need for change of having peace in all spheres of life is visible too, but we can't reach the destination unless we leave the shore. To choose is an act of will; the will to change; to cultivate peace, therefore, is first condition. In this paper the main focus is only on fear which is major factor in disturbing our peace.

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Causes of Fear

We are very much concerned about our safety and security. When there is uncertainty then this restlessness takes form of fear and anxiety. The most significant of all is lack of Faith in Supreme Consciousness. The story of BhaktPrahlaad, a staunch devotee of Lord Vishnu, who was saved in all circumstances is an example of the power of faith.

Dealing with Fear

We can understand it according to Law of attraction- that when we are afraid of certain things, say for example this disease due to Corona then actually we are attracting this. Let me share my personal experience. We were going out by taxi, one of my friend just asked- sab thik se check ker liya hai na? The taxi driver replied yes mam, baki kuch ho jay to kya kiya ja sakta hai? And new taxi got problem in mid of jungle. Actually all fear is not our fear. When we absorb others' reactions in ourselves then it comes in form of our own fear. Fear is not a thing by itself; it exists in relation to something. So cover yourself with a shield, be vigilant to not to receive fearful messages about corona. Keep yourself away from negative fearful news and pictures. When we are afraid of something that means we have accepted its possibility. Its movement is from unconscious and it makes its grip stronger.

Cognitive Behavior Therapy (CBT) is very useful. We can give logic to our fearful mind by doing self-talk. Just as we tell a child about nothing to worry while learning a cycle or swimming. For example "I have washed my hands, used sanitizer, I am staying at home or maintaining 2 yards distance while out". Removing ignorance about danger and following the practices are thumb of rule.

Spiritual Level

The best is going within and feel secure. It is different type of CBT, that I am in the shelter of you, The Lord. In Ratri Sukta of Durgasaptshati there is invocation of One who protects us while we are asleep; One who protects the bird nest in storm. This affirmation increases our inner strength.

In addition to this surrender is also very important method to cope up with fear. Surrender is inner movement by which we give ourselves and our life to the Divine. In Geeta Lord Krishna says to Arjuna

"Sarvdharmaan parityajyamaamekamsharanambraj" means leave everything on my will and be in my protection. A true surrender helps in making us free from fear.

In addition to surrender a strong faith in Divine help is also effective.

Equality is a state where one has to be unmoved by any good or bad situation or thing. When we maintain

equality and keep our faith strong then Supreme help creates a shield.

Observing silence; calling for peace is another way to combat fear. But this cannot be performed unless we have learned to be calm, quiet and silencing. Peace is not lack of activity. It is a state of mind.

How to Call Down Peace

You sit quietly, to begin with; and then, instead of thinking of fifty things, start saying to yourself, "Peace, peace, peace, peace, peace, calm, peace." You imagine peace and calm. There is a principle of any mantra that by repeating the name there is vibration through which we get that energy. So instead of repeating Corona Corona, ask for peace. You aspire, ask it to come: "Peace, peace, calm." And then, when something comes and tries to touch you and be active, you say quietly, like this: "Peace, peace, peace." Do not look at the thoughts, do not listen to the thoughts,

There should be urge for progress. It is only possible when we are at peace. Otherwise we would be caught up in storm again and again. When we observe our being we can see at how many level this peace is disturbed. At mental level, all the conversation, TV debates are big reason to infuse fear related to corona. Just observe what happens after half an hour of these debates. Instead of many ideas focus on idea. Focus gives wideness and it gives peace. Gathering of information can't give peace. Take one idea and focus on that. You can be with nature, looking at stars also gives peace.

At heart level how our peace is disturbed is to be paid heed to. Go deep inside heart and find love. At least one good quality can be perceived in a person. Then heart would be at peace.

Stepping Back

Practise that inner peace, make at least a small beginning and go on in your practice until it becomes a habit with in you. When you get the sense of the relativity of things, then whatever happens you can step back and look; you can remain quiet and call on the Divine Force and wait for an answer. Then you will know exactly what to do. Remember, therefore, that you cannot receive the answer before you are very peaceful. So, all of the should cultivate peace.

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CYBER PSYCHOLOGY OF GLOBAL PANDEMIC COVID-19: UNDERSTANDING AND COPING

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Abstract

In today's pandemic-hit world the terminologies like anxiety, stress, depression, mental health have become very common and are used more frequently as these are any kind of disease like COVID and corona virus. As COVID is one of the biggest pandemics in recent history of human race battles, which is not only fighting against the virus but also with the several economic, social and psychological effects that it brings along. The pandemic has hit to all whether people residing in cities or in villages of India. And not only to India but the whole world is going through with this panic situation. So, definitely anxiety will come along with it. The mental distresses are increasing due to the uncertainties about the immediate future, job losses, isolation from the physical world due to social distancing. Many people are trying to cope with loneliness while others are witnessing friction in relationships due to lockdown where outside social interactions are fully prohibited. And so people are having interaction with the other people present in cyberspace - the virtual world. So, this research will highlight that there is utmost need to understand the Cyberpsychology at an individual level that how it is affecting an individual's life and what will be the impact of compulsive social media use on the mental health specially at the time of Global Pandemic COVID-19.

Keywords - Cyberpsychology, COVID-19, mental health, social media addiction, Smartphone.

Understanding with Global Pandemic COVID-19

Whenever we talk about any disease, the disease in itself says that something which is not in ease i.e. DISEASE. There are several diseases, there are different affects of several sort of diseases. But if we talk about COVID-19, so in the whole life time of the century and decade, this generation will remember that something like COVID-19 took place in their life. When it reached to us, there are several months when we are in the lockdown. The name Pandemic itself says that what kind of rate it has affected us. And when we see that how things are taking place, so now the whole world has become a kind of disciplined classroom or where you are not supposed to do many things.

It's like every individual is surpassing through challenges. Those who are affected, those who died, those who have a fear of unknown, even with your people in house in office or anywhere. Like we are having a life in which

actually this COVID-19 has made us think because it is completely different from any other kind of disease or anything else. Because it has multi-faceted effect. And it ranges from the way you think, the way you eat, the way you interact with people, the way you socialize, the way you do anything, all of sudden it all stopped. Like you simply start saying NAMASTE instead of handshake, hello, hi. You have to maintain a social distance. You have to always wear a mask. The people in the country when they are asked to wear a helmet to protect their own self, they are ready for challan instead of wearing helmet.

But these days they are ready to wear a mask because now the threat to life is very close to us. Because in this kind of disease some researchers says that COVID-19 could spread through air, it could spread through surface. So like, whenever we are buying an apple and that apple is coming to your home, you are having a suspect. It is being seen as a think of suspect that it can contain any kind of bacteria and virus. So, if people can understand, they can feel that in every touch, they have a fear that in that touch a virus could be. When an individual has an interaction he/she has a fear. So, the fear, suspicion, the anxiety, the stress, the frustration where everything comes from? It comes from our mind. And the study of mind is called Psychology. It comes from our brain and from our thoughts.

Today when the effects are ranging from individuals to family, to society, to nation, to the world and not only this, rather to the nature. So, these days when you see the memes, where individuals/ human beings are lockdown and the nature is unlocked. You are breathing fresh air, you are able to see the beauty of nature, you are able to see more pure river water, you are able to see when the birds are chirping more, you are able to see when the animals are coming and walking and having a free time when we are inside. So, definitely it's a very big change.

Let's start with an individual, how it affects an individual. For an individual whenever we see the dimensions of health and wellness, we talk about individual's physical health, mental health, emotional health, social health and spiritual health. So, basically when we see that someone is ill or not, but socially lots of change has occurred. So, for the first time, people must be thinking that why I am not feeling happy, why I am not feeling that

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kind of comfort which I use to see before, when I use to go out very easily, talk to people, even not talking just walking, taking round because we are social animals. So, when social distancing is taking place, people are more thinking about social health. And it also affects their mood, their mind, their behavior and everything.

And what is happening on the other side, at physical world social distancing is happening, but on the virtual world, social engagement is taking place. So that social distancing which is taking place in the physical world, so now when people are at their homes, they are engaging more and more on social networking sites, virtual world. They are connecting with individuals, they are remembering old friends, they are talking to them, they are making new connections, they are trying to see things in a different way. Because they have ample amount of time. And when they have ample amount of time, it was not in their practice to sit, to live with their family in that way where they can talk to people, their family members hours and hours. Because there was a routine where you get up at proper time, people have a routine, get prepared for office, going and then coming from office, taking food, just seeing mobile phone, seeing cartoons or other things, take food and get back to sleep. So, people are not habitual to live with their families for 24 hours. Although they wanted to be, the situation is like as if God has fulfilled all the desires of an individual.

People must have seen that WhatsApp message - where husband was thinking...O I should get sometime from the office, so that I can spend some time with family. And wife is saying.....O my husband should stay some more time at home, my kids should stay at home, everyone should be with me. So, probably God has listened to all the desires and everyone is at home. But still not happy. The domestic violence are taking place. There are situations that people are fighting with each other. This is only happening all around the world. But the statistics says.

Kumar, et al. (2020) showed "The link between lockdown COVID-19 and domestic violence" as delivered on 17th April 2020 reported that mandatory stay - at home rules, economic uncertainty and anxiety caused by the pandemic have led to an increase in domestic violence. Another statistics quoted by National Commission for women show surge in domestic violence globally in COVID-19 lockdown, updated by News18 on 5th May 2020 showed the domestic violence complaints in India that around 587 cases came between 23rd March - 16th April 2020 and received more than 92,000 calls in the first 11 days of lockdown.

During this lockdown period we can see the dimensions of health and well-being. And not only this rather we can talk about the financial well-being, when people don't have job securities, the stress are more. A report by Global

Consultants by India Today web desk updated on 16th June 2020 that India is set to lose around 130 million jobs due to Covid-19 pandemic. So, the fear of getting job loss, survival for the fittest and so many physiological and psychological needs are there that we also see in the Maslow's hierarchy of Needs which are the basic needs of a person's life. They are actually affecting us physically. But I think if we know the concept of Psycho-soma, the mind- body relationships or the relationships between our thoughts and body says that it affects our thought first. Because we the human beings are the natural machines governed by our thoughts. And we have to understand that the thought is the pilot. Brain is the pilot, brain is the driver. And thoughts are actually the instructions that brain gives to the whole body.

You see anything; you say sometimes that the feeling of love comes from our heart. We all know the physiology of heart, physically is it possible? Heart does only few things, it pumps blood in and out. But actually these symbols of feelings and emotions, they also generate from our brain. Because brain controls our Central Nervous System, and there are several other systems in our body. When you feel happy it's due to hormones. So, I think we have to understand that the brain is the centre. And from brain the thoughts get generated, the emotions get generated. And when we talk about psychology we are trying to get understand that.

Now in this digital age, when Smartphone is everywhere. Kalam (2018) surveyed on 1000 citizens of India showed that there are about 74% respondents, when they get up in the morning they first check their Smartphones. With 26% checking it immediately, while nearly half check it within five or 15 minutes of opening their eyes. The trend doesn't change at bed time, with the vast majority of respondents (80%) checking their phone within 15 minutes of going to sleep, half of them either check it immediately before they close their eyes, or five minutes before. In India, when people use to wake up they see their both the palms and recite a shloka- "Karagrey vaste Laxmi, kar madhyey Saraswati, kar moole tu Govindum, prabhate kar darshanam". But in this digital age where Smartphone has become an organ, a part of our body, the verse of this shloka has changed. it's like- "Karagrey vastam Mobilum, kar madhyey Textum, kar moole Enterum, kar sending-receiving messagenum". Now we have to see that the way, we take food for our body, the same way through our eyes, ears, our sense organs. This Smartphone has become a very important kind of trigger, medium through which we take food for our brain in the form of thoughts. So whatever we are seeing ultimately inputting in the natural processor. It is getting processed and the output is inside and outside. Because we are not able to go in society, so what is happening. There is something happening in our brain.

Day in day out in normal days, people wanted to be with Smartphone more and more. Because now, people now loves Smartphone than any other things else. The cost of Smartphones is in lakhs, but due to that we ignores our own body, our own health, our own sleep pattern, its biological clock, the circadian rhythm has fully changed. The body cost in millions and billions, we never understand. Because we have purchased very costly Smartphones, so in that ways people want to have its optimum use. people are watching more web series, playing more videos games, surfing the websites, unnecessarily making accounts on social networking sites. Different age groups have different choices on Smartphones. So, even while talking, while walking with family members, people are engaged in Smartphones.

All of sudden things have changed. Like in normal days when people are going outside, when they are in office they have to put their Smartphones in silent mode or no need to interact with cyber world or social media. But now during COVID-19, the situation has changed. When kids are at home and they are having no restrictions of using Smartphones, they are playing games, watching videos and engaging in many other things for hours and hours. When they use to go to school they were engaged there for 6-8 hours daily. So now the scenario has changed in COVID-19 that the schools are off, offices are off. Although the problem with people that online education is taking place and people are working from home. But still it can be understood that how even lot of comedy taking place in online learning, where it can be seen that how students are responding online, giving attendance or anything else. When students are not so much attentive in the classroom, how one can find attentive in the online classes, where they are lying on the bed with video off and whether their audio is on or not, no kind of technology available for that. Yes, in future with the help of Artificial Intelligence, one can do with that.

But usually in online classes that self-disciplined is absent. And that's why when you talk in lockdown, the Smartphones are more closer. Because people are more present in cyberspace or in the virtual world than in the real world. In normal days being with their family when people are together, when people are not able to see their family members hours and hours. And now during lockdown, what is happening? People are coming more closer to Smartphones, getting more attached with their Smartphones. exploring more Apps, exploring more Web-series, exploring different kinds of Video Games. This is a thing that is also taking place, because individuals want to relax themselves. They want to get out of fear of unknown. So, what they are doing at home? They are texting, developing new relationships, surfing on internet, logging into many social networking sites like Facebook, Twitter, Instagram,

SnapChat, LinkedIn, YouTube, WhatsApp, etc just for fun. Kalam (2018) examined that the most popular smartphone activity is checking emails according to 84% of respondents, while 81% also like to stay tuned on social media. In fact, the research highlights social media and messaging apps are the most installed apps on smartphones in the country, the most popular of which is WhatsApp used by 94% of respondents, and over 90% of respondents in all age groups. YouTube is the second most popular app, used by 89% of the sample and Facebook is used by 85%. 71% also use Facebook Messenger. And research has shown that how the impact of compulsive Social Media use affects Mental Health. Results revealed by Palyan (2019) showed the major psychological consequences are facebook depression (O'Keeffe and Clarke-Pearson, 2011), sleep deprivation, insomnia, restlessness, mood swings, depression (Strickland, 2014), isolation, insecurity and recently FOMO-fear of missing out (Wortham, 2011). FOMO refers to 'a pervasive apprehension that others might be having rewarding experiences from which one is absent'(Przybylski, et al.2014). Other negative side effects (Rohilla and Kumar, 2015) like hampering students' attention span, thus decrease in academic grades , destroys real life-relationships either it is parent-child relationships or husband-wife relationships which leads to marital problems and familial problems, the feelings of suicidal tendency, mood swings, fear, loneliness, procrastination of regular work and boredom with routine task.

There is something which is happening in the brain and that is understanding mind is called as PSYCHOLOGY. And understanding the mind and behavior in cyber world is called ad CYBER PSYCHOLOGY." Cyberpsychology (also known as Internet psychology, web psychology, or digital psychology) is a developing field that encompasses all psychological phenomena associated with or affected by emerging technology. Cyber comes from the word cyberspace, the study of the operation of control and communication; psychology is the study of the mind and behavior" (Wikipedia). Now in normal days versus COVID-19 days, where the Smartphone usage has increased, the time on cyber world and interaction in social media has increased. As per the statistics updated by Diwanji on 27th May 2020, the results of a survey on the change in Smartphone usage across India due to COVID-19 pandemic, each individual users spent around 23 hours per week on their Smartphones in the time preceding coronavirus. Addiction on cyberspace is taking place . Earlier people were addicted to drugs and alcohol, substance use or any kind of medication. But when talking about the addiction in cyberspace, it is something due to which behavioral problems are taking place and which leads to disorders. Which are as follows:

- * Internet Addiction Disorder - Addiction to internet is increasing day by day which is very serious concern. people are just surfing the sites, scrolling the websites without any reason. They are addicted to online shopping and wasting their time and money both. Internet Addiction Disorder (IAD) ruins lives by causing neurological complications, psychological disturbances, and social problems (Cash, et.al., 2012).
- * Internet Gaming Addiction Disorder - These days specially children and adults are obsessed with feeling of online video games. Internet use gaming disorder has been acknowledged by The World Health Organization added "gaming disorder" to the 2018 version of its medical reference book, International Statistical Classification of Diseases(ICD) (WebMD). Kids are engrossed in online playing games like candycrush, Pub G, Bluewhale and many more. These online games increases aggressive behavior, hostile emotions, educational issues and isolation from family and friends.
- * Social Media Anxiety Disorder - It is a syndrome that relates to Generalized Social Anxiety. Social media anxiety disorder involves a kind of fear that how other person will judge your performance in virtual world. Negative interactions and social comparisons lead to higher level of anxiety (Uhls, 2017).
- * Facebook Addiction Disorder - "Facebook addiction" is a term coined by researchers that is applied to individuals who engage in excessive, compulsive Facebook use for the purposes of mood alteration, with negative personal outcomes (Ryan, 2014)." Frequently checking the notifications on facebook, how many likes the person has got, what kind of comments, how many people have commented on their post.
- * Instagram Addiction - According to Sheldon and Bryant, 2016- Instagram is used as "Surveillance/ Knowledge about others," "Documentation," "Coolness," and "Creativity." A recent survey updated by Macmillan (2017) found that the use of Instagram was associated with the high levels of anxiety, depression, bullying and FOMO, or the "fear of missing out."
- * Eating Disorder - People are too much engaged in social media and so they forget to take their meals on time. Even they forget that what they have ate their meal. While eating they are using Smartphones. their full attention is on what they are watching in internet.

- * Lifestyle Disorder - Generally for an individual relaxation means to get proper sleep. And due to the excessive use of Internet the lifestyles of people are at raze. Their sleep pattern are fully changing. The people on cyber world has no time to take proper sleep. Their bed time has changed. Late nights they are into social media accessing one or the other things without any purpose and just for fun. They are becoming inactive on physical world.

So, when people are waking up the first thing they have in their hands are Smartphones and when people go to bed they usually sleep with their Smartphones as if it is a part of their body. It can be seen that how it is affecting an individual's life.

Slowly we have to ponder, and we have to think that, we need to understand this that the 'Cyberpsychology of COVID-19' is the most important area of study. Because whatsoever is happening in the area of COVID-19, the health workers are at forefront, people in society are changing, the business is changing and also the job losses are taking place. But ultimately an individual and his/her Smartphone. The connection between this is billions of people. Billions of people and millions of phone and one on one interaction with the Smartphone. And the psychology of an individual is getting too much affected by the platform of Smartphone when it is Artificial Intelligence enabled. Whatever we are seeing, we are thinking upon it and whatever we are thinking we are acting upon it. So, in this way Cyberpsychology has affected so many things in COVID-19.

Coping strategies

There are some coping strategies which can help to overcome with the cyber addiction problems. They are-

- * Self-control - Control on self is very important. Self-control on our thoughts, emotions, utilizing time properly, control on our sense organs. Restrain oneself that the wastage of money should not be there.
- * Self-discipline - To eradicate the problem of lifestyle disorder, it is utmost important to make ones' life disciplined. There should be proper routine of waking up and night bed time.
- * Auto-suggestion - One of the best ways to cope is to give suggestion to yourself. An individual can take small resolution and work out according to that which is also called as 'Anuvrata'.
- * Mindfulness - One should give 100% to that particular work whatever a person is doing, full concentration on The Present. Focusing on his own activity either it is eating it should be mindful eating likewise mindful walking, mindful studying, mindful sleeping. As in Bhagwadgita it is also said

that- 'Excellence in action is called Yoga'. Mindfulness practices reduces stress, increases focus, resilience or increases the capacity to overcome challenges, improves emotional intelligence, physical and mental well-being, creativity and collaboration (Mission Be).

* Meditation- Reinventing yourself (Be Born Again) All thoughts like jealousy, too much attachment, anger, hostile feelings, sadness are out from my mind.

* Self-study or Self- analysis (Swadhyay)- It can be done with introspecting ourselves by reading motivational and inspirational books.

* De-stress through Haasya Asana - Laughter is a medicine which is very beneficial especially for our 32 facial muscles. As it is also said that smile is an infectious disease which should be spread all over. Through laughing a person can throw out the frustrations and stresses of life.

* Cognitive-Behavior therapy - First and foremost thing is to work on the cognition i.e. our thought pattern. Because it is only people's thoughts that is affecting their behavior and shaping their character. The strategies of CBT helps people to overcome with their stinking thinking. Such strategies may include journaling, role-playing, relaxation techniques, and mental distractions (Tsitsas, 2014).

* Digital Detox- According to the Oxford Dictionary, digital detox is "a period of time during which a person refrains from using electronic devices such as Smartphones or computers, regarded as an opportunity to reduce stress or focus on social interaction in the physical world" (Griffiths, 2015). Digital detox strategies that simply allow you to reduce the amount of time spent on social media. In India people usually observe fast for detoxing their body and while observing fast specially on that day they don't eat cereals and pulses. So, likewise one should do detox in the cyber world too. Simple steps are:

* Turning off sound notifications and only allowing yourself to check your Smartphone every 30 minutes or once an hour.

* Having slots in the day where there is self-imposed non-screen time(such as during meal times)

* Leaving your Smartphone in a separate room from where you sleep (just so you don't get the urge to check social media before bedtime, during the night, and when you wake up).

* Family Screen Audit- A screen audit is simply a process of examining our relationship to screens.

Generally an audit is done when individuals or families want to re-examine how frequently and how long they use their screens. Screen audit is best undertaken by the whole family together.

Everyone should respond to the questions like:

* How much TV do you watch per day?

* How much time do you spend on the computer for study or work purposes?

* How much time do you spend on mobile devices each day?

* How much leisure time do you spend online versus offline?

* Download Digital-well being or Moment App- One can download these Apps in their Smartphones which is a screen time tracker which will show that how many times an individual has unlock their phone. How many times you check the notifications of social networking sites. How much time spent in cyberspace?

Conclusion

Hence we can wrap up by saying that the compulsive social media use is affecting our relationships, the problematic social media use has hampering students' academic performance, the digital overuse is affecting an individual's sleep pattern, the problematic social networking sites usage is leading to lifestyle disorders. As Smartphones has become an integral part of our life, just like an organ of our body. We eat, drink, sleep, walk with the Smartphones. We always need to focus on our kids, adults, adolescence, youngsters and all family members but we are considering Cyberpsychology first in our life. Because when an individual say to themselves, sometimes they do not follow that. But many times when Smartphones says something, people try to pursue that, people try to follow that which is the bigger impact. So, if we consider an 'Iceberg Principle' on the tip of an iceberg are other things, other Psychology are taking place. But now all sort of Psychology is on the tip of iceberg and down is the Cyberpsychology which is affecting in larger way. So, Cyberpsychology of COVID-19 seems to be a big concern which needs to pay attention.

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POWER OF MUSIC TO COPE WITH GLOBAL PANDEMIC COVID- 19

Vandana Sharma

Abstract

The present paper is an experiential connotation of power of music in dealing with prevailing stressful conditions , which are primarily the offshoots of global pandemic covid 19. COVID-19 is harming public health, clearly affecting those who have been tested positive. But its reach is much more widespread .Even if person is virus-free, COVID-19 is affecting your health, not limiting only to physical health but entrapping, mental health , financial health, educational health , and social health as well . Social isolation is unhealthy for immune system and health , specially in Indian context, where personal space imbibed at the time of socialization is the base for interpersonal relationships and communication. We need to find new ways to maintain our connections to others. In this distressing time, adopting stress reduction strategies is part of keeping healthy. Chronic stress can make us more susceptible to viral infections. It is release of DOSE of music to be calming and reinvigorating, where you yourself become your own therapist fo, anxiety, fear, grief, depression and other mental health concerns. DOSE is acronym standing for dopamine, oxytocin, serotonin, and endorphins, which are labeled as happy hormones. The present paper advocates that music has the power to increase the release of happy hormones, consequently contributing to proactive, constructive, productive and positive arena of mental health in such a prevailing conditions of stressful states of covid 19.

Key Words: DOSE, COPE, MUSIC, COVID 19

According to the WHO, there can be 20 suicide attempts per completed suicide, or one suicide attempt every two seconds. Often, these can be extremely painful for the persons involved and their families, friends, and others linked with them directly or indirectly. A 10% increase in this rate, due to the very adverse circumstances prevailing today, could imply an increase of 1.6 million such attempts in one year worldwide, a tragedy of unimaginable proportions.

Suicide was the leading cause for over 300 "non-coronavirus deaths" reported in India due to anxiety , fear ,grief and depression triggered by the nationwide lockdown, revealed a new set of data compiled by a group of researchers. 338 deaths have occurred from March 19 till May 2 and they are related to lockdown.

According to the data -

80 people killed themselves due to loneliness and fear of being tested positive for the virus.

The suicides are followed by migrants dying in accidents on their way back home; 45 deaths associated with withdrawal symptoms, 36 deaths related to starvation and financial distress

There have been a staggering number of suicides caused by fear of infection, loneliness, lack of freedom of movement, and alcohol withdrawal during the lockdown.

It's a frightening time. We're in the midst of a worldwide pandemic, with cities and even entire countries struggling with lockdown and unlockdown states . Most of us are in areas that have already been affected by corona virus , and now watching the headlines and wondering, "What is going to happen next?"For many people, the uncertainty and unpredictability surrounding corona virus is the hardest thing to handle. We don't know how exactly we'll be impacted or how bad things might go and that makes it all overwhelmingly dreading and panic.

Stress during covid 19 is causing the following:

- * Fear and worry about your own health and the health of your loved ones
- * Your financial situation or job
- * Difficulty in sleeping
- * Difficulty in concentrating
- * Worsening of chronic health problems.
- * Worsening of mental health conditions.
- * Increased use of tobacco.
- * Increased use of alcohol and other drugs

The present paper implicates power of music to be one of the options that had great influence on emotional and behavioral aspects of functioning. Music is an expressive art form, and cultural activity. According to Hindu scriptures god or goddess have been associated with some or the other musical instrument. Their form has been associated with specific instrument like, Shiva carries damru. It is believed by many that damaru produced the first dhvani known as 'nada' in the universe. Another belief is that damru was born in the void and Shiva danced to the rhythm of damaru, which led to the creation of this universe. Some even suggest that this sound stands for words of the Vedas. Vishnu carries conch-shell. Sound waves produced by conch shell enhance positive psychological vibrations which improve focus and performance. It has beneficiary effect on health especially on heart and respiratory system. Likewise Krishna carries flute, the Goddess of knowledge Mother Sarasvati carries Veena, Maharishi Narad carries tambura. According to

Indian tradition Lord Shiva is the God of dance and that is Nataraja. Ancient cave paintings suggest that human beings have instinct for music as they do for language.

During Mughal period what can be a better name than Tansen. One story of Tansen's extraordinary musical talent begins with Mughal emperor Akbar's request for him to sing the "Raga Deepak" ("fire"). The raga was rarely performed, because the power of this raga was believed to have the potential to generate such heat that its singer could be consumed by fire. However, on the day of the recital, Tansen's singing caused the court to grow hot in flames. Fortunately, Tansen's daughter Saraswati who herself was a skilled musician sang "Raga Megh Malhar" ("clouds") and thus, summoned the rain, which extinguished the fire and thereby saved Tansen and the court.

Modern music therapy originated in the 1940s after World War II. Thousands of soldiers with post-traumatic stress disorder (PTSD) were unable to function normally in families and society. They were given conventional therapies but that didn't work. Then the community musicians began to visit veteran hospitals to play for those suffering from physical and emotional trauma. Nurses and doctors reported that melodies given to patients produced positive physical and emotional response, what the traditional therapies were unable to produce. As a result hospitals began to hire musicians for therapy. Indian music therapy is an integration of musical traditions with ancient healing practices and current clinical practices. This idea was popularised in south of India by Mr. Balamuralikrishna. Legendry, Thyagaraja was a famous musician of South India. He brought a dead person back to life by singing the composition Naa Jeeva Dhara in raga Bihari.

Psychology of music says that there are 4 processes involved in perception of music

- * Sensory stage (stage 1) - our ears have to detect sounds and send this information to our brain .
- * Perceptual stage (stage 2) -we process the characteristics of these sounds i.e. pitch , volume etc.
- * Cognitive perceptual (stage 3) - how different sounds relate to each other i.e. melody , rhythm , and harmony.
- * Cognitive and emotional (stage 4) -Here we understand, interpret and respond to this collection of sounds and recognize it as music.

Apart from entertainment, power of music is known to be curative and therapeutic in nature. Great philosopher Plato says, "Music gives a soul to the universe, wings to the mind, flight to the imagination and life to everything."

Music has scientifically been proved to have a stimulating effect on the brain, body and emotions of human beings. During pandemic , 'balcony concerts', have been a big hit in countries like Italy and Spain. For many musicians, virtual

shows are the new normals . Why do we sing during times of crisis?

- * Music creates a sense of belonging and participation.
- * Music is an antidote to the growing sense of alienation and isolation in society in general .
- * Music works as social balm on the forehead of isolation, uncertainty and panic. Social balm creates community connections .

Indian classical music is based on the raga and rasa system. Raga is the arrangement of notes in a particular order so as to create a musical adornment. A Raga is a sequence of selected notes (Swaras) that lend appropriate 'mood' or emotion in selective combinations because certain melodies of ragas can be related to a person's emotions and their nuances. The listener's counterpart to raga is rasa, the mental and emotional reflection of what is heard as music. The reaction to the music one listens to is both the primary effect of the notes , and a secondary effect of moods produced by arrangement of notes. It has been suggested that performing and listening to appropriate ragas can work as medicine and have definite impact on certain ailments .

Indian music has its origin in the concept of raga and rasa. Attempts have been made from long ago to relate the basic notes in Indian music to the eight basic emotions in Indian drama. The notes are sadaja, rishabha, gandhara, madhyama, panchama, dhaibata and nishada, whereas the moods are

- * Shringar (love),
- * Hasya (laughter),
- * Karuna (compassion),
- * Veer (heroism),
- * Raudra (Anger),
- * Darr (fear),
- * Vibhatsa (disgust)
- * Adbhuta (wonder).

Different notes are used to evoke different emotions. Sadaja and rishab are used to create a mood of courage or wonder. Gandhar and nishad do create mood state of compassion. Madhyam and pancham are likely to elicit mood states of love or laughter. Dhaivata evokes emotions of fear and disgust. Different musical compositions induce different kinds of feelings. These music induced feelings play a wider role in maintaining balance at personal and social levels. Music by virtue of being a sound or nada generates particular type of sensation which increases the levels of feel-good hormones and simultaneously decreases cortisol, a stress hormone.

Studies conducted on adults suggest that music provides opportunities for improving a sense of control over negative emotions through emotional catharsis. Studies have also reported that music is a good way to enrich lives of people by making them more aware of their own selves in exploring and expressing their emotions and

encouraging them to connect with each other. It is a non-threatening intervention that uses musical interaction as a means of enabling non-verbal expressions .

Researches on Indian music therapy suggested that by involving oneself deeply in ragas, one is able to realize true emotional aspects which further help to reach recesses of the mind. Moreover, special compositions of music under different ragas are thought to be beneficial for the treatment of various psychosomatic and neurological disorders . Empirical evidence has shown that different rhythms and tempos may influence the effect of raga on mood and emotions . To achieve a calm and meditative state, slow-paced rhythms and tempo have been found to be effective, Music has the power to determine the release of DOSE. DOSE is an acronym for feel good hormones i.e., dopamine , oxytocin , serotonin , and endorphins .

Dopamine is the reward drug. It has been empirically validated that the intensity of pleasurable music induces dopamine. Great philosopher Confucius says, "Music produces a kind of pleasure which human nature cannot do without."

Oxytocin is responsible for social bonding. Have you noticed that music is commonly used in every social function . We can not imagine any social function without music , particularly in Indian context. Music is something that is relatable and enjoyable . People often report a feeling of connectedness during music experiences, either as a listener or a performer. Musicians often discuss "feeling lost in the music" and audience members frequently share a sense of cohesion through a commitment to the music . It is relational, in that music helps us engage, communicate, and interact with others. We are hardwired to connect and be social, and music enriches us to do that.

Serotonin is the Confidence Drug. Listening to music releases serotonin into the brain, helping you to relax and stay focused. Music has an energizing effect, so your mood naturally improves. This state of mind helps you get in the zone and accomplish more. To increase serotonin, challenge yourself regularly and pursue things that reinforce a sense of purpose, meaning, and accomplishment. Music, whether active or receptive, is a purposeful and meaningful state.

Endorphin is the painkiller drug .It has analgesic properties . Music distracts you from aches and pains. It has a health effect too. Listening to music releases endorphins in the brain. Endorphins give us a heightened feeling of excitement.

Power of music is exhibited in taking us from chaos state to a calm and relaxed state. It has beneficial effects on our physiological functions like, lowering down the blood pressure, slowing down the pulse rate and thus decreasing the levels of stress. Music is a fun way to relax your muscles,

as a result your mind also relaxes, which helps you to reduce stress .

Insomnia is a common sleep disorder for people with stress and depression, with major impact on their quality of life. A popular historical example is worth mentioning here, which dates back to 1933. Mussolini, Italian dictator complained of terrible insomnia. No therapy or medicine could work in that case. Pt Omkar Nath Thakur , a great Indian classical musician , who was visiting Europe at that time , agreed to perform remedial music to alleviate Mussolini's sufferings . Musician's wonderful performance on raag Puriya worked like magic , and within half an hour , Mussolini fell into deep sleep.

Music plays important role in cognitive functioning. Studies found that elevated cortisol was associated with poorer cognitive functioning, as well as with poorer memory, executive functioning. Music decreases the level of cortisol, hence enhances cognitive functioning. Albert Einstein said ,

"If I were not a physicist, I would probably be a musician. I often think in music. I live my daydreams in music. I see my life in terms of music." Music appreciation begins right in the womb, with the foetus listening to the mother's heartbeat . What can be a better proof of music therapy than a lullaby that puts a child to sleep .

In the prevailing conditions of covid 19 , Communities around the world have turned to music . With constraints on our movements becoming more and more restricted, we are feeling a loss of control not experienced since the second world war. In being confined to our homes, new normals are emerging where we are missing our old normal social support from friends and family, and our freedom to control our day-to-day lives. In such a time of crises , music provides a means to regain control. People in Italy and Spain have been filmed acting out with music in their balcony concerts. The citizens of Wuhan singing patriotic songs from their windows encouraged themselves and their neighbours in their efforts to save their city.

Anasuya Ravikanti is a trained music therapist and is running her own institute 'Surajivani' in Hyderabad. Ravikanti has been reaching out to doctors and healthcare practitioners who are working with covid 19 healthcare unit. She is giving music therapy to doctors and nurses of covid 19 wards , and it has been reported by the doctors that music therapy has done wonders and now they are able to sleep peacefully.

To conclude, it has been empirically and experientially validated that music has the power to cope with global pandemic covid 19. Keeping in view the personalized needs of the individuals , a complete musical intervention program may be structured , where we can also include a bit of nature therapy , aromatherapy and chromotherapy to have optimal benefit of music therapy.

TECHNOLOGICAL TRANSFORMATION AND SOLUTIONS IN EDUCATION SECTOR DURING COVID-19

Dipti Rathi*, Rahul Sharma**

Abstract: The COVID-19 Coronavirus pandemic is causing a worldwide learning crisis in addition to health crisis. Schools are attempting to guarantee continuous learning and consistent scholastic tasks, which is just conceivable with the technology intervention.

Keywords: Covid-19, education sector, technological transformation, solutions, digital platforms.

The worldwide pandemic has endured a gigantic shot on all the parts of the economy. This effect of COVID-19 (coronavirus) will stay for quite a long time. While it has been marginally simpler for MNCs and experts to embrace telecommute as the businesses proceeds of course, the times for the education system around the globe have been challenging. With disruptions all around, many of us are worried for re-examining and re-imagining the education framework. All the schools are temporarily shut in about 185 countries so as to stop the virus spreading among students and about 89.4% learners are forced to stay home. Students are being taught remotely using technology by utilizing assortment of online courses and classes. The question emerges here is, the technological transformation providing the adequate solution to the education system?

Here, we obviously have an equity issue. However, we have a diverse group of nations at various income and development levels. The effective use and accessibility of technology as well as gadgets is the key factor. As indicated by the State of Broadband 2019 Report, in spite of the fact that internet access infiltration rate is 51.2%, it is just 45% in developing nations and 20% in least developed countries. Digital and information gaps have always existed, but it turns from a disadvantage to a crippling weakness in a situation in which many people have to stay home. A massive effort is underway to keep student engaging digitally.

Figure 1



Technological Solutions available for Education Sector

1.1 Openly licensed tools

To help with different learning materials and educator training, UNESCO has made accessible openly licensed tools that can be utilized by institutions and individuals which assists with upgrading the limit of teachers delivering on the online platforms. It additionally helps students to get to different online courses which are made available with no expenses to keep them drawing in with learning.

1.2 Digital Library

The open source advanced library offers free available eBooks in excess of 40 dialects discernible on the web, portable, or for downloading and printing. The books can likewise be deciphered or confined straightforwardly on the platform.

1.3 Online Webinars

One of the key aspects during this tough time is to ensure that the learning stays a nonstop procedure for all the intents and purposes. Associating students through digital platforms and software is the most recent progress in the education attempting to eradicate the physical classrooms. This is the right time to acknowledge technology and its contributions so as to make education conveyance effectively and more productively through web-based learning and assessments.

Figure 2



1.4 Mobile Apps

The quickened adoption of the advanced of the digital technology activated by the lockdown, educational institutes are deploying mobile applications to convey training inventively. Presently, schools are furnishing

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gadgets and various e-learning portals and apps are introduced with digital books to balance the coordination between course content, educationist, technology and course takers.

Summary

The enormous utilization of technology in instructing in the midst of crisis will prompt to a new era in the education sector wherein the best of workforce will be accessible from over the Globe to students. The online digital platforms or ed tech organization are constantly endeavouring to improve their products. Much has been planned and executed and greater improvement is in progress.

Although the concept of online learning and undertaking classes from home was already on the uptick, COVID-19 would provide a huge boost to this. It will be fortifying the nation's advanced learning foundation over

the long haul. The immensely transformative power of virtual learning halls is their capacity to carry a perpetual number of courses to students at their doorsteps.

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ANALYZING THE FINANCIAL SYNERGIES IN INDIAN BANKING INDUSTRY POST MERGER & ACQUISITION

Rashmi Dwivedi

Abstract

The complex strategic phenomena of consolidation or say Mergers & Acquisitions conveys multiple benefits and opportunities for both the acquirer and bidder bank. The term synergy as denoted under the management principle explains the miraculous equation of $1+1=11$, hence aiming to study the effects on the financial synergies of the merged entity, This paper tries to apprehend the analysis of pre and post synergetic gains if any for the banks which have under went the process of consolidation for the time period of 2008 to 2018, study employs the T test for the statistical interpretation in order to confirm the presence of financial synergetic gains post deal.

Keywords: mergers, acquisitions, synergy & consolidation.

Introduction

The Merger and Acquisitions (M & A) has grown in a rapid pace to be a key market entry strategy and also an expansion technique. The idea of mergers and acquisitions has become particularly well known in the present situation. Consolidation vide mergers and acquisitions is apprehended as one among the keys to rebuilding structure of corporate units. M&A rejuvenates the existing organizations.

The Indian Banking Industry has seen a number of changes over the last 5 decades. The major change was the Nationalization of the banks in 1969 and 1980, which eventually was followed by the liberalization of the economy in 1991, Privatization; opening the doors of Banking for the Private sector in 1993 and the most uptrend is the evolution of Payment Banks and Small Finance banks in 2015.

The strategy of consolidation for the banking sector 1 has facilitated the Indian banking industry globally competitive. In this continuation to this in the same context there are seven public sectors banks in India which have been tagged as to participate in the race of consolidation process;-

1. Central Bank of India,
2. Bank of Baroda,
3. State Bank of India
4. Punjab National Bank
5. Bank of India,
6. Union Bank of India,
7. Canara Bank.

The rationale behind identifying these banks for the

consolidation process is significantly on the account of the owning assets exceeding Rs.10,00,000 crore and possessing bigger size of balance sheet. Government has also analysed that these bank may take over another bank, be it private or Government-owned consequently proving themselves to be the fore frontier in procedure of consolidation this is mainly on accounts of the assets and size of balance that these bank possess which gives them edge in takeover of small banks. With a population of 125 crore it is not possible to have only one large bank i.e State Bank of India. There is expectation of four or five other public sector banks to grow in size and reach the level of SBI to become globally competitive

Mostly 7 out of 10 mergers which happened the date and time horizon could not be quoted when two companies were different and failed to create the synergetic gains. Mergers which did not reflect synergy effect don't worked for and even failed to create shareholders wealth.

SYNERGETIC VALUATION OF THE FIRM

Synergy: Implies a situation where the combined firm is more valuable than the sum of the individual combining firms. It refers to benefits other than those related to economies of scale. Operating economies are one form of synergy benefits.

V = Value of the firm

A = Firm 1

B = Firm 2

$$V(A+B) > V(A) + V(B)$$

The word synergy comes from a Greek word that means to co-operate or work together (Bruner, 2004). Synergy has been described as $2+2=5$ (Pearson, 1999). In other words, the whole is greater than the sum of its parts (Sherman, 1998).

The concept of synergy can also be explained symbolically as follows- If 'Company A' merges with 'Company B', the value of merged entity called 'Company AB' is expected to be greater than the sum of the independent values of Company A and Company B (Kishore, Ravi M.,: 2009, pp. 1067-1096),

i.e., $\{V(A) + V(B)\} < V(AB)$

Where, V(A) = Independent Value of Company A,

V(B) = Independent Value of Company B

$V(AB)$ = Value of Merged Entity

However, the synergistic gains by M&A activity may accrue from more efficient management, economies of scale and scope, improved production techniques, combination of complementary resources, redeployment of assets to more profitable uses, the exploitation of market power or any number of value enhancing mechanisms that fall under the general rubric of corporate synergy (Mallikarjunappa, T. and P. Nayak, : 2007, pp. 53-69).

There are five main types of synergies as depicted below in Figure (Godbole, Prasad G.,: 2009, pp. 58-68).

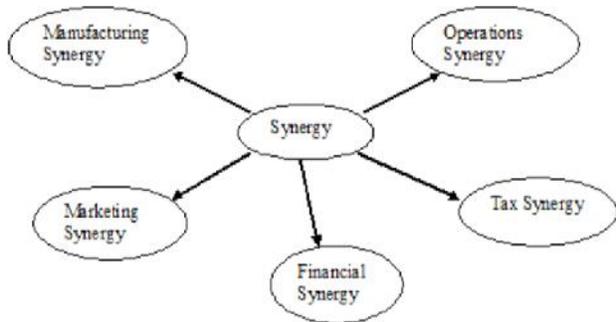


Figure 1:

types of synergies; source: Godbole, Prasad G.,: 2009

This research paper focus upon the analysis of Financial synergies gained through the M&A activity. Financial synergy involves combining both the acquirer and target companies' Balance sheets to achieve either a reduction in the weighted average cost of capital (WACC) or a better gearing ratio other improved financial parameters

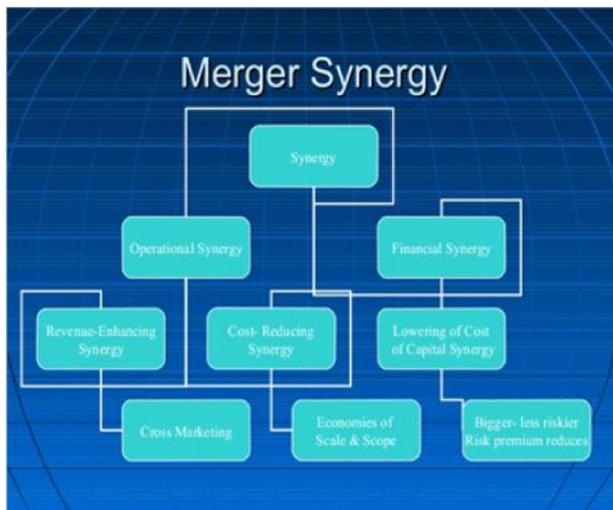


Figure 2: Explaining the synergical interconnection

LITERATURE REVIEW

A. Merger and Acquisition

Merger and acquisition benefit shareholders when the consolidated post-merger firm is more valuable than the simple sum of the two separate pre-merger firms.

Akhavein, Berger and Humphrey (1997) studied the efficiency and price effects of mega mergers on US banking industry and found that merged banks experience a statistically significant (16 percentage) increase in profit efficiency rank relative to other large banks. Further, it was found that most of the improvement was from increasing revenues, including a shift in outputs from securities to loans, a higher-valued product. Improvements were great for the banks with the lowest efficiencies prior to merging, which therefore had the greatest capacity for improvement. By comparison, the effects on profits from merger-related changes in prices were found to be very small

In line with this, Enyi (2007), concluded that the banks consolidation exercise of 2005 as supervised by the Central Bank of Nigeria has yielded basket full of benefits in terms of improved banking environment and renewed customer confidence in the banking industry.

Soludo (2004), opined that mergers and acquisitions are aimed at achieving cost efficiency through economies of scale, and to diversity and expand on the range of business activities for improved performance.

Merger and acquisition is adopted to attain the operating and financial efficiencies. According to the efficiency theory, the main motive of mergers and acquisition is to gain operating and financial synergy.

B. Corporate financial performance measures

According to Orlitzky et al., (2011), the three broad subdivisions of corporate financial performance consist of marketbased (investor returns), accounting-based (accounting returns), and perceptual (survey) measures. Alternatively, accounting-based indicators, such as the firm's return on assets (ROA), return on equity (ROE), or earnings per share (EPS), capture a firm's internal efficiency. Market base indicators such P/E ratio. Market capitalization and share price. increase in national / international ranking. This research work will analyze the data collected using the accounting-based (accounting returns) and the market-based (investor returns) and survey base financial performance measures in the pre-consolidation and post-consolidation years considered in the research work in order for meaningful conclusions to be drawn.

G and Nirmala (2013) examined the performance of the acquirer and target companies before and after the mergers by using ratio analysis and t-test during the study period of three years. It was found that the shareholders of

the acquirer companies increased their financial performance after the merger event.

Shivaji and Veerasha (2014) evaluated the impact of mergers and acquisitions on Profitability, Efficiency and Solvency of acquiring banks by using various financial parameters (such as Interest spread ratio, Net profit margin, Return on net worth, Interest income/Total fund, Interest expended/Total fund, Operating expenses/Total fund, Net income/Total fund, Credit deposit ratio, Interest coverage ratio and Cash deposit ratio) five years before and five years after the merger. It was found that there was a positive impact of the event of merger on both Indian overseas Bank and Federal Bank. But the extent of positive impact was found more in case of Indian Overseas Bank than Federal Bank.

Prabhu and Honnappa (2015) examined the Impact of Merger and Acquisitions on the performance of three banks viz. IDBI Bank, Indian Overseas Bank and HDFC Bank. The pre and post-merger performance of merged banks has been analysed in terms of profitability and their respective compound annual growth rate. It was found that the financial performance of acquiring banks has improved after the merger.

RESEARCH METHODOLOGY

Research Design:

The research design which is used is the ex post facto research design. This design is primarily used wherein the phenomenon under study has already taken place. Previous data relating to the subject matter will be collected to establish the relationship between the phenomena under study. To study the financial synergies post merger.

Period of study:

In order to make a comparison of the performance of the merged banks, data for the period 2008-2018 has been taken as the sample

Data used:

The present study is based on secondary data which has been collected from various sources such as annual reports of Reserve Bank of India and respective banks.

Statistical techniques:

Various statistical tools have been used in the present study to analyze the objectives of the study. The descriptive statistics measures i.e. Mean, Standard deviation and coefficient of variation have been used to analyze the degree of variation among the data series.

APPENDICE 1 LIST OF MERGERS AND ACQUISITIONS 2008-2018

Sr No.	Acquiring bank	Acquired bank	Year of acquisition
1	State bank of India	BhartiyaMahila bank(BMB)	2017 (Recent and Important)
		State Bank of Bikaner and Jaipur (SBBJ)	
		State Bank of Hyderabad (SBH)	
		State Bank of Mysore (SBM)	
		State Bank of Patiala (SBP)	
		State Bank of Travancore (SBT)	
2	Kotak Mahindra bank	ING Vysya bank	2014
3	ICICI Bank	Bank of Rajasthan	2010
4	SBI	State bank of Indore	2009
5	HDFC Bank	Centurion bank of Punjab	2008

Source: IBPS data on M&A

Table 1 : Mergers & Acquisitions Acquirer and the Acquired Bank

Objective of the study:

The objective of the study is to evaluate the financial performance to analyse the synergical advantages of merged banks on the basis of selected variables prior and post-merger.

Hypothesis:

The present study proposed to study the following hypothesis.

Ho: there is no significant difference between the NPA of the banks pre-post merger.

Ho: there is no significant difference between the ROA of the banks pre-post merger

Ho: there is no significant difference between the ROE of the banks pre-post merger

Ho: there is no significant difference between the OVERHEAD EFFICIENCY of the banks pre-post merger

DATA ANALYSIS

TABLE 2. BRIEF OVERVIEW OF PRE-POST MERGER STATISTICS

Bank	NPA		ROA		ROE		Overhead efficiency	
	Pre	Post	Pre	Post	Pre	Post	pre	post
Kotak Mahindra	0.90%	1.10%	2.00%	1.20%	14.80%	11.00%	27.70%	26.53%
SBI	2.10%	2.60%	0.80%	0.60%	14.30%	9.60%	22.67%	26.78%
HDFC bank	0.43%	0.47%	2.04%	1.91%	19.40%	16.05%	29.65%	30.21%
ICICI Bank	2.12%	1.11%	0.96%	1.19%	9.52%	11.43%	17.66%	20.28%
Mean	0.01710	0.01600	0.01449	0.01225	0.14505	0.12020	0.2442186	0.2595117
SD	0.00856	0.00904	0.00661	0.00536	0.04039	0.02798	0.0538276	0.0413423

TABLE 3: Me. HYPOTHESIS TESTING WITH T TEST ANALY-

	NPA	ROA	ROE	Overhead efficiency
t values	0.4251	0.1855	0.0971	0.1389
t 0.05	3.18	3.18	3.18	3.18
p value	0.752	0.6243	0.3501	0.6681
Degree of freedom	6	6	6	6
Is P value > .05	yes	yes	yes	yes

INTERPRETATIONS & FINDINGS

1. Looking over the descriptive study of all the banks in the sample it can be stated that there are visible synergetic gains in the annual statements of the banks post consolidation.

2. Testing the hypothesis no.1 ;There is no significant change in the NPA of the bank the null hypothesis is accepted, interpreting the data shown in the table 1 it can be drawn that 1 out of the 4 banks i.e ICICI has decreased the NPA figure with a change of .almost 1% which is a positive indicator for the respective bank, Rest of them remained almost at par.

Source: IBPS data on M&A

Table 1 : Mergers & Acquisitions Acquirer and the Acquired Bank

3. Testing the null hypothesis no.2 the result is hypothesis accepted, interpreting the data there is no significant and huge change in the ROA figures except for the Kotak Mahindra has shown a noticeable decline in the ROA, which can be reason of concern on the financial scale. The Table 1 above reveals that the mean of the pre-merger ROA has decreased from 1.45% to 1.23% in the post-merger

4. Testing the null hypothesis no.3 the result is hypothesis accepted, analyzing the ROE figures and looking on to the table 1 we will find sharp changes in the PRE & POST merger figures of the bank, but turning towards the statistical analysis (test of significance) and looking upon table 2 of statistical analysis we will find the test shows the P value is greater than .05. the ROE also decreased from 1.45% to 1.23%. important reason for this could be that the increase in capitalization of Indian banks which is the aim of the consolidation is yielding the desired results of improving efficiency in banks.

5. Testing the null hypothesis no.4 the result is hypothesis accepted, overhead efficiency as per both the tables has not shown any sharp decline and post to that the T test has proved the same.

CONCLUSION

Continuous growth and survival are the ultimate goals Any organization and M & A is one of the forms of survival Strategy One of the most important ways to grow profitable and to maximize shareholder equity is the

Company weddings in the corporate world. But meticulous Preliminary merger planning, including the implementation of appropriate deadlines Care, valuable communication during integration, efficient management and dedicated leadership and pace where the integration plan is ready is required together deal successfully with these business combinations. Mergers and acquisitions (M & A) are an expression of strategic objectives Business sector concepts. You can not wait Process management related to sales, purchases and Merger of one or more companies to obtain a common one Cause The common cause consists of aid, financing or Support a company to grow much faster. Business mergers and acquisitions are very important to the economy of a country. This is so because the company Mergers and acquisitions can give significant results Industry restructuring and can help you quickly Industrial growth through the generation of economies of scale, Increased market competition and market growth Shareholder vulnerability as the value of the shares Experience highs and lows after a merger or acquisition. Although the concept of merger and acquisition is different from each other, but both can be used as engines

of growth. As a result, mergers and acquisitions are considered the most Strategic concepts to guarantee the growth of companies in the corporate world

The ACQUISITION COST is so high in comparison of benefits arrived out of mergers, so as a results ROA, ROE and NPA all have shown the negative trend post merger. so analyzing the data statistically on the stated three parameters shows no significant synergetic gain post merger in terms of all the banks. So here comes a big need to focus on lifting up other financial pillars of the institution so as to arrive on the sweeter benefits of consolidation strategy.

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DEALING WITH TECHNOLOGY IN ART & EDUCATION

Juhi Shukla

Recently, in the wake of COVID-19 pandemic, the University Grants Commission had issued a circular to the universities encouraging them to adopt massive open online courses (MOOCs) offered on its SWAYAM platform for credit transfers in the coming semesters. This sounds like a benevolent act during the national lockdown. However, it poses great danger since it is also being seen as an instrument to achieve the country's target Gross Enrolment Ratio (GER) in higher education (envisioned to be 30% by 2021; it was 25.8% in 2017-18).¹

Besides this as educational institutions across the country switched to online classes following the lockdown, students across large swathes of the Northeast wait in hope for their smart phones to come alive or catch the signal long enough to keep pace with their more fortunate counterparts.^{2*}

The online education is good in the era of social-distancing or physical -distancing only for those who can afford the money on laptop, mobile, internet and beyond this the main issue is the connectivity. Suppose one can any how arrange all the electronic gadgets but there is a huge problem of connectivity especially in remote area.

"Online classes sound nice but we know how tough it can be. We have to update the district inspector of schools on the progress of the classes that we have not been able to take at all. The parents of only a few students have smart phones while many don't own a phone. The inability of school to impart online classes has only widened the gap between more than 2,000 students of the Umswai-Amkatchi area and their counterparts in the more fortunate parts of Assam," says a teacher of the government school.

Rahul Chandra Goswami, general secretary of the Assam State Primary Teacher Association says, "We are not against online class as it appears to be the only alternative now. But not more than 20% of the students have been covered, as most students do not have access to a smart phone and recharging for parents beyond the basic need to talk is taxing on the lower middle class, not to speak of those economically weaker".³

An assistant professor of Education at IDE says, "We are supposed to be the pioneers of online education (classes) throughout the year since we started out in 2005-2006 with a Bachelor's degree in five subjects- Economics, Education, English, History and Political Science and we were to have done away with face to face classes, but poor or no connectivity made us fall back on the old school method."⁴

"I have been fighting with my teachers because RGU, to which we are affiliated, the Ministry of Human Resources Development and the University Grants

Commission want us to conduct online classes. But I really cannot insist on this because of the practical situation on the ground. Almost 90% of our students are coming from far flung areas without connectivity, and those who have would rather not sacrifice their limited data pack on online classes that may snap any time," says Father Jose K., the principal of Itanagar's Don Bosco College.^{5*}

Many Students and teachers are saying that online classes are not the solutions for the States unless the mobile phone or broadband connectivity is made robust in remote areas. They do not want schools, colleges and other educational institutions to open until normalcy returns. The COVID 19 crisis is not going away soon. But online classes should not be made mandatory as there are many districts deprived of good communication and electricity.

These are the basic problems in most of the rural and remote areas in our country. But the developed areas also sometimes suffer such problems. During lockdown I have attended many webinars, but the network issues are prevalent in cities too. There are also issues in the more fortunate areas such as Guwahati the urban centre that enjoys the best connectivity in the Northeast." The schools seem to be in a hurry to finish the classes through WhatsApp groups comprising the students of class and some teachers. But the communication is one way as only the teachers can post as the administrators. If the students are not able to ask questions or say whether they have understood about the lesson, how can you judge the progress," asks a father of class 7 student of a private school in Assam.

My experiences are also very bitter in many webinars. It seems only a "Khanapurti" (formality). The real motive appears lost. Organizers call many respected fellow but time limitations do not allow question-answer session. Education is not just about information or content.. most of it takes place through social interactions in a school, with peers with teachers. My 15 years old Son, study in class 10th is not happy with the e classes. He miss his class-mates, football ground, teachers, canteen and swimming pool. I have arranged many electronic gadgets like Play-Station, Smart television, smart phone and books also but these all are not the real substitute of his beloved college/school.

The COVID-19 outbreak has disrupted the academic year, cancelled classes and examinations across the country. To ensure that students do not miss out on their studies, schools moved classes online, forcing students to attend lectures via their gadgets. However, this has also sparked a debate on whether the increased amount of screen time helps students learn or if it impedes their progress. While Maharashtra has banned online classes from pre-

primary to class 2nd, Karnataka and Madhya Pradesh have extended the ban till class 5th.

Looking at the screen for long periods of time can be harmful. And since schools have shifted to online instructions, it does imply long hours of screen time for the child. And that doesn't seem to be a healthy way of learning. In addition to the impact on their health, online learning from home can also be very isolating and lonely for the child. They don't have their peers around them and are sort of learning by themselves. Even the teacher's role becomes limited. Children do not get the kind of supervision that they would get in a classroom. Parents might be too busy with their own work to supervise online learning. These factors impact learning.

Also, many children, especially those attending government schools, are being deprived of education during the pandemic as they do not have access to online facilities. They are actually missing out on their lessons. Though some families may have access to digital technologies, there might not be enough devices for personal use of all family members. The parents may be working from home and need to use their computers. So, each household need to have several gadgets that they can distribute among all of them, which is not possible for a large section of the population.

The entire conversation has shifted to the use of technology. It is not just about computers and smartphones, even watching Doordarshan amounts to screen time. Nobody (in India) is really talking about turning schools into safe places, where education can resume. Education is not just about information or content delivered to students via screens. It is about a lot more. And most of it takes place through the social interactions in a school, with peers, with the teachers. Since online classes have begun, all that has been cut out that would have other kinds of development and cognitive impact on the child and their development. It is high time that we started to talk about how the school and colleges actually can be made a space that are safe again for children and students of higher education to come back to, rather than make a complete switch to online learning/ classes.

In other countries of the world schools and colleges may be reopening, but in India the situation is different. In abroad schools and colleges are taking utmost precautions in their opening for instance, they are using tissues and tissue boxes for every class. Students can dump their used tissues in these boxes. But the waste generated is so huge, and it will also require to be discarded safely. Do every Indian schools have that kind of infrastructure? It is also very difficult to make children sit in the classroom wearing mask without touching it or not to touch other children and their masks.

There is a large section of the population that is unable to access technology and that's huge concern. Children belonging to migrant families might have moved far away from their schools. In Delhi, the capital of India, government school teachers were trying to reach some of the students whose mobile numbers they have, but they are not able to reach them, they have disappeared. And these are kids who are going to be out of school education soon. Nobody knows whether their families will return to the cities and what's going to happen to them. Teachers are doing enough to develop better online modules, based on activities, but how many children are benefiting from it? The problem is that our policy has always neglected the marginalised child. That is why we still have so many children who are not in school. All our policies tend to focus on those who already have access to certain facilities. We just forgot the invisible-the poor and the marginalised. 5'

Reeta Sonavati, an Executive Director at the Early Childhood Education Association, says, "If we stop online education, even the children who have access to technology will lose out. So stopping online classes is not the solution. Instead, we need to work on providing technology to these (disadvantaged) children. Some non-government organisations are already working on these issues. They are providing smartphones, electronic tablets and teaching children to make use of technology. We need more such initiatives. 6'

During pandemic, schools and colleges can be opened in a staggered manner, with 50% students attending every alternate day. This will help avoid crowded classrooms and give institutions time to clean up or sanitising their premises. Temperature checks of teachers, students and non-teaching staff should become mandatory. Social distancing or physical distancing should be followed strictly by teachers and students. Second, it will be better to give priority to opening schools marginalised and migrant children, as they might not have access to technology. We can create separate safe spaces for these children.

Dealing with technology it is also important to talk about the stress in modern life. There are many factors that causes stress in the modern life. They include more engagement with technology and less with people; more focus on "success" (the end) rather than the process of learning (the means); never-ending aspirations; relationship issues; impatience while doing tasks, for this is a generation looking for instant gratification; and too many choices and the limitations of the human mind to choose wisely. With the bridging of gender inequalities, increase in employment of women, growth and development of urban and pre-urban areas, interference of the media and social media in every aspect of life, and disruption in the traditional joint family system, there is an underlying strain on the socio-cultural fabric. Some of this stress, if not handled well, can push human beings

into depression.

Some interesting cases and studies throw light on the coping mechanisms for anxiety and depression. Viktor Frankl, who was detained in Nazi concentration camps, studied the source of depression and found that it is the lack of meaning in life. Individuals who are able to discover meaning tend to achieve the will and strength to endure life. The next question is, "How do we find meaning in life?" Meaning can be found in love and work. Love for fellow being is what motivates a person to work or take action. If we can base our actions and work on a shared love for family members and society at large, we can find effective meaning in life." The Art of Living" involves managing the self for others.

Our HRD Minister Shri Ramesh Pokhriyal "Nishank" says "Prescriptions for depression and anxiety can be found in the writings of Rabindranath Tagore. Tagore believed that being socially connected was an antidote to the mental estrangement that plague-affected people were undergoing in 1918. Tagore was aware that such a wildly contagious disease was likely to cause panic among the students. He organised many events in the Ashram which ensured that social connections existed despite physical distance. In an essay, he suggested that we generate bonhomie between the affected and those who were not, because the ill were not the enemy ; the illness was. For immunity from psychological suffering, what was required was a design of togetherness, which Tagore insisted was ingrained in the famous Rig Vedic dicta, Yatra Visvam Bhavati Ekanidam (where the whole world meets in a single nest) and Vasudhaiva Kutumbkam (the world is one family).7'

In Art education technology and technique both are important but technique is must for the students which is very well known as " Shaili or School of Art" in the history of art as Bengal School, Pahari School ,Rajasthani Shaili or School etc." Gurudeva (R.N. Tagore) had recognised that an artistic atmosphere was essential for creating artists " said Nandlal Bose...." and it was in order to create such an atmosphere that he summoned us to the Shantiniketan Ashrama. Here in Kala- Bhavana it is recognised that to keep us in such an atmosphere, the teacher must continue producing original works of art which will inspire the pupils to similar efforts. This is considered to be an essential part of teaching and, without it teaching would be a mechanical process devoid of inspiration and utterly useless".8'

Tagore's Shantiniketan did not believe in rigid formulate nor in-flexible or dogmatic methods or in any techniques being forced on the students. There were no admission tests. If a student was very keen to learn he would normally get a place and probably was more welcome than those who had already an art training behind him. These latter would need one full year to unlearn what they had

learnt and come out of the pedantic groove." Technique is not recognised as a study by itself nor are lessons as such given in it. The aim always kept in view is that technique must help forward the original work of student. As an individual's needs differ, the order of study differs accordingly".(Nandalal Bos)9'

Today in the era of COVID-19 pandemic life is our priority and education is very essential for a society to live respectively. It is also very necessary for every individual to become a civilized human being. Physical distancing needs a different education system, and online teaching / learning programme is no doubt a very good option but we should be very careful, especially for the marginalised society. Our Government is working very positively with some schemes like "Ek Bharat-Shreshtha Bharat, Dekho Apna Desh, Lokal Se Vokal, Swakshata Mission, Kaushal Vikas ,Digital India" etc. We hope one day India will become very sound and friendly with technologythen we will be able to say "Sabka Sath- Sabka Vikas".

We should always remember that we come from a very powerful civilization of Indus-Valley and our Art and culture are still our strength, as they were in the ancient time. Today we all are Quarantine but the theory of Vasudhaiva -Kutumbkam 'make us UNITED.

To conclude I will cite the Syrian astronomer-monk SEVERUS SEBOKHT(writing A.D. 662)

"I shall not speak of the knowledge of the Hindus,...of their subtle discoveries in the science of astronomy--- discoveries even more ingenious than those of the Greeks and Babylonians-of their rational system of mathematics, or of their method of calculation which no words can praise strongly enough ---I mean the system using nine symbols. I these things were known by the people who think that they alone have mastered the sciences because they speak Greek they would perhaps be convinced, though a little late in the day, that other folk, not only Greeks but also men of a different tongue, know something as well as they."10'

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CULTURAL DEPICTION IN ROCK ART OF NORTHERN REGION OF REWA

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Rock art is human made markings placed on natural stone. The study of rock art is considered as the most important element to know about the culture of prehistoric human because in the absence of literary sources, it is the only source through which we can know about the early humans. These art works are often divided into two art forms Pictograph and Petroglyphs.

The rock art of India includes relief carving, engraving and paintings. Rock art sites have been reported from different geophysical zones of India and the largest concentration documented in the central India specifically in the state of Madhya Pradesh. Rock art in Madhya Pradesh is reported from Bhimbetka, Daraki - Chattan, Indragarh, Rewa etc. There are many rock art sites located in Rewa like Shivpurva, Dundi Gaddhi, Keraha, Deur Kothar, Sirmour etc. Among these the rock paintings of northern region of Rewa especially the paintings of Yogini Mata rock art site and Ghinauchi dhamare in very good condition.

GEOGRAPHICAL INTRODUCTION:

Rewa lies between 24°18' and 25° 12' north latitudes and 81°2' and 82° 18'. The rock art sites are located at Sirmour on the Rewa- Dabhawra road at a distance of about 3 km from the power house colony which is about 50 km from Rewa. There are altogether 5 shelters at the Yogini Mata rock art site and among them 3 are painted. The paintings consist of human figures, animal figures, weapons like bow and arrow, spears, handaxe etc. It can be said that shelter no.1 is the most important among all the shelters as it contains large number of paintings. The paintings of shelter no.1, 2 & 3 are of red colour and still they are in a very good condition. The shape of shelter no.1 is like umbrella, the shelter no.3 of Yogini Mata rock art site is box shaped and other shelters don't have any specific shape. There is one painted shelter in Ghinauchi Dham. The rock art site of Yogini Mata is declared as tourism site by the government of Madhya Pradesh.

LOCATION OF PAINTINGS:

Within a shelter, the paintings are usually executed on the walls and ceilings. In shelter no.1 very artistic paintings of animals, humans, reptiles, birds and weapons had been executed. The canvas of the shelter is full of paintings from top to bottom. On the walls paintings are placed in horizontal pattern. In shelter no.3 one painting is founded at the ceiling of the shelter.

DETAILS OF SHELTER:

Yogini Mata Rock Art Site

Shelter no 1

The canvas is full of paintings from bottom to top. At the bottom there is a painting of five men in a group. They had kept their both hand at their waist. It seems that they are in dancing position. Just above this painting there is the painting of five men which seems to be injured and about to fall on the ground. Above them there is a painting of a reptile which looks like a snake and bird is sitting on it. Just beside the group of five men there is a painting of a man in left side who is holding bow and arrow in his hand and targeting towards his left side, beside this there is a painting of three men who is riding on three elephant holding weapons in their hand which looks like bow and arrow, behind them there is a image of a man riding on a horse holding weapon in his hand, behind him there is group of nine men standing together looks like soldier who were waiting for the commands of their leader. Beside this, there are paintings of two men riding on elephant facing towards each other. Both the men are attacking on each other with bow and arrow. Beside this there is painting of one man and behind him six men are standing in same position. Just above this scene there is a painting of an elephant and two men. First man is beside the elephant and second one is behind the first one. It seems that elephant is walking in the path and about to cross between both the men. In the left side of the painting there is a painting of two groups facing towards each other and continuously attacking with bow and arrow. In the painting of right side group, only the images of four men are clear and rest of the paintings are not clear. They are holding bow and arrow in their hands and targeting towards the group who were in right side. In the group of left side there is a painting of twenty one men among them sixteen men are holding bow & arrow and targeting at the left group, two men are holding spears, one is holding spear upward and other downward and at the back three man are on the horse, below this there is a painting of six more men attacking with bow and arrow at left side. There are two types of bow used by man one is curved inwards and other is curved outward. Two men are holding four arrows in hand other is using one arrow at a time. Just above this scene there is painting of nine men in group in which from the left side the first man had raised his right hand upwards in the form of dancing and kept left hand on the waist, both the hand of second

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and third man are on the waist, the right hand of fourth man is on the waist and left hand is raised upward like the right hand of first man, the left hand of fifth man is on the waist and right hand is raised upward like first and fourth man, both the hand of sixth, seventh, and eighth man are on the waist and the right hand of ninth man is on the waist and left hand is raised upward like first, fourth and fifth man. Just above this scene, there is a painting of elephant whose trunk is touching the ground and near him there is a symbol which looks like Damru.

Shelter no. 2

There is a painting of five men in a row who were generally standing and watching something.

Shelter no. 3

One figure of single man is painted in the ceiling of the shelter no.3 of Yogini Mata rock art site in which he is holding one axe in his right hand. His right hand is raised upwards and there is a gap between the feet and it seems that he was ready to hit or cut something with the tools in his hand.

Ghinauchi Dham Rock Art Site:

There is one painted shelter at this site. There is a painting in which two men are holding an animal (which looks like deer) separately with left hand and in right hand they are holding similar tools which look like spears. It might be possible that they use to hunt deer for meat. In the same group of painting there is a painting of one more animal just beside the hunting scene. It was standing freely facing towards the man and looks like a cow.

SELECTIVE NATURE OF HUMANS:

The shelters which are generally box shaped and umbrella shaped has its opening towards the valley. Such shelters can be approached only from the top and they are generally cut off from the sides. These are comparatively safe for living but generally narrow in width. They have a rocky surface devoid of accumulation. The paintings are generally found on the wall facing the valley and the ceiling of the shelter. The selection of shelter shows that the humans of that era have conservative culture.

Hunting:

In the shelter no.1 of Yogini Mata rock art site there is a painting at in which elephant is being attacked by a single man and in second painting group of five men are targeting an elephant with spears. One figure of single man is painted in the ceiling of the shelter no.3 of Yogini Mata rock art site in which he is holding one axe in his right hand. His hand is raised upwards and there is a gap between the feet and it seems that he was ready to hit or cut something with the tools in his hand. In the shelter of Ghinauchi Dham, there is a painting in which two men is holding an animal (which looks like deer) separately with left hand and in right hand

they are holding similar tools which looks like spears. It might be possible that they use to hunt deer for meat. In the same group of painting there is a painting of one more animal just beside the hunting scene. It was standing freely facing towards the man and looks like a cow.

WAY OF EXPRESSING EMOTIONS:

It is the nature of humans that they use to express their emotions and feelings according to the situation which they use to face. We can come to know about the feelings and emotions of early humans through the paintings which were founded in the shelters. The paintings of group dancing has been founded in the shelter and it express that early man use to celebrate their happiness by dancing or it may be some rituals which were performed on some specific occasion.

Battle scenes were also founded in the shelter which depicts the anger of the early human. Same way hunting scenes indicates animal were killed by men for meat, flesh, to make weapons from their bones or teeth or to protect themselves from the wild animals. It shows the protective nature of men to deal with the danger.

FIGHTING OR BATTLE SCENES:

There are fighting's scenes painted on the shelters which provides us information about the battles which might took place in the past and the best example for this category is the painting in shelter no. 1 of Yogini Mata Rock Art site. In the painting, it is clearly shown that two groups are fighting each other. The weapons used by them are bow & arrow and spears. They also use animals like elephant & horse in battle and elephant is mostly used by them as it is the heavier and powerful animals. In the paintings we can see that five men are on the top of the elephant and others are infantry, it seems that during that period also there were leader who used to guide the follower and they might be having some specific power or quality.

There are two groups fighting with bow and arrow. Some of them were riding on elephant and rests of them were standing on the ground targeting to the opposition group. It seems that this painting belongs to later phase and battle is going between two dynasty or two tribes in order to gain authority ship or power because the body language of the images had been made by perfection and it is the work of skilled person where as the paintings of early stone age was not made with perfection. Dancing scenes are also painted in the shelter.

Group dance:

In shelter no.1 above the battle scene, there is a painting of dancing scene in which five human are standing in a row in same posture. It seems that they are in dancing position. In other painting they are dancing by holding each other hands. It might be possible that it was performed and made by victorious group in order to express their

happiness and victory or it may be some rituals performed during some specific occasion.

DOMESTICATION:

Elephants were used while fighting battles and riding purpose as it was done because elephant was the biggest and strongest animal. Therefore we can say that people were aware about the uses of animal according to purpose. In the shelter of Ghinauchi Dham there is a painting of cow facing towards a man. It indicates that cow had domesticated by the early people.

CONCLUSION:

Thus it can be concluded by saying that rocks are the most precious gift which we have got through nature. Rocks served as a solid platform to the people of early period in order to represent their emotions, feelings, daily activities etc. in the absence of paper, pen, colour or any other source. As we know that the early man lives in every part of the world and migrates from one place to another according to their needs and circumstances but they used to leave their marks or other archaic forms of early humans cultural activities such as dance, music, thoughts, ideas, body language in the form of art which they used to make on rocks. Hence these type of art is known as "Rock Art".

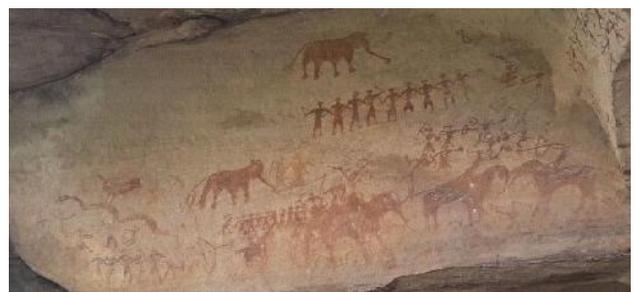
The styles of paintings of Sirmour range from naturalistic to very symbolic or abstract. The scenes which are painted in the shelter depict the existence of large group of people but the shelters which are founded at the site are generally small and it was not possible for them to reside together in five shelters. The paintings belongs to a later phase therefore it might be possible that due to some reason war is held between two groups at this place and it was painted by the members of one of the group. Nearly all drawings of animals are shown in profile and in motion.



Outlines of animal forms are generally realistic and they were serving humans. Therefore it can be said rock art is the only medium through which we can know the culture of early man.

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महिलाओं की स्थिति : एक संक्षिप्त अध्ययन सल्तनतकाल के विशेष सन्दर्भ में

मनोरमा सिंह

सारांश : सल्तनत काल में स्त्रियों की स्थिति अत्यधिक खराब थी। यद्यपि समाज में पत्नी, पुत्री, माँ और बहन के रूप में उसे सम्मान प्राप्त था, लेकिन महिलाओं की स्थिति पुरुषों के अधीन ही थी। पुत्री के रूप में पिता और पत्नी के रूप में पति के संरक्षण में, विधवा के रूप में उसे अपने सबसे बड़े बेटे की देख-रेख में रहना होता था। संक्षेप में उसका जीवन निरंतर संरक्षण का था। सामाजिक रीति-रिवाजों परंपराओं और पिछड़े हुए दृष्टिकोण के कारण जन्म से लेकर मृत्यु तक उसकी सामाजिक स्थिति दयनीय थी। पैदा होने पर लड़की को अनचाहा मेहमान समझा जाता था। कुछ कबीलों और पिछड़ी जाति के लोगों में जन्म के समय ही उसकी हत्या कर दी जाती थी। विवाह के बाद उसे पति की इच्छा के अनुरूप चलना होता था। यदि वह पुत्र को जन्म देती थी, तो भाग्यशालिनी समझी जाती थी। मुस्लिम परिवारों में स्त्रियों की दशा कुछ मामलों में अच्छी और कुछ में अधिक बुरी थी। उदाहरण के लिए वह तलाक व विधवा की स्थिति में पुनः विवाह कर सकती थी, लेकिन उसे बहु विवाह तथा आसान तलाक का षिकार बनना पड़ता था, उसे पर्दा प्रथा का बड़ी कठोरता से पालन करना होता था। रजिया सुल्तान जैसी स्त्री को इस काल का अपवाद कहा जा सकता है। हिन्दुओं में विधवा होने की स्थिति में सती होना पड़ता था। राजपूत समाज में स्त्रियों और बच्चों के सम्मान के लिए जौहर की प्रथा प्रचलित थी। हिन्दू समाज की निचली जातियों में पुत्र-पुत्रियों के अल्पायु में विवाह की परंपरा ऐसी जड़ पकड़ गई थी, कि वे दुधमुह बच्चे की षादियां कर दिया करते थे।

प्रस्तावना :- विभिन्न ग्रन्थों के अध्ययन पर आदिकाल से महिला पुरुष की सहचरी रही हैं और पुरुष भी महिलाओं को अपने जीवन का मुख्य हिस्सा मानकर उनकी रक्षा के लिये अपना सर्वस्व निछावर कर महिलाओं की रक्षा के प्रयास किए हैं। महिलाओं द्वारा भी अपने

राज्य, देश व पतियों की रक्षा जान को जोखिम में डालकर की है। सल्तनतकालीन समाज काफी विकृत हो गया था, इसके बाद भी इस काल की महिलाओं ने विभिन्न क्षेत्रों में महत्वपूर्ण भूमिका निभाई हैं। जिनमें दिल्ली की सुल्तान रजिया, काष्मीर की रानी दिद्दा, काकतीयवंश की रानी रुद्रमा, बहमनी वंश की मखमूदजहां, सल्तनत काल में महिला शासक भी रही हैं। इसके साथ ही महिलाओं की स्थिति कहीं-कहीं सामाजिक दृष्टि से बहुत अच्छी नहीं रही, क्योंकि उस समय जब अनेक हिन्दू राजाओं के राज्यों में मुस्लिम शासकों द्वारा युद्ध करके अपने राज्यों में मिलाने की होड़ सी थी, तब अनेक जगहों पर स्त्रियों के अपमान भी हुए हैं। जलालुद्दीन के चित्तोड़ आक्रमण के समय स्त्रियों को अपमान से बचने के लिए युद्ध भी करना पड़ा था। इस प्रकार सल्तनत काल में नारियों की सामाजिक, राजनैतिक क्षेत्रों में स्थितियां विभिन्न प्रकार की थी।

अध्ययन के उद्देश्य :- अतीत के अध्ययन से ही वर्तमान और भविष्य को संवारने का जानकारी प्राप्त होती है। अध्ययन के माध्यम से आधुनिक समाज की महिलाओं को सल्तनत कालीन महिलाओं की स्थिति की जानकारी प्राप्त हो सकेगी। सल्तनत कालीन महिलाओं ने समाज के विभिन्न क्षेत्रों में जो कार्य किये हैं, उनका अध्ययन किया जाकर समाज हित के कार्यों का अनुसरण किया जा सकेगा, जो आधुनिक युग की उभरती हुई महिलाओं को आगे बढ़ने के लिये पथ प्रदर्शक हो सकेंगी।

भौगोलिक पृष्ठभूमि :- भौगोलिक क्षेत्र की दृष्टि से हिन्दुस्तान में मुहम्मद गोरी द्वारा स्थापित राज्य का विस्तार उसके उत्तराधिकारी गुलाम सुल्तानों के शासनकाल में कोई परिवर्तन नहीं हुआ। यदि परिवर्तन हुआ भी तो फलस्वरूप सिकुड़ ही गया, उसमें वृद्धि नहीं हुई। मुहम्मद गोरी तथा सुल्तान होने से पहले कुतुबुद्दीन ऐबक ने जितनी भूमि जीत ली थी, उसमें गुलाम सुल्तानों

में से कोई भी वृद्धि नहीं कर सका। सल्तनत में बसने वाले हिन्दू शासकों ने बारम्बार तुर्की प्रभुत्व से मुक्त होने का प्रयत्न किया। प्रत्येक शासन काल में सल्तनत की सीमाएं घटती-बढ़ती रहती थीं। सामान्यतया उसकी सीमाएं उत्तर में हिमालय की तराई तक पहुंचती थीं और दक्षिण में एक टेढ़ी-मेढ़ी रेखा बंगाल से सिन्ध तक जाती थी। जिसके अन्तर्गत उत्तरी बंगाल, उत्तरी बिहार, बुंदेलखण्ड का कुछ भाग, ग्वालियर, रणथम्भौर, अजमेर तथा नागपुर आ जाते थे और जो जैसलमेर के उत्तरी भाग से होती हुई आगे चलकर सिन्ध को गुजरात से अलग करती थी। पूरब में ढाका के पश्चिम तक आधा बंगाल दिल्ली सल्तनत का अंग था। उत्तर-पश्चिमी सीमा साधारणतया झेलम तक पहुंचती थी, किन्तु कभी-कभी सिकुड़कर व्यास तक ही रह जाती थी। भौगोलिक तथा सांस्कृतिक दृष्टि में एक समय था जब अफगानिस्तान भारत का ही भाग माना जाता था। राजनीतिक दृष्टि से भी वह चन्द्रगुप्त मौर्य के समय से तीसरी शताब्दी ई.पू. भारत का प्रान्त बना रहा। 1947 में भारत से पाकिस्तान के पृथक होने से स्पष्ट है कि सल्तनतकाल में पाकिस्तान भी भारत का अभिन्न भाग था।

ऐतिहासिक पृष्ठभूमि :- हमारी संस्कृति उतनी ही प्राचीन है, जितना मानवता का इतिहास। संस्कृति की वाहिका के रूप में भारतीय सभ्य समाज में नारी का स्थान प्रारंभ से ही उच्च रहा है। समाज में नर-नारी को एक साथ दम्पति के रूप में किसी पारिवारिक समारोह में भाग लेने पर जो सम्मान दिया जाता है। वह अकेले पुरुष के भाग लेने पर नहीं मिलता है। इस आदर्श ने मनु-शतुरुपा, राधा-कृष्ण, सीता-राम जैसे संबंधनों को लोकप्रिय बनाया है। प्राचीनकाल में स्त्रियों को बड़ा सम्मान प्राप्त था, किन्तु कुरान स्त्रियों की समानता का विरोधी था। अतः मुस्लिम स्त्रियों की दशा खराब हो गई। बहु-विवाह प्रथा से उनकी दशा और बिगड़ गई। मुसलमानों के आगमन से हिन्दू स्त्रियों की दशा सोचनीय हो गई थी। मध्यकाल में मुसलमान सुंदर हिन्दू स्त्रियों का बलपूर्वक अपहरण कर लेते थे। अतः इससे रक्षा हेतु हिन्दू स्त्रियों के बाहर निकलने पर प्रतिबंध लगा दिया गया था। पर्दा प्रथा से स्त्री शिक्षा समाप्त होने लगी। विद

वा स्त्रियों को अपने पति के शव के साथ सती होना पड़ता था। राजपूत स्त्रियाँ मुस्लिम आक्रमणकारियों से इज्जत की रक्षा करने हेतु जौहर कर लेती थी।

सल्तनतकालीन समाज :- सल्तनत कालीन समाज में हिन्दू और मुस्लिम एक दूसरे के संपर्क में आए। इस युग के दोनो संप्रदाय के लोगों की बहुत सी पुरानी प्रथाएँ जारी रही और इनमें से बहुत सी बातें एक दूसरे से अपनाई गई, परन्तु इस युग में पूर्ण सामाजिक समन्वय नहीं हुआ। समय के साथ साथ दोनों समुदायों में सांस्कृतिक आदान प्रदान की गति निरंतर तीव्र होती गई और कुछ ही वर्षों के बाद सामान्य वर्ग के जन-जीवन में एकरूपता दिखाई देने लगी।

सल्तनतकालीन महिलाओं के विभिन्न स्वरूप :- सल्तनतकालीन ऐतिहासिक स्रोतों के अध्ययन से सल्तनतकाल में महिलाओं की विभिन्न स्थितियां थी। जिनके स्वरूपों का संक्षिप्त विवरण निम्न प्रकार है:- शासिका के स्वरूप में महिला :- रजिया सुल्तान शासिका के रूप में तो सल्तनत युग में स्वतंत्र कार्य करती थी। इसके पूर्व शाहजहाँ, रुकनुद्दीन फीरोजशाह के कार्यकाल में अपरोक्ष रूप से भी कार्य कर चुकी थी। रजिया केवल नाम मात्र के लिए शासक हुईं। उसे दिल्ली की जनता तथा अमीरों का समर्थन प्राप्त था। इनके अतिरिक्त अनेक महिला शासकों के इस काल के पूर्व भी शासक होने के प्रमाण प्राप्त होते हैं।

विदुषी :- सल्तनतकालीन समाज विदुषी महिलाओं से परिपूर्ण था। जिसमें से एक असाधारण विदुषी लीलावती थी। जिनके पिता भास्कराचार्य प्राचीन भारत के एक प्रसिद्ध गणितज्ञ व खगोलशास्त्री थे। भारत का गणित और ज्योतिष का ज्ञान अन्य देशों से उच्च स्तर का था। ब्रह्मगुप्त ने आर्य भट्ट के पृथ्वी को सूर्य के चारों ओर घूमने के सिद्धांत का विरोध किया था। परन्तु 12वीं शताब्दी में भास्कराचार्य ने उसका फिर प्रतिपादन किया। बिल्हण ने भी काष्मीर की स्त्रियों की प्रशंसा में लिखा है कि वह संस्कृत एवं प्राकृत दोनों भाषाएं अच्छी धारा प्रवाह में बोलती थीं।

हरम की स्थिति :- हरम या रनिवास का अर्थ उस निवास स्थल से था, जहाँ महिलाएं रहती थीं। हरम में

शासकों, राजाओं की पत्नियों व रानियों, शासक की बेगमें रखैल व अन्य महिलाएं रहती थी। इल्तुतमिष सल्तनत युग में 1211-1236 तक दिल्ली का सुल्तान था। शाह तुर्कान इल्तुतमिष के रनिवास में एक अत्यंत महत्वाकांक्षी दासी थी। जिसका पुत्र रूकुनुद्दीन फीरोजशाह 1236 में सल्तनत युग का सुल्तान बना।

दासियों :- इस युग में दास प्रथा का काफी प्रचलन था। जो हिन्दू तथा मुस्लिम दोनों समाजों में विद्यमान थी। इस काल में पशुओं सदृश्य दासों का हाट लगता था। दासों के साथ सामान्यतः अच्छा व्यवहार होता था।

स्त्रियों की दशा :- सल्तनत काल में भारतीय स्त्रियों की दशा बाहरी आक्रमणों के कारण दयनीय हो गई थी, पर्दाप्रथा, बहुविवाह तथा वेष्यावृत्ति बढ़ गई थी। महिलाओं का अपना कोई स्वतंत्र बचत खाता नहीं था। मध्ययुग की समाप्ति होते-होते स्त्रियों की दशा इतनी अधिक खराब हो गई थी, कि अधिकारों के नाम पर उनके पास कुछ भी नहीं था। हाँ यदि बात राजपरिवारों या उनके संबंधित स्त्रियों की हो तो उसे सामान्य महिलाओं से बेहतर कहा जा सकता था। हस्तलिखित बहियों से हमें ज्ञात होता है कि राजपरिवारों की महिलाओं की राजनीतिक, सामाजिक स्थिति के साथ आर्थिक अधिकार सुरक्षित थे। राजपरिवार की महिलाओं द्वारा जनहित में मंदिर, कुएं, बावड़ी, धर्मशाला आदि का निर्माण स्वयं की इच्छा तथा अर्थ से होता था। परंतु सामान्य स्त्रियां जो भी कमाती थी, वह न तो सुरक्षित था, न ही उस पर उनका अधिकार था। सल्तनतकालीन समाज में स्त्रियों की स्थिति समस्याग्रस्त रही है। समय के साथ-साथ उनकी दशा में परिवर्तन होते गये। प्राचीन काल में उनकी दशा ठीक रही, परंतु बौद्धकाल से उनकी दशा का पतन आरंभ हुआ जो सल्तनत युग तक निरंतर जारी रहा। भारत में कम्पूर-तम्पूर के साथ कई तिब्बती यात्री आए जिन्होंने आखों देखी खबर लिखी है। उसमें भारत की तत्कालिक दशा के वर्णन के साथ नारियों की जानकारी भी मिल जाती है। इस काल में स्त्रियों की स्थिति अधिक खराब थी। सामाजिक रीति-रिवाजों परम्पराओं और पिछड़े हुए दृष्टिकोण के कारण जन्म से मृत्यु तक उसकी सामाजिक स्थिति दयनीय थी। पैदा होने पर लड़की को अनचाहा मेहमान समझा जाता था।

कुछ कबीलों और पिछड़ी जाति के लोगों में जन्म के साथ उसकी हत्या कर दी जाती थी। विवाह के बाद उसे पति की इच्छा के अनुरूप चलना होता था। यदि वह पुत्र को जन्म देती थी, तो भाग्यशालिनी समझी जाती थी। मुस्लिम परिवारों में स्त्रियों की दशा कुछ मामलों में अच्छी और कुछ में अत्यधिक बुरी थी। उदाहरण के लिए वह तलाक व विधवा की स्थिति में पुनः विवाह कर सकती थी, लेकिन उसे बहु विवाह तथा आसान तलाक का षिकार बनना पड़ता था। उसे पर्दा प्रथा का बड़ी कठोरता से पालन करना होता था। **सामाजिक समस्याएं :-** सल्तनत कालीन समाज में स्त्री और पुरुष में असमानता थी। हिन्दू समाज में सवर्ण हिन्दुओं और शूद्रों में असमानता थी। मुस्लिम समाज में भी असमानता थी। इसका कारण यह था कि उस समय मुसलमान प्रायः नगरों में व हिन्दू समाज प्रायः ग्रामीण क्षेत्रों में रहते थे, जहां खान-पान वेषभूषा के वर्गों के आधार पर असमानता कम दिखाई पड़ती थी। इस काल में एक ओर शासक, अमीर, एवं समृद्ध व्यापारी वर्ग अत्यधिक विलासी जीवन व्यतीत करते थे, तो दूसरी ओर साधारण वर्ग के शहरी और ग्रामीण लोग बहुत ही साधारण जीवन व्यतीत करते थे। जिनका जीवन सुखी नहीं था और उन्हें अनेक कठिनाइयां झेलनी पड़ती थी। प्रायः सामाजिक और धार्मिक त्योहार ही उनके जीवन की नीरसता को तोड़ा करते थे। अधिकांश जनता का जीवन स्तर निम्न था। समाज में मद्यपान, वेष्यावृत्ति, बहुविवाह, बालविवाह, सतीप्रथा, दहेज प्रथा, पर्दा प्रथा जैसी सामाजिक बुराइयां विद्यमान थी। प्रायः शिक्षा कुछ ही विषयों तक सीमित थी और स्त्री शिक्षा की ओर बहुत कम ध्यान दिया जाता था।

मुस्लिम समाज में नारी :- इस्लाम के प्रादुर्भाव के समय स्त्रियों की स्थिति गिरी हुई थी। पैगम्बर मुहम्मद के प्रादुर्भाव के साथ स्त्रियों की स्थिति सुधरी। मुहम्मद के चचेरे भाई इब्न अब्बास ने लिखा है कि "यदि किसी के यहाँ लड़की का जन्म हो और वह उसका अनादर न करे और अपने पुत्रों के समान पुत्री का लालन-पालन करे, तो खुदा जन्नत में उसे इनाम देगा। मुहम्मद साहब ने दासी स्त्रियों के प्रति भी अच्छे व्यवहार का उल्लेख किया है। स्त्रियों के संबंध में बने इस्लामी नियम लचीले

थे। मुहम्मद साहब ने कहा था सभी महिलाएँ व लड़कियाँ ईद के नमाज पर सम्मिलित होंगी। पर ऐसा हुआ नहीं, उन्हें घर की चहारदीवारी में रहने को बाध्य कर दिया गया। उन्हें हरम में रख दिया गया, जहाँ उनकी संख्या हजारों में थीं। प्राचीन काल की तुलना में मध्यकाल में स्त्रियों की दशा में निरंतर गिरावट आती गई फिर भी उनको आदरपूर्ण स्थान प्राप्त था। हिंदू परिवारों में स्त्री गृहस्वामिनी समझी जाती थी और कोई भी धार्मिक कृत्य उसके बगैर नहीं होता था। इसलिए उसे धर्म पत्नी भी कहा जाता था। उसे पुरुष की अर्द्धांगिनी समझा जाता था। परंतु इतना होते हुए भी उन्हें पूर्णतया स्वतंत्रता प्राप्त नहीं थी और उसे पारिवारिक एवं सामाजिक नियंत्रण में रहना पड़ता था। हिंदुओं में बच्चियों का जन्म होना शुभ नहीं माना जाता था। कुछ कबीलों में तो उसे तुरंत ही जान से मार दिया जाता था। महिलाओं की स्थिति विचारणीय थी।

हिन्दू समाज में नारी :- हिन्दू मान्यता एवं चिंतन के अनुसार स्त्री का कार्य पुरुष की सेवा करना था। यदि वह पुत्र को जन्म देती तो भाग्यपालिनी समझी जाती थी। कुछ स्त्रियों को छोड़कर अधिकतर नारियों की दशा गृहस्थों में तो ठीक ही होती थी।

स्त्री शिक्षा :- स्त्री शिक्षा वर्ग के आधार पर ही थी। ग्रामीण स्त्रियों का शिक्षित होना कठिन ही था। क्योंकि वहाँ का वातावरण इस प्रकार का नहीं था। गरीब किसानों की स्त्रियाँ गृहकार्य के अतिरिक्त बुनाई कढ़ाई इत्यादि के कार्य करती थी। उच्च वर्ग के लोग सभ्य जीवन व्यतीत करते थे तथा इसी कारण से वहाँ कला और विज्ञान की उन्नति हुई। इनके यहाँ स्त्री शिक्षा का भी प्रचार था, क्योंकि इस युग में अनेक विदुषी महिलाएँ हुईं। गार्गी, शंकराचार्य एवं मण्डन मिश्र के शास्त्रार्थ के समय निर्णायक बनी थी।

उपसंहार :- संस्कृति की वाहिका के रूप में भारतीय सभ्य समाज में नारी का स्थान प्रारंभ से ही उच्च रहा है। कोई भी समय या समाज महिलाओं के बिना अपूर्ण था। यह अलग है कि विभिन्न समयों पर उनके स्वरूप

या प्रकार पृथक हों। इसी प्रकार सल्तनतकाल में महिलाओं के स्वरूपों में भी कुछ ऐसा ही है। सामान्यतया इस काल के समाज में स्त्रियों की स्थिति अच्छी नहीं थी। आषीर्वादीलाल श्रीवास्तव की सोच है कि सल्तनत काल में स्त्रियों की स्थिति बहुत खराब थी। इस युग में महिलाओं की स्थिति बहुत अच्छी नहीं कही जा सकती है। इस अवधि में कई वंशों के बदलाव एवं इस्लाम के प्रचार के कारण होने वाले युद्धों दुष्मनों को मारने व उन्हें अपनी अधीनता में करने आदि के कारणों से होने वाले दुर्व्यवहारों से उस काल की महिलाएँ भी अछूती नहीं रहीं। युद्धों के समय जीतने वाले क्षेत्रों की महिलाओं को दासियाँ बनाना, हरम में रखना आदि की स्थितियाँ उस काल में अत्यधिक रहती थी। सल्तनतकालीन भारत में प्रचलित नारी परक प्रथाओं में बाल-विवाह, बहु-विवाह, सती-प्रथा, पर्दा-प्रथा, जौहर-प्रथा आदि ने इनकी स्थिति को और भी दयनीय बना दिया था। सल्तनत काल में महिलाओं के स्वरूप अन्य काल के जैसे माँ, बहन, बेटा, पत्नी आदि सभी रिश्तों के साथ शासिका संरक्षिका, कवियत्री बीरांगणा विदुषी आदि विभिन्न स्वरूपों में थी।

संदर्भ ग्रन्थ :

1. श्रीवास्तव, आषीर्वादी लाल 1959 दिल्ली सल्तनत 711 से 1526, शिवलाल अग्रवाल एण्ड कम्पनी आगरा.
2. श्रीवास्तव, आषीर्वादीलाल भारत का इतिहास 1000-1760
3. चतुर्वेदी, हेराम्ब मध्यकालीन भारत में राज्य एवं राजनैतिक
4. जैन, संजीव पूर्व एवं उत्तर मध्यकालीन भारतीय संस्कृति (650 से 1707) कैलाश पुस्तक सदन भोपाल.
5. राधेप्याम सल्तनतकालीन सामाजिक तथा आर्थिक इतिहास राधेप्यरण 1998 मध्यकालीन भारत की सांस्कृतिक संरचना, म.प्र. हिन्दी ग्रन्थ अकादमी भोपाल (म.प्र.)

महारानी लक्ष्मीबाई : एक संक्षिप्त अध्ययन

शालिक राम मिश्र

सारांशः— महारानी लक्ष्मीबाई का जन्म उस समय हुआ, जब देश ब्रिटिश सरकार की परतंत्रता में था। अपने देश में कुछ क्षेत्र आज भी अनेक दशाओं में पिछड़े हुए हैं, तब 1827 की स्थिति क्या रही होगी यह स्वयं विचारण योग्य है। इनका जन्म काशी में मोरोपन्त ताम्बे जी के घर हुआ था, इनकी माता जी का नाम भागीरथी बाई था। लक्ष्मीबाई का बचपन का नाम "मनु" था। मनु कि अल्पायु में ही इनकी माता जी का निधन हो जाने के पश्चात् इनका पालन पोषण बिदूर के बाजीराव पेशवा के यहाँ हुआ था। पेशवा बाजीराव के अन्य बच्चों के साथ बचपन व्यतीत होने से घुड़सवारी व तलवार चलाना लक्ष्मीबाई बचपन से ही सीख गयी थीं। इनकी शादी झांसी के राजा गंगाधर से हो जाने से ये झांसी की रानी हो गयी, महारानी लक्ष्मीबाई देश के स्वतंत्रता संग्राम में अंग्रेजों से अपने जीवनकाल तक युद्ध करती रहीं। महारानी लक्ष्मीबाई की वीरता के संबंध में कवि नाथूराम माहौर ने स्वर्णाक्षरों में लिखा है कि रानी ने अतुल पराक्रम दिखाकर सन् सत्तावन में स्वतंत्र भावना का जो बीज बोया था, वह 1947 में फलीभूत हुआ है।¹

प्रस्तावनाः— महारानी लक्ष्मीबाई के जन्म से मात्र 4 वर्ष की आयु पूर्ण होने पर इनकी माता भागीरथी बाई की मृत्यु हो गयी, जिसके पश्चात् इनका पालन पोषण बाजीराव पेशवा के यहाँ बिदूर में हुआ। 13 वर्ष की उम्र में इनका विवाह झांसी के राजा गंगाधर राव से हुआ। 16 वर्ष की उम्र में महारानी माता बनी, परन्तु शीघ्र ही नवजात की मृत्यु हो गयी। पुत्र शोक में 1853 में गंगाधर राव का भी निधन हो गया। अपनी मृत्यु के पूर्व ही गंगाधर राव दामोदर राव को गोद ले लिये थे। गंगाधर राव की मृत्यु के पश्चात् तत्कालीन गवर्नर जनरल डलहौजी राज्य को हड़पने के उद्देश्य से झांसी को ब्रिटिश साम्राज्य में विलीन करने की घोषणा कर दी, जिसका महारानी ने विरोध करते हुए घोषणा की, कि "मैं अपनी झांसी नहीं दूंगी।"² अंग्रेजों के साथ युद्ध सुनिश्चित था अतः रानी ने दीवान रघुनाथ सिंह को सेनापति

नियुक्त कर दिया। महारानी का अन्तिम व भीषण युद्ध अंग्रेजों के साथ हुआ। रानी के महल को अंग्रेजी सेना घेर रखी थी। सिजमें झांसी की हार सुनिश्चित थी। ऐसी परिस्थिति में झलकारी बाई, रानी के वेश में अंग्रेजों के समक्ष समर्पण की, जिससे युद्ध बन्द हो जावे, परन्तु सर ह्यूरोज चालाक था, वह रानी का पीछा कालपी तक किया व अन्त में ग्वालियर में महारानी बीरगति को प्राप्त हुई।

महारानी लक्ष्मीबाई का बचपन :- भारतीय इतिहास में रानी लक्ष्मीबाई का नाम गौरव के साथ लिया जाता है। लक्ष्मीबाई का जीवन काफी संघर्षपूर्ण था। इनका जन्म 19 नवम्बर 1827 को काशी में मोरोपन्त ताम्बे के घर हुआ। लक्ष्मीबाई के बचपन का नाम 'मनु' था व इनकी माता का नाम भागीरथी बाई था। मनु की चार वर्ष की उम्र में इनकी माता भागीरथीबाई का निधन हो गया। भागीरथीबाई की मृत्यु के पश्चात् बिदूर के बाजीराव पेशवा, मोरोपन्त व मनु को अपने पास बुलवा लिया। पेशवा मनु को छबीली कहकर पुकारते थे। पेशवा बाजीराव नाना साहब नाम के एक बच्चे को गोद लिये थे, जिनके दो भाई बालाराव व रावसाहब थे, जिन तीनों के साथ ही मनु का लालन पालन हुआ। बचपन नाना साहब, बालाराव व राव साहब के साथ व्यतीत होने के कारण मनु तलवार चलाना, घुड़सवारी आदि कलाओं को सीख ही नहीं गई बल्कि इन सभी की अपेक्षा अत्यधिक निपुण हो गयी। मनु के स्वभाव और रुचि के अनुरूप इनकी शादी झांसी के राजा गंगाधर से की गयी, जो अब झांसी की रानी हो गयी थी।

महारानी की राजनीतिक स्थिति :- विवाह के पश्चात् लक्ष्मीबाई को किले के महल में रहने को स्थान दिया गया। लक्ष्मीबाई जब महल से बाहर निकलती थी, तब उनके चारों ओर पर्दा कर दिया जाता था। लक्ष्मीबाई अपनी दासियों को सदैव सहेलियों की तरह मानती थीं। इनकी इन्हीं सहेलियों में एक झलकारीबाई थी, जो लक्ष्मीबाई की सबसे प्रिय थी। लक्ष्मीबाई अपनी सहेलियों

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को घुड़सवारी व शस्त्र चलाने का भी प्रशिक्षण देती थी। विवाह के तीन वर्ष पश्चात् लक्ष्मीबाई ने एक पुत्र को जन्म दिया, परन्तु यह खुशी बहुत दिनों तक न रह सकी व तीन माह के बच्चे की मृत्यु हो गयी। पुत्र की मृत्यु के बाद महारानी लक्ष्मीबाई व महाराज दुःख में डूब गये।^१ कुछ समय पश्चात् रानी लक्ष्मीबाई एक बार फिर गर्भवती हुई, परन्तु देश की परिस्थितियों के कारण उन्हें आराम करने का समय नहीं मिलने से गर्भपात हो गया। इसी शोक से गंगाधरराव भी अस्वस्थ हो गये। महारानी लक्ष्मीबाई व गंगाधरराव ने आनन्दराव नामक एक बच्चे को गोद लिया, जिसका नाम दामोदरराव रखा गया। अंग्रेजों द्वारा दामोदर राव को महारानी का उत्तराधिकारी मानने से इंकार कर दिया गया। रानी को किला खाली करने के लिए अंग्रेजों द्वारा ढिंढोरा पिटा दिया गया। रानी ने अपना किला खाली कर झांसी के महल में रहना प्रारंभ कर दिया। रानी अपने राज्य की सभी महिलाओं को घुड़सवारी व हथियार चलाने का प्रशिक्षण दिलवाने लगीं, जिससे विषम परिस्थिति के लिये तैयार हो सकें। रानी लक्ष्मीबाई दामोदर राव को सदैव अपने साथ रखती थीं। उक्त समय तक भारत के अधिकांश रियासतों पर अंग्रेजों की सेनाएँ तैनात रहती थी। झांसी की तरह कुछ अन्य राज्य भी थे, जिनमें कुछ भागों पर अंग्रेजों का अधिकार था। जो आय होती थी उसे अंग्रेज अपनी सेना में खर्च करते थे। रानी लक्ष्मीबाई को विदेशियों का अपने देश में इस प्रकार हस्तक्षेप अच्छा नहीं लगता था। राजा गंगाधरराव की स्थिति बिगड़ती गयी और एक दिन हृदयघात से मृत्यु हो गयी। जिसके बाद महारानी की स्थिति बिगड़ती गयी जो उनके पिता से नहीं देखी जा रही थी। एक दिन लक्ष्मीबाई के पिता, दामोदरराव को अपने साथ लाकर महारानी की गोद में बैठा दिये, जिससे महारानी भावविह्वल होकर अपने कर्तव्य के प्रति जागरूक होकर राज्य की सुरक्षा के लिये सचेत हुई। रानी लक्ष्मीबाई को दामोदर राव को गोद लेने की अनुमति गवर्नर जनरल द्वारा नहीं दी गयी। पाँच हजार रुपये प्रति माह पेंशन महारानी को दिये जाने का आदेश दिया गया। महारानी ने पेंशन लेने से मना कर दिया। महारानी की सहेलियों रोने लगीं, तब लक्ष्मीबाई ने कहा "इस विपरीत परिस्थितियों का सामना आंसुओं से नहीं तलवारों से करेंगे। हम हार नहीं मानेंगे। ब्रिटिश

सरकार द्वारा बनाए गए नियमों से लक्ष्मीबाई को अपने पैसे निकालने में परेशानी होने लगी, जिसके पश्चात् अपने साथियों के साथ मिलकर 31 मई 1857 को क्रांति प्रारंभ करने की तैयारी में जुट गई। इसी बीच 10 मई 1857 को मंगल पाण्डेय द्वारा अंग्रेज अफसर को मेरठ छावनी में गोली मार दिया और बहादुर शाह जफर प्रथम को भारत का बादशाह घोषित कर दिया गया। क्रांति की आग संपूर्ण उत्तर भारत में फैल चुकी थी। झांसी के छोटे किले में अंग्रेज कुछ धन व अस्त्र-शस्त्र छिपा रखे थे, जिसे एक हवलदार कुछ सैनिकों को लेकर भाग गया।

महारानी की वेशभूषा :- महारानी सदैव पुरुष वेश में रहती थीं। सिर पर साफा बांधती थीं, उसके अन्दर लोहे का कड़ा धारण करती थीं। बगल में दोनों तरफ पिस्तौलें व तलवार होती थी। महारानी घुड़सवारी की बचपन से ही शौकीन थीं।

गुप्तचर व्यवस्था :- महारानी लक्ष्मीबाई स्वाधीनता संग्राम में किसी भी परिस्थिति हारना नहीं चाहती थी। इसलिये उन्होंने स्थान-स्थान पर अपने गुप्तचर नियुक्त कर रखे थे, जिससे उन्हें अंग्रेजों की प्रत्येक गतिविधियों के साथ अपने बीच के विश्वासघातियों व देशद्रोहियों की जानकारी प्राप्त हो सके। इनके गुप्तचरों में मोतीबाई व जूही जो नृत्यांगना थीं, इनकी प्रमुख गुप्तचर थी। जो बाद में अंग्रेजों द्वारा गिरतार कर ली गयी थी।

महारानी के युद्ध :- देश की बिगड़ती हुई स्थितियों के कारण समय के पूर्व युद्ध प्रारंभ हो गया। जिस किले में अंग्रेज छिपे थे, रानी के सैनिक उन्हें घेरकर युद्ध करते रहे, परन्तु भारतीय सेना को अंग्रेजी सेना पीछे कर दिया। अंग्रेजी सेना की अपेक्षा भारतीय सेना के पास संसाधन कम थे, परन्तु देशभक्ति से ओत-प्रोत भारतीय सेना लड़ती रही। अगले दिन शाम को अंग्रेजी सेना लड़ते-लड़ते थक कर धीमे पड़ गये थे, भूख से छटपटा रहे थे, जो रानी से खाना मांगे जिन्हें अपनी सहृदयता का परिचय देते हुए सुरंग के माध्यम से खाना भिजवाया। महारानी की सेना में दुल्हाजू नाम का एक देशद्रोही भी था, जिसे रानी की सहेली सुन्दर ने मारने के लिए वार किया परन्तु वह बच निकला व सुन्दर अंग्रेजों की गोली से शहीद हो गयी। युद्ध बढ़ते रहने से रानी कमजोर

पड़ती जा रही थी व सैनिकों की संख्या भी कम होती जाती थी। महारानी की सहेली सुन्दर की मृत्यु के पश्चात् उनका वफादार सेनापति खुदाबख्श शहीद हो गया, जिसकी खबर पाते ही लक्ष्मीबाई का खून खौल उठा। रानी घोड़े पर सवार होकर पूरी सिद्धत के साथ अंग्रेजों पर टूट पड़ी। महारानी कह रहीं थी "वीर सैनिकों, आज दिखा दो अपनी तलवार की ताकत अंग्रेजों को दिखा दो कि हिन्दुस्तानी सिपाहियों के सामने टिक पाना मुश्किल है। हम वीर भारतीयों के आगे तुम्हारी एक न चलेगी। युद्ध के विकराल स्वरूप होने और महारानी के कई योद्धाओं के मारे जाने से महारानी अपने कुछ जवानों को लेकर रणचण्डी की तरह अपने पुत्र दामोदर राव को चद्दर से कस कर बांध ली व मैदान में अंग्रेजी सेना पर टूट पड़ी। इस युद्ध में लक्ष्मीबाई साक्षात् दुर्गा लग रहीं थीं। लक्ष्मीबाई के तलवार की रक्त पिपासा शांत ही नहीं होना चाहती थी। झांसी नगर में अप्रैल 1857 को ह्यूरोज के नेतृत्व में ब्रिटिश सेना प्रविष्टि कर गयी। इसी अवधि में महारानी लक्ष्मीबाई 4 अप्रैल की रात्रि निकल कर 5 अप्रैल की रात्रि में कालपी पहुँच गयीं।¹⁴ उसी दिन तात्या टोपे बेतवा युद्ध के पश्चात् कालपी पहुँच गया था। कालपी की तरफ बढ़ते हुए ह्यूरोज को रोकने के लिए झांसी की तरफ बढ़कर कौंच में 4 हजार सैनिकों व तोपों के साथ महारानी व तात्या टोपे मोर्चा लिये, जिसके पश्चात् बची हुई सेना के महारानी वापस कालपी लौट आयीं थीं। इस युद्ध में महारानी व राव साहब के मनोबल गिरे थे, परन्तु बोंदा के नवाबअली बहादुर के सेना व तोपों के साथ कालपी पहुँच जाने से जोश व साहस पुनः आ गया था। "काफिर फिरंगियों की दोजख रसीद कर अपने लिए जन्मत सुरक्षित कर लेने" की आशा फिर बलवती हो उठी। इसी बीच ह्यूरोज 15 मई को कालपी से 6 मील पूर्व गुलांउली आ पहुँचा। कालपी की ओर बढ़ती हुई सेना का सामना करने का भार मुख्य रूप से महारानी लक्ष्मीबाई और नवाब अली बहादुर पर ही पड़ा। महारानी लक्ष्मीबाई, नवाबअली बहादुर और राव साहब ने अपनी तैयारी कर ली व 22 मई को हमला करने की योजना बनाई, परन्तु ह्यूरोज को इसकी खबर हो जाने से वह सतर्क हो गया। 22 मई को हुए हमले में राव साहब के सैनिक भाग खड़े हुये जहाँ पर महारानी लक्ष्मीबाई व

नवाब अली अपनी लाल वर्दीधारी सेना को उत्साहित कर आगे बढ़ाया, जो अंग्रेजों की तोपों के 20 फिट पास तक पहुँच गई। युद्ध की बाजी रानी के पक्ष में पलटने वाली थी कि ब्रिगेडियर स्मिथ तोपों के पास पहुँच गया, तोपों और ऊँट सेना की चपेट में रानी व नवाब के सैनिकों में भगदड़ मच गयी, किसी प्रकार नवाब व महारानी बचकर कालपी आये। कालपी में पहुँचते ही रानी लक्ष्मीबाई, नवाब अली बहादुर और राव साहब की एक बैठक हुई। इसमें विद्रोही सैनिकों के प्रतिनिधि भी थे। कालपी से कूचकर कहाँ जाया जाए, इस पर बड़ी ही जल्दी फैसला लेना था। अंग्रेजी सेना ह्यूरोज के नेतृत्व में कालपी आने को ही था। सिपाही अवध जाना चाहते थे, राव साहब दक्षिण की ओर कूच करने के पक्ष में थे, लेकिन रानी का सुझाव ग्वालियर के सिंधिया का सहयोग प्राप्त कर वहीं एक बार फिर भाग्य आजमाने का था। अन्त में रानी का ही सुझाव मान लिया गया। सिंधिया के पूर्वज इस सदी के शुरु-शुरु तक पूना के पेशवाओं के सामंत रह चुके थे। इसीलिये उन्हें आशा थी कि यदि 23 वर्षीय सिंधिया राजा जयाजीराव की मराठा जाति और राष्ट्र संबंधित भावनाओं को उभारा जा सके, तो वह उनके साथ हो जायेगा और फिर हारी हुई बाजी जीती जा सकेगी। अतएव रानी के सुझावानुसार विद्रोही नेता और विलंब न कर कालपी से तेजी से कूच करते हुए ग्वालियर से 46 मील पश्चिम गोपालपुर आ पहुँचे। गोपालपुर में तात्या टोपे भी चुरखी से आकर मिल गया। अब रानी लक्ष्मीबाई नवाब अली बहादुर, राव साहब और तात्या टोपे सेना ग्वालियर की ओर बढ़ गये।¹⁵ 16 जून को ह्यूरोज के बहादुरपुर, ग्वालियर तक आ जाने से राव साहब सेना की कमान तात्या टोपे को सौंपकर दान पुण्य में लग गये। फिर भी महारानी लक्ष्मीबाई नवाब अली बहादुर व तात्या टोपे इस मुसीबत के क्षणों में भी साहस नहीं छोड़ा। उन्होंने इस स्थिति में भी अंग्रेजों से मोर्चा लेने की तैयारियाँ जो हो सकती थी, कर डाली। रानी लक्ष्मीबाई ने ग्वालियर के पूर्व का सबसे कठिन मोर्चा संभाला। नवाब अली बहादुर भी इसी ओर रानी के पास रहा। रानी ने तात्या टोपे को अंग्रेजों के आक्रमण की प्रतीक्षा न कर अकस्मात स्वयं उन पर हमला कर उन्हें पीछे खदेड़ देने की सलाह दी थी। वह स्वयं भी जैसे स्वातंत्र्य युद्ध के अंतिम चरण में

अपनी आहुति देने को कटिबद्ध हो उठी थीं। कोटा की सराय से ब्रिगेडियर स्मिथ ने 17 जून की सबेरे ग्वालियर की ओर बढ़ना शुरू किया। वह अपनी सेना और तोपों के सहित थोड़ा ही आगे बढ़ा था कि स्वतंत्रता सेनानियों की सेना को लगभग हजार—पंद्रह सौ गज की दूरी में देखा। उसने तुरंत उस पर भयंकर गोलाबारी शुरू कर दी। स्वतंत्रता सेनानियों की तोपे भी गरजने लगीं। उनके एक सैन्य दल ने तोपों के धूम—धड़ाके के बीच द्रुतगति से बढ़कर रेन्स के दाहिने पक्ष पर हमला कर दिया। रानी और नवाब अली बहादुर इसी तरफ की कमान संभाले थे। वे भी जीवन का मोह छोड़कर शत्रुओं से भिड़ गये, रेंज के इस दायें भाग के सैनिकों के पैर उखड़ने को ही थे कि ब्रिगेडियर स्मिथ अपने सवारों के साथ स्वतंत्रता सेनानियों से भिड़ गया। उसके साथ के आठवीं हुसार्स सेना के खड्ग और बंदूकधारी अनुभवी कुशल सवार अपने कैप्टन हेनियेज के नेतृत्व में तेजी से घोड़े दौड़ाते हुए विद्रोहियों के सिर पर पहुँच गए। अब भयंकर मारकाट शुरू हो गई। रानी घोड़े की बाग दाँतों के बीच दबाकर दोनों हाथों से तलवार भँजने लगी। पर सैनिकों के हौसले अंग्रेजी सेना के भारी दबाव से पस्त होने लगे और वे रानी के रोकते—रोकते बदहवास होकर ग्वालियर की ओर कटते—मरते भाग निकले। इस भाग—दौड़ के बीच रानी अपने कुछ साथियों और सवारों सहित मुख्य विद्रोही सैन्यदल से अलग जा पड़ीं।⁶ अंग्रेजों से रानी का भीषण युद्ध हुआ। महारानी लक्ष्मीबाई अपने सेनापति रघुनाथ सिंह से कहा कि “अगर मैं लड़ते—लड़ते मृत्यु को प्राप्त हो जाऊँ तो भी मेरा शव दुश्मनों को मत छूने देना।” लक्ष्मीबाई लगातार दुश्मनों का सफाया कर रही थी, जिनके विकराल स्वरूप को देखकर दुश्मन भी थर—थर कांप रहे थे। महारानी अपनी बची हुई सेना की ओर जा रही थी कि दुश्मन सैनिकों ने उन्हें घेर लिया। रानी को दुश्मनों से पीछा छुड़ाना मुश्किल हो रहा था। रानी व इनकी सेना ने घोर युद्ध किया, परन्तु इसी बीच दुश्मन के एक सैनिक ने महारानी के पेट में वार कर दिया। रानी के पेट से रक्त धारा बहने लगी। महारानी ने रघुनाथ सिंह को आवाज देकर कहा कि “रघुनाथ सिंह” दुश्मन मेरे शरीर को छूने न पाएँ। झाँसी की स्त्री सेना अंग्रेजों में भारी मार—काट मचाई,

परन्तु सेना छोटी होने के कारण अंग्रेजों ने झाँसी के किले पर कब्जा कर लिया। घायलावस्था में लक्ष्मीबाई ने बच निकलने का प्रयास किया और घोड़े पर सवार हो गयी परन्तु कुछ दूर जाकर घोड़ा अचानक अड़ गया। रानी ने लगाम को झटके दिए, घोड़े को पुचकारा, परन्तु घोड़ा टस से मस नहीं हो रहा था। अन्ततः दुश्मन रानी के बिल्कुल नजदीक आ पहुँचे। तभी एक सैनिक द्वारा गोली दागी गयी, फिर भी रानी रुकी नहीं। उन्होंने किसी तरह घोड़े को आगे बढ़ाया और दुश्मनों को काटते हुए आगे बढ़ गयीं। कुछ सैनिक रानी का पीछा कर रहे थे, यह देखकर रानी ने अपना घोड़ा दौड़ाया परन्तु नाला आ जाने से घोड़ा नाला पार न कर सका। रानी की सहायता के लिए उनका एक सैनिक आगे आया परन्तु तब तक एक अंग्रेज सैनिक ने लक्ष्मीबाई के सिर पर मार दिया, जिससे रानी लक्ष्मीबाई गम्भीर रूप से घायल हो गई। घायल महारानी कई अंग्रेजों को मौत के घाट उतारा महारानी का रौद्र रूप देखकर कई गोरे सैनिक भाग खड़े हुए। रानी के सेनापति गौस खान ने घायल रानी को बाबा गंगादास कि कुटिया में पहुँचाया। उसी कुटिया में जल पीने के बाद वीरांगना रानी लक्ष्मीबाई ने 17 जून 1858 को वीरगति प्राप्त की। रानी यह चाहती थी कि मरने के बाद भी अंग्रेज उनके शव को हाथ न लगाएँ। इसलिए बाबा गंगादास अपनी कुटिया को ही चिता का रूप देकर कुटिया में ही उनका अन्तिम संस्कार कर दिया। झाँसी पर अंग्रेजों के पुनराधिकार से राजघराने से बेशकीमती जवाहरात अंग्रेजों के हाथ लगे। इन जवाहरातों से ब्रिटिश सरकार को 19000 पौंड अर्थात् लगभग एक लाख सत्तासी हजार नौ सौ चौसठ रुपयों की आय हुई। गवर्नर जनरल लार्ड डलहौजी ने रानी लक्ष्मीबाई के दत्तक पुत्र को मान्यता नहीं देते हुए, यह अधिकार प्रदान किया था कि वह झाँसी के राजा गंगाधर राव की हीरे—जवाहरात एवं अन्य मूल्यवान वस्तुओं समेत राजसी संपत्ति का मनचाहा हिस्सा ले सकता है और इस पैतृक संपत्ति पर उसका अधिकार है, परन्तु कम्पनी के राज्यारोहण के बाद यह वायदा भुला दिया और पूर्ववर्ती शासक की समस्त निजी सम्पत्ति अंग्रेजों ने हड़प ली।

महारानी की जांबाज वीरांगनाएं :- मोतीबाई, गोलंदाजी, पटेबाजी और घुड़सवारी में प्रवीण थी। वह कुँवर खुदाबख्श की मंगेतर और गुप्तचर विभाग की मुखिया थी। झांसी की लड़ाई में आहत होकर उसने रानी की गोद में दम तोड़ा था। उसकी शहादत पर रानी ने कहा था – ‘आज मेरी मोती, हीरा हो गयी। अंग्रेजों से लड़ाई में रानी की अनेक वीरांगनायें, जिन्हें रानी द्वारा कर्नल का ओहदा दिया था, कर्नल कुमारी सुंदरबाई, कर्नल कुमार मुंदरबाई, कर्नल कुमारी जूही, कर्नल कुमारी काशीबाई, कर्नल कुमारी मोतीबाई, कर्नल श्रीमती बरिशन, बलिवेदी पर निछावर हो गयीं। इनमें से शेष बची श्रीमती झलकारीबाई। झलकारी, महारानी के तोपची पूरन की पत्नी थी। रानी को अंग्रेजों की पकड़ से बचाने के लिए झलकारी ने रानी का वेष बनाकर जनरल ह्यूरोज के समक्ष समर्पण कर दिया। अंग्रेजों को जब झांसे का पता चला तो ह्यूरोज ने दांत पीसते हुये कहा – ‘टुम रानी नहीं, झलकारी हो, टुम को गोली मार दी जायेगी।’ इस पर झलकारी ने कहा था – ‘मारे दे। मैं क्या मरबे को डरती हूँ। जैसे इत्ते सिपाही मरे, तैसे एक मैं सही।’ रोज और स्टुअर्ट दोनों ही अंग्रेज जनरलों ने झलकारी को पागल घोषित किया तथा जेल भेज दिया। झलकारी गाते हुये चली गयी – ‘जननी जनम दियो थो तोको बस आजहि के लाने।’ किन्तु जनरल रोज ने सेनापति स्टुअर्ट से कहा “If one percent of Indian women become so mad, as this girl is, we have to leave all that we have in this country,” अर्थात् यदि भारतीय स्त्रियों में से एक प्रतिशत भी इस लड़की के समान पागल हो जायें तो जो कुछ हमारे पास है, उस सबको छोड़कर हमें इस देश से चले जाना पड़ेगा। यह स्टुअर्ट वही है जो महारानी की स्त्री सेना को गोलंदाजी करते हुए अपनी दूरबीन से देखा था तो कहा था – ‘बलवाइयों की यह रानी औरत है या जादू। इसने तो गर्ल्स को गनर्स बना दिया। अब क्या बंदरों को बंदूकची बनायेगी।’

उपसंहार :- लक्ष्मीबाई का बाह्यरूप जितना उग्र और प्रचंड था, अंदर उतना ही कोमल और उदार था। समकालीन इतिहासकार पारसनीस ने ‘लक्ष्मीबाई का चरित्र’ नामक अपनी पुस्तक में लिखा है कि युद्ध में लगे

सैनिकों के घाव पर महारानी अति सहज भाव से स्वयं मरहम पट्टी भी कर दिया करती थीं। इतना ही नहीं, अपितु दौराने जंग एक बार तो उन्होंने सेना को अपने हाथ की पकी रसोई भी खिलाई थी। लक्ष्मीबाई अपनी लाल कुर्ती सेना की कठोर सेनापति ही नहीं थी, अपितु करुणामयी माँ भी थी। महारानी की इसी साधना के कारण सागर सिंह जैसे खूंखार और उद्दण्ड डकैत तक उनकी सेना के अनुशासित और आज्ञाकारी सिपाही बन कर मातृभूमि के चरणों में अपने शीश चढ़ा गये। लक्ष्मीबाई ने सागर सिंह को भी कुँवर के खिताब से सम्मानित किया था। 1857 के प्रथम भारतीय स्वतन्त्रता संग्राम की यह वीरांगना आज भी करोड़ों लोगों की प्रेरणा हैं। वीरता की प्रतिमूर्ति रानी लक्ष्मीबाई आज हमारे बीच नहीं हैं, लेकिन उनकी देशभक्ति और अदम्य साहस की अमर गाथा लाखों-करोड़ों स्त्रियों को हमेशा प्रेरणा प्रदान करती रहेगी। विश्व इतिहास में रानी लक्ष्मीबाई की तुलना फ्रांस की जोन ऑफ आर्क से की जाती है। भारतीय इतिहास में लक्ष्मीबाई ने रजिया सुल्तान, महारानी दुर्गावती और चांदबीवी की परंपरा को आगे बढ़ाया है।

सन्दर्भ ग्रन्थ:-

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बघेलखण्ड की जनजातियाँ और उनकी सामाजिक एवं सांस्कृतिक परम्पराएँ

रश्मि सिंह चौहान

बघेलखण्ड के पर्वतीय, एवं वन्य क्षेत्रों में अनेक ऐसे मानव समूह निवास करते हैं। जो मानव सभ्यता के विकास की दृष्टि से आज भी पिछड़ी अवस्था में है। यह समुदाय आधुनिकता से दूर अपनी संस्कृति को जीवित किये हुये है। पहाड़ी धरातल, अनुपजाऊ भूमि, अविकसित परिवहन सुविधा एवं सघन वन आदिवासी क्षेत्रों की प्रमुख विशेषताएँ है। समाज की मुख्य धारा से अलग आधुनिकता से दूर प्रगति की दौड़ में पिछड़ा एवं शिक्षा से अछूता, शोषण का शिकार, आधुनिक कृषि एवं उद्योग धान्धों से दूर विकास की दहलीज पर खड़ा है। जनजाति नाम उनके पारिस्थितिकी सामाजिक, सांस्कृतिक और स्थान परिवर्तन की प्रकृति से ही पड़ा है। बघेलखण्ड क्षेत्र में गोड़, कोल, बैगा इत्यादि जनजातियाँ हैं। जो सामाजिक तथा आर्थिक रूप से पिछड़ी है।

भारत एक विशाल देश है, जो अनेक भौगोलिक प्रदेश अपनी विशिष्टताओं के कारण एक-दूसरे से अलग चिन्हित होते हैं इन्हीं में से एक है। बघेलखण्ड जिस तरह से इन्द्रधनुष के सात रंग आकाश की सुन्दरता बढ़ाते हैं, ठीक उसी प्रकार बघेलखण्ड भी भारत को गौरवान्वित कराती है। बघेलखण्ड का अक्षांशीय विस्तार की दृष्टि से 22030' और 25012' उत्तरी अक्षांश एवं 80032' और 82051' पूर्वी देशान्तर के मध्य स्थित है। यह उत्तर से दक्षिण लगभग 165 मील लम्बा और पूर्व से पश्चिम लगभग 161 मील चौड़ा है। इसका कुल क्षेत्रफल लगभग 13000 वर्गमील है।¹

बघेलखण्ड में अनेक ऐसे मानव समूह निवास करते हैं जो मानव सभ्यता के विकास की दृष्टि से आज भी पिछड़ी अवस्था में है। समाज की मुख्य धारा से अलग-अलग यह समुदाय वन्य अंचलों, नदी, पर्वत-पहाड़ों व दुर्गम स्थानों में निकवास करती है।

आर्यों के अपने मूल निवास से पलायन का एक कारण बढ़ती जनसंख्या के भरण-पोषण का बदलाव भी था, जिसमें उन्हें पहाड़ी, पठारी और घने जंगलों में रहने

के लिये प्रेरित किया। जनजाति नाम उनके परिस्थितिकी सामाजिक, सांस्कृतिक, आर्थिक और स्थान परिवर्तन प्रकृति से ही पड़ा है, जनजातियों का रहन-सहन उनकी सामाजिक व्यवस्था, उनकी सांस्कृतिक, उनका नृत्य, संगीत सब कुछ प्रकृति के साथ सामंजस्य तथा तालमेल से संचालित होता है।

गोड़ जनजाति :-

अविभाजित मध्यप्रदेश में गोड़ जाति का निवास सबसे अधिक है। इसी कारण मध्य प्रदेश सहित भारत की सबसे अधिक जनजाति गोड़ की है। गोड़ शब्द की उत्पत्ति तेलगू शब्द 'कोण्ड' से हुई है।² जिसका अर्थ पर्वत होता है। गोड़ शब्द कोण्ड का ही विकृत रूप है, अर्थात् कोण्ड यानी की पर्वतों पर रहने वाले 'गोड़' कहलाये।³ यह जनजाति मध्यप्रदेश, महाराष्ट्र, आन्ध्र प्रदेश, उड़ीसा, बिहार, गुजरात, पश्चिम बंगाल, कर्नाटक और उत्तर प्रदेश में भी निकवास करते हैं। गोड़ सामान्य रूप से बघेलखण्ड में सभी जगहों पर पाये जाते हैं। 1991 में सीधी में (सिंगरौली सम्मिलित) में 47.0 प्रतिशत एवं शहडोल (उमरिया, अनूपपुर सम्मिलित) में 51.11 प्रतिशत पाये गये हैं।⁴ गोड़ों के विभिन्न समूहों में अपनी स्वयं की बोली तथा रहन-सहन का विशिष्ट ढंग अपना लिया है। पूर्वी गोड़ मध्यप्रदेश में स्थानीय छत्तीसगढ़ी एवं बघेली बोली बोलते हैं। इनकी मूल भाषा गोंडी है।

गोड़ जनजाति की उत्पत्ति संबंधी कोई ऐतिहासिक साक्ष्य उपलब्ध नहीं है, लेकिन गोड़ लोग अपनी उत्पत्ति पाण्डव राजकुमार भीम तथा उसकी आदिवासी पत्नी हिडिम्बा से मानते हैं। बसन्त निरगुणे की मानना है कि गोड़ जनजाति का मूल स्थान अमरकंटक और नर्मदा का अंचल तथा विंध्य सतपुड़ा की उपत्यिकाएँ हैं। अमरकंटक व नर्मदा को विभिन्न जनजातियों का उद्गम स्थल माना गया है। पुराण इसके साक्ष्य है। नर्मदा संस्कृति के विस्तार में इन जनजातियों की महत्वपूर्ण भूमिका रही है।⁵ गोड़ जनजाति की 50 से अधिक

शोधार्थी, इतिहास, शासकीय कन्या महाविद्यालय, रीवा (म.प्र.)

उपशाखाएँ हैं। गोड़ों में सबसे प्रतापी नरेश संग्रामशाह और दलपतशाह थे। दलपतशाह की आकस्मिक मृत्यु पर रानी दुर्गावती ने राज्य शासन कुशलपतापूर्वक संभाला। दुर्गावती राजपूत थी किन्तु उसका विवाह राजगोंड दलपतशाह से हुआ था। रानी दुर्गावती ने मुगल सेना से लोहा लिया और युद्ध क्षेत्र में वीरगत प्राप्त की। यद्यपि मुगलों के बाद मराठों तक राज्य में राजगोंडों ने प्रशासन सम्बन्धी दायित्व संभाला, किन्तु गोंड जाति जो विकास के क्रम में आगे बढ़ चुकी थी, एक सामाजिक टूटन का शिकार होकर रह गयी। कन्दमूल फल और आखेट पर आश्रित रहने वाले गोड़ कई वर्गों में विभक्त हो गये।

फुक्त (1960) के अनुसार गोड़ों का सामाजिक संगठन दो विभिन्न प्रणालियों पर आधारित है। ये प्रणालियाँ क्रमशः 'कुलगत' एवं 'क्षेत्रीय' है। गोड़ प्रकृति की गोद में किसी पहाड़ी पर नदी के किनारे रहना पसंद करते हैं। गोड़ों के अधिकांश गांव शहर से दूर जंगलों में बसे होते हैं। गोड़ प्रायः सूती वस्त्र पहनते थे, अपने पशुओं से ऊन प्राप्त कर कंबल बनाते हैं। ये मुख्यतः खेती करते हैं। लकड़ी काटना, वनोपज संग्रहण एवं पशुपालन का काम भी करते हैं। ये अन्य जनजातियों की तुलना में अधिक शिक्षित व परिवर्तनशील जनजाति है।

बैगा जनजाति :-

बैगा जनजाति बघेलखण्ड की दूरी प्रमुख जनजाति है, 1991 की जनगणना के अनुसार बघेलखण्ड में 17.11 प्रतिशत पाये गये हैं।^{१०} बैगा बघेलखण्ड के मूल आदिवासी है। ये 1991 में सम्मिलित सीधी, सिंगरौली 10.1 प्रतिशत, शहडोल (उमरिया एवं अनूपपुर) में 20.73 प्रतिशत पाये गये हैं। इनकी उपस्थिति बघेलखण्ड की सभी तहसीलों में है परन्तु पुष्पराजगढ़ में सर्वाधिक पाये जाते हैं। इसके बारे में 1967 में कैप्टन थॉमसन ने लिखा है कि बैगा बहुत घने जंगलों में बसने वाली सबसे वनप्रिय जनजाति है। जंगलों पर निर्भर, तीर-कमान धारण करने वाली शिकारी जनजाति बेहद शर्मीली है, जिस पर समय और युग के बदलते प्रभाव का सबसे अधिक असर देखा गया है। बैगा जनजातीय समाज में चिकित्सक के रूप में प्रतिष्ठित है एवं झाड़-फूक 'जोशी फंदा' के इलाज का दावा करते हैं।^{११}

कोल जनजाति :-

कोल जनजाति के उत्पत्ति के संबंध में ऐतिहासिक अभिलेख नहीं मिलता। कोल जनजाति का उल्लेख भील एवं किरात के साथ रामायण एवं वन्य जाति के रूप में मिलता है। जिन्होंने बनवास में राम-लक्ष्मण तथा सीता जी की सेवा की थी। पौराणिक आख्यानों के अनुसार कोल आदिवासी की उत्पत्ति पृथ्वी-पुत्र राजा बेन से हुई थी। जनजाति 1991 में बघेलखण्ड पठार में 14.65 प्रतिशत प्रतिशत पायी गयी है। ये इस क्षेत्र की तीसरी बड़ी जनजाति है। कोल जनजाति भी इस क्षेत्र की मूल जनजाति है। 'कोलारियन' समूह की एक प्राचीन जनजाति है। सम्मिलित सीधी में 27.3 प्रतिशत एवं सम्मिलित शहडोल में 8.12 प्रतिशत पायी गयी है। पर मुख्य रूप से उमरिया की सभी तहसीलों गोपद बनास, ब्यौहारी एवं देवसर तहसील में पायी जाती है। दैनिक परिश्रम ही इनकी आजीविका का साधन है। इनमें शिक्षा की कमी के कारण ये लोग शासकीय सेवा में कम आ पाते हैं। मजदूरी में काफी रुचि लेते हैं, इससे उनकी आय अच्छी होती है और जीवन स्तर तथा उपभोग स्तर में वृद्धि हुई है। कोल जनजाति की प्रमुख समस्या आर्थिक है। कम तथा असिंचित भूमि होने के कारण कृषि उपज कम होती है जिससे अभावग्रस्त जिन्दीग जीते हैं।^{१२}

जनजातियों की सामाजिक एवं सांस्कृतिक परम्पराएँ :

जनजातीय समाज में पुरुषों का स्थान स्त्रियों में ऊपर है। यहाँ पर पितृ सप्तात्मक परिवार व्यवस्था है। सभ्य समाज का एक दुर्गुण जनजातियों में समान रूप से पाया जाता है और वह है बहु विवाह प्रथा। जनजातियों में तलाक सरलता से दिया जा सकता है और इस कारण से भी स्त्री कभी आर्थिक शोषण का शिकार नहीं होती। जनजातियों में अन्य प्रकार के दुर्गुण जैसे बाल विवाह, सती प्रथा तथा दहेज प्रथा की परम्पराएं देखते को नहीं मिलती। सामाजिक संगठन जैसे पंचायत तथा मुखिया का पद पुरुषों को प्राप्त होता है परिवार के भरण-पोषण की जिम्मेदारी भी पुरुषों को ही प्राप्त होती है। पुरुष वर्ग शिकार और कृषि जैसे अधिक श्रम वाले कार्य करता है।

बघेलखण्ड में मध्यप्रदेश के सापेक्ष अधिक जनजातियाँ नास करती है। यहाँ पर 45 प्रतिशत से अधिक जनजातियाँ निवास करती है, जनजातियों का बाहुल्य क्षेत्र अधिकांशतः पर्वतीय एवं वनाच्छादित है, या ये जिससे उन्हें अपनी अधिकांशतः जीवनोपयोगी सामग्री वनो से प्राप्त हो गयी। फलतः इन्हें अन्य स्थानों पर जाने की आवश्यकता नहीं पड़ी। जनजातियाँ कई गोत्र से मिलकर बनी होती है। एक गोत्र समूह अपनी उत्पत्ति एक ही पूर्वज से मानता है। यहां गोत्र वर्हिंविवाही होते हैं, जब कि एक जाति अर्न्तविवाही होती है। अर्थात् जनजाति के लोग अपनी जाति के बाहर एवं अपने ही गोत्र में शादी विवाह नहीं कर सकते हैं। यह जनजाति स्वनिर्मित सामाजिक नियों द्वारा अनुशासित है। पुरुष एवं स्त्री के बीच समाज में स्वीकृत नियमों के अनुसार विवाह होते हैं, विवाह के बाद वर एवं कन्या पक्ष के लोग भी आपस में नातेदारी निश्तेदारी में बंध जाते हैं।

जनजातियाँ वनोपज (कन्दमूल, शिकार, फल) के साथ कृषित से उत्पन्न अन्य सामग्रियों को अपने दैनिक जीवन में प्रयुक्त करता है। उनका एक विशिष्ट पेय "पेज" है, जो उनके खान-पान का प्रमुख अंग है। अन्य पेय 'बडका माठा' है जो स्वद में खट्टा होता है। आदिवासियों का सर्वाधिक प्रिय पेय, महुे की मदिरा है जिससे ठर्रा कहते हैं। जनजातियाँ वनो पहाड़ों में दुर्गम स्थानों में निवास करती है इसलिये इनका निवास स्थल आसपास उपलब्ध लकड़ियों घास-फूस बांस से तथा कुछ के आवास मिट्टी, खपरैल आदि से निर्मित होते हैं। भण्डार घर या पटौहा का प्रयोग अनाज एवं अन्य उपयोगी सामान रखने के लिये होता है। जहां कुटिला, बखरी बनाये गये होते हैं जिसमें अनाज का भण्डार किया जाता है।⁹ स्वभाव से जनजातियाँ मेहनती होती है किन्तु इनके साधन सीमित हैं। सरकारी योजनाओं का पूर्ण लाभ इन्हें नहीं मिल पाता जिसका कारण इनमें जानकारी का अभाव शिक्षा का निम्न स्तर अंधविश्वासी मान्यताएं हैं, जो इनके विकास में बाधा होती है।

पाषाणोपकरणों के रूप में आदिम मानव जाति के पुरावशेष बघेलखण्ड में पाये गये हैं, यहां की अधिकांश जनजातियाँ बाहर से आयी हुई हैं। पहले आखेट जन के बाद कृषक बन गये। यहां झूम या बाउर (बेवरा या

दाहीं) उस ढंग की खेती है। जिसमें हल का उपयोग नहीं किया जाता। वनपाषाण काल से प्रचलित इस खेती को आजकल वे ही लोग करते हैं जो यह मानते हैं कि धरती माता की छाती को हल से चीरना घोर पाप है। यहां की जनजातियाँ निर्गुण ब्रम्हा की उपासना करती है, जिन्हें बड़ा देव कहते है पर प्रगट देवता के रूप में विभिन्न देवी-देवताओं को पूजती हैं। जनजातियों के प्रमुख देवता हैं। बूढादेव, ठाकुरदेव, परमदेव या परमेश्वर। जनजातियाँ हिन्दू धर्म को मानने वाली प्रतीत होती, परन्तु अविकसित तथा अपने आप में विशिष्ट होने के कारण सामान्य से भिन्न है।¹⁰

जनजातीय समाज में आभूषण पहनना विशेष रूप से पसंद किया जाता है। जनजातियों में पुरुषों का भी कर्ण छेदन होता है, स्त्रियाँ मूँगा और नकली मोतियों से बने आभूषण गले और हाथों में पहनती है। एल्युमिनियम की बालियाँ भी पहनती है। ये सामान्यतः सोना चाँदी, पीतल एल्युमिनियम एवं लोहे से मिली धातुओं के बने आभूषण पहनते हैं। जनजातियों में गोदना की प्रथा बहुत लोकप्रिय है। इनकी मान्यता है कि मरते समय सबकुछ यही रह जाएगा परन्तु यह शरीर के साथ स्वर्ग जायेगा।

जनजातीय संगीत पूर्णतः मौलिक है। जनजातीय कलाकार किसी संगीत विद्यालय में शिक्षा प्राप्त नहीं करते अपितु यह इन्हें पीढ़ी दर पीढ़ी हस्तांतरित होती है। संगीत में विभिन्न वाद्ययंत्रों का उपयोग किया जाता है। सैला नृत्य बघेलखण्ड में निवास करने वाली गोड़ जनजाति का नृत्य सैला अपनी वीरता से परिपूर्ण गुणों के कारण जाना जाता है। सैला नृत्य में नर्तक काठ के बने अस्त्र-शस्त्र जैसे लाठी, भाला, तलवार, लम्बे उण्डे आदि लेकर युद्ध की तरह कौशल एवं पराक्रम का प्रदर्शन कर दर्शकों को रोमांचित कर देते हैं तथा दूसरी तरफ हाथ पर मोर पंखों का मूठा नृत्य की श्रृंगारिता एवं सौन्दर्य की अनुभूति कराता है।¹¹

"रीना नृत्य" अदवासियों की स्त्रियों द्वारा किया जाता है। इसका प्रचलन विंध्याचल और सतपुड़ा पर्वत के पूर्वी भाग में निवास करने वाली गोड़ जनजाति के बीच है। गोड़ स्त्री समाज का यह नृत्य शरद ऋतु में किया जाता है। जब पुरुष सैला नृत्य करते हैं तो गोड़

पर्यटन का पर्यावरण पर सकारात्मक एवं नकारात्मक प्रभाव

अनु पाण्डेय एवं ऊषा पन्त जोशी

पर्यटन आज विश्व के अति शीघ्रगामी विकासमान उद्योगों में से एक है। वैश्विक अर्थव्यवस्था में पर्यटन उद्योग सबसे वृहत्तम व तीव्रता से विकसित उद्योग क्षेत्र माना जा सकता है। पर्यटन की आदि काल से ही अस्तित्व में है जब मानव अपनी भोजन संबंधी व अन्य आवश्यकताओं की पूर्ति हेतु एक स्थान से दूसरे स्थान पर जाता था। कालान्तर में यह क्रिया विलासिता की सूचक बन गयी, जो वर्तमान में अब कई राष्ट्रों व राज्यों की अर्थव्यवस्था का आधार सतम्भ बनी हुयी है। जैसे कोस्टा-रिका, इक्वाडोर, भारत, नेपाल, केन्या, मेडागास्कर, मालदीव, थाइलैंड, कैरेबीयन द्वीपसमूह आदि इसके उदाहरण हैं, जिनके आर्थिक आय व रोजगार का मुख्य स्रोत पर्यटन ही है जिसका GDP में योगदान 28 प्रतिशत से अधिक है। पर्यटन एक सामाजिक आर्थिक संवृत्ति है व एक महत्वपूर्ण आर्थिक क्रिया भी है जिसके अंतर्गत विभिन्न सेवायें सम्मिलित हैं। पर्यटन क्रिया में एक स्थान से दूसरे स्थान में जाने हेतु परिवहन साधनों (वायु मार्ग, जल मार्ग, सड़क मार्ग), आवास, मनोरंजन की व्यवस्था आदि विभिन्न औद्योगिक उत्पादों का प्रयोग किया जाता है। पर्यटन स्वयं में तृतीय आर्थिक क्षेत्र (सेवा क्षेत्र) की क्रिया है। सेवा क्षेत्र का योगदान सकल घरेलू उत्पाद GDP में प्राथमिक व द्वितीयक क्षेत्र से सर्वाधिक लगभग 63 प्रतिशत है। इस क्षेत्र की महत्वता का अंदाजा इस बात से लगाया जा सकता है कि "विश्व एवं भारत के सकल घरेलू उत्पाद का क्रमशः (लगभग) 12 प्रतिशत और 6 प्रतिशत पर्यटन उद्योग से आता है।"¹ साथ ही बड़ी मात्रा में विदेशी मुद्रा भण्डार का स्रोत भी पर्यटन उद्योग ही है। "सन् 2005 में विदेशी पर्यटकों के कारण हमारे देश को 7493 मिलियन अमेरिकी विदेशी मुद्रा प्राप्त हुई थी, जो 2016 में यह आँकड़ा बढ़कर 22923 मिलियन था।"² "वैश्विक आर्थिक क्षेत्र में 2311 मिलियन रोजगार व भारत के कुल रोजगार में 8.78 प्रतिशत राजगार पर्यटन उद्योग के माध्यम से प्राप्त होता है।"³ विश्व व्यापार संगठन ने 2003 में पर्यटन के महत्व

को बताते हुये कहा था कि "Tourism as a driving force for Poverty alleviation, job certainty and Social harmony."⁴

पर्यटन के प्रभाव – पर्यटन के प्रभावों का अध्ययन प्रायः आर्थिक समाजिक व पर्यावरणीय रूप में होता है। जब भी भौतिक पर्यावरण प्राकृतिक पर्यावरण के संपर्क में आता है तो कोई न कोई प्रभाव अवश्य छोड़ता है, जो सकारात्मक व नकारात्मक दोनों रूप में होता है। किसी अन्य मानवीय क्रिया की अपेक्षा पर्यटन प्राकृतिक वातावरण पर अधिक निर्भर है। अतः पर्यटन का पर्यावरण के साथ सम्बन्ध बहुत जटिल है। यह पर्यावरण पर सकारात्मक प्रभाव भी डालता है व नकारात्मक प्रभाव भी, जो निर्भर करता है नीति निर्मातओं व हित धारकों ने नीति पर कि उनकी पर्यटन विकास की नीतियाँ पर्यावरण हेतु कितनी अनुकूल व कितनी प्रतिकूल है।

पर्यटन को सकारात्मक प्रभाव की दृष्टि से देखा जाये तो इसे आर्थिक विकास का इंजन कहा जा सकता है। इसके अन्तर्गत आधारीक संरचना व सुविधाओं में विकास, विदेशी मुद्रा भण्डार में वृद्धि पर्यटन विभाग की वर्ष 2017-18 की रिपोर्ट के अनुसार "पर्यटन द्वारा 1,80,379 करोड़ पिछले वर्ष की तुलना में 17 प्रतिशत अधिक विदेशी मुद्रा अर्जित की गई।"⁵ इसके साथ पर्यटन के विकास के रूप में उचित जल प्रबन्धन, मल निष्कासन की उत्तम व्यवस्था धरोहरों का उत्तम परिरक्षण व प्रबन्धन, बड़ी मात्रा में रोजगार सृजन, सार्वजनिक आय में वृद्धि, निवेश में वृद्धि, सांस्कृतिक विकास सतत् आर्थिक विकास आदि कई पहलू हैं जिनको पर्यटन के सकारात्मक प्रभाव कहा जा सकता है। वहीं इसके नकारात्मक प्रभावों में पर्यटन द्वारा पर्यावरण को होने वाली क्षति महत्वपूर्ण विषय है। पर्यटन के विषय में कहा जाता है कि यह उद्योग उन्हीं संसाधनों का नुकसान पहुँचाता है जिस पर उसका निर्माण हुआ है।

जब भी हम किसी अवसंरचना जैसे होटल, आवास, सड़कों आदि का निर्माण करते हैं तो प्राकृतिक संसाधनों

*शोध छात्रा : मोतीराम बाबूराम राजकीय स्नातकोत्तर महाविद्यालय, हल्द्वानी (नैनीताल)

**एसोसिएट प्रोफेसर (अर्थशास्त्र विभाग)मोतीराम बाबूराम राजकीय स्नातकोत्तर महाविद्यालय, हल्द्वानी (नैनीताल)

को नुकसान पहुँचाते हैं। पर्यटन के विकास हेतु इन्हीं संसाधनों का प्रयोग किया जाता रहा है जिसने कई तरह के प्रदूषण में (वायु, जल, भूमि) में वृद्धि तथा ग्रीन हाउस गैसों की विशाल मात्रा दुनिया भर में एक दिन में 1,00,000 से अधिक उडानों द्वारा वातावरण में पंप कर दी जाती है। "यूएनईपी के अनुसार विमानन वैश्विक CO₂ उत्सर्जन के लिये 2 से 2.5 प्रतिशत के लिये जिम्मेदार है और इसके 2050 तक 15 प्रतिशत तक बढ़ने की उम्मीद है।"⁶ पारिस्थितिक असंतुलन, नगरीकरण में वृद्धि, प्राकृतिक संसाधनों को क्षति, ट्रैफिक में वृद्धि, शहरों को नुकसान, वैश्विक तापमान में वृद्धि, जल संकट अत्यधिक दोहन के कारण भूमिगत जल का स्तर निरंतर कम होता जा रहा है। प्रतिवर्ष 0.33 की दर से जल स्तर में कमी आ रही है। इसके अतिरिक्त प्रायः पर्यटकों द्वारा पर्यटक स्थलों पर पर्यटन क्रिया के दौरान गंदगी, कूड़ा कचरा (प्लास्टिक बोतलें, खाद्य सामग्री में इस्तेमाल प्लास्टिक पैकेजिंग) आदि उन स्थानों में छोड़े जाने से उन स्थानों की सुन्दरता व गुणवत्ता में कमी आयी है, साथ ही प्रदूषण में वृद्धि हुयी है। कई बार प्राकृतिक स्थानों पर मानव उपस्थिति वन्य जीव जन्तुओं को उनके निवास स्थान छोड़ने पर मजबूर कर देती है। इस तरह की नकारात्मक प्रक्रिया ने पर्यावरण पर प्रतिकूल प्रभाव डाला है।

इन प्रभावों के बावजूद पर्यटन के महत्व को नकारा नहीं जा सकता। अतः आवश्यकता है पर्यटन को बढ़ावा देने के साथ-साथ पर्यावरणीय संतुलन को बनाये रखने की। प्रायः किसी भी प्रक्रिया के नकारात्मक प्रभावों को पूर्णतः समाप्त नहीं किया जा सकता किंतु कुछ प्रयासों द्वारा अल्पतम अवश्य किया जा सकता है। इस दशा में आवश्यकता है नीति निर्माताओं द्वारा उचित नीति निर्माण व प्रबन्धन की जो पर्यटन को पर्यावरण अनुकूल क्रिया के रूप में विकसित करें। इस हेतु कई प्रयास अन्तराष्ट्रीय स्तर पर भी किये गये हैं। जैसे इको-पर्यटन (इको टूरिज्म) को बढ़ावा देना "इको पर्यटन प्राकृतिक क्षेत्रों की वह दायित्वपूर्ण यात्रा है जो पर्यावरण को संरक्षित रखती है और स्थानीय लोगों के विकास में सुधार करती है।"⁷ इस संकल्प का सर्वप्रथम प्रयोग "मैक्सिकन इंजीनियर पर्यावरणविद हेक्टर सेबलोस-लेस्कुरेन के द्वारा सन् 1983 में किया गया"⁸ यह पर्यटन

की पर्यावरण अनुकूल अवधारणा है। इसके अतिरिक्त जन-जागृति को पर्यावरण संरक्षण हेतु प्रोत्साहित किया जाना, क्षेत्रीय जनता को आर्थिक सहयोग के साथ उनकी संस्कृति का सम्मान किया जाना, साथ ही पर्यटन विकास हेतु नीति निर्धारण में उनकी सहभागिता भी सुनिश्चित की जानी चाहिये व रिसाइक्लिंग या कम्पोस्ट अपशिष्ट वाली (Ecolodges) आवास हेतु होम स्टे का अधिकाधिक निर्माण व प्रयोग को प्रोत्साहित किया जाना चाहिए। स्थानीय अर्थव्यवस्था को प्रोत्साहन दिया जाना, पर्यटक के रूप में पर्यावरण हेतु अपनी व्यक्तिगत भागीदारी सुनिश्चित करना तथा अन्य को इस हेतु प्रेरित किया जाना, टैक्स आदि के रूप में अर्जित की गयी राशि का प्रयोग उस क्षेत्र की पारिस्थितिकी व जीव जन्तुओं के विकास हेतु किया जाना चाहिये। पर्यटन के सफल विकास में शासन की भूमिका भी सर्वोपरि है। उनके द्वारा किये गये उचित नियोजन वित्त व प्रशिक्षण का प्रभाव अनुकूल परिणाम देगा। इसके साथ ही इको पर्यटन के क्षेत्र में कार्यरत अंतर्राष्ट्रीय संस्था, अंतर्राष्ट्रीय इको पर्यटन संस्था, विश्व पर्यटन संघ, अंतर्राष्ट्रीय संरक्षण संघ आदि के सहयोग द्वारा इनकी मानक रणनीतियों को प्रोत्साहित किया जाना आदि कुछ इस तरह के प्रयासों द्वारा निश्चित ही पर्यटन को पर्यावरण अनुकूल बनाकर अधिकतम आर्थिक लाभ भी प्राप्त किये जा सकते हैं।

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8. पूर्वोक्त

विन्ध्य के पर्यटक स्थल : एक अध्ययन

आराधना मिश्रा

सारांशः— किन्ही भी ग्रंथो, आदिकाव्यों के अध्ययन पर, प्रत्येक ग्रंथो में किन्ही न किन्ही स्वरूप में विन्ध्य क्षेत्र की उपस्थिति अवश्य है। आधुनिक परिवेश में जब हम इस यांत्रिक संयंत्रों से सुसज्जित युग में विभिन्न मशीनरी यंत्रों, विद्युत संयंत्रों के कोलाहल में अपने आपको दबे, सहमें महसूस कर रहे हैं। इन दबावों के समय पर भी हमारा विन्ध्य क्षेत्र अपनी प्राकृतिक छटाओं से लोगों के मन को मोहित करने वाले दृश्यों को आज भी प्रस्तुत करता है। इन्ही प्राकृतिक, मनोरम छटाओं में विन्ध्य क्षेत्र के प्रपात लोगों के मन में वर्तमान समय पर भी अपनी प्राकृतिक सौन्दर्यता से मनमोहक लगते हैं, जिन्हें देखने के लिये भारतीय जनसमुदाय के साथ अंतर्राष्ट्रीय पर्यटक भी देखने आते हैं। विन्ध्य क्षेत्र की मुख्य शैलमाला विन्ध्य है, जिसके विभिन्न भागों को प्राचीन भारतीय इतिहास में अलग-अलग नामों से संबोधित किया गया है। एक ओर जहाँ यह पर्वत श्रंखला विन्ध्यक्षेत्र की दक्षिणी सीमाओं का निर्धारण करती है, वहीं वह उत्तर भारत को दक्षिण भारत से पृथक करती है।

प्रस्तावना :- विन्ध्य की भौगोलिक एवं ऐतिहासिक यात्रा प्राचीनकाल से ही महत्वपूर्ण रही है। भारत को कई नामों से अभिहित किया जाता है, कोई इसे 'जम्बूदीप' कोई 'मध्यभारत' 'रेवाखण्डे' कहता है। रेवांचल दक्षिणी भाग 'दण्डकारण्य' को जोड़ता है। विन्ध्य क्षेत्र की पर्वत मालाएँ भारतवर्ष की उपत्यकाओं की रीढ़ मानी जाती हैं। 'रेवा' के दक्षिणी भाग में कभी चालुक्यों व उत्तरी भाग में हर्षवंश का आधिपत्य था। उत्तर भारत के राजवंशों का दक्षिण भारत के चालुक्य राजा पुलकेशिन के बीच मैत्री संधि ऐतिहासिक घटना है। हमारे आदिकाव्य रामायण, महाभारत, महापुराण, भागवतपुराण, वायुपुराण आदि ग्रंथों में भी विन्ध्य का वर्णन किया गया है। इस प्रकार पूरे संस्कृत साहित्य में कहीं न कहीं विन्ध्य की चर्चा अवश्य की गई। यह विन्ध्य क्षेत्र अनेक जल प्रपातों की प्राकृतिक सौन्दर्य का भण्डार है। जो विभिन्न पर्यटक स्थलों से भरा पड़ा है, यह पर्यटकों के लिये बहुत ही

सुन्दर प्राकृतिक स्थल हैं। यहाँ पर पर्यटकों के आवागमन से लोगों के अनेक प्रकार के छोटे-बड़े व्यवसायों को बढ़ावा मिलता है, जो बेरोजगारों को कुछ कार्य मिलने व विदेशी पर्यटकों के देश में आने पर विदेशी मुद्रा प्राप्ति के लिये भी उपयुक्त है।

भौगोलिक परिचय : विन्ध्य प्रदेश वर्तमान मध्यप्रदेश के उत्तरी-पूर्वी भाग में स्थिति भू-मध्य रेखा से 22°20' उत्तरी अक्षांश से 25°0' उत्तरी अक्षांश तक तथा 78°15' पूर्वी-दक्षिणी से 82°32' देशान्तर के बीच स्थित है। प्रसिद्ध भूगोलवेत्ता एस.एम.अली ने पुराणों के आधार पर विन्ध्य क्षेत्र को तीन जनपदों में बाँटा हुआ बताया है—विदिशा, दशार्ण एवं करुश। विदिशा का ऊपरी बेटवा के बेसिन से दशार्ण का धसान और उसकी प्रमुख धाराओं की गहरी घाटियों द्वारा चीरा हुआ सागर प्लेटों तक फैले प्रदेश से तथा करुश का सोन-केन नदियों के बीच समतलीय मैदान से संबधित है। विन्ध्य क्षेत्र के उत्तर में उत्तर-प्रदेश और पश्चिमी सीमा में उत्तर-प्रदेश व मध्य भारत, दक्षिण में मध्य-प्रदेश एवं पूर्व में उत्तर-प्रदेश व मध्य-प्रदेश स्थित हैं। इसकी पूर्व से पश्चिम की लम्बाई (बैठन से ओरछा तक) लगभग 326 मील तथा चौड़ाई उत्तर से दक्षिण (त्यांथर से अमरकण्टक) लगभग 242 मील है। इस प्रकार विन्ध्य क्षेत्र इतिहास, संस्कृति और भाषा की दृष्टि से बघेलखण्ड और बुन्देलखण्ड दो क्षेत्रों से मिलकर बना हुआ है। समस्त विन्ध्य प्रदेश का भौगोलिक क्षेत्रफल लगभग 22,867 वर्गमील है। दतिया जिला उपर्युक्त सीमा एवं क्षेत्र से हटकर लगभग 1325 मील के क्षेत्रफल में बिल्कुल अलग स्थित है, भौतिक रचना की दृष्टि से त्रिभुजाकर एवं विलक्षण है। स्कार्पलैण्ड के मध्य का भाग सोनार, केन तथा टोंस नदियों का समतल पठार हैं, जिसका निर्माण बलुआ पत्थर से हुआ है। उत्तर की ओर यह प्रदेश विन्ध्य के प्रपातों पर समाप्त होता है। डॉ. वी.पी. मिराशी के अनुसार विन्ध्य क्षेत्र का विस्तार मध्यकाल में नर्मदा तक हो गया था। विन्ध्य पर्वत के मैदानी भाग से

विभागाध्यक्ष, समाजशास्त्र, डा.सोमेश्वर सिंह शासकीय महाविद्यालय नईगढ़ी रीवा (M0P0)

बहने वाली नदियाँ अनेक मनोरम जल प्रपातों का निर्माण करती हैं, जिनमें प्रमुख जल प्रपातों का संक्षिप्त विवरण निम्नानुसार है:—

ऐतिहासिक पृष्ठभूमि :— बघेलखण्ड का इतिहास गरिमामय रहा है। रीवा के निकट ही भरहुत एवं देउर—कोठार के ऐतिहासिक बौद्ध स्तूप हैं। शुंग राज्य के पश्चात् ईशा की चौथी तथा पांचवी शताब्दी में यह क्षेत्र मगध के गुप्त सम्राटों के अधीन रहा, जिसके पश्चात् इस क्षेत्र में कलचुरि, चेदि और हैहय वंश के राजाओं ने राज्य किया। ईशा की 12 वीं शताब्दी तक कलचुरि राजा इस क्षेत्र के भाग्य विधाता रहे। इसके बाद लगभग 100 वर्षों तक यह क्षेत्र चौहानों, सेंगरों तथा गोड़ों के हाथ में रहा। 13वीं शताब्दी में इस क्षेत्र पर “बघेल” राजपूतों का अधिपत्य था। भारत में मुस्लिम शासकों के आने से पहले यह क्षेत्र महाकौशल “चेदि देश” या “दाहाल देश” आदि नामों से संबोधित किया जाता था। मुस्लिम ऐतिहासिक ग्रन्थों में इस क्षेत्र को “भाट देश” या “भट—गोड़ देश” कहा गया है। सम्राट अकबर के शासन काल के पूर्व यह क्षेत्र “भट—गोड़” देश का ही अंग था। सम्राट अकबर के समय में इस क्षेत्र का कुछ भाग भट—गोड़ में और कुछ भाग इलाहाबाद के कालिंजर क्षेत्र के अंतर्गत कर दिया गया था। ब्रिटिश सरकार के पत्रों में 1853 के बाद से इस नाम का उल्लेख बराबर मिलता है। 1862 में रीवा में ब्रिटिश सरकार की एक एजेंसी खोली गई थी, जिसे कुछ समय बाद तोड़ दिया गया था। 1870 में सेन्ट्रल इंडिया एजेंसी के अंतर्गत ‘बघेलखण्ड पोलिटिकल एजेंसी’ की स्थापना हुई और 1871 में कर्नल सर एडवर्ड कालबोर्न ब्राडफोर्ड (बेरोनट) इसके प्रथम पोलिटिकल एजेंट नियुक्त किये गये।

गोविन्दगढ़ : कैमोर की तलहटी में रीवा मुख्यालय से 20 कि.मी. दक्षिण दिशा की दूरी पर गोविन्दगढ़ की अनुपम व प्राकृतिक निराली छवि है। यह स्थान ग्रीष्म ऋतु में रीवा महाराजाओं का आवास स्थल होता था। कैमोर पहाड़ियों से लगे इस क्षेत्र में स्थित विश्वनाथ सागर (गोविन्दगढ़ तालाब), इस क्षेत्र की सुन्दरता में चार चाँद लगा देता है। यहाँ पर निर्मित किला व मंदिर दर्शनीय स्थल हैं।

मुकुन्दपुर :— यह स्थान सतना जिला में स्थित है, जो रीवा से मात्र 14 किलोमीटर दूरी पर स्थित है, यहाँ पर व्हाइट टाइगर सफारी है। यह स्थान पर्यटकों के लिये आकर्षण का प्रमुख केन्द्र है, जो सतना जिला में बेला—गोविन्दगढ़ मार्ग पर है।

अमरकंटक :— रीवा से अमरकंटक सड़क मार्ग से 310 किलोमीटर दूरी पर स्थित है। रीवा रेलवे स्टेशन से रीवा—बिलासपुर ट्रेन द्वारा अमरकंटक जाने के लिए पेण्ड्रा स्टेशन पर उतरा जा सकता है। पेण्ड्रा से लगभग 30 कि.मी. की दूरी पर अमरकंटक है तथा नियमित रूप से बस सेवा व टैक्सी सेवा उपलब्ध है। अमरकंटक नर्मदा का उद्गम स्थल है। इस स्थान को सोमपर्वत भी कहा जाता है। अमरकंटक में ही पुण्य सलिला जुहिला का उद्गम स्थल है। यहाँ जलेश्वर महादेव का अत्यंत प्राचीन मंदिर है। अमरकंटक में माई की बगिया, कपिल धारा, दूध धारा, कबीर चौरा, मार्कण्डेय आश्रम, महर्षि भृगु की साधना स्थली (भृगु कमाण्डल) आदि प्रमुख दर्शनीय, धार्मिक एवं अध्यात्मिक महत्व के स्थान हैं।

बान्धवगढ़ :— बान्धवगढ़ नेशनल पार्क इस क्षेत्र को प्रकृति का अनुपम वरदान है, जो बरबस ही पर्यटकों का ध्यान मोहित कर लेता है, हवाई मार्ग से, दिल्ली से खजुराहों या दिल्ली से जबलपुर पहुँचा जा सकता है। बान्धवगढ़ राष्ट्रीय अभ्यारण्य का वर्तमान क्षेत्र लगभग 105.4 कि.मी. है। इस अभ्यारण्य में बाघों की संख्या प्रति किलोमीटर की दर से सर्वाधिक है। यहाँ 250 से अधिक प्रजातियों की चिड़ियाँ तथा 72 प्रकार की तितलियाँ देखी जा सकती हैं। संपूर्ण अभ्यारण्य घने जंगलों से आच्छादित है। अभ्यारण्य में वायरलेस स्टेशन तथा अग्निशामक पथ निर्मित किये गये हैं। सुरक्षा व्यवस्था को मजबूत बनाये रखने के लिये अनेक चौकियों का निर्माण भी किया गया है। अभ्यारण्य में चार छोटी—छोटी नदियाँ तथा अमरकंटक से निकलने वाली प्रसिद्ध जुहिला नदी व 24 तालाब भी हैं, जो प्राकृतिक वातावरण को मनमोहक बनाते हैं। बान्धवगढ़ में एक प्रागैतिहासिक काल का दुर्ग भी है, जिसे कहा जाता है कि लक्ष्मण जी द्वारा बनवाया गया है।

चचाई जलप्रपात :— यह जलप्रपात रीवा जिले के अन्तर्गत सिरमौर तहसील मुख्यालय से लगभग 7

किलोमीटर पश्चिम में स्थित है। यह बीहर नदी द्वारा निर्मित होता है। बीहर नदी करीब 150 किलोमीटर की लम्बी यात्रा तयकर रीवा नगर से गुजरते हुए चचाई नामक स्थान पर पहुँचकर करीब 1372 फीट गहरे जल प्रपात का निर्माण करती है। चचाई जल प्रपात सिरमौर तहसील में 24°46'1 उत्तरी अक्षांश एवं 81°22'1 पूर्वी देशान्तर पर स्थित है। जल प्रपात के नजदीक बीहर नदी की चौड़ाई लगभग 200 फीट है। प्रपात में जहाँ पानी गिरता है, वहाँ पर विशाल कुण्ड की रचना हो गयी है, जो विशाल सरोवर जैसा दिखता है। प्रपात के पश्चिमी भाग से कुण्ड तक जाने का पगडंडी मार्ग है, जहाँ से प्रपात के अनुपम सुन्दरता का आनंद लिया जा सकता है। यह सुरम्य प्रपात बघेलखण्ड का गौरव है।

क्योंटी जलप्रपात:— महाना नदी से बना क्योंटी जल प्रपात करीब 333 फीट गहरा है। यह प्रपात रीवा जिले के सिरमौर तहसील के क्योंटी नामक गाँव में है। स्थानीय लोग इसे कुण्डा भी कहते हैं। महाना नदी रीवा के समीप पुरास गाँव के महाइन नामक तालाब से निकलती है। यह नदी करीब 70 किलोमीटर की यात्रा तयकर क्योंटी ग्राम के पास जल प्रपात का निर्माण करती है। वर्तमान में प्रपात के पूर्वी तट पर ऐतिहासिक महत्व का स्थल क्योंटी की गढ़ी है। प्राचीनकाल से लेकर आजतक प्रत्येक युग में यह गढ़ी सामरिक दृष्टि से महत्वपूर्ण मानी जाती है। प्रपात के घाटी के कटाव के बीच में द्वीप जैसा उभार है, जिसमें भगवान चतुर्भुज एवं भैरवनाथ जी मंदिर बने हैं। सीता रसोई, ऋषि की छतरी इसी द्वीपनुमा उभार में हैं। अतः बघेलखण्ड के प्रपातों में क्योंटी प्रपात का अत्यधिक महत्व है।

पुरवा जलप्रपात:— यह जल प्रपात टोन्स नदी (तमसा) से बना है। इसकी गहराई लगभग 200 फीट है। टमस नदी रीवा जिले की सबसे बड़ी नदी है, परन्तु पुरवा जल प्रपात रीवा जिले का सबसे कम गहरा प्रपात है। प्रपात की जलधारा सीढ़ीदार आकृति की रचना करते हुये नीचे गिरती है, जिसके कारण इस प्रपात में छिट्रिका जैसा रूप देखने को मिलता है, जो अति मनोहर है। टमस नदी के किनारे उत्तरी तट पर बसामन मामा का स्थल है, जिसके बारे में अनेक किवदंतियाँ प्रचलित हैं। बसामन मामा के पास अगल—बगल यात्रियों के ठहरने के लिए

पक्के कमरे बने हैं, वर्ष में कई बार मेला लगता है व प्रति सोमवार लोग यहाँ पर दर्शन के लिए एकत्र होते हैं।

बेलौही जलप्रपात:— बेलौही जल प्रपात गोरमा नदी से बना है, यह 334 फीट गहरा है तथा हनुमना से कटरा के लिए बनी नयी सड़क के पास स्थित है। यह प्रपात मैदानी भाग में स्थित है, जो दूर से नहीं दिखता, परन्तु नजदीक पहुँचने पर अत्यन्त सुन्दर दृश्य देखने को मिलता है। नीचे तरफ गिरती हुई जलधारा की कल—कल आवाज दूर से ही सुनाई देने लगती हैं। बेलौही जल प्रपात की सबसे बड़ी विशेषता यह है कि प्रपात के कुण्ड की परिक्रमा की जा सकती है। प्रपात के पश्चिमी तट पर 2 किलोमीटर के अंतराल पर एक प्राचीन गढ़ी का खण्डहर है, गढ़ी से सीधे प्रपात के कुण्ड तक जो रास्ता गया है, उसके मध्य में एक लम्बी चौड़ी प्राकृतिक गुफा है। इस गुफा के पश्चिम में एक खोह है, जो पूर्व पश्चिम लम्बाई में फैली है, जिसमें घना अंधकार रहता है। इस खोह के बारे में जनश्रुति है कि यह खोह बेलौही जल प्रपात से बहुती तक जुड़ी है। प्रपात के ऊपर नदी की धारा के मध्य विशाल चट्टान के ऊपर दो पैरों के चिन्ह आज भी अंकित है, जिसके बारे में लोक मान्यता है कि एक गाय जो बह रही थी, उसे भगवान ने इसी पत्थर पर खड़ा होकर निकाला था। जिस स्थल पर मकर संक्रान्ति में प्रसाद चढ़ाया जाता है।

बहुती जलप्रपात :— यह प्रपात ओड्डा नामक नदी में है। यह नदी रीवा जिले के सीतापुर से निकलकर लगभग 50 कि.मी. की दूरी तय करके बहुती ग्राम के पास 465 फीट गहरे सुरम्य जल प्रपात की रचना करती है। यह प्रपात मऊगंज से 14 कि.मी. उत्तर मऊगंज—नईगढ़ी सड़क मार्ग पर 24°42' उत्तरी अक्षांस तथा 81°57' पूर्वी देशान्तर पर स्थित है। बहुती ग्राम में पहुँचते—पहुँचते ओड्डा नदी अपनी तरुणाई को प्राप्त कर लेती है तथा करीब 200 फिट चौड़े पाट का निर्माण करती है। यहाँ से जलधारा चट्टानों से टकराती, छलांग लगाती व अन्तर्नाद करती हुई विशाल कुण्ड में गिरते हुए बहुत ही मनमोहक दृश्य का निर्माण करती है। ओड्डा नदी के इस प्रपात में सदैव सुन्दर धारा प्रवाहित होती रहती है, जिसकी हर हर की ध्वनि दूर से

सुनाई पड़ती है। प्रपात के अनुपम सौन्दर्य का दर्शन, आनन्द पूर्वी भाग से लेने योग्य है। प्रपात के नीचे की वनस्थली की प्रकृति निराली है। जहाँ पर विभिन्न प्रकार के पशुपक्षी पाये जाते हैं। प्रपात के दक्षिण-पूर्व में एक कि.मी. पर अष्टभुजी देवी का मंदिर है। इसी मंदिर के दक्षिण ओर एक पुराने भवन का खण्डहर है। इस प्रपात के उत्तर में 6 कि.मी. की दूरी पर फुलवारी नामक घना जंगल है, जो रीवा राजाओं द्वारा जंगली पशुओं के लिए अभ्यारण्य के रूप में सुरक्षित कराया गया था। बहुती प्रपात के ठीक सामने पूर्व की ओर अमदह नाला है, जो एक छोटे प्रपात की रचना करता है। यह प्रपात वर्षान्त के दिनों में दर्शनीय है। यहाँ मकर संक्रांति पर विशाल मेला लगता है। यहाँ आने-जाने के लिए सड़क मार्ग से निजी वाहन या बसों द्वारा पहुँचा जा सकता है।

दुग्धधारा जलप्रपात :- दुग्धधारा जल प्रपात अमरकंटक नामक स्थान में स्थित है। यह प्रपात कपिलधारा जलप्रपात से एक फर्लांग पश्चिम घने जंगल में विशाल पहाड़ों के बीच स्थित है। इस प्रपात की जल धारा 10 फिट ऊँचाई से चट्टानों से टकराती हुई नीचे गिरती है। उत्तरी तट से पहाड़ी की चट्टानी दीवाल में थोड़ी ऊँचाई पर एक प्राकृतिक गुफा है। नर्मदा जी को पार करने के लिए काम चलाऊ लकड़ी का पुल बनाया गया है। इस पुल से कन्दरा तक जाने के लिए सीढ़िया हैं, जिससे कन्दरा तक आने-जाने की सुविधा हो गई है। इस प्रपात के आगे जाने का साहस पर्यटक नहीं कर पाते क्योंकि इसके चारों ओर घनघोर जंगल शुरू हो जाता है, जिसमें अनेक हिंसक जानवर निवास करते हैं।

कपिलधारा जलप्रपात :- यह प्रपात शहडोल जिले के अमरकंटक नामक स्थान में स्थित है। यह प्रपात नर्मदा के उद्गम स्थल से 6 कि.मी. दूरी पर स्थित है। नर्मदा की पतली धारा विविध क्रीड़ा करती हुई अनेक तीर्थों को आश्रय देती हुई, चक्रतीर्थ का निर्माण कर आगे बढ़ जाती है और कपिलधारा पहुँचते-पहुँचते 150 फिट गहरे मनोरम जल प्रपात की रचना करती है। जल धारा सीधे ऊपर से नीचे गिरती हुई खंडित हो जाती है, पूरा कुंड फेनिल सफेद दिखाई देता है। प्रपात का ऊपरी दृश्य भी बड़ा मनोहारी दिखता है। उत्तर तरफ विन्ध

यांचल एवं दक्षिण की ओर सतपुड़ा पहाड़ियों के बीच यह प्रपात बहुत सुन्दर लगता है। कपिल धारा प्रपात के पास ही कपिल मुनि का आश्रम है। कपिल मुनि के कारण ही इस प्रपात का नाम “कपिलधारा प्रपात” पड़ा।

पाण्डव जलप्रपात :- पन्ना से 10 किलोमीटर दूर सड़क के पश्चिम तरफ दो सौ फुट दूर पाण्डव प्रपात स्थित है। यह प्रपात किसी नदी द्वारा निर्मित नहीं है, लेकिन बरसात का पानी सिमट कर नाले का रूप धारण करके थोड़ी दूर प्रवाहित होकर 100 फुट गहरे प्रपात का निर्माण करता है। इस प्रपात का सौन्दर्य अद्वितीय है। इस प्रपात के नीचे कुंड के ऊपर प्राकृतिक झरना है, जिससे निरंतर जलधारा प्रवाहित होती है। पाण्डव प्रपात के सौन्दर्य के कारण पन्ना के महाराजा छत्रसाल समय-समय पर यहाँ निवास करते थे। यह प्रपात प्राकृतिक घटा के साथ-साथ सुख-शान्ति भी प्रदान करता है।

रनेह जलप्रपात:- इस प्रपात का निर्माण केन नदी करती है, रंग-बिरंगे पाषाणखण्डों के बीच रनेह प्रपात का निर्माण हुआ है। इस प्रपात में एक कुण्ड सा बना है और तीन ओर से पानी गिरता है, केवल सामने खुला है। तीनों ओर से गिरती हुई जल धाराओं को देखकर ऐसा प्रतीत होता है कि जल धाराओं का समूह पाताल लोक में पहुँचना चाहता है। सूर्योदय और सूर्यास्त के समय इस प्रपात का सौन्दर्य अद्वितीय हो जाता है। यह प्रपात खजुराहों से ईशान कोण में 20 किलोमीटर दूर स्थित है। इस प्रपात से 4 किलोमीटर उत्तर घड़ियाल पालन केन्द्र भी है।

कुण्डेश्वर जलप्रपात:- कुण्डेश्वर प्रपात का निर्माण जमडार नाम की छोटी नदी से हुआ है, यह प्रपात कृतिम है। टीकमगढ़-ललितपुर मार्ग में 6 किलोमीटर की दूरी पर यह प्रपात स्थित है। इस प्रपात के चारों ओर वनस्थली का वैभव बिखरा है। यह स्थान कवि कलाकारों को उदत्त प्रेरणा प्रदान करता है, इस प्रपात की ऊँचाई 10 फुट है। कुण्डेश्वर प्रपात प्रकृति, पुरुषार्थ और धर्म तीनों का संगम है। शिवरात्रि के पर्व पर यहाँ विशाल मेला लगता है।

सेवदा जलप्रपात :- सेवदा प्रपात सिंधु नदी द्वारा

निर्मित है। इस प्रपात में 30 फुट ऊपर से जलधारा नीचे गिरती है। यह प्रपात भी कृतिम है, लेकिन जहाँ जलधारा गिरती है, वह प्राचीन है। इस प्रपात को सनकुआ के नाम से भी जाना जाता है। दतिया जिले का यह प्रसिद्ध एवं मनोरम स्थान है।

उपसंहारः— विन्ध्य क्षेत्र में अनेक जल प्रपात हैं, जहाँ पर आवागमन की दृष्टि से समुचित व्यवस्था की जाकर कई प्रकार के रोजगार बढ़ाये जा सकते हैं। अन्तर्राष्ट्रीय स्तर पर इन प्रपातों के प्रचार प्रसार से विदेशी पर्यटक आयेंगे। जिससे विदेशी मुद्रा प्राप्त होगी। इन सभी प्रपातों व पर्यटक स्थलों को आवागमन की दृष्टि से सुव्यवस्थित मार्ग से एक-दूसरे से जोड़ देने पर पर्यटकों की संख्या में अत्यधिक वृद्धि की संभावनाएँ हैं। वास्तविक रूप से इन सभी प्रपातों व स्थलों से विन्ध्य क्षेत्र के स्थानीय निवासी ही पूर्णरूपेण परिचित नहीं हैं, तो बाहर के लोगों को जानकारी नहीं होना स्वभाविक है। इन सभी प्रपातों के प्रचार-प्रसार की समुचित व्यवस्था की जानी चाहिए, जिससे विन्ध्य धरा के पर्यटक स्थलों को ख्याति तो प्राप्त होगी ही साथ ही स्थानीय लोगों को पर्यटकों व पर्यटक स्थलों से सम्बन्धित अनेक व्यवसायों व रोजगारों के मार्ग प्रशस्त होंगे एवं इस क्षेत्र का विकास भी संभव होगा। विन्ध्य क्षेत्र में प्राकृतिक सौन्दर्य से भरपूर अनेक पर्यटक स्थल। जिसमें गोविन्दगढ़ का किला, मुकुन्दपुर का व्हाइट टाईगर सफारी के साथ अविरल बहती हुई विभिन्न नदियों का मनोरम दृश्य जिसमें चित्रकूट की मंदाकिनी व अमरकंटक के साथ यहाँ के प्रपात पर्यटकों व सैलानियों के आकर्षण केन्द्र है। विन्ध्य क्षेत्र पर्यटक स्थलों का भण्डार है, परन्तु यहाँ

पर्यटकों को पर्यटक स्थलों तक आवागमन आदि सुविधाओं की समस्याएँ अवश्य होती हैं। इस ओर प्रशासन की निगाहें अभी तक नहीं गयी हैं। स्थानीय प्रशासन को विन्ध्य के सभी पर्यटक स्थलों को जोड़ते हुए आवागमन की दृष्टि से पर्यटक बस व टैक्सियाँ आदि उपलब्ध करवाने की समुचित व्यवस्था की जानी चाहिए।

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सीधी जिले के पर्यटन विकास में राष्ट्रीय उद्यानों एवं अभ्यारण्यो की भूमिका

वंदना तिवारी

1. प्रस्तावना –

सीधी जिले में प्रचुर प्राकृतिक, सांस्कृतिक एवं ऐतिहासिक धरोहर के कारण पर्यटन –व्यवसाय के विकास की अत्यन्त संभावनाएँ हैं। यह जिला प्रकृति अभूतपूर्व प्राकृतिक सुन्दरता से भरपूर है, यहाँ पर जगह-जगह ऊँची-नीची भूमि तथा धरती का उदर विदीर्ण कर फैली पहाड़ियाँ कैमोर, कहेजुआ और रानी मुण्डा घाटी में विशाल दृश्य, जंगल की ज्वाला संजय गांधी (दुबरी) राष्ट्रीय उद्यान और फूलों का खूबसूरत नजारा देखने को मिलता है। विन्ध्य की ऊँची-ऊँची कैमोर श्रेणियाँ, सोन, गोपद, बनास, महान नदियाँ दुर्गभ पहाड़ियाँ, नदी घाटी, सघन सागौन एवं साल के तन तथा नदियों पर बने बाँधों ने इस जिले को नैसर्गिक सुन्दरता प्रदान करते हैं। सोन नदी पर निर्मित बाणसागर परियोजना महान नदी पर गुलाब सागर परियोजना, गोपद स्टाप डैम, संजय गांधी (दुबरी) राष्ट्रीय उद्यान एवं कुसत्री, मझौली के अभ्यारण्य, सोन नदी एवं गोपद नदी का संगम स्थल तथा घड़ियाल अभ्यारण्य पर्यटन स्थलो के विकास में सहायक भी हैं।

2. शोध विधि –

प्रस्तुत शोध पत्र में प्राथमिक एवं द्वितीयक आकड़ों का संकलन, सारणीयन एवं प्रस्तुतीकरण किया गया है। विषय वस्तु को वैज्ञानिक रोचक एवं बोधगम्य बनाने के लिए आकड़ों के तहसील वार एवं विकासखण्ड वार संकलित करते हुए विश्लेषण किया गया है। गुणात्मक एवं मात्रात्मक तकनीक के प्रयोग विधि से क्षेत्रीय सर्वेक्षण किया गया है क्षेत्रीय सर्वेक्षण से प्राप्त प्राथमिक आकड़ों का आवश्यकता नुसार सृजन, एवं सांख्यिकीय विधियों के द्वारा प्रदर्शन किया गया है।

3. शोध क्षेत्र परिचय –

अपनी भौगोलिक स्थिति के कारण मध्यप्रदेश में सीधी जिले का एक विशेष स्थान है, भौगोलिक दृष्टिकोण से सीधी जिला प्रायद्वीपीय भारत के उत्तर-पूर्व में गीता ज्योति बी.एड.कालेज रीवा

“बघेलखण्ड पठार” का उत्तरी भू-भाग है, जो रीवा संभाग के दक्षिणी-पूर्वी भाग पर विस्तृत है। इसका विस्तार 23’ 47’ उत्तरी अक्षांश से 24’ 42’ उत्तरी अक्षांश तथा 81’ 18’ पूर्वी देशान्तर से 82’ 49’ पूर्वी देशान्तर के मध्य स्थित है। जिले के पूर्व में नवगठित जिला सिंगरौली, दक्षिण में (छत्तीसगढ़) सरगुजा दक्षिण-पश्चिम में जिला शहडोल उत्तर पश्चिम में जिला रीवा एवं सतना (तहसील अमरपाटन) तथा सीधी जिले के उत्तर पूर्व में उत्तर प्रदेश जिला रापटसगंज विस्तृत है। वर्तमान में 07 तहसील एवं 05 विकास खण्ड है, वर्ष 2011 की जनगणना के अनुसार जिले में कुल जनसंख्या 1127033 है, जिसमें 5759912 पुरुष एवं 551121 महिलाएँ पायी गई हैं। लिंगानुपात 957 तथा जनसंख्या घनत्व (वर्ष 2011) प्रति वर्ग किलामीटर 232 तथा दशाब्दिक जनसंख्या वृद्धि दर 2001से 2011 की अवधि में 23.72 प्रतिशत ज्ञात हुई है।

सम्पूर्ण सीधी जिला कैमोर श्रेणियों के दक्षिण में स्थित है ये श्रेणियाँ पश्चिम से पूर्व की ओर समानान्तर पूरे जिले में फैली हैं, पश्चिम से पूर्व की ओर सोन नदी तथा सोन की सहायक नदी गोपद, बनास, महान नदियाँ हैं। जिले का कुल भौगोलिक क्षेत्रफल 4720 वर्ग कि०मी तथा सागर तल से औसत ऊँचाई 426 मीटर है यहाँ 45 प्रतिशत भू भाग पठारी, 40 प्रतिशत पहाड़ी तथा लगभग 15 प्रतिशत भाग घाटी युक्त मैदानी है। कठोर, खेदार एवं मुरमुरी चट्टानी, संरचना से युक्त गोड़वाना लैण्ड की इस धरा पर सोन नदी को यहाँ की जीवन रेखा की संज्ञा दी गई है। सोन एवं उसकी सहायक नदियाँ कई स्थानों पर काट वॉट कर गहरी कन्दराओं एवं घाटियों का निर्माण किया है।^१ कर्क रेखा से निकटता, समुद्र से दूरी (बंगाल की खाड़ी से 715 कि.मी.) एवं सागर समतल से 243 से 609 मीटर तक की ऊँचाई, जलवायु की दृष्टि से इसे एक विशेष स्वरूप प्रदान करती है। यहाँ का न्यूनतम तापमान 70 से.ग्रे. (जनवरी) एवं

अधिकतम तापमान 42° से0ग्रे0 (मई) में पाया जाता है। यहाँ की औसतन वर्षा 1249.5 मि.मी. है, जिसका 90 प्रतिशत भाग ग्रीष्म काल में एवं 10 प्रतिशत भाग शीत काल में प्राप्त होता है। इस जिले का 33 प्रतिशत भू-भाग वनों से आच्छादित है जिसमें शाल, शीशम, साजा, सलई, गुरजा, खैर, महुआ, तेन्दू, हर्रा, चार, आंवला, कटहल, वॉस, जामुन, पलास, सेध, बीजा, सागौन आदि वन पाये जाते हैं। वृक्षों के साथ ही विभिन्न प्रकार की घास एवं लताएँ पायी जाती हैं।³ प्रमुख खनिज सोन नदी का बालू, वाक्साइड पत्थर, मुरुम, चिनी मिट्टी, सिलीमेनाइट, कारण्डम आदि हैं।

जिले में कुल ग्रामों की संख्या 1092 जिसमें आवाद ग्राम 10163 वीरान ग्राम 28, तहसील 07, विकासखण्ड 05, सामुदायिक विकासखण्ड 04, नगर 04, नगर पालिका 01, नगर पंचायत 03 तथा एक मात्र आदीवासी ब्लाक कुसमी जहाँ 70 प्रतिशत आबादी अनुसूचित जनजातियों की पायी जाती है। जिले में कुल जनसंख्या में 29, 89 प्रतिशत जनसंख्या जनजातियों की पायी जाती है। राष्ट्रीयकृत बैंकों की संख्या 93 निजी बैंक 03, सहकारी बैंक 14 भूमि विकास बैंक 04, डाकघर 45 आरक्षी केन्द्र 11 उपआरक्षी केन्द्र 06 पाये गये हैं। जिले में कृषि कार्य पूर्णतः वर्षा पर निर्भर रहती है, क्योंकि लगभग 22, 34 प्रतिशत भूमि पर सिंचाई की सुविधा उपलब्ध है, यहाँ की प्रमुख फसलों में खरीफ फसल धान, मक्का, कोदौ, कुटकी, उड़द, मूग, तुअर, तिल, तथा रबी फसल गेहूँ, जौ, चना, मसूर, राई, सरसौ, अल्सी है। जिले में कुल 09 लघु सिंचाई उहवाहन परियोजनाएँ पूर्ण है, जिसमें वर्ष 2017 तक 66253 हेक्टेयर भूमि सिंचित है।

4. संजय राष्ट्रीय उद्यान –

मध्यप्रदेश में 12 राष्ट्रीय उद्यानों में सीधी जिले का “संजय राष्ट्रीय उद्यान” एक प्रमुख है, यह राष्ट्रीय उद्यान 1938 वर्ग कि0मी0 क्षेत्र में सीधी एवं सरगुजा (छत्तीसगढ़) जिलों में फैला है। सीधी जिले के दक्षिण में स्थिति आदिवासी ब्लाक कुसमी का दक्षिणी –पूर्वी भाग में 230 450 उत्तरी अक्षांश तथा 810 45 से 820 पूर्वी देशान्तर के मध्य मझौली तहसील एवं कुसमी तहसील में विस्तृत है। सीधी जिला मुख्यालय से 70

कि0मी0 दूर कुसमी, आम गांव, रमदहा कुण्ड, भुइमाड मेम्बरा नामक प्रवेश द्वारों से पहुँचा जा सकता है। सफेद शेर 27 मई सन् 1951 को रीवा राज्य के भूतपूर्व महाराजा स्वर्गीय मार्तण्ड सिंह द्वारा इसी क्षेत्र में पकड़ा गया था। यह उद्यान विभिन्न प्रकार के वन्य प्राणियों – शेर, काला हिरण, बाथ, तेन्दुआ, चिंकारा, नीलगाय, साँभर, चीतल, बारह सिंघा, जंगली सुअर, भालू, बन्दर, अजगर, एवं विभिन्न प्रकार के पक्षियों के साथ प्राकृतिक स्थलों को भी समाहित किए हुए है। अतः इस राष्ट्रीय उद्यान में वन्य प्राणियों के स्वच्छदन विचरण के साथ ही नैसर्गिक सुन्दरता का भी अवलोकन किया जा सकता है।⁴ यही नहीं अपितु यहाँ के सघन वन क्षेत्रों एवं बीहड़ पहड़ियों एवं नदी घाटियों में गोड़, पनिका अगिया, मरावी, कँवर, भूमिहा बैगा, कोल, खैखार, माझी, कोखा, आदि जनजातियों को उनके आदिय आवस्था में सभ्यता से दूर प्राचीन आदिवासी संस्कृति एवं परम्पराओं से जकड़ी हुई निर्धन समाज आज भी देखा जा सकता है।

संजय राष्ट्रीय उद्यान में यातायात के साधनों की कमी भोजन एवं आवास की असुविधा दुर्गम क्षेत्रों के प्रचार प्रसार की कमी के कारण ख्याति प्राप्त नहीं हो सका है। यही कारण है कि इतने विशाल क्षेत्र में फैले असंख्य वन्य प्राणियों हजारों प्रकार के वानास्पतिक विशेषताओं एवं नैसर्गिक सुन्दरता से परिपूर्ण यह राष्ट्रीय उद्यान अभी तक पर्यटकों को अपनी ओर आकर्षित नहीं कर सका है। इतने विशाल राष्ट्रीय उद्यान में कुसमी, पोडी, वस्तुआ, भगवार, सोनहट, दुआरी, टमसार, जूटी, रौहाल, कमछ, कोड़ार आदि ग्रामों में दो-दो कमरों का वन विश्राम गृह एवं जलपान की व्यवस्था पर्याप्त नहीं हो सकी है। यदि यहाँ पर्यटन विकास निगम के होटल, राष्ट्रीय उद्यान व्यवस्थापक की ओर से भ्रमण हेतु वाहन एवं हाथी की व्यवस्था पर्याप्त प्रचार-प्रसार एवं आवागमन के साधनों का विकास किया जा सके तो निकट भविष्य में सीधी जिले के पर्यटन विकास में इसकी भूमिका महत्वपूर्ण नहीं हो सकी है।

5. सीधी जिले के प्रमुख अभ्यारण्य –

सीधी जिला सम्पूर्ण रीवा संभाग अन्तर्गत अन्य जिलों की तुलना में यह अभ्यारण्य एवं प्राकृतिक पर्यटन स्थलों की दृष्टिकोण से सम्पन्न एवं परिपूर्ण है। जिले में

दुवरी अभ्यारण्य जो सीधी जिला मुख्यालय से दक्षिण पश्चिम 70 कि०मी० की दूरी पर कुसमी तहसील एवं मझौली तहसील में विस्तृत है। 368 वर्ग कि०मी० क्षेत्रफल में फैले इस अभ्यारण्य में विभिन्न प्राणियों, वन्य जीवों के साथ-साथ प्राकृतिक सुन्दरता से परिपूर्ण सघन वनक्षेत्र, एवं रमणीय स्थल महान नदी एवं गोपद नदी के किनारे लोक निर्माण विभाग द्वारा बनाये गये (रेस्ट हाउस) विश्राम गृहस्थिति है। पर्सिली नामक आधुनिक विश्राम गृह पर्यटकों के लिए आकर्षण का केन्द्र बना हुआ है। पर्सिली आधुनिक विश्राम गृह पक्की सड़कों से जुड़ा हुआ आवास एवं भोजन की व्यवस्था से सुसज्जित जिले का एवं प्रमुख पर्यटन स्थल है, जहाँ प्रतिदिन सीधी तथा समीप वर्ती जिलों के पर्यटकों का आना जाना लगा रहता है। किन्तु आर्थिक दृष्टि से यह अभ्यारण्य कोई लाभ नहीं प्राप्त कर रहा है, पर्याप्त प्रचार-प्रसार एवं सुविधाओं में वृद्धि के उपरान्त जिले के पर्यटन विकास में इस अभ्यारण्य का योगदान महत्वपूर्ण हो सकता है।

जिले के उत्तर पूर्व में सोन नदी की घाटी से कैमोर पर्वतमाला एक 478 वर्ग कि०मी० भू-भाग में फैले तीन वन वृत्त दो निरीक्षक कुटीर, तीन वन अवरोच 64 गाँव एवं चार ग्राम पंचायतों से युक्त सिहावल तहसील एवं सिगरौली जिले के चितरंगी तहसील में फैला यह अभ्यारण्य जहाँ कृष्ण मृगों के लिए सम्पूर्ण भारत देश में विख्यात है। सीधी मुख्यालय से 110 कि०मी० दूर सीधी, वनारस मार्ग पर चितरंगी नामक तहसील एवं सिहावल तहसील में फैला है। अभ्यारण्य में सीधी की ओर से कुदेरी गेट एवं मिर्जापुर की ओर से आयनिया गेट से प्रवेश किया जा सकता है। यहाँ कृष्ण मृगों (काला हिरण) के चौकड़ी भरते झुण्डों, नीलगाय, चितकारा, लंगूर, शेर, बाथ, तेन्दुआ, चितकारा, नीलगाय, साँभर, चीतल, बारह सिंघा, जंगली सुअर, भालू, बन्दरो के स्वच्छन्द विचरण एवं कमोर पर्वतों में विभिन्न स्थानों पर स्थित शैल चिभ तथा सोन घाटी के विहंगम दृश्य को देखने में वंचित रह जाते हैं। यदि इस पर्यटन स्थल को पक्के सड़क मार्ग एवं आवास की समुचित व्यवस्था एवं भ्रमण हेतु वाहन की सुविधा से परिपूर्ण करा दिया जाये तो यह अभ्यारण्य केवल सीधी जिले का ही नहीं अपितु सम्पूर्ण मध्यप्रदेश के महत्वपूर्ण पर्यटन स्थलों के रूप में ख्याति अर्जित कर सकता है।

6. सोन घड़ियाल अभ्यारण्य -

सीधी जिले में संजय राष्ट्रीय उद्यान एवं वगदरा राष्ट्रीय अभ्यारण्य के अतिरिक्त जल जीवों के संरक्षण के लिए भी एक अभ्यारण्य बनाया गया है, जो सोन घड़ियाल के नाम से प्रसिद्ध है। सोन घड़ियाल अभ्यारण्य सीधी जिला मुख्यालय से लगभग 50 कि०मी० की दूरी पर वहरी अभिलिया मार्ग में सोन नदी पर निर्मित जो गच्छा पुल के समीप विस्तृत है। सोन नदी के इस गहरे घाट में घड़ियालों को संरक्षण प्रदान करते हुए अभ्यारण्य का दर्जा दिया गया है। सोन नदी के तट पर एक वाच टावर बनाया गया है, जहा से दूर वीन (सूक्ष्मदर्शी) से नंगी आँखों द्वारा घड़ियालों को नदी पट पर झुण्ड के रूप में स्वच्छन्द विचरण करते हुए देखा जा सकता है। यहा वालू के विशाल निक्षेप पर घड़ियाल अण्डे देते हैं। इन्हे प्रतिदिन मांस तथा अन्य प्रकार से भोजन की व्यवस्था करते हुए घड़ियालों का पालन-पोषण किया जाता है। सोन घड़ियाल अभ्यारण्य के समीप ही जोमदहा घाट, कुठली, देह घाट, एवं टेड़ी घाट पर भी घड़ियालों को संरक्षित किया गया है। सीधी जिले का सोन घड़ियाल अभ्यारण्य एक ऐसा प्राकृतिक पर्यटन स्थल है जहाँ पर सुगमतापूर्वक पहुँच वाली पक्की एवं चौड़ी सड़कों की सुविधा उपलब्ध करायी गई है।¹⁹ मात्र आवास एवं भोजन की व्यवस्था एवं पर्याप्त प्रचार-प्रसार के द्वारा इसे आर्थिक दृष्टि से लाभप्रद पर्यटन स्थल के रूप में विकसित किए जाने की प्रचल सम्भावनाएँ हैं। तथा इस घड़ियाल अभ्यारण्य की और अधिक व्यवस्थित बनाकर देश एक प्रदेश के पर्यटकों के लिए आकर्षण का केन्द्र तथा प्रचुर मात्रा में पूजा की प्राप्ति तथा राजस्व में वृद्धि होने की अपार संभावनाएँ हैं। यद्यपि सीधी जिले में वन्य प्राणी संसाधन एवं वन सम्पदा की दृष्टि कोण से भी एक सम्पन्न जिला है जो यहाँ कि अर्थ व्यवस्था एवं पर्यटकों के लिए आकर्षण का केन्द्र बिन्दु है। जिले में वन्य प्राणियों के संरक्षण के साथ अनेक अभ्यारण्य एवं नवीन पर्यटन स्थल विकसित किए जाने की अपार संभावनाएँ हैं। जिले में वनों का संरक्षण, जंगली पशुओं को प्राकृतिक आवास एवं ग्रामीण वानकी विकास के माध्यम से वनोंपज का विकास तथा अनेक नवीन पर्यटन केन्द्रों का विकास किया जा सकता है। साथ ही नवीन

अभ्यारण्य एवं विविध प्रकार के वनोपज से करोड़ों की राजस्व प्राप्ति की जा सकती है। तथा पर्यटन केन्द्र के विस्तार से सम्पूर्ण जिले का आर्थिक, सामाजिक विकास के साथ समग्र विकास में तीव्रता संभव हो सकती है।

इस प्रकार राष्ट्रीय उद्यानों एवं जिले के अभ्यारण्यो में पाये जाने वाले वन्य जीवों, पशु संसाधनों अथवा जंगली जानवरों में प्रमुख रूप से काला हिरण, तेदुआ, भालू, जंगली सुअर, बन्दर साँभर मृग, चीतल, शेर, नीलगाय, कोर्गा, बारह सिंघा, विगा, जंगली विलाव आदि प्रमुख है।¹⁰ इन जंगली जानवरों का शिकार करना निषेध है वन विभाग एवं भारत सरकार के वन अधिनियम के अनुसार काले हिरण को मारने पर तीन वर्ष की कैद की सजा का प्रावधान है एक अध्ययन प्रतिवेदन के अनुसार सीधी जिले के संजय राष्ट्रीय उद्यान एवं वगदरा अभ्यारण्य में जंगली जानवरों अथवा वन्य जीवों की संख्या वर्ष 2017 के अनुसार निम्न लिखित सारणी की सहायता से स्पष्ट किया गया है :-

क्र.	अभ्यारण्य	शेर	तेदुआ	चीतल	साँभर	नील गाय	काला हिरण	भालू	जंगली सुअर	जंगली कुत्ता	भेड़िया	लकड़ वग्घा	फोगी
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	संजय उद्यान	03	16	385	32	285	—	118	929	17	24	25	605
2	वगदरा अभ्यारण्य	02	05	28	205	281	155	72	786	—	12	25	635
	योग	05	21	413	237	566	155	190	1715	17	36	50	1240

स्रोत :- संचालक संजय राष्ट्रीय उद्यान केन्द्र एवं वगदरा अभ्यारण्य जिला सीधी (म.प्र.) (वर्ष 2016-17)⁷

निष्कर्ष -

निष्कर्ष सम्पूर्ण सीधी जिला अभूतपूर्व प्राकृतिक सम्पदा वन संसाधन से समृद्ध एवं प्रकृति की नैसर्गिक सुन्दरता से परिपूर्ण है, यहाँ पर धरती का उदर विदीर्ण करती हुई फैली पहाड़ियाँ, घने वन, बीहड़ नदी घाटियाँ, बहु संख्यक प्राकृतिक जल श्रोत, जल प्रताप, जहाँ एक ओर पर्यटन उद्योग के तीव्र विकास की सम्भावनाएँ तथा दूसरी ओर आदिम अवस्था में जीवन निर्वाह कर रही जनजातियाँ शोध कर्ताओं एवं अन्वेषकों में जिज्ञासा एवं चुनौती प्रदान करती है। इन समृद्ध प्राकृतिक संसाधनों का लाभ उठाते हुए राज्य सरकार को इस जिले में वर्ष 1981 में संजय (20 फरवरी 1981) राष्ट्रीय उद्यान तथा सोन घड़ियाल अभ्यारण्य तथा वगदरा (सिहावल) अभ्यारण्य की स्थापना की है। जो इस जिले को न सिर्फ एक पहचान प्रदान करते हैं अपितु वर्तमान में जिले के पर्यटन विकास में ये स्थल आर्थिक दृष्टि से लाभ तथा भविष्य में सुविधाओं में वृद्धि, प्रचार के द्वारा इन्हे जिले के पर्यटन मानचित्र में महत्वपूर्ण स्थान प्राप्त करने की प्रबल संभावनाएँ है तथा पर्यटन विकास के क्षेत्र में राष्ट्रीय

उद्यानों एवं अभ्यारण्यों की महत्वपूर्ण भूमिका का निर्वाहन हो सकेगा।

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