

DETERMINATION OF FACTORS CONTRIBUTING TOWARDS CIRCULAR ECONOMY: AN EMPIRICAL EVIDENCE OF HOMEMAKERS – NON WORKING FEMALES.

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Purpose- This paper highlighted the significance of various factors influencing the contribution of home economists or simply the homemakers (non working females) towards the ‘Circular Economy’. The study was based on the empirical study conducted in Meerut City in western UP, India.

Design/Methodology/Approach- The paper employed the exploratory research design in the initial stage for identifying the influencing factors/variables and furthermore descriptive research design was used to analyse the primary data. The sample unit was the housewives/house makers (non working females) of Meerut City with sample size of 250 (valid responses). Tabulation, Cross Tabulation & Descriptive Statistics were utilized to describe the data and ‘Correlation and Regression techniques’ were used for compiling the results.

Findings- The findings ascertained that mostly house makers were in the age bracket of 26-35 years, post graduates with an income level of Rs. 40000/- pm who were significantly contributing towards ‘Circular Economy’. This contribution had positive relationship with various relevant factors, out of which most significant were ‘Resource saving initiatives’, ‘Avoiding Unnecessary use of Social Media’ and Recycling of the Products’.

Practical Implication- The study was highly practical being ‘Circular Economy’ had been the most sought transformation in recent times and every social unit was responsible for the same. Homemakers were the key managers in terms of managing the whole house and they required more visibility and transparency for their fruitful efforts towards economy of the nation.

Originality/Value- The study was highly valuable because the entire world had been stepping towards the circular economy and the paper was original as it was based on primary data obtained from 250 (valid responses) of housewives of Meerut City.

Keywords – Circular Economy, Contribution, Homemakers, Non Working Females, Transformation.

Paper Type – Research Paper

1. INTRODUCTION

The ‘Circular Economy’ as the name suggests is comprised of two words circular and economy whereas circular denotes the ‘unending life’ and economy denotes the ‘resource utilization system in most efficient and effective manner’. Collectively ‘Circular Economy’ emphasizes on the system which utilizes the resources in such a manner that there is consistent transformation of resources in various forms. The ‘Circular Economy’ relates to the reusability of the available resources so that there will be no wastage by any means. Hence ‘Circular economy’ is a basic responsibility of each and every process, job, manufacturing activity, operation, service etc being resources are

scarce in nature. The objectives of circular economy can be achieved through redesign, redevelopment, reuse, reengineer, research, rethink, regenerate, restore, rebuilt etc. Eventually, every social unit and element in any case directly or indirectly related to ‘Circular Economy’. Even if these social units are not aware with technical terms, then also they have to or are contributing towards the ‘Circular Economy’. House makers (Non working females) have prominent role as far as contribution towards the same is concerned being they are responsible for the management of entire house in all respects. They are highly conscious towards the dimensions of circular economy and influencing it directly and indirectly. The basic research questions are as follows:

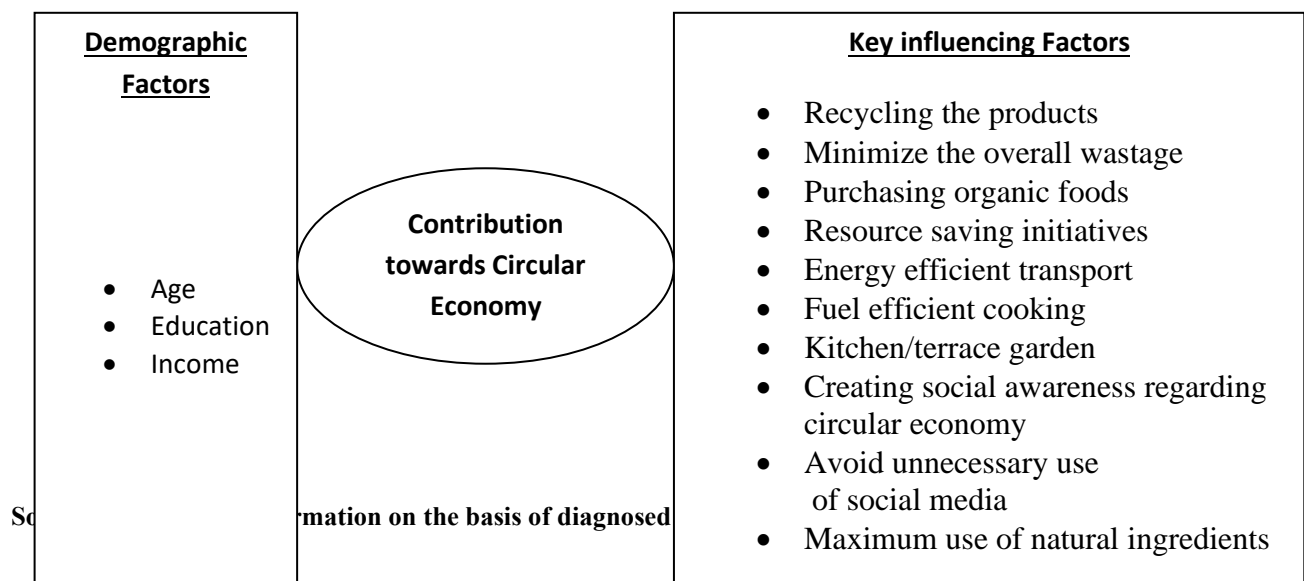
- What are the significant factors which influence the contribution of homemakers in circular economy?
- What is the impact of these influencing factors in overall contribution?
- What is the relation among these factors?

Hence to answer these questions, an empirical assessment has been done in Meerut city of ‘Uttar Pradesh, India’ by conducting the survey of house makers ((Non working females). Meerut city in western UP is one of the most prominent economic, social, educational and financial hubs. It is the part of NCR (National Capital Region) and with the advent of ‘Metro and Rapid Rail’, the trade and industrial development is expected to take roundabout metamorphosis. Therefore selecting the Meerut City as a part of study is highly justified for this domain.

2. LITERATURE REVIEW

Though extensive literature and past studies were available for ‘Circular Economy’ but they were mainly confined to manufacturing industries and production hubs. So for the specific objectives of the study, the data was significantly obtained from OECD library for secondary aspect and obtaining key variables. Finally, the following conceptual model had derived as a part of the study:

Fig.1 Conceptual Framework of the Study



3. RESEARCH OBJECTIVES

- To diagnose the various factors influencing the contribution of homemakers (non working females) towards circular economy in Meerut City.
- To demonstrate the relationship among various factors influencing the contribution of homemakers (non working females) towards circular economy in Meerut City.
- To ascertain the most significant influencing factors contributing towards ‘Circular Economy’.

4. METHODS AND MATERIALS ;In the first stage, the secondary data related to circular economy and its study with reference to the households and homemakers (non working females) was explored with the help of websites and specifically the OECD library. Around ten factors were identified which influence the contribution of respondents towards circular economy and further they were subjected to empirical assessment. Apart from these ten factors, demographic factors like age, education and family income of the respondents were also considered. Structured questionnaire was designed and respondents were contacted physically (to increase the response rate) through the selected BBA students of DVSGI, Meerut for obtaining the responses. These BBA students were provided thorough training for the same. Sample size was 300 out of which 250 valid responses were considered. The method applied for sampling is convenience sampling. The intensity of the selected factors were rated by the respondents with the assistance of 5 point likert’s scale (1- Strongly Disagree (SD), 2- Disagree (D), 3- Can’t Say (CS), 4- Agree (A), 5- Strongly Agree(SA)). Reliability analysis was not conducted scientifically but pilot testing was conducted with 25 personally known housewives and the questionnaire was changed accordingly. Complete data was collected in one month and entered in excel sheet with a proper coding with the help of the selected BBA students only. Consequently with the assistance of SPSS tabulation, cross tabulation & descriptive statistics were performed to present the data .Correlation and Multiple Regression techniques were applied for reaching out to specific results. Key research (influencing) variables with their description and measurement scale used in the study were as follows (Table 1):

S. No	Name	Description	Measurement Scale used
1	Age	Age of the Respondents	Nominal
2	Education	Education of the Respondents	Nominal
3	Income	Income of the Respondents	Nominal
4	Contribution	Contribution towards ‘Circular Economy’	Interval
5	Rec_Prod	Recycling the products	Interval
6	Min_Wast	Minimize the overall wastage	Interval
7	Pur_Organic	Purchasing organic foods	Interval
8	Res_Sav	Resource saving initiatives	Interval
9	Ener_Trans	Energy efficient transport	Interval
10	Fuel_Cook	Fuel efficient cooking	Interval
11	Kit_Terr_Gard	Kitchen/terrace garden	Interval
12	Crea_Social_Awar	Creating social awareness regarding circular economy	Interval
13	Avoid_Unneces	Avoid unnecessary use of social media	Interval
14	Use_Natural	Maximum use of natural ingredients	Interval

Source: Author’s own tabulation on the basis of Secondary data for fulfilling the research objectives.

It was clear from the above Table1 that the first three variables (age, education and income) were related to demographic factors and rests were the key study factors. However, the variable named as ‘Contribution’ was a

dependent factor and all other were the independent ones. As stated above, questions were asked in a statement form like 'I significantly contribute to 'Circular Economy', I recycle the all sorts of products, and I minimize the overall wastage' etc.

5.DATA ANALYSIS & INTERPRETATION

This data analysis and interpretation part has been divided into two parts as 'Tabulation of all variables' & 'Descriptive Statistics of all variables'. The collective interpretation is provided at the end of this section.

5.1.1 Age of the Respondents:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	0-25 Years	10	4.0	4.0	4.0
	26-35 Years	115	46.0	46.0	50.0
	36-45 Years	69	27.6	27.6	77.6
	46-55 Years	56	22.4	22.4	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.2 Education Level of the Respondents:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Below Intermediate	13	5.2	5.2	5.2
	Graduation	54	21.6	21.7	26.9
	Post Graduation	146	58.4	58.6	85.5
	Higher than Post Graduation	36	14.4	14.5	100.0
	Total	249	99.6	100.0	
Missing	System	1	.4		
Total		250	100.0		

Source: SPSS output on the basis of primary data.

5.1.3 Income Level of the Respondents:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Below 30000/-pm	18	7.2	7.2	7.2
	30001-40000/-pm	38	15.2	15.2	22.4
	40001-50000/-pm	102	40.8	40.8	63.2
	50001/-pm and above	92	36.8	36.8	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.4 Overall Contribution towards 'Circular Economy':

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	3	1.2	1.2	1.2
	CS	22	8.8	8.8	10.0
	A	130	52.0	52.0	62.0
	SA	95	38.0	38.0	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.5 Recycling of the Products:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	1	.4	.4	.4
	D	1	.4	.4	.8
	CS	18	7.2	7.2	8.0
	A	122	48.8	48.8	56.8
	SA	108	43.2	43.2	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.5 Minimize the Overall Wastage:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	1	.4	.4	.4
	D	3	1.2	1.2	1.6
	CS	16	6.4	6.4	8.0
	A	137	54.8	54.8	62.8
	SA	93	37.2	37.2	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.5 Purchasing Organic Foods:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	5	2.0	2.0	2.0
	D	31	12.4	12.4	14.4
	CS	34	13.6	13.6	28.0
	A	109	43.6	43.6	71.6
	SA	71	28.4	28.4	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.6 Resource Saving Initiatives:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	2	.8	.8	.8
	D	2	.8	.8	1.6
	CS	14	5.6	5.6	7.2
	A	134	53.6	53.6	60.8
	SA	98	39.2	39.2	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.7 Energy Efficient Transport:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	3	1.2	1.2	1.2
	D	1	.4	.4	1.6
	CS	12	4.8	4.8	6.4
	A	131	52.4	52.4	58.8
	SA	103	41.2	41.2	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.10 Fuel Efficient Cooking:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	18	7.2	7.2	7.2
	D	21	8.4	8.4	15.6
	CS	30	12.0	12.0	27.6
	A	105	42.0	42.0	69.6
	SA	76	30.4	30.4	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.11 Kitchen/Terrace Garden:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	17	6.8	6.8	6.8
	D	19	7.6	7.6	14.4
	CS	18	7.2	7.2	21.6
	A	114	45.6	45.6	67.2
	SA	82	32.8	32.8	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.12 Creating Social Awareness about 'Circular Economy':

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	2	.8	.8	.8
	D	4	1.6	1.6	2.4
	CS	5	2.0	2.0	4.4
	A	149	59.6	59.6	64.0
	SA	90	36.0	36.0	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.13 Avoid unnecessary use of Social Media:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	3	1.2	1.2	1.2
	D	3	1.2	1.2	2.4
	CS	9	3.6	3.6	6.0
	A	151	60.4	60.4	66.4
	SA	84	33.6	33.6	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data.

5.1.14 Maximum use of Natural Ingredients:

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	SD	1	.4	.4	.4
	CS	10	4.0	4.0	4.4
	A	155	62.0	62.0	66.4
	SA	84	33.6	33.6	100.0
	Total	250	100.0	100.0	

Source: SPSS output on the basis of primary data

5.2 Descriptive Statistics pertaining to all variables:

S. No.	Variables	N	Mean	Median	SD	Variance	Range
		Valid					
5.1	Age of the Respondents	250	2.684	2.5	0.8643683	0.747133	3
5.2	Income Level of the Respondents	250	3.516	4	0.9948381	0.989703	4
5.3	Education Level of the Respondents	249	2.823 293	3	0.735683	0.541229	3
5.4	Overall Contribution towards 'Circular Economy'	250	4.256	4	0.7159009	0.512514	4
5.5	Recycling the Products	250	4.34	4	0.6649576	0.442169	4
5.6	Minimize the Overall Wastage	250	4.272	4	0.669184	0.447807	4
5.7	Purchasing Organic Foods	250	3.84	4	1.0366768	1.074699	4
5.8	Resource Saving Initiatives	250	4.296	4	0.6828243	0.466249	4
5.9	Energy Efficient Transport	250	4.32	4	0.6953662	0.483534	4
5.10	Fuel Efficient Cooking	250	3.8	4	1.1719616	1.373494	4
5.11	Kitchen/Terrace Garden	250	3.9	4	1.1450961	1.311245	4
5.12	Creating Social Awareness	250	4.284	4	0.6611296	0.437092	4
5.13	Avoid Unnecessary use of Social Media	250	4.24	4	0.687233	0.472289	4
5.14	Maximum use of Natural Ingredients	250	4.284	4	0.5767796	0.332675	4

Source: SPSS output on the basis of primary data.

Interpretation: It is clear from Tables 2-15 and Table 16, that mostly home makers are in the age bracket of 25-35 years, post graduates and with income level of around 40000/- pm. Mean values for all the key study variables are 3.8 to 4.3 which strongly indicates that all the respondents were agree that they contribute significantly to 'Circular Economy'.

6 RESULTS AND DISCUSSIONS Results along with key findings are obtained by using the inferential statistics tools like Cross Tabulation (Overall contribution to 'Circular Economy' with Demographic Factors), Regression and Correlation Analysis.

6.1 Cross Tabulations – Overall Contribution to 'Circular Economy' with Age of the Respondents:

Table 17: Overall Contribution towards 'Circular Economy' to Age of the Respondents						
Count						
		Age of the Respondents				Total
		0-25 Years	26-35 Years	36-45 Years	46-55 Years	
Overall Contribution towards 'Circular Economy'	SD	0	2	0	1	3
	CS	1	11	7	3	22
	A	7	59	34	30	130
	SA	2	43	28	22	95
Total		10	115	69	56	250

Source: SPSS output on the basis of primary data

6.2 Cross Tabulations – Overall Contribution to 'Circular Economy' with Income Level of the Respondents:

Table 18: Overall Contribution towards 'Circular Economy' to Income Level of the Respondents						
Count						
		Income Level of the Respondents				Total
		Below 30000/- pm	30001-40000/- pm	40001-50000/- pm	50001/- pm and above	
Overall Contribution towards 'Circular Economy'	SD	1	0	2	0	3
	CS	2	2	10	8	22
	A	10	22	54	44	130
	SA	5	14	36	40	95
Total		18	37	102	92	250

Source: SPSS output on the basis of primary data

6.3 Cross Tabulations – Overall Contribution to ‘Circular Economy’ with Education Level of the Respondents:

Count		Education Level of the Respondents				Total
		Below Intermediate	Graduation	Post Graduation	Higher than Post Graduation	
Overall Contribution towards 'Circular Economy'	SD	0	2	1	0	3
	CS	2	5	12	3	22
	A	5	25	78	21	129
	SA	6	22	55	12	95
Total		13	54	146	36	249

Source: SPSS output on the basis of primary data

Results & Discussions: It is obvious from Tables 17 to 19 that maximum respondents who have agreed for contribution towards ‘Circular Economy’ are in the age bracket of 26-35 years, post graduates and income level is around Rs. 40000/- pm. They are more concerned on savings and keen on agreement on the factors relevant to ‘Circular Economy’.

6.4 Correlation Matrix:

Pearson Correlation (PC) coefficient is calculated to view the significance of relation between 'Overall Contributions towards Circular Economy' and all others factors and data is presented in Table 19:

Table 19: Correlation Analysis		
		Overall Contribution towards 'Circular Economy'
Age of the Respondents	PC	.053
	S***	.401
Education Level of the Respondents	PC	.010
	S***	.875
Income Level of the Respondents	PC	.130*
	S***	.041
Overall Contribution towards 'Circular Economy'	PC	1
	S***	
Recycling the Products	PC	.230**
	S***	.000
Minimize the Overall Wastage	PC	.139*
	S***	.028
Purchasing Organic Foods	PC	.061
	S***	.338
Resource Saving Initiatives	PC	.329**
	S***	.000
Energy Efficient Transport	PC	.166**
	S***	.009
Fuel Efficient Cooking	PC	.042
	S***	.507
Kitchen/Terrace Garden	PC	.115
	S***	.070
Creating Social Awareness	PC	.168**
	S***	.008
Avoid Unnecessary use of Social Media	PC	.364**
	S***	.000
Maximum use of Natural Ingredients	PC	.037
	S***	.558
*. Correlation is significant at the 0.05 level (2-tailed). *** Sig. (2-tailed) denoted by S.		
. Correlation is significant at the 0.01 level (2-tailed). * Sig. (2-tailed) denoted by S.		

Source: SPSS output on the basis of primary data.

Results and Discussions: The correlation coefficients from above Table 19 indicate the positive correlation between all the variables to ‘Overall Contribution towards Circular Economy’, however the most significant relationship is between ‘Avoid Unnecessary use of Social Media’, ‘Recycling the Products’ and ‘Resource Savings Initiatives’ being p value is less than .005.

6.5 Regression Summary:

Though the ‘Pearson Correlation’ has demonstrated the vital results but as a progression, ‘Regression Analysis (Method is used ‘Enter’, Dependent variable is ‘Overall Contribution towards Circular Economy’ and Independent variables are Maximum use of Natural Ingredients, Purchasing Organic Foods, Creating Social Awareness, Fuel Efficient Cooking, Energy Efficient Transport, Kitchen/Terrace Garden, Avoid Unnecessary use of Social Media, Resource Saving Initiatives, Recycling the Products, Minimize the Overall Wastage) through SPSS is conducted and composed of following four self explanatory tables as Table 6.5.1 to Table 6.5.2:

6.5.1 Model Summary:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.481 ^a	.231	.199	.641

a. Independent Variables: (Constant), Maximum use of Natural Ingredients, Purchasing Organic Foods, Creating Social Awareness, Fuel Efficient Cooking, Energy Efficient Transport, Kitchen/Terrace Garden, Avoid Unnecessary use of Social Media, Resource Saving Initiatives, Recycling the Products, Minimize the Overall Wastage

Source: SPSS output on the basis of primary data.

6.5.2 ANOVA Results:

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	29.469	10	2.947	7.176	.000 ^b
	Residual	98.147	239	.411		
	Total	127.616	249			

a. Dependent Variable: Overall Contribution towards 'Circular Economy'

b. Predictors: (Constant), Maximum use of Natural Ingredients, Purchasing Organic Foods, Creating Social Awareness, Fuel Efficient Cooking, Energy Efficient Transport, Kitchen/Terrace Garden, Avoid Unnecessary use of Social Media, Resource Saving Initiatives, Recycling the Products, Minimize the Overall Wastage

Source: SPSS output on the basis of primary data.

Interpretations: It is indicated from Table 6.5.1 and Table 6.5.2, that 23% of the variations in the dependent variable has been enumerated by all predictors. Though it is very low but quite significant as the p value is .000.

6.5.3 Regression Coefficients

Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.291	.519		2.488	.014
	Recycling the Products	.113	.072	.105	1.578	.116
	Minimize the Overall Wastage	.110	.074	.103	1.495	.136
	Purchasing Organic Foods	.018	.040	.026	.459	.647
	Resource Saving Initiatives	.299	.068	.285	4.410	.000
	Energy Efficient Transport	.045	.063	.043	.702	.483
	Fuel Efficient Cooking	.005	.036	.007	.126	.900
	Kitchen/Terrace Garden	.028	.037	.045	.774	.440
	Creating Social Awareness	.066	.065	.061	1.015	.311
	Avoid Unnecessary use of Social Media	.300	.064	.288	4.699	.000
	Maximum use of Natural Ingredients	.059	.073	.048	.807	.420

a. Dependent Variable: Overall Contribution towards 'Circular Economy'

Source: SPSS output on the basis of primary data.

Results and Discussions: It is evident from Table 6.5.3, that all the variables are positively influencing the 'Overall Contribution towards Circular Economy'. However the most significant variables are 'Resource Saving Initiatives' and 'Avoid Unnecessary use of Social Media' being the p value is .000.

7. CONCLUSION

The current study states that management of 'Circular Economy' is not just related to manufacturing industries or the production powerhouses only rather is the concern of individual unit or the citizen which lead to integrate in a bigger landscape and larger phenomenon. In Indian culture housewives are the real house managers and their responsibilities are not less than any of the corporate manager. They significantly contribute towards the 'Circular Economy' through their household activities. They undertake various resource saving (electricity, water etc) initiatives and avoid unnecessary use of social media significantly to contribute for the same. Furthermore they strategize for recycling of the products as much as possible.

8. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The study has undergone certain limitations as availability of highly comprehensive and extensive pool of literature related to 'Circular Economy' which was highly impossible to cover in such a short span of research time. Furthermore, convenience sampling method with small sample and reluctant & hesitant attitude of respondents while providing responses had provided an obstacle for this study. Hence, it could be stated here that there is an

immense scope for future research in this domain being ‘Circular Economy’ was predicted as the most prominent transformation. This research study could be conducted with increasing the sample size and in other cities of India.

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