

# Analyzing the factors suitable for developing sustainable tourism at Chhattisgarh

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**Abstract -** The study is conducted to collect information about analyzing the factors suitable for developing sustainable tourism at Chhattisgarh. The study aimed to analyze the factors influencing sustainable tourism development at Chhattisgarh. Primary Data from respondents who have visited various destination of Chhattisgarh has been gathered. Exploratory factor analysis (EFA) approach has been used to identify the factors taking help of AMOSS statistical tool. Results show the major factor which will contribute for sustainable tourism development are Government initiatives, Awareness, Social upliftment, Carrying Capacity Reduction, Stakeholder Enlightenment about sustainability, Strengthening economy & Maintaining ecological balance. , The findings of this research provide parameters and factors for the tourism developers and the state government for decision making. Further there is scope for Confirmatory Factor Analysis (CFA) and Sequential Equation Modeling (SEM) for the sustainable development of the state.

**Keyword(s) –** Tourism, Sustainability, Development, Factors.

## I. INTRODUCTION

The tourism industry is helping nations to bring big economic fortunes and social reforms but simultaneously it is a big threat to sustainability across the globe the industry is exploiting new avenues for tourism development but because of unplanned development and jockeying for making money serious issues regarding hazards have been kept aside (Kshitiz Sharma, 2014). The industry is a serious threat to nations where tourism contributes as a important sector in the economy & unplanned growth is possibly the main reason behind it (Aguirre, 2012).

Chhattisgarh being a green state in all terms having good level of education, male female ratio, natural resources good economic condition the state now aggressively trying to develop tourism activities in the entire state at different levels (Dalal Mott MacDonald, March 2003) due to the initiatives taken by the government pace of tourism activity is increasing but if not planned may be threat to sustainability.

## II. LITERATURE SURVEY

(IBEF , 2018)Tourism in India accounts for 9.6 per cent of the GDP making the industry third largest contributor to the economy in terms of foreign exchange earnings (UNWTO , 2017) is expected to reach15.3 million by 2025 thus the strong momentum is expected to continue in the coming years a projection is made international tourist arrivals will grow in Asia and the Pacific by 5%-6% more all this

projections are making tourism sector more demanding and a good avenue to make money by the investors for coming years (IBEF , 2018) direct contribution of travel and tourism to GDP is expected to reach US\$ 147.96 billion by 2027. Offering a diverse portfolio of niche tourism products India is developing a large market for travel and tourism in the world. (IBEF , 2018) India ranked third among 184 countries in terms of travel & tourism's total contribution to GDP in 2016. (FEEs, 2017).

Sustainability is a term of great importance by across the world and the developed and developing nations are experiencing threats to sustain themselves for future ( The Brundtland Commission Report, 1987). In few years life threatening environmental conditions will be visible similarly a threat to economy and society as well thus collaborations among all stake holders is very much essential (Bramwell Bil, 1999). Chhattisgarh is experiencing huge growth in all sectors thus all initiatives to develop travel industry are part of development policy of the government (Dalal Mott MacDonald, March 2003) as this sector will provide opportunity like learning from other cultures understanding the global development, provide career opportunities (UNWTO and WYSE Travel Confederation, 2011)

To plan a sustainable model for tourism development proper research is very much essential it will help to action plan which will harm destination less and will also help to slow the process of destination saturation in long term.

**Objectives:**

- 1) To find the factors tourist’s selection of destination in the state of Chhattisgarh.
- 2) To find the influencing factors
- 3) To develop a conceptual model for sustainable development of tourist destinations.

**III. RESEARCH METHODOLOGY**

- **Sampling design and data collection** - The data has been collected from visitors visiting various destinations of Chhattisgarh.
- **Target population:** Sampling elements - tourists visiting Chhattisgarh ; and
- **Sampling units-** individuals (in the case of couples/families/groups, everyone in the group could be a sampling unit)
- **Sampling frame** - Sampling is done at the from visitor visiting destinations more than 248 samples were collected out of which 230 were valid for the study.
- **Sampling technique:** Convenience sampling from 230 respondents.
- **Time frame:** Feb 2017 to July 2017

**IV. STATISTICAL TOOLS**

- This study follows the research methodology
- Based on previous research in related areas, a questionnaire was constructed to measure and a 5-point likert-scale used.
- A pilot study on a small group of individual is used and for 230 respondents data is collected.
- Exploratory Factor Analysis (EFA) statistical technique is used to identify the factors.

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.835
Bartlett's Test of Sphericity	Approx. Chi-Square	2701.709
	Df	465
	Sig.	.000

**Table 1- KMO and Bartlett's Test**

KMO value is 0.835 which is greater than 0.6 thus confirms that sample is adequate for exploratory factor analysis (Kaiser, 1974). This indicates that correlations are comparatively compact which will yield distinct factors (Field, 2000).

Bartlett’s Test of Sphericity is significant as p-value is less than 0.05. Thus it can be concluded that correlation matrix (R-Matrix) is not an identity matrix.

Anti image correlation is analysed to check the data adequacy for each statement. KMO value for each statement is greater than 0.06, therefore data is sufficient for each statement used. Communalities for statement “Tourism leads to transfer of communicable diseases” is less than 0.5, therefore this statement is removed as it can produce inflated value of variance (Gorsuch, 1990)

Again KMO and Bartlett’s Test is performed to analyse the changes because of omission of one statement as stated above and found adequate.

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.837
Bartlett's Test of Sphericity	Approx. Chi-Square	2621.396
	Df	435
	Sig.	.000

**Table 2 KMO and Bartlett's Test**

Table 3 summarised the Principal Component Analysis (PCA) the eigenvalues for each factors before and after extraction and also after rotation (Field, 2000). Before extraction, there are 27 variables as listed in below table. The below table is presented after considering all steps to remove cross-loadings among statements and factors (Mulaik, 1990). From eigenvalues component-1 have 23.2% of total variance explained while component-2 have 13.1% of total variance explained and so on. Under extraction sums of Squared Loadings, only components having eigenvalues greater than “1” is listed, there are 7 such components which accounts to 62.3% of total variance explained. Rotation of the factor axis leads to restructuring of total variance explained. The restructured factors have now changed variance as Factor-1 explains 14.9% of total variance while Factor-2 explains 12.3% of total variance whereas Factor-7 explains 6.3% of total variance.

**Total Variance Explained**

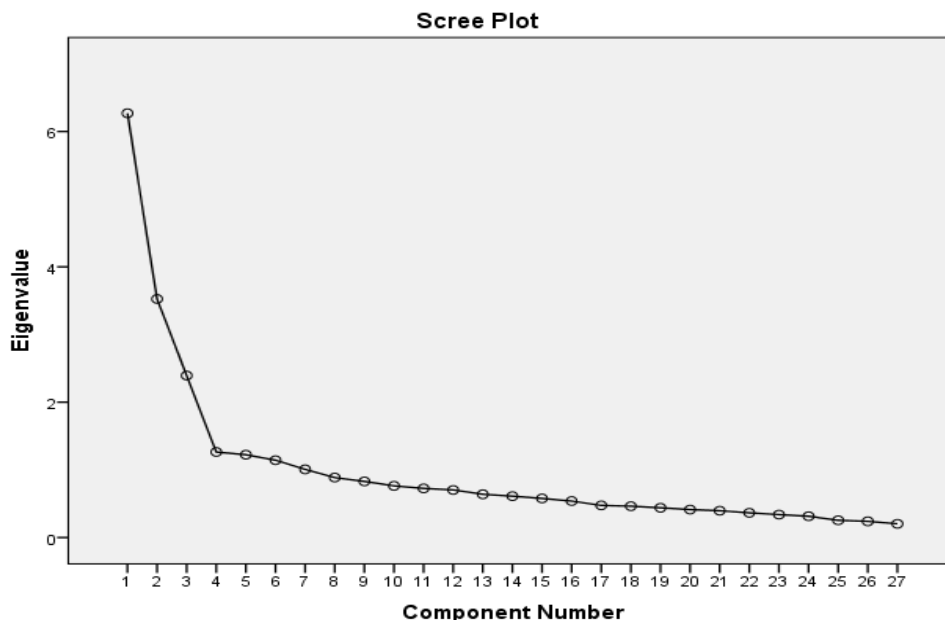
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.3	23.2	23.2	6.3	23.2	23.2	4.0	14.9	14.9
2	3.5	13.1	36.3	3.5	13.1	36.3	3.3	12.3	27.1
3	2.4	8.9	45.1	2.4	8.9	45.1	2.3	8.6	35.8
4	1.3	4.7	49.8	1.3	4.7	49.8	1.9	6.9	42.7
5	1.2	4.5	54.4	1.2	4.5	54.4	1.8	6.7	49.4

6	1.1	4.2	58.6	1.1	4.2	58.6	1.8	6.6	56.0
7	1.0	3.7	62.3	1.0	3.7	62.3	1.7	6.3	62.3
8	0.9	3.3	65.6						
9	0.8	3.1	68.7						
10	0.8	2.8	71.5						
11	0.7	2.7	74.2						
12	0.7	2.6	76.8						
13	0.6	2.4	79.2						
14	0.6	2.3	81.4						
15	0.6	2.1	83.6						
16	0.5	2.0	85.6						
17	0.5	1.8	87.3						
18	0.5	1.7	89.0						
19	0.4	1.6	90.7						
20	0.4	1.5	92.2						
21	0.4	1.5	93.6						
22	0.4	1.4	95.0						
23	0.3	1.3	96.3						
24	0.3	1.2	97.4						
25	0.3	0.9	98.4						
26	0.2	0.9	99.2						
27	0.2	0.8	100.0						

Extraction Method: Principal Component Analysis.

**Table 3: Total Variance Explained**

The below Scree-Plot also confirmed the number of factors explored through exploratory factor analysis. By examining the graph of the eigen values and looking for natural bend of the graph it can be seen that there are 7 numbers of factors which are required to be retained , as after point 7 the curve gets flattened (Velicer & Jackson, 1990).



**Figure 1: Scree Plot**

The identified factors through PCA is analysed through Rotated Component Matrix for grouping of statements. All 27 statements are grouped in 7-factors and their reliability is analysed using Cronbach’s Alpha test for reliability and internal consistency. The below table shows Rotated Component Matrix shows the loadings of seven identified factors extracted. Higher the absolute value of the loading represents more contribution is by the factor for the variables identified. The loading less than 0.4 is suppressed.

**Rotated Component Matrix<sup>a</sup>**

	Component						
	1	2	3	4	5	6	7
Q10	.755						
Q9	.753						
Q5	.714						
Q6	.709						
Q8	.701						
Q11	.667						
Q12	.623						
Q7	.583						
Q21		.745					
Q4		.700					
Q19		.681					
Q3		.680					
Q20		.622					
Q18		.574					
Q15			.804				
Q16			.727				
Q17			.678				
Q26				.774			
Q25				.606			
Q27				.595			
Q22					.683		
Q23					.665		
Q24					.612		
Q13						.881	
Q14						.810	
Q2							.835
Q1							.732

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

**Table 4: Rotated Component Matrix**

**Factor-1: Government Initiatives** includes seven statements which accounts to 23.2% of total variance explained having eigen value of 6.3. Total reliability of factor-1 is .869. Individual reliability, mean, standard deviation, communalities and factor loading are described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990).

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-1: Government Initiatives</b>	<b>23.2% of total Variance explained with eigen value of 6.3</b>				<b>0.869</b>
State government successfully manages tourism activity throughout the state.	2.78	1.16	.710	.755	0.84
State government has good relations with the local residents for supporting tourism activities across the state.	2.93	1.09	.588	.753	0.862
The state has excellent qualities of public services.	2.83	1.08	.641	.714	0.859
The state government has created enough infrastructures and super-infrastructures for supporting tourism activities in various destinations.	2.90	1.17	.602	.709	0.848

The state government is having enough number of facilitation centres supporting tourist activities.	2.81	1.01	.640	.701	0.847
The state government is having enough number of lodging and boarding facilities for tourists.	2.94	1.12	.618	.667	0.861

**Table 5: Government Initiatives**

**Factor-2: Carrying Capacity Reduction** include seven statements which accounts to 13.1% of total variance explained having eigen value of 3.5. Total reliability of factor-2 is .805. Individual reliability, mean, standard deviation, communalities and factor loading are described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990)

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-2: Carrying Capacity Reduction</b>	<b>13.1% of total variance explained with eigen value of 3.5</b>				<b>0.805</b>
Tourism damages flora-fauna of the local.	2.94	1.03	0.52	0.745	0.785
Tourism increases the level of pollution.	3.16	1.12	0.57	0.700	0.779
Tourism degrading natural resources.	2.82	1.10	0.60	0.681	0.765
Tourism is increasing cost of facilities to the locals	3.50	0.95	0.51	0.680	0.802
Tourism is causing threat to natural resources	3.06	1.06	0.59	0.622	0.761
Tourism is causing overcrowding	3.20	1.11	0.45	0.574	0.784
Tourism is causing social disturbances to the community	2.85	1.06	0.57	0.572	0.782

**Table 6: Carrying Capacity Reduction**

**Factor-3: Social Upliftment** includes three statements which accounts to 8.9% of total variance explained having eigen value of 2.4. Total reliability of factor-3 is .753. Individual reliability, mean, standard deviation, communalities and factor loading are described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990)

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-3: Social Upliftment</b>	<b>8.9% of total variance explained with eigen value of 2.4</b>				<b>0.753</b>
Tourism helps in upgrading social status	3.88	0.95	0.76	0.804	0.651
Tourism has improved basic infrastructures of the locality	3.82	0.95	0.65	0.727	0.659
Tourism has helped to improve social status	3.76	0.93	0.59	0.678	0.699

**Table 7: Social Upliftment**

**Factor-4: Stakeholder Enlightenment** includes three statements which accounts to 4.7% of total variance explained having eigen value of 1.3. Total reliability of factor-4 is .667. Individual reliability, mean, standard deviation, communalities and factor loading are described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990)

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-4: Stakeholder Enlightenment</b>	<b>4.7% of total variance explained with eigen value of 1.3</b>				<b>0.667</b>
Authorities involve local community to participate in sustainable tourism planning	3.25	0.94	0.54	0.774	0.572
Local community is aware about sustainability and its importance.	3.00	1.09	0.59	0.606	0.696
Long-term government planning controls tourism's negative environmental impacts.	3.21	0.97	0.50	0.595	0.618

**Table 8: Stakeholder Enlightenment**

**Factor-5: Awareness** includes three statements which accounts to 4.5% of total variance explained having eigen value of 1.2. Total reliability of factor-5 is .649. Individual reliability, mean, standard deviation, communalities and factor loading is



described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990)

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-5: Awareness</b>	<b>4.5% of total variance explained with eigen value of 1.2</b>				<b>0.649</b>
Government has achieved social solidarity in communicating about sustainable tourism development to local community	3.12	0.90	0.57	0.683	0.575
Government is successful in equal distribution of wealth earned from tourism helping poverty alleviation.	2.72	1.07	0.69	0.665	0.541
Government is successful in creating awareness for the use of new technologies to reduce the harmful effects of tourism development.	2.99	1.13	0.54	0.612	0.534

**Table 9: Awareness**

**Factor-6: Strengthening Economy** includes two statements which accounts to 4.2% of total variance explained having eigen value of 1.1. Total reliability of factor-6 is .835. Individual reliability, mean, standard deviation, communalities and factor loading is described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990).

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-6: Strengthening Economy</b>	<b>4.2% of total variance explained with eigen value of 1.1</b>				<b>0.835</b>
Tourism helps in income Generation	4.08	1.07	0.83	0.881	0.718
Tourism helps in job creation	4.00	1.00	0.83	0.810	0.831

**Table 10: Strengthening Economy**

**Factor-7: Ecological Degradation** includes two statements which accounts to 3.7% of total variance explained having eigen value of 1.0. Total reliability of factor-7 is .696. Individual reliability, mean, standard deviation, communalities and factor loading are described in below table. The reliability for each statement is greater than 0.5, therefore each statement is reliable (Marsh, 1990)

Factor Name & Statements	Mean	Std. Dev	Communalities	Factor Loading	Reliability
<b>Factor-7: Ecological Degradation</b>	<b>3.7% of total variance explained with eigen value of 1.0</b>				<b>0.696</b>
Tourism Increases energy consumption leading crisis of Energy	2.91	1.10	0.69	0.835	0.565
Tourism Increases water consumption leading to crisis.	2.93	1.08	0.81	0.732	0.755

**Table 11: Ecological Degradation**

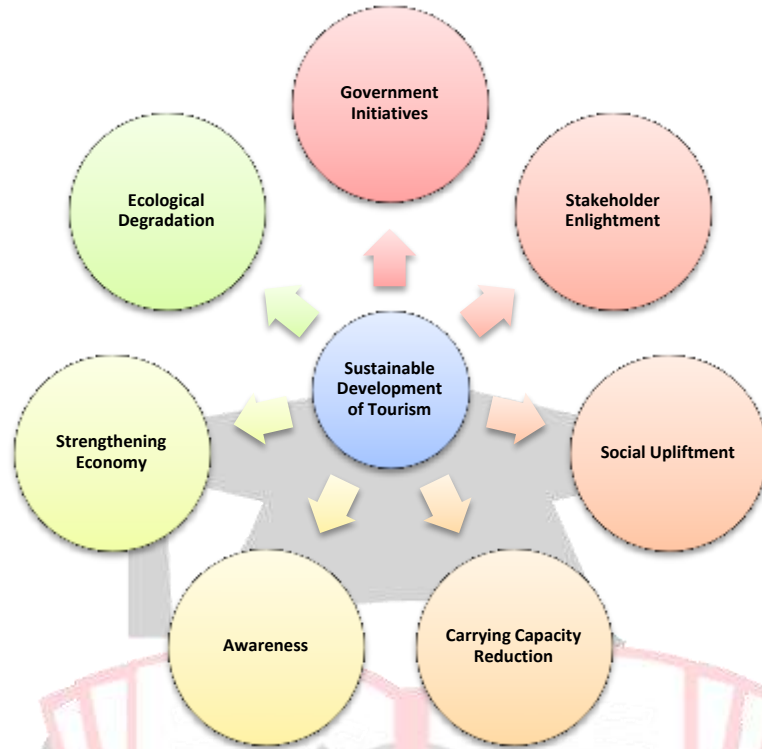
The component score covariance matrix provides variance of factor scores. The values in the main diagonal of the matrix are  $R^2$  between the factor and the observed variables, which confirm the internal consistency of the solution. Diagonal matrix value less than 0.7 are undesirable (MacCallum, Widaman, Zhang, & Hon, 1999) for the internal consistency in factor analysis.

**Component Score Covariance Matrix**

Component	1	2	3	4	5	6	7
1	1.000	.000	.000	.000	.000	.000	.000
2	.000	1.000	.000	.000	.000	.000	.000
3	.000	.000	1.000	.000	.000	.000	.000
4	.000	.000	.000	1.000	.000	.000	.000
5	.000	.000	.000	.000	1.000	.000	.000
6	.000	.000	.000	.000	.000	1.000	.000
7	.000	.000	.000	.000	.000	.000	1.000

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 Component Scores.

**Table 12: Component Score Covariance Matrix**



**Figure 2: Conceptual Model for sustainable development of Tourism**

Model Validity Measures (Hu & Bentler, 1999) provides the model fit snapshot for the conceptual framework.

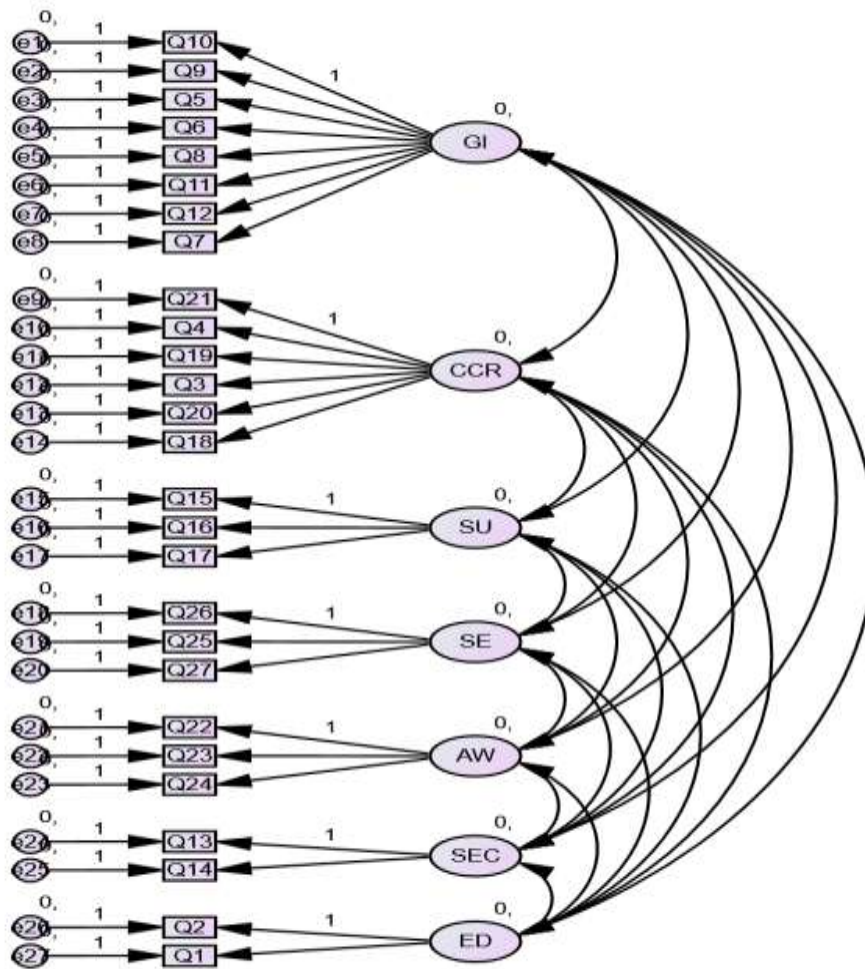
### Model Validity Measures

	CR	AVE	MSV	MaxR(H)	GI	CCR	SU	SE	AW	SEC	ED
GI	0.986	<b>0.901</b>	0.958	0.989	<b>0.949</b>						0.961***
CCR	0.993	<b>0.959</b>	0.987	0.995	0.951***	<b>0.979</b>					0.993***
SU	0.960	<b>0.890</b>	0.892	0.960	0.928***	0.934***	<b>0.943</b>				0.939***
SE	0.944	<b>0.850</b>	0.958	0.949	0.979***	0.942***	0.932***	<b>0.922</b>			0.950***
AW	0.940	<b>0.840</b>	0.931	0.946	0.964***	0.959***	0.944***	0.965***	<b>0.916</b>		0.963***
SEC	0.968	0.938	0.891	0.989	0.899***	0.921***	0.944***	0.897***	0.920***	<b>0.968</b>	0.921***
ED	0.998	0.995	0.987	0.998							<b>0.998</b>

Significance of Correlations:

- † p < 0.100
- \* p < 0.050
- \*\* p < 0.010
- \*\*\* p < 0.001

**Table 13: Model Validity Measures**



**Figure 3: Conceptual Model for sustainable development of Tourism after EFA**

The statistical analysis approach of data helps to frame above conceptual model using 27 constructs or statements and the procedure followed considering the help of various literatures helps to identify seven factors for sustainable development of tourism in the state of Chhattisgarh. Through EFA analysis seven factors are explored, using 27 constructs or statements: Government Initiative (GI), Stakeholder Enlightenment (SE), Social Upliftment (SU), Carrying Capacity Reduction (CCR), Awareness (AW), Strengthening Economy (SEC), and Ecological Degradation (ED)

### V. FINDINGS AND CONCLUSION

The synthesis of the literature review helps to identify the various attributes and parameters which influence the tourism and the socio economic development of the tourist destinations. In this paper the factors which influence the tourism in Chhattisgarh state in India has been identified using Exploratory Factor Analysis Approach considering the tourists perception about the tourist destination.

Through EFA analysis seven factors are explored, using 27 constructs or statements: Government Initiative (GI), Stakeholder Enlightenment (SE), Social Upliftment (SU), Carrying Capacity Reduction (CCR), Awareness (AW), Strengthening Economy (SEC), and Ecological Degradation (ED). These factors help in better understanding the impact of existing mechanism and the significant role of identified factors for sustainable development of tourism industry in the state.

Though this study it was found that the state is rich in natural as well as man-made pilgrimage destinations having huge scope of development. The tourist destinations like Gangrel Dam and others which are in the phase of development have to consider the identified factors during its planning development stage.

From implementation point of view, the findings of this research provide parameters and factors for the tourism developers and the state government for decision making. It can also be concluded that the support of local people of the



destination is very important for sustainable tourism. It has been found that the support from local people can be gained only if there is eco-balanced development considering socio-economic development as well through proper planning and development.

### FUTURE SCOPE

The factors identified though this paper can be used to develop sustainable development model through confirmatory analysis and sequential equation modelling approach and thus can be generalised as a tourism model for other states.

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