

Measuring Quality of Life (QoL) in Fringe Area with Large Scale Infrastructural Project- Mihan

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Abstract: *Special economic zone (SEZ) is a major activity which has started initialising recently. Large scale Industrial zones are planned by the government adjacent to the metropolitan cities in order to encourage development. Essentially large junk of lands are acquired for such projects. Predominantly agricultural land of private ownership are acquired by using legal tools and by paying minimum compensation. Also the villages in the project areas are shifted near to these large Industrial zones. The population of these villages undergo a series of changes, at economical, cultural, social and occupational levels. Besides this, the lack of skills (which are needed for sustaining in the industrialized area) also adversely affects the local population. This type of Industrialization also changes the social fabric of the country at macro and micro level in many ways. Typically, resulting into inferior quality of life for workers, and rapid degrading continuity with the past social fabric.*

Keywords: SEZ, Land acquisition, Quality of life

1. Introduction

Despite the huge rate of approval and establishment of Special Economic Zones (SEZs), and thus their apparent success, the development of SEZs has faced considerable opposition and in some cases the work is stalled. This resistance has arisen because of various controversial aspects regarding the establishment of SEZs. However, at the heart of the problem is the fact that the establishment of an SEZ generally requires the forced acquisition of land and the eviction of its previous users. This is possible for Indian states under the Land Acquisition Act of 1894 for “public purposes”. The invocation of “public purpose” for what are essentially private commercial ventures has been repeatedly questioned. At this level, the controversy centres on the grave inadequacy of packages of compensation, resettlement and rehabilitation. While state authorities are required to compensate previous owners for the value of land and dwellings, such compensation, even if paid in full, is woefully inadequate to the loss of land and non-land assets, the loss of livelihood opportunities and the disruption to traditional sustenance systems. Popular resistance to SEZs also contests the whole development model that replaces farming on fertile agricultural land with autonomous, private industrial enclaves that mostly just provide jobs for urban skilled and semi-skilled workers. SEZs are charged with being a concession to corporate, rather than popular interests. These SEZs however, are primarily sanctioned near to a major City thereby affecting the overall ecosystem of the region. Moreover, the nature and scale of industrialization has not been often witnessed by the local inhabitants. Thus, making the situation tricky for the administrators as well as the planners while actual implementation of the projects. This is primarily because of the uncertainty associated with the response of the local population to these projects. All in all the land use changes, especially in the peri-urban areas affect a large quantum of population (often adversely).

In view of the importance of industrialization it is necessary that the mega developmental projects be implemented with faster speed so that the socio-economic difference between

the different individuals of the population can be minimized. In view of the above, this study aims at examining the impact of Multi-modal International Cargo Hub and Airport at Nagpur (MIHAN an international cargo hub) on local residents, specifically in the peri-urban areas of Nagpur City (where the MIHAN is established).

Therefore this study was carried out to identify the key source of impact and to separately identify various impacts arising out of such kind of Urban Magnet i.e. MIHAN.

Hypotheses of the Study

“When any major Economic activity is suddenly initialized near the Existing major urban Center, then it adversely affects the Quality of life of the local inhabitants in the peri-urban Area.”

2. Research Methodology

The methodology used was first to design a research instrument i.e. Survey questionnaire.

Factor Analysis

A critical analysis of the various aspects related to the quality of life of people (the people living in the peri-urban area of the Nagpur city in this study) residing in the study area was carried out. For this study, a critical analysis of the literature was carried out to determine the different variables, which are considered as important aspects in the settings such as these, like sudden changes in lifestyle as a function of large scale industrial or other projects (like the one in this study i.e. MIHAN near Nagpur City). To find out the critical factors affected by this activity, the data was collected from the households of the study area and was subjected to Factor Analysis procedure. The Factor Analysis is an explorative analysis, which helps to *classify variables*. Therefore, factor analysis is applied as a data reduction or structure detection method. Since factor analysis is an explorative analysis it does not distinguish between independent and dependent variables. And hence, in this study the dependent and independent variables were identified by the researcher and were analysed separately

using Factor Analysis procedure. Factor Analysis reduces the information in a model by reducing the dimensions of the observations. This procedure was primarily used to simplify the data, for example reducing the number of variables in predictive regression models. If factor analysis is used for these purposes, most often factors are rotated after extraction. The results of factor analysis are used to

describe variability among observed variables in terms of fewer unobserved variables that are known as factors. The observed variables are modelled as linear combinations of the factors, plus "error" terms. The information gained about the interdependencies is used later to reduce the set of variables in a dataset.

Dependant Variables

1	Material comforts home, food, conveniences, financial security	1	Better financial security
2	Health - being physically fit and vigorous	2	Robust Health and personal safety
3	Relationships with parents, siblings & other relatives-communicating, visiting, helping	3	Cordial Relations with parents, siblings, other relatives
4	Close friends	4	Better Relations with Friends
5	Helping and encouraging others, volunteering, giving	5	Activities related to helping or encouraging others
6	Activities related to local and national government	6	Activities related to local and national government
7	Learning- attending school, improving understanding, getting additional knowledge	7	Personal development
8	Work - job or in home	8	Better Occupational Opportunities
9	Participating in organizations and public	9	Creativity and personal expression
10	Socializing - meeting other people, doing things, parties, etc	10	Improved Socialization
11	Reading, listening to music, or observing entertainment	11	Passive and observational recreational activities
12	Participating in active recreation	12	Active and participatory recreational activities

Independent Variables

1	Industrial activities in the vicinity of village	18	Agricultural activities
2	Infrastructure for education	19	Allied activities (dairy, cottage industry, etc.)
3	Social security	20	Government policies
4	Economic growth	21	Role of NGO's in solving different issues
5	Financial management	22	Cost of living
6	Family cohesion	23	Mode of transport
7	Compensation for land/house	24	Social harmony
8	Savings	25	Cultural change
9	Occupation	26	Ancestral assets and Infrastructure (Well/ fencing/tractor/cow/bullocks/bullock carts etc)
10	Adequacy of income	27	Emotional/Religious attachment with place
11	Legal disputes	28	Food Habits
12	Clarity of compensation	29	Occupational skills
13	Availability of water	30	Project benefit to displaced people
14	Quantity of the water	31	Real cost bared by displaced person
15	Source of water supply	32	Pressure on natural resources
16	Wastewater disposal	33	Economic Exploitation
17	Security	34	Resettlement

Data Generation

Prior to data analysis, the validity and reliability of the collected data was checked. **Validity of the research instrument**

The validity of a measure refers to the extent to which it measures what it intends to measure. Three different types of validity were considered:

- Content validity (content of the questionnaire was carefully selected from the literature published in the standard journals, which satisfied the content validity)
- Criterion-related validity (the criterion related validity was checked using co-relation coefficient method)
- Construct validity (the construct validity was determined by validation of the construct)

Reliability Estimation

Reliability is a measure of how consistent the results of using a survey questionnaire will be. By consistent we mean that respondents understand the true meaning of the question

as it is stated. Reliability of the instrument was assessed by using Cronbach's alpha coefficient determination, which allowed determining the repeatability of the instrument. The criterion suggested by Nunnally (1978) i.e. a coefficient value larger than 0.6 demonstrates the internal consistency was used. The results of this exercise showed that the reliability coefficient for both the scales i.e. Independent Variables and Dependent Variables was more than 0.800, which indicated that the developed scales are reliable. The total sample size was 230.

Reliability

Independent Variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.932	34

Table: Item Statistics (Independent Variables)

Independent Variables	Mean	SD	N
Industrial activities in the vicinity of village	4.2348	.80750	230
Infrastructure for education	3.8609	.80269	230
Social security	3.4087	.98367	230
Economic growth	3.7913	.69302	230
Financial management	3.9913	.69929	230
Family cohesion	3.7913	.87164	230
Compensation for land/house	3.4261	1.02851	230
Savings	4.0652	.98020	230
Occupation	3.4783	1.01816	230
Adequacy of income	3.3826	1.02869	230
Legal disputes	3.7565	.78291	230
Clarity of compensation	4.0522	.82899	230
Availability of water	3.8609	.85024	230
Quantity of the water	3.2174	1.36892	230
Source of water supply	3.8826	1.02337	230
Wastewater disposal	3.4826	.97888	230
Security	3.8391	.99133	230
Agricultural activities	3.6522	1.13340	230
Allied activities (dairy, cottage industry, etc.)	4.2391	.72343	230
Government policies	4.0565	.93982	230
Role of NGO's in solving different issues	3.8522	.95527	230
Cost of living	3.7348	.91284	230
Mode of transport	3.5174	.96992	230
Social harmony	3.6435	.80056	230
Cultural change	3.5826	1.02359	230
Ancestral assets and Infrastructure (Well/ fencing/tractor/cow/bullocks/bullock carts etc)	3.4043	.93779	230
Emotional/Religious attachment with place	3.9957	.87417	230
Food Habits	4.3000	.68770	230
Occupational skills	3.6435	1.06710	230
Project benefit to displaced people	3.4913	.80794	230
Real cost bared by displaced person	3.9783	.72054	230
Pressure on natural resources	2.9087	1.31016	230
Economic Exploitation	3.8391	.82284	230
Resettlement	3.6609	1.08894	230

Table: Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Industrial activities in the vicinity of village	122.7870	297.697	.641	.929
Infrastructure for education	123.1609	298.695	.609	.930
Social security	123.6130	297.548	.522	.930
Economic growth	123.2304	304.545	.463	.931
Financial management	123.0304	300.379	.633	.930
Family cohesion	123.2304	296.693	.625	.929
Compensation for land/house	123.5957	294.827	.576	.930
Savings	122.9565	296.749	.548	.930
Occupation	123.5435	291.612	.678	.929
Adequacy of income	123.6391	299.716	.434	.931
Legal disputes	123.2652	297.148	.684	.929
Clarity of compensation	122.9696	299.078	.574	.930
Availability of water	123.1609	299.053	.559	.930
Quantity of the water	123.8043	299.817	.307	.934
Source of water supply	123.1391	294.723	.582	.930
Wastewater disposal	123.5391	296.747	.549	.930
Security	123.1826	299.355	.463	.931
Agricultural activities	123.3696	294.706	.520	.931
Allied activities (dairy, cottage industry, etc.)	122.7826	304.145	.458	.931
Government policies	122.9652	301.029	.439	.931
Role of NGO's in solving different issues	123.1696	297.556	.539	.930
Cost of living	123.2870	299.419	.506	.931
Mode of transport	123.5043	292.932	.673	.929
Social harmony	123.3783	296.551	.690	.929
Cultural change	123.4391	298.867	.461	.931

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Ancestral assets and Infrastructure (Well/ fencing/ tractor/ cow/ bullocks/bullock carts etc)	123.6174	293.975	.664	.929
Emotional/Religious attachment with place	123.0261	301.860	.448	.931
Food Habits	122.7217	303.617	.506	.931
Occupational skills	123.3783	295.974	.520	.930
Project benefit to displaced people	123.5304	304.294	.400	.932
Real cost bared by displaced person	123.0435	301.509	.567	.930
Pressure on natural resources	124.1130	298.852	.346	.933
Economic Exploitation	123.1826	303.853	.408	.932
Resettlement	123.3609	295.655	.518	.931

Dependent Variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.874	12

Table: Item Statistics (Dependent Variables)

Dependent Variables	Mean	SD	N
Better financial security	4.0087	1.02796	230
Robust Health and personal safety	4.0913	.77933	230
Cordial Relations with parents, siblings, other relatives	3.8913	1.14511	230
Better Relations with Friends	3.8130	.73870	230
Activities related to helping or encouraging others	4.1478	.66403	230
Activities related to local and national government	3.8783	.83742	230
Personal development	4.0043	.71477	230
Better Occupational Opportunities	3.8435	.66202	230
Creativity and personal expression	4.2348	.80750	230
Improved Socialization	3.8609	.80269	230
Passive and observational recreational activities	3.4087	.98367	230
Active and participatory recreational activities	3.7913	.69302	230

Table: Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Better financial security	42.9652	33.230	.647	.858
Robust Health and personal safety	42.8826	36.768	.485	.868
Cordial Relations with parents, siblings, other relatives	43.0826	32.198	.650	.859
Better Relations with Friends	43.1609	36.572	.541	.865
Activities related to helping or encouraging others	42.8261	36.136	.674	.859
Activities related to local and national government	43.0957	34.986	.633	.859
Personal development	42.9696	35.523	.695	.857
Better Occupational Opportunities	43.1304	37.800	.457	.870
Creativity and personal expression	42.7391	35.539	.599	.862
Improved Socialization	43.1130	36.022	.549	.864
Passive and observational recreational activities	43.5652	34.972	.517	.868
Active and participatory recreational activities	43.1826	38.167	.386	.873

3. Factor Analysis

In this study factor analysis was carried out to represent a set of observed variables $X_1, X_2 \dots X_n$ in terms of, a number of 'common' factors plus a factor that is unique to each variable. The common factors (latent variables) are hypothetical variables which explain why a number of variables are correlated with each other, since they have one or more factors in common (Saravanan and Rao, 2008). Factor analysis is performed (for independent variables as well as dependent variables separately) to understand the degree/multitude of total variation in the recorded data. The results of the factor analysis are presented hereunder.

The factor analysis technique was adopted to summarize different variable's scores with a small number of factors without losing too much information. Before subjecting the data for factor analysis procedure, its multi co-linearity was checked by determining the correlation coefficients (r^2). The results showed that all the correlation coefficients (r^2) were less than 0.900, which confirmed the suitability of data for factor analysis. The factor analysis results are presented in following sections

Factor Analysis

a) Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

- Independent Variables
- Dependent Variables

b) Communalities

- Independent Variables
- Dependent Variables

c) Eigenvalues

d) Total Variance Explained

- Independent Variables
- Dependent Variables

e) Scree Plot

- Independent Variables
- Dependent Variables

f) Component Matrix

- Independent Variables
- Dependent Variables

g) Rotated Component Matrix

- Independent Variables
- Dependent Variables

h) Factor Naming

- Names of the factors – Independent Variables
- Names of the factors – Dependent Variables

i) Factor scores

j) Regression models

k) Model – 1: Improved financial security and Local Governance

l) Model – 2: Better Occupational Opportunities and Social Fabric

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

The sample sufficiency for Factor analysis was determined by calculating the KMO statistic. In the present investigation, the KMO statistics was found to be 0.800 (for independent variables) and .754 (for dependent variables), which indicated a sufficient number of samples (data adequacy) for Factor analysis (Kim and Mueller, 1978). Furthermore, for this data the Bartlett's test is highly significant ($P < 0.001$), and therefore indicated a suitability of data processing employing factor analysis procedure (Bartlett, 1950)

Table: KMO and Bartlett's Test – Independent Variables		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.800
Bartlett's Test of Sphericity	Approx. Chi-Square	14383.841
	df	561
	Sig.	0.000
Table : KMO and Bartlett's Test – Dependent Variables		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.754
Bartlett's Test of Sphericity	Approx. Chi-Square	1575.565
	df	66
	Sig.	.000

Communalities

Proportion of a variable's variance explained by a factor was calculated by determining the communalities. With the present data sets, the extraction communalities were found to be fairly high, indicating that the variables fit well with the factor solution. The results of the communalities statistics are presented in following Tables.

Table: Communalities – Independent Variables		
	Initial	Extraction
Industrial activities in the vicinity of village	1.000	.820
Infrastructure for education	1.000	.850
Social security	1.000	.932
Economic growth	1.000	.802
Financial management	1.000	.823
Family cohesion	1.000	.854
Compensation for land/house	1.000	.925
Savings	1.000	.910
Occupation	1.000	.912
Adequacy of income	1.000	.731
Legal disputes	1.000	.789
Clarity of compensation	1.000	.864
Availability of water	1.000	.786
Quantity of the water	1.000	.848
Source of water supply	1.000	.825
Wastewater disposal	1.000	.821
Security	1.000	.806
Agricultural activities	1.000	.903
Allied activities (dairy, cottage industry, etc.)	1.000	.768
Government policies	1.000	.844
Role of NGO's in solving different issues	1.000	.707
Cost of living	1.000	.859

Mode of transport	1.000	.949
Social harmony	1.000	.822
Cultural change	1.000	.915
Ancestral assets and Infrastructure (Well/ fencing/tractor/cow/bullocks/bullock carts etc)	1.000	.954
Emotional/Religious attachment with place	1.000	.807
Food Habits	1.000	.802
Occupational skills	1.000	.845
Project benefit to displaced people	1.000	.748
Real cost bared by displaced person	1.000	.877
Pressure on natural resources	1.000	.777
Economic Exploitation	1.000	.682
Resettlement	1.000	.909
Extraction Method: Principal Component Analysis.		

Table: Communalities – Dependent Variables		
	Initial	Extraction
Better financial security	1.000	.816
Robust Health and personal safety	1.000	.559
Cordial Relations with parents, siblings, other relatives	1.000	.726
Better Relations with Friends	1.000	.554
Activities related to helping or encouraging others	1.000	.765
Activities related to local and national government	1.000	.777
Personal development	1.000	.645
Better Occupational Opportunities	1.000	.842
Creativity and personal expression	1.000	.627
Improved Socialization	1.000	.725
Passive and observational recreational activities	1.000	.732
Active and participatory recreational activities	1.000	.476
Extraction Method: Principal Component Analysis.		

4. Eigen values

The Eigen values equal the sum of the column of squared loadings for each factor. They measure the amount of variation accounted for by a pattern. Dividing the Eigen values either by the number of variables or by the sum of h^2 values and multiplying by 100 determines the percent of either total or common variance, respectively. Following Tables lists the Eigen values associated with each linear component (factor) before and after extraction. Before extraction SPSS has identified a total of 34 linear components (as the total numbers of independent variables were 34) and 12 for the dependent variables. The Eigen values associated with each factor explains the variance explained by that particular linear component.

Since factor analysis is mainly used for data reduction, the minimum numbers of factors that explain more than 60% of variance (i.e. first four factors) were

selected. The total number of factors for extraction was based on Kaiser (1960, 1970) Eigen values rule and Cattell (1966) scree test. He suggested a rule for selecting a number of factors m less than the number needed for perfect reconstruction: set m equal to the number of Eigen values greater than 1. Several lines of thought lead to Kaiser's rule, but the simplest is that since an Eigen values is the amount of variance explained by one more factor, it doesn't make sense to add a factor that explains less variance than is contained in one variable. The scree test is based on a subjective examination of the plot of Eigen values for each successive factor, looking for an "elbow" in the plot. Cattell guidelines call for retaining those factors above the "elbow" and rejecting those below it. Hence, in the present study, based on Kaiser (1960, 1970) Eigen values rule and Cattell (1966) scree test, a limited number of factors i.e. four for independent variables and two for dependent variables were selected for extraction.

Table: Total Variance Explained – Independent Variables

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.377	33.463	33.463	11.377	33.463	33.463
2	4.901	14.415	47.878	4.901	14.415	47.878
3	2.765	8.133	56.011	2.765	8.133	56.011
4	2.235	6.575	62.586	2.235	6.575	62.586
5	2.063	6.067	68.653	2.063	6.067	68.653
6	1.556	4.575	73.228	1.556	4.575	73.228
7	1.376	4.048	77.276	1.376	4.048	77.276
8	1.189	3.498	80.775	1.189	3.498	80.775
9	1.000	2.942	83.716	1.000	2.942	83.716
10	.929	2.733	86.449			
11	.786	2.313	88.762			
12	.654	1.922	90.684			
13	.554	1.629	92.314			
14	.489	1.439	93.753			
15	.408	1.201	94.954			
16	.326	.959	95.912			
17	.302	.888	96.800			
18	.218	.642	97.442			
19	.201	.590	98.032			
20	.163	.480	98.513			
21	.115	.340	98.852			
22	.098	.289	99.141			
23	.084	.247	99.388			
24	.060	.178	99.565			
25	.040	.117	99.682			
26	.031	.090	99.773			
27	.024	.071	99.844			
28	.018	.053	99.897			
29	.017	.049	99.946			
30	.010	.029	99.975			
31	.008	.022	99.997			
32	.001	.002	99.999			
33	.000	.000	100.000			
34	5.259E-05	.000	100.000			

Table: Total Variance Explained – Dependent Variables

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.182	43.182	43.182	5.182	43.182	43.182
2	1.705	14.208	57.390	1.705	14.208	57.390
3	1.358	11.315	68.705	1.358	11.315	68.705

4	.789	6.571	75.276			
5	.775	6.456	81.732			
6	.510	4.251	85.983			
7	.437	3.640	89.623			
8	.395	3.291	92.914			
9	.363	3.028	95.942			
10	.214	1.785	97.727			
11	.167	1.392	99.119			
12	.106	.881	100.000			

Scree Plot

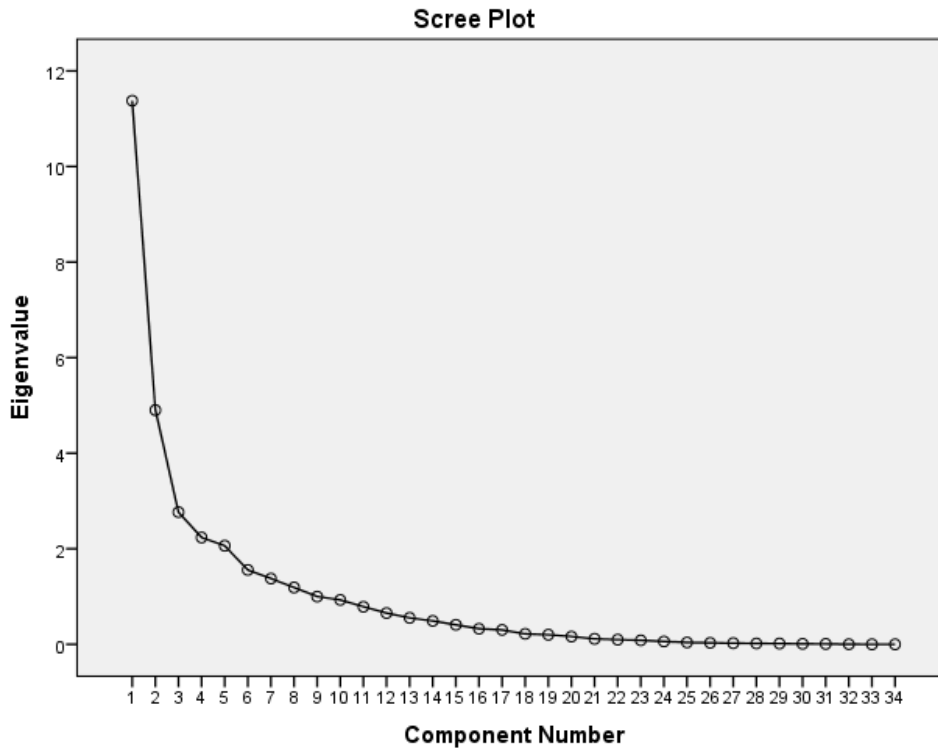


Fig.: Scree Plot – Independent Variables

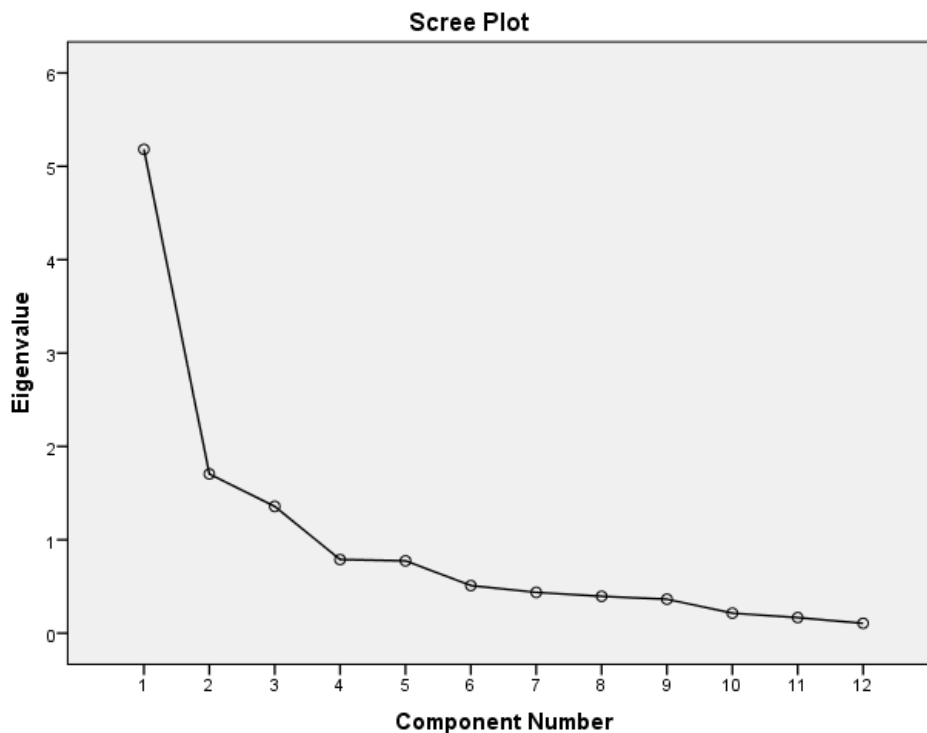


Fig.: Scree Plot – Dependent Variables

5. Component Matrix

Table: Component Matrix^a – Independent Variables									
	Component								
	1	2	3	4	5	6	7	8	9
Social harmony	.720								
Occupation	.711								
Legal disputes	.704								
Mode of transport	.701					.473			
Ancestral assets and Infrastructure (Well/ fencing/ tractor/ cow/bullocks/ bullock carts etc)	.698					.524			
Financial management	.692								
Industrial activities in the vicinity of village	.690								
Family cohesion	.686								
Infrastructure for education	.660								
Clarity of compensation	.628			.501					
Source of water supply	.628								
Savings	.621		.428					.423	
Real cost bared by displaced person	.610								
Role of NGO's in solving different issues	.602								
Availability of water	.581								
Cost of living	.574		.521						
Food Habits	.565			.476					
Emotional/Religious attachment with place	.509						.468		
Economic Exploitation	.475			.406					
Adequacy of income	.440		.437						
Compensation for land/house	.615	.657							
Wastewater disposal	.581	.655							
Social security	.562	.653							
Agricultural activities	.548	.639							
Government policies	.452	.637							
Security	.497	.585							
Resettlement	.540	.583							
Occupational skills	.542	.564		.405					
Pressure on natural resources		.554	.403						
Cultural change	.496	.544			.456				
Allied activities (dairy, cottage industry, etc.)	.478	.517							
Quantity of the water			.777						
Economic growth	.445		.513						
Project benefit to displaced people	.419		.434						
Extraction Method: Principal Component Analysis.									
a. 9 components extracted.									

Table: Rotated Component Matrix^a – Independent Variables									
	Component								
	1	2	3	4	5	6	7	8	9
Social security	.900								
Cultural change	.879								
Compensation for land/house	.870								
Wastewater disposal	.779								
Pressure on natural resources	.665								
Resettlement		.894							
Agricultural activities		.825							
Government policies		.814							
Occupational skills		.792							
Security		.721							
Allied activities (dairy, cottage industry, etc.)		.706							
Emotional/Religious attachment with place			.756						
Clarity of compensation			.673						
Food Habits			.671						
Role of NGO's in solving different issues			.648						
Quantity of the water				.835					
Adequacy of income				.725					
Economic growth				.594					
Social harmony				.519					

Financial management						.737				
Family cohesion						.683				
Infrastructure for education						.641				
Economic Exploitation						.505				
Source of water supply						.436	.415			
Project benefit to displaced people							.809			
Availability of water							.755			
Legal disputes							.550			
Ancestral assets and Infrastructure (Well/ fencing/tractor/cow/bullocks bullock carts etc)								.838		
Mode of transport								.806		
Occupation								.641		
Real cost bared by displaced person									.814	
Cost of living									.723	
Savings										.798
Industrial activities in the vicinity of village										.599
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.										
a. Rotation converged in 16 iterations.										

6. Factor Naming

After rotation (step in factor analysis) the results allow us in identifying meaningful factor names or descriptions. We can then name the factors subjectively, based on an inspection of their loadings. In common factor analysis the process of rotation is actually somewhat more abstract. Naming factors is a theoretical and inductive step, where the procedure usually considers three or four items with the highest loading on a particular factor, are selected and studied in relation to the prevailing concepts in the domain (sudden economic activity involving MIHAN project in this study) under investigation. A common theme representation by different elements (items) was assessed for all the factors to get deeper insight about each factor. While naming the factor, care was taken so as to have a simpler name for the factor, which was suggestive as to what dimension that factor represented. The factors are named as follows.

	Component		
	1	2	3
Personal development	.780		
Activities related to helping or encouraging others	.762		
Better financial security	.739		-.415
Cordial Relations with parents, siblings, other relatives	.723	-.447	
Activities related to local and national government	.715		
Creativity and personal expression	.657	-.433	
Better Relations with Friends	.625		
Improved Socialization	.611		.581
Passive and observational recreational activities	.596		.587
Robust Health and personal safety	.556		.446
Better Occupational Opportunities	.568	.711	
Active and participatory recreational activities	.478	.495	
Extraction Method: Principal Component Analysis.			
a. 3 components extracted.			

Table: Names of the factors – Independent Variables

Factor Name	Items
Cultural Economic and Environmental Sustainability	Social security and Family cohesion
	Cultural change
	Compensation for land/house
	Pressure on natural resources
	Emotional/Religious attachment with place
Satisfactory Resettlement and rehabilitation	Clarity of compensation
	Resettlement
	Legal disputes
	Exploitation of Land Value
	Government policies
Financial Growth and Economic Security	Role of NGO's in solving different issues
	Adequacy of income and Economic Growth
	Occupational skills and Allied activities (dairy, cottage industry, etc.)
	Project benefit to displaced people
Health and Infrastructural sustainability	Real cost bared by displaced person
	Infrastructure for education
	Ancestral assets and Infrastructure (Well/ fencing/tractor/cow/bullocks bullock carts etc)
	Source of water supply and Waste Disposal
	Food Habits and General Physical Health

	Component		
	1	2	3
Better financial security	.870		
Activities related to local and national government	.859		
Cordial Relations with parents, siblings, other relatives	.763		
Creativity and personal expression	.639		
Better Occupational Opportunities		.915	
Activities related to helping or encouraging others		.686	
Active and participatory recreational activities		.678	
Better Relations with Friends		.661	
Personal development		.585	
Improved Socialization			.816
Passive and observational recreational activities			.766
Robust Health and personal safety			.690
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 6 iterations.			

Table: Names of the factors – Dependent Variables

Factor Name	Items
Improved Financial security and Local Governance	Better financial security
	Activities related to local and national government
	Cordial Relations with parents, siblings, other relatives
	Creativity and personal expression
Better Occupational Opportunities and Social Fabric	Better Occupational Opportunities
	Activities related to helping or encouraging others
	Active and participatory recreational activities
	Better Relations with Friends
	Personal development

Factor scores

Subsequent to factor naming factor scores were determined. In this study the factor scores were calculated so that they can be used as variables in subsequent modelling using multiple regression analysis. Factor scores are the scores of each case (row) on each factor (column). To compute the factor score for a given case for a given factor, we have taken the case's standardized score on each variable, multiplied by the corresponding factor loading of the variable for the given factor, and summing it to get the products. These factor scores were then used as variable F1, F2, F3 and F4 (for independent variables) and F5 and F6 (for dependent variables) for performing multivariate analysis i.e. multiple regression analysis.

Regression models

Regression analysis is widely used for prediction and forecasting, where its use has substantial overlap with the field of machine learning. Regression analysis is also used to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships. In restricted circumstances, regression analysis can be used to infer causal relationships between the independent and dependent variables. On the basis of the factor analysis results, relationship of different clusters (Factor 1 to Factor 4) of independent variables with the dependent variables was evaluated. In order to check the predictability of the proposed model, multiple regression analysis was carried out by employing the aforementioned four factors as independent variables and dependent variables (Factors 5 and 6).

Regression Analysis Results

Table: Model – 1: Improved financial security and Local Governance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.748 ^a	.559	.552	.60256

a. Predictors: (Constant), Input-Factor-4, Input-Factor-1, Input-Factor-3, Input-Factor-2

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	103.737	4	25.934	71.427	.000 ^b
	Residual	81.694	225	0.363		
	Total	185.43	229			

a. Dependent Variable: Improved Financial security and Local Governance
 b. Predictors: (Constant), Input-Factor-4, Input-Factor-1, Input-Factor-3, Input-Factor-2

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.291	.271		1.074	.284
	Cultural Economic and Environmental Sustainability	.219	.238	.205	.920	.359
	Satisfactory Resettlement and rehabilitation	.462	.243	.439	1.898	.059
	Financial Growth and Economic Security	-.382	.310	-.276	-1.231	.220
	Health and Infrastructural sustainability	.561	.315	.409	1.782	.076

a. Dependent Variable: Improved Financial security and Local Governance

Model 1

Improved financial security and Local Governance = - 0.291+ (0.219 x Cultural Economic and Environmental Sustainability) + (0.462 x Satisfactory Resettlement and rehabilitation) + (-0.382x Financial Growth and Economic Security) + (0.561x Health and Infrastructural sustainability)

Table: Model – 2 - Better Occupational Opportunities and Social Fabric

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.721 ^a	.519	.511	.71921

a. Predictors: (Constant), Input-Factor-4, Input-Factor-1, Input-Factor-3, Input-Factor-2

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	125.703	4	31.426	60.754	.000 ^b
	Residual	116.384	225	.517		
	Total	242.087	229			

a. Dependent Variable: Output-Factor-2
 b. Predictors: (Constant), Input-Factor-4, Input-Factor-1, Input-Factor-3, Input-Factor-2

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.027	.324		.084	.933
	Cultural Economic and Environmental Sustainability	-.090	.284	-.074	-.316	.753
	Satisfactory Resettlement and rehabilitation	.780	.290	.649	2.687	.008
	Financial Growth and Economic Security	-.280	.370	-.177	-.756	.451
	Health and Infrastructural sustainability	.558	.376	.356	1.485	.139

a. Dependent Variable: Better Occupational Opportunities and Social Fabric

Model 2

Better Occupational Opportunities and Social Fabric = $0.027 + (-0.090 \times \text{Cultural Economic and Environmental Sustainability}) + (0.780 \times \text{Satisfactory Resettlement and rehabilitation}) + (-0.280 \times \text{Financial Growth and Economic Security}) + (0.558 \times \text{Health and Infrastructural sustainability})$

7. Conclusions

Conclusions drawn on the basis of the Factor Analysis

On the basis of the study results, the most important factors, which govern the Quality of Life of the people living in the peri-urban areas of Nagpur City, are as follows.

Cultural Economic and Environmental Sustainability

- Social security and Family cohesion
- Cultural change
- Compensation for land/house
- Pressure on natural resources
- Emotional/Religious attachment with place

Satisfactory Resettlement and rehabilitation

- Clarity of compensation
- Resettlement
- Legal disputes
- Exploitation of Land Value
- Government policies
- Role of NGO's in solving different issues

Financial Growth and Economic Security

- Adequacy of income and Economic Growth
- Occupational skills and Allied activities (dairy, cottage industry, etc)
- Project benefit to displaced people
- Real cost bared by displaced person

Health and Infrastructural sustainability

- Infrastructure for education
- Ancestral assets and Infrastructure (Well/ fencing/tractor/cow/bullocks bullock carts etc)
- Source of water supply and Waste Disposal
- Food Habits and General Physical Health

Most important indicators of improved Quality of Life of people living in the peri-urban area of Nagpur City are as follows

Improved Financial security and Local Governance

- Better financial security
- Activities related to local and national government
- Cordial Relations with parents, siblings, other relatives
- Creativity and personal expression

Better Occupational Opportunities and Social Fabric

- Better Occupational Opportunities
- Activities related to helping or encouraging others
- Active and participatory recreational activities
- Better Relations with Friends
- Personal development

The regression models indicate that there is positive relationship amongst the independent and dependent variables. The r^2 values are fairly high 0.559 and 0.519 for model 1 and mode 2 respectively. Moreover, the relationships are significant at $P < 0.001$ level. Overall, it is clear from the results that the independent parameters selected in this model have a noticeable influence on the dependent variables i.e. improved financial security/local governance (model 1) and better occupational opportunities and social fabric (model 2) of the local inhabitants.

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