

Neutrosophic statistical evaluation of migration with particular reference to Jaipur

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ABSTRACT. This paper is principally focused on the basic characteristics and various factors affecting the migration in Jaipur. By graphical representation we have tried to explain the main reason of migration. We tried to explain the independence between satisfaction level of migration & marital status of migrated persons using SPSS software also to test the independence between satisfaction level of migration and reason of migration using SPSS software. We use neutrosophic statistics, which is statistics with indeterminate data.

INTRODUCTION

Migration is the movement of people across a specified boundary for the purpose of establishing a new or semi-permanent residence. Migration from one area to another in search of important livelihood is a key feature of human history. Numerous studies show that the process of migration is influenced by social, cultural and economic factors and outcome can be vastly different for men and women, for different groups and different regions. The migrants respond primarily to economic incentives. People move from poorer area to wealthier area to improve their economic condition. Fewer studies have used neutrosophic statistics in their research, so we are among the first.

CAUSES OF MIGRATION

Push factors. are those that compel a person, due to different reasons, to leave that place or go to some other place for instance, low productivity, unemployment and underdevelopment.

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Exhaustion of natural resources and natural calamities may compel people to leave the native place in search of better economic opportunities.

. **Pull factors.** refer to those factors which attract the migrants to the area, such as, opportunities for better employment, higher wages, facilities, better working conditions and amenities etc. There is generally city ward migration, when rapid growth of industry, commerce and business takes place, migration from the country side to bears a close functional relation to the process of industrialization, technological advancement and other cultural changes which characterize the evaluation of modern society in almost all parts of world.

Objectives of the Survey.

- To Study the main reason & impact of migration in Jaipur city.
- To study the distance graph between native place & current place and well test the following Hypotheses:
- The independency between satisfaction level of migration and marital status of migrated persons.T
- The independency between satisfaction level of migration and male female ratio.

Data collection technique. We collect primary neutrosophic data with the help of questionnaire method that includes indeterminacy which is filled by the respondent itself. Questionnaire consists of 18 questions to collect the information from the migrated persons in different areas of Jaipur city. (A neutrosophic questionnaire with (t,i,f)-answers will be used in a future study.) We used multistage neutrosophic sampling to collect the data, based on migration. In this survey our universe (population) is Jaipur city. Firstly, we found the total wards in Jaipur i.e. 77. Now, at the first stage we used purposive neutrosophic sampling and classified our population into two groups, first group consists of zero migration or negligible migration & second group consists of those areas from the population which fulfill our objective of migration. By the prior information we get 39 wards in first group and 38 wards in second group. Now, keeping in view the objective of the survey we had selected the second group. Now, at the second stage we applied simple random sampling without replacement for selecting 4 wards out of 38 wards, and for the selection of 4 wards we used Lottery method. The wards are Sanganer, Malviya Nagar, Murlipura, Bapu Nagar. Now, at third stage we used acceptance sampling. We collected neutrosophic data of

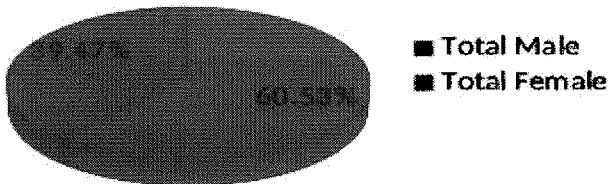
size 135 from each area. Thus, we got a sample of size 540.

Graphical Representation of Data.

1. Male Female Ratio:

Total Male	Total Female
322	210

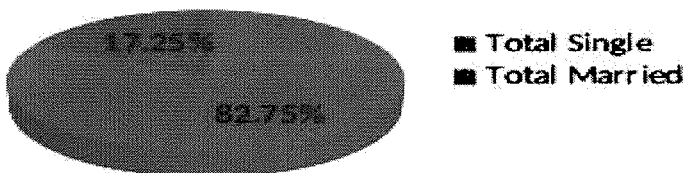
Migrate Male Female Ratio



2. Single Married Ratio:

Total Single	Total Married
422	118

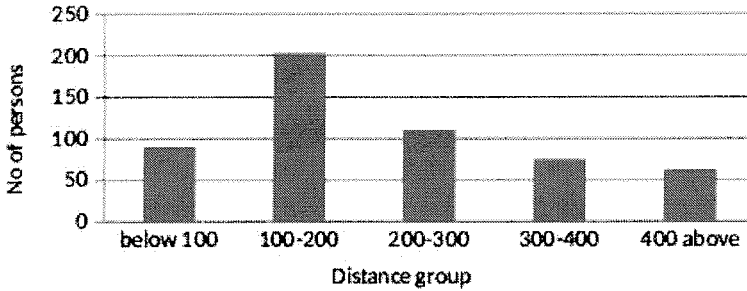
Migrate Single Married Ratio



3. Graph between native place and current place:

Distance group	No of persons
Below 100	90
100-200	203
200-300	110
300-400	75
400 above	62
Total	540

Graph Between native place and current place



Statistical test for association of migration neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction with different demographic variables, we used (X^2_{test}) Chi-square test, whether two attributes are independent or dependent to each other. This is one of the very important applications of Chi-square distribution. To apply this test, first we arranged frequencies in a contingency table. Test statistic is:

$$X^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where, O_i is observed frequency; E_i is expected frequency. We extend the Chi-square distribution to neutrosophic Chi-square distribution by taking the observed and expected frequencies as neutrosophic numbers of the form $N = a + bI$, where a is the determinate part of N , while bI is the indeterminate part of N .

1). To test the independence between neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction of migration and marital status of migrated persons

Null hypothesis, H_0 : The satisfaction level of migration is independent to marital status of migrated persons V_s .

Alternative Hypothesis, H_1 : The satisfaction level of migration is dependent to marital status of migrated person.

Now, from our data we get a 2*2 contingency table as follow:

Marital status	Satisfied	Not satisfied	Total
Single	310	81-82	391-392
Married	50	38	88
Total	360	120	479-480

By applying the SPSS, we got the following results:

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
MARITAL STATUS * Satisfaction level for migration	479-480	99-100.0 %	0	0.0%	479-480	99-100.0 %

MARITAL STATUS * Neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction for migration Cross tabulation					
		Neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction for migration			Total
		0	1		
MARITAL STATUS	0	Count	82	310	392
		Expected Count	98.0	294.0	392.0
	1	Count	38	50	88
		Expected Count	22.0	66.0	88.0
Total		Count	120	360	479-480

	Expected Count	120.0	360.0	480.0	
Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	18.998 ^a	1	.000		
Neutrosophic Chi-square	18.9-19	1	.000		

2). To test the independence between Neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction of migration and reason of migration.

Null hypothesis, H_0 : The Neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction of migration are independent to reason of migration.

Alternative Hypothesis, H_1 : The satisfaction level of migration are dependent to reason of migration.

Now, from our data we get a 3*2 contingency table as follow:

Reason	Satisfied	Not satisfied	Total
Study	235	76-77	311-312
Study & job	88	8	96
Service	37	35	72
Total	360	120	479-480

By apply the SPSS Statistics, we get the following results

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
REASON * Satisfaction level for migration	479-480	100.0%	0	0.0%	479-480	100.0%

REASON * Neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction for migration Cross tabulation			
	Satisfaction level for migration		Total
	0	1	

REASON	N	Count	77	235	312
		Expected Count	78.0	234.0	312.0
1	Count	8	88	96	
	Expected Count	24.0	72.0	96.0	
2	Count	34-35	37	71-72	
	Expected Count	18.0	54.0	72.0	
Total		Count	120	360	479.0-480
		Expected Count	120.0	360.0	479.0-480.0

Chi-Square Tests			
	Value	Df	Asymp.Sig.(2-sided)
Pearson Chi-Square	35.647 ^a	2	.000
Neutrosophic Chi-Square	34.997-35.779 ^a	1.92-2.02	.000-.020

Conclusion. From the above approximate graphical representation we have the following conclusion about data:

- According to neutrosophic data (i.e. data with unclear, vague or incomplete information) we conclude that the number of migrated male persons are greater than the number of migrate female persons in Jaipur city, because in Rajasthan, there is a considerable gap between male and female literacy rates. In most of the families, boys at home are given priority in terms of education, but girls are not treated in the same way. Right from the

beginning, parents do not consider the girls as earning members of their family, as after marriage they have to leave their parents home. So, their education is just considered as wastage of money as well as time. For this reason, parents prefer to send the boys to schools, but not girls.

- According to the neutrosophic data we conclude that the numbers of single migrated persons are greater than the number of married migrated persons in Jaipur city, because after marriage people want a stable life, so they do not move frequently.
- According to the neutrosophic chart (i.e. not exact) we conclude that maximum number of migrated persons in Jaipur is from 100 to 200 km from their native place, so it is very convenient for them to move.
- According to our neutrosophic survey we conclude that the neutrosophic degree of satisfaction/indeterminacy/nonsatisfaction is dependent to marital status of migrated persons, which shows that marital status affects their satisfaction level. Because, in regard to female candidates, marriage makes the migration convenient, but jobs and services are more difficult.

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