

Density of the Population in India during 1901 to 2011.

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Abstract

In this research paper the author has attempted to know the density of the population of India and its trend during years 1901 to 2011. For this purpose I have collected the data of population and density of population for above period. I applied regression analysis i.e. method of least square to find trend value in the time series of data of density of the population. The density of the population of India is rising at the speed of 2.7 % during the decade period. R^2 is 87 % and p value is less than 0.005.

Key words: Population, Density of the population, Regression Analysis ,trend

1.Introduction

In this research paper the author has tried to know the density of the population of India during the year 1901-2011 and its trend. For this purpose I have collected the data of the population and the area of India for the period 1901-2011. I have calculated the density of population by dividing the total population by total land area (excluding water and glaciers) of India in square kilometre for every decade. In this way the density of population is found out for period of last 12 decades. I applied regression analysis i.e. method of least squares to find the trend in it.

2.Methodology

In this research paper the author have collected census data from .INDIA 2017

A REFERENCE ANNUAL Compiled by NEW MEDIA WIN PUBLICATIONS DIVISION ,PUBLICATIONS DIVISION ,MINISTRY OF INFORMATION AND BROADCASTING for the 1901 to 2011 and worked out density of the population per square km during these years. I have applied regression analysis to find trend value in the time series of population density data.

3.Objectives

- To know the density of population during 1901 to 2011.
- To compare the density of population of India with other countries in Asia
- To form housing policy, town planning
- To avoid concentration of population

4.Hypothesis:

Ho; There is no change in density of the population of India.

H1: There is some change in density of the population of India.

5.Statistical technique ; Regression Analysis(Method of Least Square)

6. India;

“INDIA is the cradle of the human race, the birthplace of human speech, the mother of history, the grandmother of legend and the great grandmother of tradition. Our most valuable and most instructive materials in the history of man are treasured up in India only.”—Mark Twain India has a unique culture and is one of the oldest and greatest civilizations of the world. It stretches from the snow-capped Himalayas in the north to sun drenched coastal villages of the south and the humid tropical forests on the south-west coast, from the fertile Brahmaputra valley on its east to the Thar desert in the west. It covers an area of 32,87,263 sq. km.¹ It has achieved all-round socioeconomic progress during the last 66 years of its Independence. India is the seventh largest country in the world and ranks second in population. The country stands apart from the rest of Asia, marked off as it is by mountains and the sea, which give her a distinct geographical entity.

Bounded by the Great Himalayas in the north, it stretches southwards and at the Tropic of Cancer tapers off into the Indian Ocean between the Bay of Bengal on the east and the Arabian Sea on the west. Lying entirely in the northern hemisphere, the mainland extends between latitudes 8°4' and 37°6' north, longitudes 68°7' and 97°25' east and measures about 3,214 km from north to south between the extreme latitudes and about 2,933 km from east to west between the extreme longitudes. It has a land frontier of about 15,200 km. The total length of the coastline of the mainland, Lakshadweep Islands and Andaman and Nicobar Islands is 7,516.6 km.

7.Census

The Census of India 2001, was historic and epoch making, being the first census of the twenty-first century and the third millennium. It reveals benchmark data on the state of abundant human resources available in the country, their demography, culture and economic structure at a juncture, which marks a centennial and millennial transition. Census 2011 was the 15th census of its kind since 1872.

It was held in two phases:

1. House listing and Housing Census (April to September, 2010) and
2. Population Enumeration (February 9th to 28th 2011 with Revisional round during 1st to 5th March, 2011).

Reference Date was 0.00 hour of March 1st, 2011. In snow bound areas, the Population Enumeration was conducted from September 11th to 30th, 2010. The Final Population data was released on April 30th, 2013. The general trends of census 2011 are being mentioned as under:

- Population: Persons-1,210.9 million; Males=623.3 million; and Females-587.6 million.
- Density of Population 2001-2011: density in 2001=325 and density in 2011=382, difference being 17.5 per cent (density is defined as the number of persons/sq. km.)
- Gender composition of Population 2011: Overall sex ratio at the national level has increased by 7 points since census 2001 to reach 943 at census 2011. This is the highest sex ratio recorded since census 1991.
- As per the census 2011, literates constituted 73.0 per cent of the total population aged seven and above and illiterates formed 27.0 per cent. Literacy rate has gone up from 64.8 per cent in 2001 to 73.0 per cent showing an increase of 8.2 percentage points. It is encouraging to note that out of a total of 202,951,015 literates added during the decade, females 104,721,109 outnumber males 98,229,906.

8. Population

The population of India as on March 1, 2011 stood at 1,210.9 million (623.2 million males and 587.5 million females). India accounts for a meagre 2.4 per cent of the world surface area of 135.79 million sq.km. Yet, it supports and sustains a whopping per cent of the world population. The population of India, which at the turn of the twentieth century was around 238.4 million, increased to reach 1,210.9 million by 2011. The population of India as recorded at each decennial census from 1901 has grown steadily except for a decrease during 1911-21. Population Density

One of the important indices of population concentration is the density of population. It is defined as the number of persons per sq.km. The population density of India in 2011 was 382 per sq. km-decadal growth 17.72 per cent. The density of population increased in all states and union territories between 1991 and 2011. Among major states, Bihar is the most thickly populated state with (a population density of) 1,106 persons per sq.km followed by West Bengal 1,028 and Kerala 860.

9. Population density (in agriculture: standing stock and standing crop) is a measurement of population per unit area or unit volume; it is a quantity of type number density. It is frequently applied to living organisms, and most of the time to humans. It is a key geographical term.

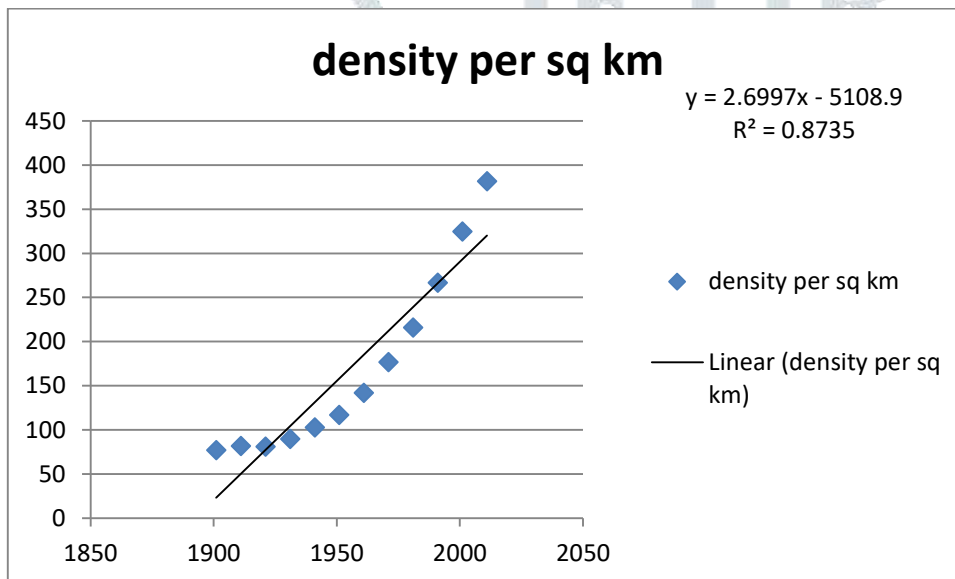
For humans, **population density** is the number of people per unit of area, usually quoted per square kilometre or square mile (which may include or exclude, for example, areas of water or glaciers).

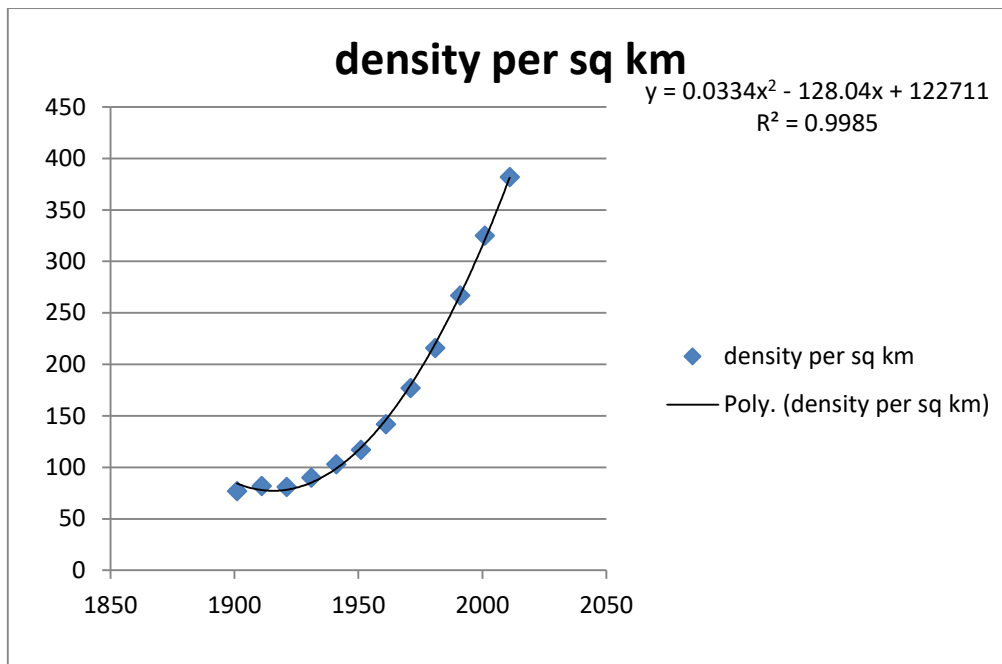
Table -1

Census year	density per sq km	Absolute Increase	% age Increase	Linear Trend
1901	77	-	-	22.80
1911	82	5	6.5	49.79
1921	81	-1	-1.2	76.78

1931	90	9	11.1	103.77
1941	103	13	14.4	130.76
1951	117	14	13.6	157.75
1961	142	25	21.4	184.74
1971	177	35	24.6	211.73
1981	216	39	22	238.72
1991	267	51	23.6	265.71
2001	325	58	21.7	292.70
2011	382	57	17.5	319.69

(.INDIA 2017, A REFERENCE ANNUAL)





SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.934629
R Square	0.873531
Adjusted R Square	0.860884
Standard Error	38.84445
Observations	12

ANOVA

	df	SS	MS	Significance F	
				F	F
Regression	1	104220	104220	69.07057	8.42E-06
Residual	10	15088.91	1508.891		
Total	11	119308.9			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-5108.93	635.4735	-8.03957	1.13E-05	-6524.86	-3693.01	-6524.86	-3693.01
Census year	2.69965	0.324834	8.310871	8.42E-06	1.975876	3.423425	1.975876	3.423425

Conclusion:

Linear Trend $Y = 2.699X - 5108.93$

$R^2 = 0.87$, P value < 0.05

Polynomial trend $Y = 0.033x^2 - 128.0x + 12271$

$R^2 = 0.998$

Reject H_0 .

Density of the population of India is rising at the rate of 2.7 % per decade during 1901 to 2011

At this rate the projected density of population of India for the year 2111 is 589.50

References:

- INDIA 2017, A REFERENCE ANNUAL

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- From Wikipedia, the free encyclopedia.
- Jump up**^ "*World Population Prospects*".
- Jump up**^ Current Special Administrative Region (SAR) of the People's Republic of China (PRC). Former Portuguese colony.
- Jump up**^ Calculated based on average growth since last census
- Jump up**^ Kosovo is the subject of a territorial dispute between the Republic of Kosovo and the Republic of Serbia. The Republic of Kosovo unilaterally declared independence on 17 February 2008, but Serbia continues to claim it as part of its own sovereign territory. The two governments began to normalise relations in 2013, as part of the Brussels Agreement. Kosovo has received formal recognition as an independent state from 111 out of 193 United Nations member states.
- Jump up**^ Partially recognized state, claimed by the People's Republic of China as one of its provinces.

Table 1.3 : Ranking of states by density 2001-2011

Rank in 2011	States/Union Territory*	Density		Rank in 2001
		2011	2001	
1	2	3	4	5
	India	382	325	-
1.	NCT of Delhi*	11320	9340	1
2.	Chandigarh*	9528	7900	2
3.	Puducherry*	2547	2034	3
4.	Daman and Diu*	2191	1413	4
5.	Lakshadweep*	2149	1895	5
6.	Bihar	1102	881	6
7.	West Bengal	1028	903	7
8.	Kerala	860	819	8
9.	Uttar Pradesh	829	690	9
10.	Dadra and Nagar Haveli*	700	449	10
11.	Haryana	573	478	11
12.	Tamil Nadu	555	480	12
13.	Punjab	551	484	13
14.	Jharkhand	414	338	14
15.	Assam	398	340	15
16.	Goa	394	364	16
17.	Maharashtra	365	315	17
18.	Tripura	350	305	18
19.	Karnataka	319	276	19
20.	Gujarat	308	258	20
21.	Andhra Pradesh	308	277	21
22.	Odisha	270	236	22
23.	Madhya Pradesh	236	196	23
24.	Rajasthan	200	165	24
25.	Chhattisgarh	189	154	25
26.	Uttarakhand	189	159	26
27.	Meghalaya	132	103	27
28.	Himachal Pradesh	123	109	28
29.	Nagaland	119	120	29
30.	Manipur	128	103	30
31.	Sikkim	86	76	31
32.	Jammu and Kashmir	124	100	32
33.	Mizoram	52	42	33
34.	Andaman and Nicobar Islands*	46	43	34
35.	Arunachal Pradesh	17	13	35

Table 1.4 : Distribution of Population, Sex Ratio, Density and Decadal Growth rate of Population: 2011

Sl. No.	India/State/ Union Territory*	Total Population Persons	Males	Females	Sex Ratio- (Females per 100	Density (Per sq. km)	Decadal growth rate
1	2	3	4	5	6	7	8
	India	1,21,08,54,977	62,32,70,258	58,75,84,719	942	382	17.72
1.	Jammu and Kashmir	1,25,41,302	66,40,862	59,00,640	889	124	23.71
2.	Himachal Pradesh	68,64,602	34,81,873	33,82,729	972	123	12.81
3.	Punjab	2,77,43,338	1,46,39,465	1,31,03,873	895	550	13.73
4.	Chandigarh*	10,55,450	5,80,663	4,74,787	818	9,252	17.10
5.	Uttarakhand	1,00,86,202	51,37,773	48,48,519	963	189	19.17
6.	Haryana	2,53,51,462	1,34,94,734	1,18,56,728	879	573	19.90
7.	NCT of Delhi*	1,67,87,941	89,87,326	78,00,615	866	11,297	20.96
8.	Rajasthan	6,85,48,437	3,55,90,997	3,29,57,440	928	201	21.44
9.	Uttar Pradesh	19,98,12,341	10,44,80,510	9,53,31,831	912	828	20.09
10.	Bihar	10,40,99,452	5,42,78,157	4,98,21,295	918	1,102	25.07
11.	Sikkim	6,10,577	3,23,070	2,87,507	890	86	12.36
12.	Arunachal Pradesh	13,83,727	7,13,912	6,69,815	938	17	25.92
13.	Nagaland	19,78,502	10,24,707	9,53,851	971	119	-04.47
14.	Manipur	28,55,794	14,38,586	14,17,208	985	128	24.50
15.	Mizoram	10,97,206	5,55,339	5,41,867	976	52	22.78
16.	Tripura	36,73,917	18,74,376	17,99,541	960	350	14.75
17.	Meghalaya	29,66,889	14,91,832	14,75,057	989	132	27.82
18.	Assam	3,12,05,576	1,59,30,443	1,52,66,133	958	307	16.93
19.	West Bengal	9,12,76,115	4,68,09,027	4,44,67,088	950	1,029	13.93
20.	Jharkhand	3,29,88,134	1,69,30,315	1,60,57,819	948	434	22.34
21.	Odisha	4,19,74,218	2,12,12,156	2,07,62,062	970	269	13.97
22.	Chhattisgarh	2,55,45,198	1,28,32,895	1,27,12,303	991	188	22.58
23.	Madhya Pradesh	7,26,26,809	3,76,12,306	3,50,14,503	931	236	20.30
24.	Gujarat	6,04,39,692	3,14,91,260	2,89,48,432	919	308	19.17
25.	Daman and Diu*	2,43,247	1,50,301	92,946	618	2,169	33.54
26.	Delhi and Nagar Haveli*	3,43,709	1,93,760	1,49,949	774	698	55.50
27.	Maharashtra	11,21,74,333	5,82,43,056	5,41,31,277	929	365	15.99
28.	Andhra Pradesh	8,45,80,777	4,24,42,146	4,21,38,631	993	398	11.10
29.	Karnataka	6,10,95,207	3,09,66,657	3,01,28,640	973	319	15.67
30.	Goa	14,38,545	7,39,140	7,19,405	973	394	8.17
31.	Lakshadweep*	64,473	33,123	31,350	946	2,013	6.23
32.	Kerala	3,34,06,061	1,60,27,412	1,73,78,649	1,084	859	4.86
33.	Tamil Nadu	7,21,47,000	3,61,37,975	3,60,09,025	996	555	15.60
34.	Puducherry*	12,47,993	6,12,511	6,35,442	1,037	2,598	27.72
35.	Andaman and Nicobar Islands*	3,80,581	2,02,871	1,77,710	876	46	6.68



Sex Ratio

Sex ratio, defined as the number of females per thousand males is an important social indicator to measure the extent of prevailing equality between males and females in a society at a given point of time. The sex ratio in the country has always remained unfavourable to females. It was 972 at the beginning of the twentieth century and thereafter showed continuous decline until 1941. The sex ratio from 1901- 2011 has registered a 10 point increase at census 2011 over 2001; however, child sex ratio has declined to 919 per thousand male.

Table 1.5 : Sex Ratio : 1901-2011

Census Year	Sex Ratio (Females per 1,000 males)
1901	972
1911	964
1921	955
1931	950
1941	945
1951	946
1961	941
1971	930
1981	934
1991	927
2001	933
2011	943

Census Year	Sex Ratio
2001	972
2011	964
2021	955
2031	950
2041	945
2051	946
2061	941
2071	930
2081	934
2091	927
2001	933
2011	943

References:

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