Impact of Population Growth Rate on Literacy Rate and Contraceptive Use in Districts of West Bengal

Prepared by

NEHA KHATUN AFSAR MIDDA

A Student of Economics Honours of

MAHARAJADHIRAJ UDAY CHAND WOMEN'S COLLEGE, BURDWAN

To

THE UNIVERSITY OF BURDWAN

(For BSc Semester VI Honours Examination)

College Roll no- 393, University Roll No- 180311000033

Registration No-201801005040 of 2018-2019

Course Name- Field Survey and Project Report

Course code- CC14

Under the supervision of

DR. HIRANYA LAHIRI

Assistant Professor,

Department Of Economics,

MAHARAJADHIRAJ UDAY CHAND WOMEN'S COLLEGE, BURDWAN

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1.INTRODUCTION

> " The raging monster upon the land is population growth . In its presence , sustainability is but a fragile theoretical concept ."
>
> -   E . O . Wilson

The rate at which the number of individuals in a population in a given time period is the population growth rate. India is the second most populated country with current population growth rate of 2021 is 1,393,409,038 . Among all 28 states and 8 union territories Uttar Pradesh has the highest population 199,812,341 and lowest population in Lakshadweep with 64,473 according to the census 2011.

 Our topic is based on West Bengal, the population growth rate according to the census 2011 is 9.13 crores that is 13.84% with total males 46,809,027 and total females 44,467,088. The total Rural population growth rate of West Bengal is 7.68% and total Urban population growth rate of West Bengal is 29.72% . In India among all the States , West Bengal is one of the most populous state. District wise North Twentyfour Parganas has highest population growth rate 10,009,781 and Dakshin Dinajpur has lowest population growth rate 1,676,276 in West Bengal. As the growth of population grows it needs all its basic necessities like, land , water , food , sanitation , health care, etc. With the rise in population growth rate the basis necessities may also affected like it affects the quality of life of women as west bengal is one of the most populous state of the country.

As the population growth rate rises , unemployment also rises as well. Growth of population increases and it reduces the income , savings , and investments as this capital formation is retarded . Due to growth of population, people are unable to get a job that is job opportunities are reduced . Again this increase of unemployment leads to migration of people from one place to another to get better job opportunities . It may be International that is

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migration of people across the countries of the world and Internal is the migration of people . within the national boundary of a country . People are migrating from Rural to Urban, Rural to Rural, Urban to Urban, or Urban to Rural and because of such migration population growth rate is also affected. Among all the district of West Bengal Murshidabad accounts for the most migration of people.

Literacy and education is considered as one of the key indicator of human resource development, literacy could be considered both cause and effect of development .

Literacy also provides better employment prospects and gives a higher Socio – economics status . In west bengal as per the census 2011, west bengal ranks 20th amongst the case of literacy rate in India . The literacy rate of West Bengal is 78.26% . As per 2001 the total male literacy rate is 82.67% while total female literacy rate is 71.16% , among all districts of west bengal two distinct with highest literacy rate Purba Medinipur and kolkata with 87.66% and 87.14% on the other hand two distinct with lowest literacy rate are North Dinajpur and Malda with 60.13% and 62.71% according to the census 2011. Countries with highest literacy rate usually have high GDP per capita income and countries with lowest literacy rate have low GDP and because of less assess to education , children's often have to work to help the family .

The purpose of education and literacy is to establish a non-violence, non-exploitative social and economic order according to Mahatma Gandhi. An old proverb says that a mam without education is a best without its horns and tail . Literacy is very important. Increase of literacy rate leads to a decrease of population growth rate .

India was the first country in the world to launch a National Programme for Family Planning in 1952. The survey figures we got from NFHS- 3 (2005-06) and DLHS-3 (2007-08), which are being used for describingcurrent family planning situation in India. Contraceptive use among married women (aged 15-49 years) was 56.3% in (NHFS, DLHS AND AHS) NFHS-3 (an increase of 8.1 percentage points from NFHS-2) while corresponding increase between DLHS-2 & 3 isrelatively lesser (from 52.5% to54.0%). The proximate determinants of fertility like, age at marriage and age at first childbirth (which are societal preferences) are also showing good

improvementat the national level. We got the data of Change in Contraceptive Prevalence where,DLHS-1 is 69%, DLHS-2 is 74%, DLHS-3 is 72% and DLHS-4 is also 74%.

West Bengal is one of the most densely populated State, it produces 5.7% of domestic output on the Gross State Domestic Product (GSDP) . According to RBI's data west bengals per capita income was Rs. 67300 . West Bengal's primary sector (Agricultural sector) economy was 21% and the secondary sector (Industrial sector) economy was 25% in 2018-2019. The primary sector growth rate was higher during the 1989s . The unorganised industries contributed the major share of output and employment of the total industrial sector or secondary sector in west bengal . By the size of the economy in terms of GSDP west bengal ranked sixth among Indian states in 2011- 2012 . Rapid growth of population in poor countries would divert scarce capital away from saving and investment , thereby placing a drag on economic development.

At the most basic level , population growth increase the total size of the economy including the demand for labour . More people buying or purchasing the goods and services so that the economy grows to meet that demand . The effect of growth of population can be both positive as well as negative it depends on the circumstances . Limited resources and a large number of people means more mouth to feed , as population growth rate raising it is rising with highest birth rates and lowest death rates due to improved medical science

2. <u>MOTIVATION</u>

The planet and it's resources cannot support continuous population growth. If the rights of women and girls are realized the health and prosperity of individuals, families and the earth. Population growth is one of the major problem across the world, it not only affect the quality of life but also affect the employment, economy, literacy, environment, etc. As the growth of population increases the human demand for resources like land, water, food, trees, energy,etc also increases. But in this developing world the status of women's is improving day by day in many aspects such as gender based violence, genital mutilation, forced postitution, child marriage, etc.

We cannot stop the growth of population but we can take some important measures to control it. As the increase of rapid birth rate are mainly responsible for population growth. So, there are several measures we can adopt to reduce the birth rate such as minimum age of marriage, rising the status of women, spread of education, adoption, change in social outlook, social security, etc. In India population control comes under the ministry of Family and health welfare, with family planning services provided through the free health delivery system. The main strategy continues to persuade people on an individual basis to accept the small family norms by a wide range of advertising and educational efforts.

Population growth also has some positive effects on society. These include benefits such as expansion of tax bases and increased consumer spending of local business, as well as benefits drived from innovations by cultures seeking to keep up with population. A large population also provides a large domestic market for the economy.

The question is why we need to study population ? Not only India but the whole world is densely populated and we need to study it to know it's advantages and disadvantages. In today's date population education is very important as the growth of population rising day by day and the resources decreasing, we need to take some initiatives to control it as we cannot stop it. We can control it by giving knowledge about population situations, make people aware of population and teaching methods of its management. Population studies are concerned with the size, composition, and distribution of population. The government is taking important measures in the field of health, education, housing, social security, employment, and environmental preservation. The government are concerned with its size, it's structure and characteristics, it's distribution and the changes taking place due to the interaction of fertility, mortality and migration.

The knowledge of population makes people aware of population related issues. Population is a continuous and dynamic process, it gives knowledge about the population situation. It also brings the behavioural changes in their lives and doing so, it makes the people more responsible towards solving population- related problems. Thus, there is an improvement in the quality of their lives.

3. LITERATURE REVIEW

World wide the growth of population has a great positive as well as negative effect on Literacy, Economic Development, Unemployment, Environment,etc. There are large number of studies on population growth and it's aspects. Malthus (1798), in " An Essay on the Principles of Population" was concerned and according to Malthus, the population growth would undo itself through its rising pressure on natural resources like, land, water, forest, and thereby declining the productivity of such resources and rising incidence of poverty, population, mortality, etc. Chattopadhyay , studied on growth of population by decade 1880 , in three Sundarbans old districts Khulna and Backarganj, Bangladesh and 24-Parganas (including Calcutta). Chacraverti, has analysed the population growth in the year 1911 with growth rate per annum. Ahmad (1982), examined the inter district inequalities in literacy of tribal population of Bihar. Kundu and Rao (1982), made a comparative study of the nature and pattern on on or inequality in literacy among different segments of population at the state level . Jjoshi (1990), in his study of "Poverty, Inequality and the Social Structure" he argued that poverty and population growth has Affected the economic growth and development of the state of Meghalaya, also Banerjee (1994), In the paper " Demographic Profile of Meghalaya", Banerjee argued that the rapid growth in world population and it's effect on food production and more particularly the food supply poses a sever threat to mankind. In India rising growth of population is the root cause of poverty and unemployment. He further Argued that due to high rate of population growth (over 2% per year), the pattern of Economic growth could not be improved and also the living conditions of the people. Ehrlich (1968), Meadows et al (1972), Ehrlich and Ehrlich (1990) , in " Population Explosion", who were of the opinion that the world would be falling short of natural resources after some time if population continues to grow. Das and Bandyopadhay , studied on population growth in 15 selected blocks of Indian Sundarban area. They have measured the growth rate between 1991 and 2001. Maurya (1991), using population geography he tries to study the demographic Sceneries of rural India of the "Demographer Profile of Rural India" . Sen in his study " Population and Research: Food, Fertility and Economic Development", that the growth of population is the cause of Several problems such as it intensifies food problem, reduces the quality of life of the People and also reduces the happiness of the human race Sen (1994). Julian Simon (1981, 1996), Simon and Myers (1994), in their study of " Scarcity or Abundance" they

concluded that the population growth is not a danger, but a benefit. According to them, the world is not at a shortage of resources. Rather, population in many ways helps the economic development and better management of resources through their effort and improving knowledge, innovation, etc. Chandana R.C , according to his study it is the systematic revive of population studies. He touches all the aspects and components related to the population studies.Chaubey and Chaubey (1998) development a methodology to analyze the iteracy among different segments of population Based on 1981 and 1991 census data . Goodstein . E.S (1999), according the study of " Economics and Environment" Goodstein argued that the poor has a tendency to have more Children and spent very less on birth control for their future security. So, the population growth and family size is rapid in many underdeveloped and developing countries. " Demography and Population Problems", by Sharma R.K (2004), gives ideas shout distribution of population factors which affects the distribution and also the various problems occurred in the field of population studying. Mohammad (2005), he gives information about various factors of population in a systematic manner. The book " Population Geography" is the whole herded contribution in the of population geography. " Principle of Population Studies" gives ideas of various components of population studies. He through light on the focus of population studies . Bendre Asha and Kantikar Tara (2006). Patil S.A., Dr. Gatade D.G.(2006), In the paper "Spatio-Temporal changes in the growth Of population of the Kolhapur district". They studied the decade growth of population in the Year 1981-91 and 1991-2001 for the Kolhapur district. Patil V.D (2007), in his dissertation he co- related the cropping pattern and it's effects on the society and environment. It is systematic study with all reliable data. In support of his study he gives various futures for the fruifullers of the problem. Dusane Y.B (2009), in the present dissertation he gives his emphasis on river interlinking and phad system of the study region. He also throw light on physical as well as Socio – Economic personality of the study area. Thakare Dipali (2009), in this discussion she study the Distribution and Density, Growth of Population, Social Structure and Literacy, Sex Ratio of the Dhule tehsil. Sangwan Randhir Singh, Sangwan Shesh (2009), their present study has endeavoured, therefore to find out the Rural- Urban differentials in sex ratio in India and to explain their trends from 1901 to 2001. All the relevant data meant for the purpose have obtained from various publication of the Census of India. According to Kalikar Ambarish,

Bhitar Sanjiv (2010), the present paper focused on population projections are necessary for setting employment targets for manpower planning, for supply of food and services of various types for producing input to agriculture and industry. It gives an indication to the planners as to how the economy is to be adjusted according to the economy. Cholke S.P, Chaudhari C.B (2011), the study of population growth is most important and needful aspect in population geography as the concept of population growth or change refers to change to the growth of the human population in a particular area during a specific period of time it gives us a general idea of the development of the region and socio- economic characteristics of the region. Nikam S.R (2011), in his paper the author throws light on population scenario of various state in India. He also study the density natural growth, sex ratio and birth rate of various states in India. He concluded that there is need defined programme for the population problem. Roy Piyal Basu and Das Sukanta (2011), in their study of " Population Growth, Socio- economy and Quality of life of Birbhum district", they study attempts the decadal variation of population growth, Socio- economic condition and quality of life of the people in birbhum district, west bengal. Vilcea Ionan Christiana (2011), in the paper "The Characteristics of the Evolution Regarding the Population Growth in the land of Severin" according to her paper it is important to have an insight on the trends of population growth on decline in the past, which should be correlated with political, historical and Social events. She throws light to anticipate the danger of disappearing and social economic problems generated by aging of the population or by the amplification of the phenomenon to more attractive areas. Rathod H.B (2012) according to his paper, "A Study of Growth and Density of Population in Udgir Tehsil", the aim of his paper is to study the density of population, the density of agricultural of the udgir tehsil. Mitra K.C (2012), in his study of Population Geography, in his book he throws light on various aspects of population studies. His book is like a light house to the field of population studies. Khadke V.V, Kadam N. B (2012), in his paper " Disparity in Literacy Rate in Marathwada (M .S)",it is an important element for transformation of Social, economic and political development in India today. It is a critical stage of demographic evolution, badly stand in need of an accelerated place to literacy transition which alone can serve the causes of continuing the menace of growing population.

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World wide many authors and scholars have given various principles, ideas, and merits as well as demerits of population growth and it's aspects and components. The authors and scholars given the principles, or ideas to make us understand the causes and consequences of population phenomenon, it enables the individual to understand how does population situation affect the individual and society.

4.OBJECTIVE

The study of Population growth rate on literacy rate and contraceptive use is based on the secondary data . We will show the district wise data of population growth, literacy rate and contraceptive use of west bangal. In the study we will see the impact of population growth, literacy rate and contraceptive use among the nineteen districts of west bangal. The main objective of this study is to see the impact of population growth rate on literacy rate and contraceptive use.

Using different district wise data we will show their mean, median, mode, and skewness, We will show the interrelation and the impact of population growth rate on literacy rate and contraceptive use, using Multiple Linear Regression Model.

5.METHODOLOGY

The present study is based on the secondary data that has been collected from the census of India 2011 . Due to present pandemic situation we are unable to do the proper field survey . So we have to rely on the secondary data.

In the present research, we have used different secondary data collected from the Census of India. In this paper we have used the district wise data on Population growth, literacy rate and contraceptive use . We have collect the data on population and literacy rate of West Bengal from census 2011 and contraceptive use from DLHS- 3.

Using the collected data, this study is thoroughly analyzed with the help of descriptive statistics, bar diagram and pie chart. We will use the multiple linear regression models in this study, to examine the data, used in the research, are statistically significant or not.

In our study we have seen that many authors and scholars have given various methodologies and studies on Population growth rate and it's components. Joshi (1990) and Banerjee (1994), have studied about the effect of population growth in Meghalaya. Julian Simon (1981, 1996), Simon and Myers (1994), Kalikar Ambarish, Bhitar Sanjiv (2010) and Cholke S.P, Chaudhari C.B (2011), they gave the idea of positive of population growth on economic development. Maurya R.D (1991), Mohammad (2005),and Mitra K.C (2012) have studied about the population geography. Chottopadhyay (1880), Chacraverti (1911), Das and Bandyopadhay (1991), they studied about the district wise decadal growth of population of Sundarban while Roy Piyal Basu and Das Sukanta (2011), studied about the decadal variation of population growth oBirbhum district.

6.<u>RESULT AND DISCUSSION</u>

In the study we have considered the different cases of population growth rate and their distribution among all the districts of west bengal.

1. **<u>Table-1 Population by residence – Persons</u>**

District code	District	Population 2011		
		total	Rural	Urban
1	Darjeeling	1842034	1123859	718175
2	Jalpaiguri	3869675	2825001	1044674
3	Koch Bihar	2822780	2533480	289300

4	Uttar Dinajpur	3000849	2638662	362187
5	Dakshin Dinajpur	167093	1434856	236075
6	Malda	3997970	3446056	551914
7	Murshidabad	7102430	5697224	1405206
8	Birbhum	3502387	3054019	448368
9	Bardhaman	7723663	4644079	3079584
10	Nadia	5168488	3730897	1437591
11	North Twentyfour Parganas	10082852	4275724	5807128
12	Hugli	5520389	3388395	2131994
13	Bankura	3596292	3295613	300679
14	Purulia	2927965	2554584	373381
15	Howrah	4841638	1776970	3064668
16	Kolkata	4486679	0	4486679
17	South Twentyfour Parganas	8153176	6065179	2087997
18	Paschim Medinipur	5943300	5228308	714992
19	Purba Medinipur	5094238	4500770	593468
Total	west bengal	91347736	62213676	29134060

Source: Census of India 2011

Figure-1
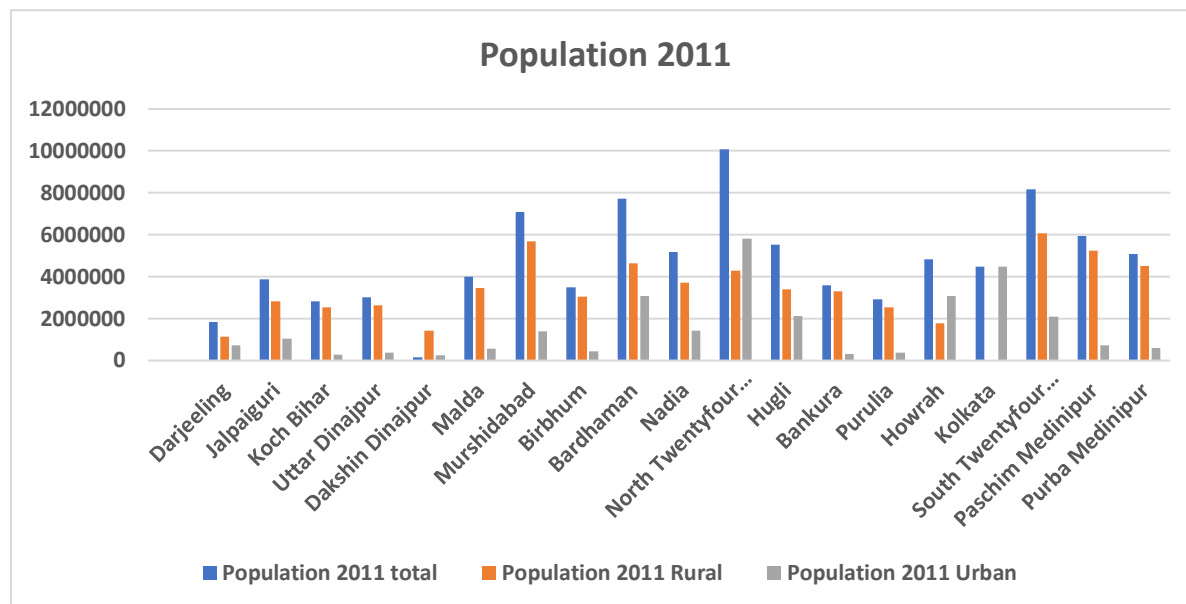
In the above table we have shown the Population Growth of 2011 by persons , in which we see that the total population of rural areas is 62213676 in which South Twentyfour Parganas ranks 1st and Kolkata ranks last in population while the total population of urban areas is 29134060 in which North Twentyfour Parganas ranks 1st and Dakshin Dinajpur ranks last. So, from the information given in the table we can conclude that the population growth rate is higher in rural areas than in the urban areas.

From the data given in the table we have calculated the mean, median, mode and skewness.we have calculated the Mean = 6064785.1, Median= 3072126, Mode = 4486679, Skewness =5.04871111 of Population Growth by Residence 2011 .
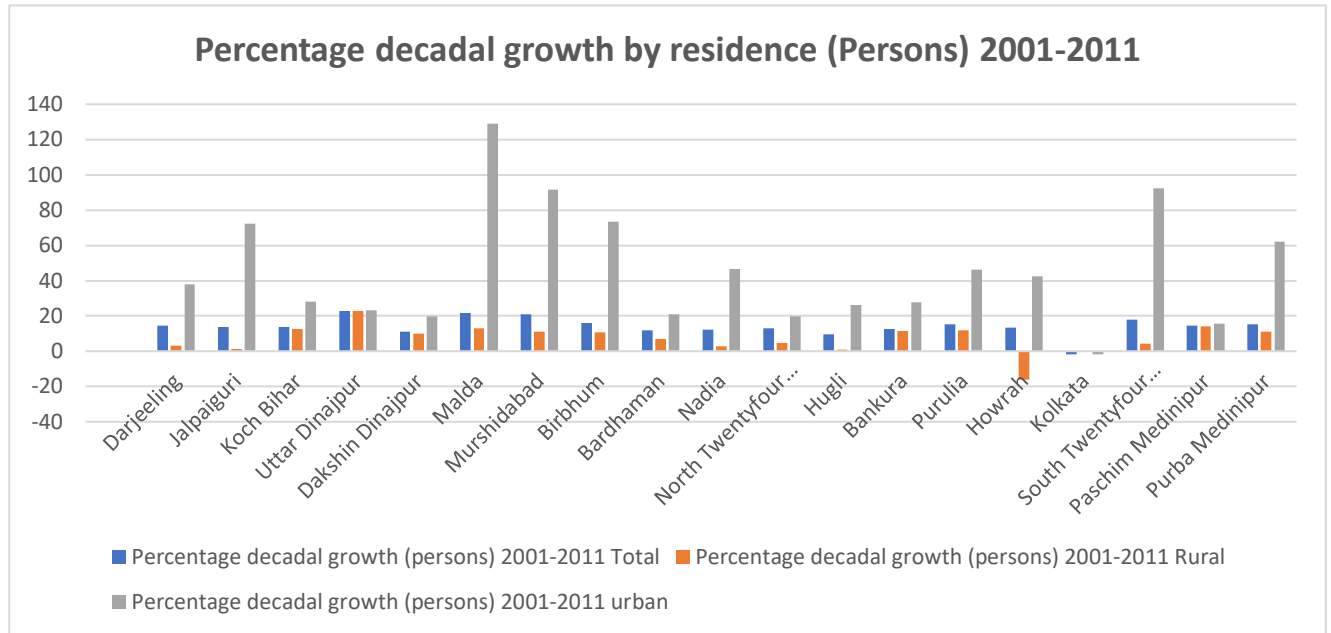
2. Table-2 Percentage decadal growth rate by residence – Persons

District code	District	Percentage decadal growth (persons) 2001-2011		
		Total	Rural	Urban

1	Darjeeling	14.47	3.23	38
2	Jalpaiguri	13.77	1.1	72.14
3	Koch Bihar	13.86	12.42	28.23
4	Uttar Dinajpur	22.9	22.88	23.01
5	Dakshin Dinajpur	11.16	9.84	19.92
6	Malda	21.5	13	129.07
7	Murshidabad	21.07	10.97	91.78
8	Birbhum	16.15	10.77	73.5
9	Bardhaman	12.01	6.8	20.91
10	Nadia	12.24	2.91	46.76
11	North Twentyfour Parganas	12.86	4.71	19.71
12	Hugli	9.49	1.02	26.32
13	Bankura	12.64	11.43	27.81
14	Purulia	15.43	11.99	46.18
15	Howrah	13.31	-16.22	42.41
16	Kolkata	-1.88	0	-1.88
17	South Twentyfour Parganas	18.05	4.2	92.23
18	Paschim Medinipur	14.44	14.26	15.74
19	Purba Medinipur	15.32	11.1	62.09
Total	west bengal	15.99	7.73	29.9

Source: Census of India 2011

Figure-2

Percentage decadal growth by residence (Persons) 2001-2011

Legend:
- Percentage decadal growth (persons) 2001-2011 Total
- Percentage decadal growth (persons) 2001-2011 Rural
- Percentage decadal growth (persons) 2001-2011 urban

In the above table we have taken the district wise data of Percentage decadal growth rate by residence of 2001-2011 . In the table we can see the Percentage decadal growth of west bengal 2001-2011, in rural 22.88 % in. Uttar Dinajpur has the highest population of 2001-2011 while in urban areas 129.07% in Malda has the highest population on the other hand Howrah ranks last with -16.22% in rural areas and Kolkata with -1.88% in urban areas. The total Percentage decadal growth of west bengal, the population in urban areas is much higher than the rural areas.

From the data given in the table we have calculated the mean, median, mode and skewness.we have calculated the Mean = 22.2125, Median= 14.35, Mode = -1.88, Skewness = 2.253475736 of Percentage Decadal Growth by Residence in Persons 2001-2011 .

Literacy rate

Literacy is very important and every person has a right to education. Literacy let's us to make sense of the world. In study we have taken Literacy Rate of west bengal and it's distribution among the 19 districts.

3. <u>Table-3 Literacy Rate By Persons- 2011</u>

District	Literates (Persons)-2011		
	Total	Rural	Urban
Darjeeling	1328218	752287	575931
Jalpaiguri	2527018	1752822	774196
Koch Bihar	1879984	1643723	236261
Uttar Dinajpur	1521933	1262730	259203
Dakshin Dinajpur	1102355	906370	195985
Malda	2136898	1771627	365271
Murshidabad	4134584	3254627	879957
Birbhum	2175923	1846090	329833
Bardhaman	5350197	3048014	2302183

Nadia	3524073	2386942	1137131
North Twentyfour Parganas	77988722	2973608	4825114
Hugli	4140487	2421002	1719485
Bankura	2264013	2028958	235055
Purulia	1656940	1404686	252254
Howrah	3642617	1277133	2365504
Kolkata	3648210	NA	3648210
South Twentyfour Parganas	5639112	4065797	1573315
Paschim Medinipur	4173522	3606955	566567
Purba Medinipur	3959750	3494836	47491
west bengal	62614556	39898187	22716369

Source: Census of India 2011

Figure-3

Literates (Persons)-2011 Urban   Literates (Persons)-2011 Rural   Literates (Persons)-2011 Total
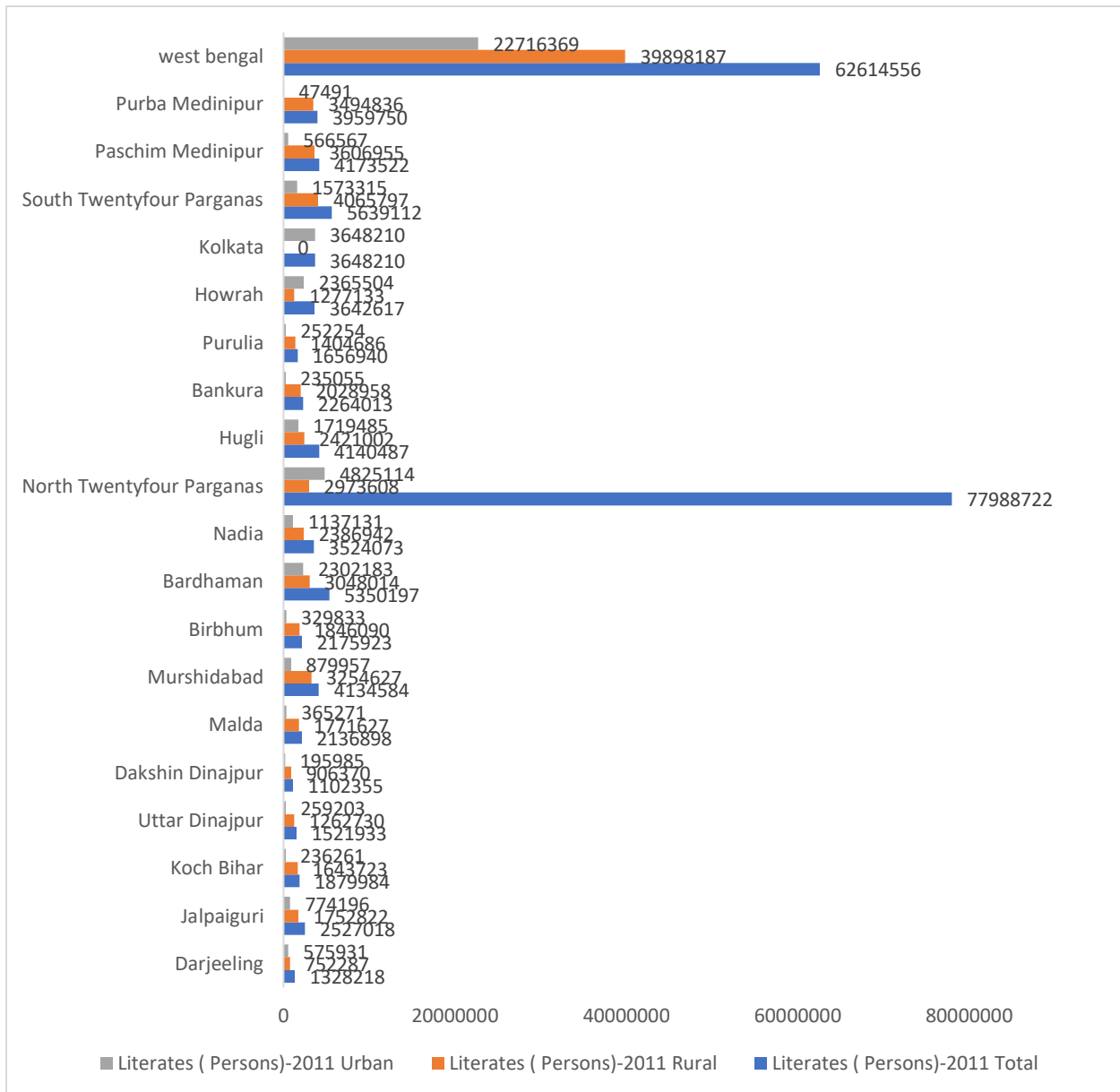
The literacy rate of literates 2011, we can observe from the above table that the literates in rural areas is greater than the urban areas. In rural areas South Twentyfour Parganas has highest rate 4065797 and in urban areas North Twentyfour Parganas has highest rate of literates in 2011 4825114 and has lowest rate in Purba Medinipur 47491.

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Using the data given in the above table we have calculated the mean, median, mode and skewness of Literacy Rate by Persons 2011. In which we got the Mean= 5427302.051, Median=2028958, Mode = 3648210 and Skewness= 4.339593238.

4. Table- 4 Literacy Rate by Residence- Persons 2001 and 2011

District code	District	Literacy rate by residence - Persons					
		Total Persons 2001	Rural Persons 2001	Urban Persons 2001	Total Persons 2011	Rural Persons 2011	Urban Persons 2011
1	Darjeeling	71.79	66	83.34	79.92	74.97	87.48
2	Jalpaiguri	62.85	58.93	80.02	73.79	70.55	82.33
3	Koch Bihar	66.3	64.27	85.18	75.44	73.87	84.01
4	Uttar Dinajpur	47.89	42.86	80.5	60.13	57.15	80.65
5	Dakshin Dinajpur	63.59	60.38	83.28	73.86	71.18	84.42
6	Malda	50.28	47.76	79.28	61.71	60.42	76.82
7	Murshidabad	54.35	52.28	68.34	67.53	66.17	72.65
8	Birbhum	61.48	29.88	77.65	70.9	69.25	81.74
9	Bardhaman	70.18	65.83	77.39	77.15	73.39	82.75
10	Nadia	66.14	61.82	81.41	5.58	71.5	85.88
11	North 24 Parganas	78.07	64.07	85.19	87.95	78.11	84.8
12	Hugli	75.11	71.02	82.95	82.55	79.22	87.75
13	Bankura	63.44	62.04	80.22	70.95	69.6	85.23
14	Purulia	55.57	53.24	75.4	65.38	63.75	76.24

15	Howrah	77.1	72.81	81.02	83.85	80.82	78.98
16	Kolkata	80.86	-	80.86	87.14	-	87.14
17	South 24 Parganas	69.45	67.4	79.84	78.57	76.78	83.62
18	Paschim Medinipur	70.41	68.71	82.43	79.04	77.92	87.01
19	Purba Medinipur	80.16	79.83	83.79	87.66	81.47	89.14
Total	West Bengal	68.64	63.42	81.25	77.08	72.97	85.54

Source: Census of India 2011

Figure-4

In the above table we have shown the District wise Literacy Rate by Residence-Persons of 2001 and 2011, from this we can compare the difference in Literacy Rate from 2001 to 2011. So we can clearly observe the difference and can say that the literacy rate has been increased from 68.64 in 2001 to 77.08 in 2011. Literacy rate of Purba Medinipur is highest in 2001 in rural areas and it has also been increased in 2011 from 79.83 to 81.47. In urban areas Koch Bihar has highest rate in 2001 but decreased in 2011 from 85.18 to 84.01 .

We have calculated the total Mean, Median, Mode and Skewness of 2001 and 2011 from the above table and we got the Mean= 72.66949153, Median= 75.42, Mode= 80.86, and Skewness= -1.927781881.we have found it seperately as well, Mean= 69.32571429, Median= 70.295, Mode=80.86, Skewness=-0.894091431 of 2001 . And Mean= 75.78321429, Median= 78.015, Mode=87.14, Skewness=-03.362415495 in 2011

Contraceptive use

Use of Contraception is very important as the population growth is rising day by day. Contraceptive methods plays an important role in controlling the population growth.

5. Table- 5 Contraceptive Prevalence Rate by District 2012-2013

District	Any mehod	Any modern method	Male sterilization	Female sterilization	IUD	Pill
Darjiling	68.5	55.5	0.2	28.6	1.1	18.4
Jalpaiguri	78	65.9	4.2	35.1	0.2	17.2
Koch Bihar	76.4	58.6	0.5	33.6	0.2	17.4
Uttar Dinajpur	62.9	42.7	0.1	22.1	0.2	15.2
Dakshin Dinajpur	72.9	57.5	0.2	32	0.5	19.8
Maldah	68.4	52.9	0	20.7	0.1	23.4
Murshidabad	67.9	51.1	0	32.3	0.3	13.6
Birbhum	69	63.2	0.3	39.6	0.6	19.9
Barddhaman	76.9	65.6	0.2	46.3	0.3	14.2
Nadia	64.7	49.7	0.1	28.1	0.8	14.9
North Twentyfour Parganas	62.2	46.2	0.4	20.2	0.6	18.8
Hugli	68.2	57.3	0.6	39.3	0.7	11.2
Bankura	76.3	68.5	0.3	46.2	0.5	16.1
Puruliya	72.8	60	0.1	42.5	0.8	10
Pachim Medinipur	79.4	68.4	0.6	39.1	0.2	20.1
Haora	73.1	58.1	0.3	31.8	0.5	15.3
Kolkata	66.7	50.9	0.1	19.5	1.3	18.3
South Twentyfour Parganas	73.8	59.8	0	20.2	0.7	33.4
Purab Medinipur	79.4	60.5	0	29.2	0.5	25.5

DLHS-3	71.81	58.8	0.5	33.8	0.5	18.2
DLHS-4	72	53.4	0.5	35	0.7	13.4

District	Condom/ Nirodh	rhythm method	Withdrawal method	Others	Number of women
Darjiling	6.8	4.5	7.6	1	1,145
Jalpaiguri	9.1	6.3	5.7	0.1	1,168
Koch Bihar	6.9	5.7	11.6	0.4	1,112
Uttar Dinajpur	4.7	4.1	15.5	0.6	1,262
Dakshin Dinajpur	4.9	7.7	6.5	1.3	1,235
Maldah	8.3	8	5.7	1.8	1,160
Murshidabad	4.7	6.6	9.7	0.6	1,180
Birbhum	2.9	3.7	1.7	0.4	1,213
Barddhaman	4.3	2.1	8.7	0.6	1,532
Nadia	5.7	10.6	3.9	0.6	1,663
North Twentyfour Parganas	6.1	8.3	6.9	0.8	1,105
Hugli	5.5	2.5	8.3	0.1	1,312
Bankura	5.4	2.3	5.2	0.3	1,288
Puruliya	6.5	2.7	8.7	1.3	1,312
Pachim Medinipur	8.3	5	6	0.1	1,194
Haora	9.9	4.3	9.7	1	1,084
Kolkata	11.4	7.8	7.6	0.5	909
South Twentyfour Parganas	5.4	4.9	9	0.1	1,280

Purab Medinipur	5.1	13.1	5	0.8	1,272
DLHS-4	5.6	5.6	6.9	0.6	23426
DLHS-3	3.4	12.6	5.5	0	20542

Source: District Level Household Survey-4

 Figure-5

Contraceptive Prevalence Rate by District 2012-2013

Legend: Any mehod, Any modern method, Male sterilization, Female sterilization, IUD, Pill, Condom/ Nirodh, rhythm method, Withdrawal method, Others, Number of women
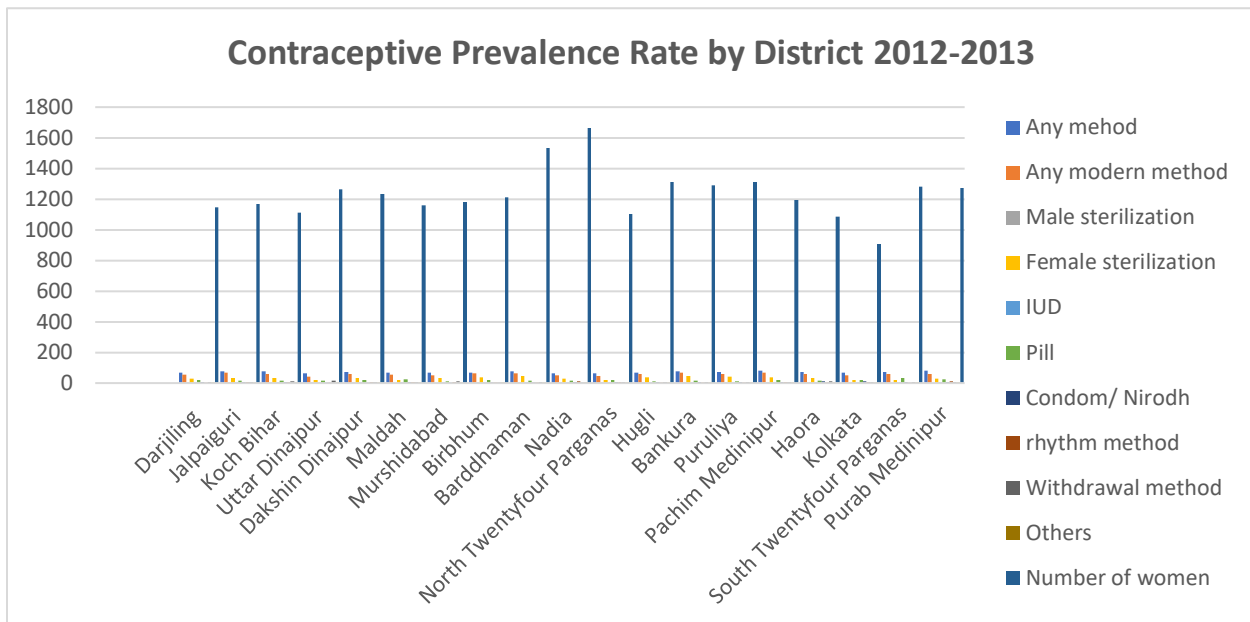
In the above tables we collected the data of different contraceptive methods , we used these data's we have seen the rates of using contraceptive Prevalence Rate among the 19 districts of west bengal. The contraceptive methods methods we have computed the rates from DLHS-3.

From the above date given in the table we can observe that the among all Contraceptive methods, Any Method is most popular and it is highest in Purba Mmedinipur with 79.4 and lowest in North Twentyfour Parganas with 62.2, and less popular in Male Sterilization Method in which Jalpaiguri has highest rate with 4.2 and Malda, Murshidabad, South Twentyfour Parganas and Purba Medinipur has lowest with 0 rate, according to DLHS-3 and DLHS-4.

We have calculated the Mean, Median, Mode and Skewness from the above table and the Mean= 130.2909091, Median= 9, Mode= 0.1, and Skewness= 2.945362457.

Regression analysis

District	Percentage of population growth by residencee - 2011 (Y)	Percentage of total literacy rate by residence-2011 (X1)	Percentage of contraceptive use of any method - 2012-2013 (X2)
Darjeeling	14.47	79.92	68.5
Jalpaiguri	13.77	73.79	78
Koch Bihar	13.86	75.49	76.4
Uttar Dinajpur	22.9	60.13	62.9
Dakshin Dinajpur	11.16	73.86	72.9
Malda	21.5	62.71	68.4
Murshidabad	21.07	67.53	67.9
Birbhum	16.15	70.9	69
Bardhaman	12.01	77.15	76.9
Nadia	12.24	75.58	64.7
North Twentyfour Parganas	12.86	84.95	62.2
Hugli	9.49	82.55	68.2
Bankura	12.64	70.95	76.3
Purulia	15.43	65.38	72.8
Howrah	13.31	83.85	79.4
Kolkata	-1.88	87.14	73.1
South Twentyfour Parganas	18.05	78.57	66.7
Paschim Medinipur	14.44	79.04	73.8

Purba Medinipur	15.32	87.66	79.4

Here, we have taken the above table for Regression analysis, in which we have Percentage of population growth (Y) our dependent variable and Percentage of total literacy rate (X1) , Percentage of Contraceptive use of any method (X2) as our independence variables. In this we will see the impact of population growth on literacy rate and contraceptive use.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.677684898
R Square.	0.459256822
Adjusted R Square	0.391663924
Standard Error	4.117307116
Observations	19

ANOVA

	df	SS	MS	F	Significance F
Regression	2	230.3621243	115.1811	6.794454	0.007310185
Residual	16	271.2354862	16.95222		
Total	18	501.5976105			

	coefficients	Standard error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	54.13311972	14.03671822	3.856537	0.001396	24.37660638	83.88963306
(X1)	-0.418799186	0.126643634	-3.30691	0.004454	-0.687271697	-0.15032667
(X2)	-0.116288785	0.185927338	-0.62545	0.540493	-0.510437133	0.277859563

From the above table of regression we have done our regression on population growth rate on literacy rate and contraceptive use, and we got the values as needed.

$$Ŷ = α + β̂1X1 + β̂2X2$$

The above table gives the overall goodness-of-fit measures:

$R^2 = 0.45925$

Correlation between y and y-hat is 0.67768 (when squared gives 0.45925).

Adjusted $R^2 = R^2 - (1-R^2)*(k-1)/(n-k) = 0.39166$.

The standard error here refers to the estimated standard deviation of the error term u.

It is sometimes called the standard error of the regression. It equals sqrt(SSE/(n-k)).

It is not to be confused with the standard error of y itself (from descriptive statistics) or with the standard errors of the regression coefficients given below.

$R^2 = 0.45925$ means that 45.924% of the variation of y_i around ybar (its mean) is explained by the regressors $X1$ and $X2$.

The ANOVA (analysis of variance) table splits the sum of squares into its components.

Total sums of squares
= Residual (or error) sum of squares + Regression (or explained) sum of squares.Thus $\Sigma_i (y_i - ybar)^2 = \Sigma_i (y_i - yhat_i)^2 + \Sigma_i (yhat_i - ybar)^2$
where $yhat_i$ is the value of y_i predicted from the regression lineand ybar is the sample mean of y.

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For example:

$R^2 = 1$ - Residual SS / Total SS   (general formula for R^2)

   = 0.0.4592   (which equals R^2 given in the regression Statistics table).

The column labeled F gives the overall F-test of H0: β1= 0 and β2 = 0 versus Ha: at least one of β1 and β2 does not equal zero.

Aside: Excel computes F this as:

F = [Regression SS/(k-1)] / [Residual SS/(n-k)] = 6.7944.

The column labeled significance F has the associated P-value.

Since 0.007310185 < 0.05, we reject H0 at signficance level 0.05.

The regression output of the following table of coefficients and associated output:

	df	SS	MS	F	Significance F
Regression	2	230.3621243	115.1811	6.794454	0.007310185
Residual	16	271.2354862	16.95222		
Total	18	501.5976105			

Let βi denote the population coefficient of the ith regressor (intercept, X1 and X2).Then,

- Column "**Coefficient**" gives the least squares estimates of βi.
- Column "**Standard error**" gives the standard errors (i.e.the estimated standard deviation) of the least squares estimates bi of βi.
- Column "t **Stat**" gives the computed t-statistic for H0: βi = 0 against Ha: βi ≠ 0.This is the coefficient divided by the standard error. It is compared to a t with (n-k) degrees of freedom where here n = 19 and k = 3.
- Column "P-**value**" gives the p-value for test of H0: βi= 0 against Ha: βi≠ 0.This equals the Pr{|t| > t-Stat}where t is a t-distributed random variable with n-k degrees of freedom and t-Stat is the computed value of the t-statistic given in the previous column.

Columns "Lower 95%" and "Upper 95%" values define a 95% confidence interval for βi.
A simple summary of the above output is that the fitted line is

$\hat{Y} = 54.133 - 0.419X1 - 0.116X2$

TEST HYPOTHESIS OF ZERO SLOPE COEFFICIENT ("TEST OF STATISTICAL SIGNIFICANCE")

The coefficient of X1(Literacy rate) has estimated standard error of 0.126643634, t-statistic of -3.30691 and p-value of 0.004454. It is therefore statistically significant at significance level $\alpha = .05$ as $p < 0.05$.

The coefficient of X2(Contraceptive use) has estimated standard error of 0.185927338, t-statistic of -0.62545 and p-value of 0.540493. It is therefore statistically insignificant at significance level $\alpha = .05$ as $p > 0.05$.

We know, P value is less than equal to α then we reject the null hypothesis and we say the result is statistically significant and if P value is greater than α then we fail to reject the null hypothesis and we say the result is statistically insignificant.

We want to test hypothesis relating to significance of individual partial regression coefficients. Specially, the hypotheses are

   H0 : $\beta1 = 0$

   H1 : $\beta1 \neq 0$

       the p value of X1 (0.004454) is less than α = (0.05) we reject the null hypothesis and we say that the result is statistically significant . on the other hand the P value of X2 (0.540493) is greater than the α = (0.05) we say that the result is statistically insignificant.

       Now , we know that the X1 (Literacy Rate) is statistically significant that means ,If the literacy rate increases the population growth rate will decrease. But as X2 is statistically insignificant we didn't get the result. So this means , If the rate of contraceptive use increases it

doesn't mean that the population growth rate will decrease, but we can say as the use of Contraception may have some kind of side effects such as weakness/ inability to work, bodyache , abdominal pain, weight gain, dizziness, nausea/ vomiting, fever, breast tenderness, irregular periods, excessive bleeding, spotting, amenorrhea, cramps, decreased libido, rashes/ irritation, infection, Women with less schooling more often reported nonuse due to "lack of access." Pro-rich inequality was detected for reasons "health concerns," "infrequent sex," and "method-related", while the reasons "other opposed," "fatalistic," "lack of access," and "lack of knowledge" were linked to patterns of pro-poor inequality . The use of Contraception is not that much preferred hence we got insignificant result .

$\hat{Y} = 54.133 - 0.419X_1 - 0.116X_2$ is our regression model.

We have calculated the Mean = 22.2125, Median= 14.35, Mode = -1.88, Skewness = 2.253475736 of Percentage Decadal Growth by Residence in Persons 2001-2011 from table-2 , and we have calculated Mean= 69.32571429, Median= 70.295, Mode=80.86, Skewness=-0.894091431 of 2001 . And Mean= 75.78321429, Median= 78.015, Mode=87.14, Skewness=-03.362415495 in 2011 and total Mean= 72.66949153, Median= 75.42, Mode= 80.86, and Skewness= -1.927781881 we got of Literacy Rate by residence 2001 and 2011 from table-4. From our calculations on Literacy Rate we can say that the literacy rate has been increased from 2001 to 2011. From table- 1 and table-3 we can say that growth rate is high then the Literacy rate. Again in the table-6 we have calculated the Mean= 130.2909091, Median= 9, Mode= 0.1, and Skewness= 2.945362457 of Contraceptive Prevalence Rate by District 2012-2013 and if we compare it with the table -3 then we can say that Population Growth is high then the Contraceptive use . But from our regression we have analysed that as literacy rate increases the Growth of Population decreases but not much effect of Contraception on Population Growth.

Hence in our study we can conclude that as literacy rate increases the population growth rate decreases, which is a good result and the use of Contraception does not have that much effect on population growth rate.

 7.<u>POLICY SUGGESTION</u>

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The present section put forward some of the policies that can be implemented in our study.

Population growth rate is one of the major problem and it is rising at an alarming rate. So, the government of India undertaken several policies to reduce the growth of population such as, Minimum age of marriage, Spread of education, Adoption, Change in social outlook, Rising the status of women, Social security, Industrial and agricultural development, More employment opportunities, Standard of living, Urbanization, Late marriage, Self control, Family planning, Employment to women, etc.

An important measure that may reduce the growth of population is literacy. The government of India have taken some measures to improve literacy conditions in India, such as Free education is provided in rural areas, Scholarships are provided to increase the interest of students on education, Sarva Shiksha abhiyan scheme which also provides free education, provides midday meal that provide food for the students and as children are getting food parents are sending them to school.

National Population Policy (NPP) in 2000 brought about a holistic and a target free approach which accelerated the reduction of fertility. Family Planning Programme plays an important role in reducing population growth. Contraception is also an important method but it is not that much preferred specially in rural areas.

The Ministry of Health and Family Welfare is the government unit responsible for formulating and executing family Planning in India. Two-Child Policy have been adopted by many indian states. Family Planning not only benefit parents and children but also to society and nation, by being able to keep number of new births under control allows for less Population Growth.

The government may launch some ideas or initiatives to make people aware of Contraceptive use in rural as well as urban areas as the rural people are not aware of using Contraception. So, government or some NGOS may do campaigns or surveys to spread the importance and usefulness of of using Contraception, etc.

8.CONCLUSION

Present analysis shows that there has been changing scenario of Population growth on Literacy rate and contraceptive use in west bengal. Decadal Population growth in West Bengal

has registered a fall from 17.77 % in 2001 to 13.93 % in 2011, and the Literacy Rate was 68.64 % in 2001 and increased in 2011 with 76.26% . But in case of Contraception we have seen that from DLHS-3 and DLHS-4 the Percentage of Contraceptive Prevalence Rate is not very far from each other, we have concluded this from the table-5. In the year 2001 and 2011 Purba Medinipur has highest literacy rate which has been increased from 80.16% to 87.66% and lowest in Uttar Dinajpur, in 2001 it was 47.89% and it has been increased to 60.13%. Uttar Dinajpur has the highest population growth from 2001-2011 is 22.9% and lowest in Kolkata -1.88%.

Women in India are not being fully educated on Contraception usage, and what they are putting in their bodies. Awareness of Contraception is near universal among married women in India reported significant problems in assessing a choice of Contraceptive methods. Comparative studies have indicated that increased female literacy is correlated strongly with a decline in fertility. Studies have indicated that not only female but also male literacy levels are an independent strong predictor of the use of Contraception.

From the regression analysis, we have concluded that Literacy Rate has a positive impact of on decrease in Population Growth. That means, if we increase the Literacy rate Population Growth may decrease and contraceptive use may also increase.

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