

CHAPTER 2

CLASSIFICATION AND RANKING OF DISTRICTS BASED ON GROWTH OF POPULATION

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2.1 Introduction

The population growth of Assam is very high which is even higher than the country's average growth. It has been observed that there is an inter district disparities in the growth of population in Assam [18]. Significant growth of population has been observed in nine districts which are namely Dhuburi, Goalpara, Darrang, Barpeta, Bongaigaon, Karimganj, Hailakandi, Nagaon and Marigaon. These districts have growth rates ranging from 20 percent to 24 percent during the last decade against national average of 18 percent. On the other hand, the eastern Assam districts mostly in upper Assam registered around a nine percent population growth only. Muslims constituted 30.9 percent of the state's population in 2001 and it has risen to 34.2 percent a decade later. The population density is highest in the Nagaon district having 604 persons per sq.km. All the major religions in Assam except Islam have literacy rates higher than the national average. The proportion of Muslim in Dhuburi district is the highest, 79.67 percent, which may be due to lowest literacy rate (58.34 percent) according to Census of 2011. It may be noted that districts of Assam which are closer to Bangladesh border are showing significantly high population growth.

According to the Census of 2001, population of Assam was 2.66 crore out of which 7,72,96,455 were Hindus and 82,40,611 were recorded as Muslim population. During the period 1991-2001, Muslim majority districts were Dhuburi, Goalpara, Barpeta, Karimganj and Hailakandi. The Growth rates of Muslim in those districts were rising from 20 per cent to 24 percent during the last decade 2001-2011. It results the increase of Muslim population to more than 50 percent out of the total population. Muslims constituted 30.9 percent of the state's population in 2001 and it has risen to 34.22 percent a decade later [21, 22]. The density of population of the state has gone up to 398 as against India's density 382 as per 2011 census report.

The share of Hindus in the population came down marginally from 80.5 percent in 2001 to 79.8 percent in 2011. In 2001, Muslims constituted 13.4 percent of the country's population; this went up marginally to 14.2 percent [2, 22]. The Census

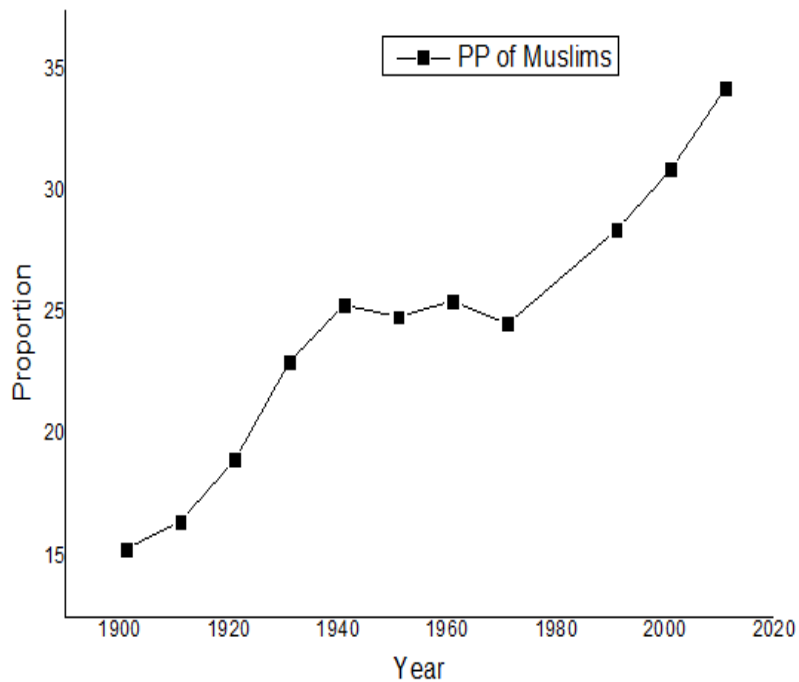
data of 2011 on Population by Religious Communities, released by the Registrar General and Census Commissioner of India, confirms the declining trend in population growth rate among the Hindus in the country. Religious profile of the populace is an important demographic feature noticeable from the first Census in 1872 till now. The analysis shows that the proportion of Muslim population has been rising rapidly in some districts whereas the Hindu population is declining and losing their share in all the districts of Assam [7].

The growth rate has also been consistently higher for Muslims than for Hindus in all intercensal decades. The wide differentials in the growth rate of major two religious groups have clearly been observed. It may be noted from the census data that the growth rate of Hindus are declining since 1981, whereas the percentage of Muslim to the total population are growing linearly upwards. In this chapter we shall classify the districts of Assam in respect of their growth of population.

2.2 Religion wise Proportion of Population

The proportion of Hindu population to the total population of India has declined by 0.7 percentage point (pp). Similarly for Sikh and Buddhist, it has declined by 0.2pp and 0.1 pp respectively. On the Census Report of 2011, no significant change in the proportion of Christian and Jain has been observed. But the proportion of Muslim has significantly increased by 0.8 percentage point. The following Fig.2.1 shows the proportion of Muslim population to the total population in Assam during the period of 1901 to 2011.

Fig. 2.1: Percentage of Muslim in the total population of Assam, 1901-2011

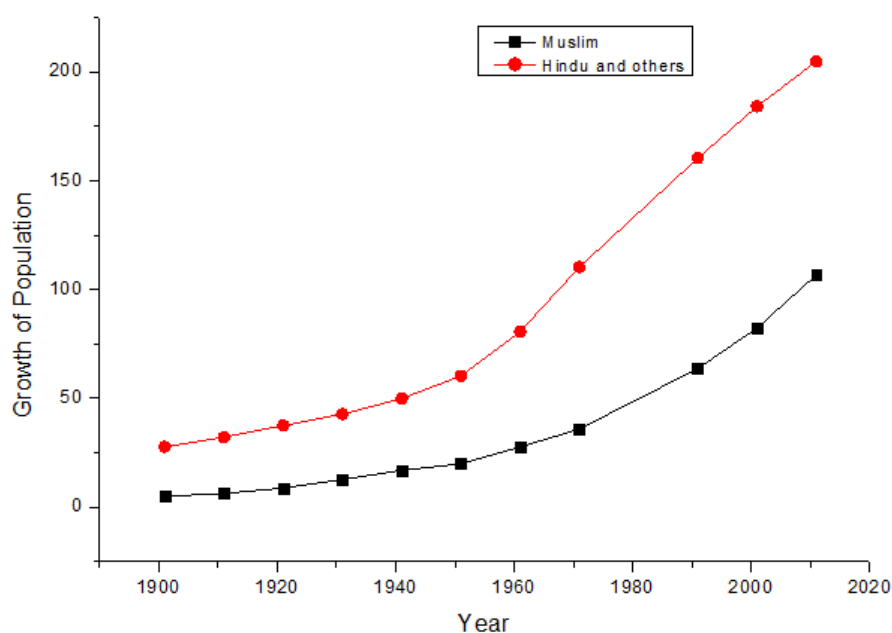


Source: Census Report of India, Government of India, 2011

Fig. 2.1 shows the mounting of percentage of Muslim population from 15 percent in 1901 to 25 percent in 1951. The religious demography of Assam will be cleared if we analyze the disaggregated data for the districts. A comparative curve between Muslims and Hindus and other religions of Assam has been evaluated as shown in Fig. 2.2. It reveals the uniform growth of population of Muslims from 2001.

Islam can be identified as the fastest growing religion particularly in Assam. The census figures since 1951 onward shows that the growth rate among the Muslims in Assam is consistently higher than that of the Hindus. It is worthwhile to note that there is always a huge gap between the growth rates of Hindus and Muslims in Assam.

Fig 2.2: Growth of Population of Muslim and Hindu & Others



Source: Census Report of India, Government of India, 2011

2.3 Variables affecting the Demography

Demographic characteristics of a country provide an overview of its population size, composition of territorial distribution, changes there in and the components of changes such as nativity, mortality, and social mobility. Population statistics include indicators that measure the population size, sex ratio, density and dependency ratio while vital statistics include indicators such as birth rate, death rate, and natural growth rate, life expectancy at birth, mortality and fertility rates. These indicators for the country as well as states will help in identifying areas that need policy and programmed interventions.

The term fertility is a major element of population growth. It may be defined as the number of live births that a woman produces during her reproductive span. Measures such as the Crude Birth Rate (CBR) and Total Fertility Rate (TFR) show the level of fertility at a specific point in time and are time or age structure dependent. The demography as a whole in the world is concerned with understanding the fertility behavior. The demography extends to applications of its data and finding

in a number of fields including the study of problems such as pressure of a population upon resources, depopulation, family limitation, the assimilation of immigrants, urban problem, manpower and many others. It is to be mentioned that, the average marriage age of the Muslim is below 20 years, which is below the legal age at marriage. If a woman gets married below the legal age at marriage, below 18 years and her daughter is also given in marriage at the same age, then the first woman has a chance to see the third generation even at the age of 40. It is very commonly observed in Muslim community [49]. The early marriage and the lack of family planning among the Muslims are the signs of their social, economic and educational backwardness.

2.4 Analysis and Results

There are already indications that several districts of Assam have shown a very low rate of growth, while some other districts like Dhuburi, Goalpara, Barpeta, Nagaon and Marigaon in lower Assam, and also Hailakandi and Cachar have grown at a much high rate. According to population census of 2001, religion wise percentage distribution of population reveals that out of total population in the state, 30.92 percent were Muslims, Hindus and others forms 64.89 percentages. In the census report of 2011, the highest growth rate of population in Dhuburi district has been recorded as 24.44 percent. Table 2.1 shows the district wise growth of population in the decade 2001-2011.

Table 2.1: Growth of population of two major communities

Districts	Major Religion (in percent)	Increase (in percent)
Kokrajhar	Hindu(59.63)	5.21
Dhuburi	Muslim(79.67)	24.44
Goalpara	Muslim(57.52)	22.64
Barpeta	Muslim(70.74)	21.43
Morigaon	Muslim(52.56)	23.34
Nagaon	Muslim(55.36)	22.00
Sonitpur	Hindu(73.94)	15.55
Lakhimpur	Hindu(76.48)	17.22
Dhemaji	Hindu(95.47)	19.97
Tinsukia	Hindu(88.96)	15.47
Dibrugarh	Hindu(90.35)	11.92
Sibsagar	Hindu(87.5)	9.44
Jorhat	Hindu(92.3)	9.31
Golaghat	Hindu(85.99)	12.75
KarbiAnglong	Hindu(80.09)	17.58
DimaHasao	Hindu(67.08)	13.84
Cachar	Hindu(59.82)	20.19
Karimganj	Muslim(56.36)	21.9
Hailakandi	Muslim(60.31)	21.45
Bongaigaon	Muslim(50.22)	20.59
Chirang	Hindu(66.5)	11.34
Kamrup	Hindu(57.82)	15.69
Kamrup(M)	Hindu(84.22)	18.34
Nalbari	Hindu(63.7)	11.99
Baksa	Hindu(82.4)	10.74
Darrang	Muslim(64.34)	22.19
Udalguri	Hindu(73.63)	9.61

Source: Census Report of India, Government of India, 2011

From the Table2.1, it can be deduced that Muslims are the majority in nine districts out of the total 27 districts of Assam. In this section, we are investigating the

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parameters which are responsible for the change of population composition of Assam in terms of two major religions (i.e. Hindu and Muslim). Table 2.2 shows the ranking of the districts based on percentage growth rate of two major religious groups.

Table 2.2: Ranking of the districts

Districts	Growth rate of population in the year 2011		Ranking of Districts based on growth rate	
	Hindu	Muslim	Hindu	Muslim
Kokrajhar	59.63	28.44	17	13
Dhuburi	19.92	79.67	27	1
Goalpara	34.5	57.52	25	5
Barpeta	29.1	70.74	26	2
Morigaon	47.19	52.56	20	8
Nagaon	43.39	55.36	21	7
Sonitpur	73.94	18.22	11	16
Lakhimpur	76.48	18.57	10	15
Dhemaji	95.47	1.96	1	27
Tinsukia	88.96	3.64	4	24
Dibrugarh	90.35	4.86	3	23
Sibsagar	87.5	8.3	5	21
Jorhat	92.3	5.01	2	22
Golaghat	85.99	8.46	6	20
KarbiAnglong	80.09	2.12	9	25
DimaHasao	67.08	2.04	13	26
Cachar	59.82	37.71	16	11
Karimganj	42.48	56.36	22	6
Hailakandi	38.1	60.31	23	4
Bongaigaon	48.61	50.22	19	9
Chirang	66.5	22.66	14	14
Kamrup	57.82	39.66	18	10
Kamrup (M)	84.88	12.05	7	19
Nalbari	63.7	35.96	15	12
Baksa	82.4	14.29	8	17
Darrang	35.25	64.34	24	3
Udalguri	73.63	12.66	12	18

Source: Census Report of India, Government of India, 2011

It is observed from the Table 2.2 that the proportion of Muslim population is rising whereas Hindu population is losing their share in all the districts of Assam. In the year 1971, the percentage of Hindu population for the districts of Dhuburi, Kokrajhar, Dhemaji were 34.8, 76.2 and 98.9 respectively. But by the year 2011 it has

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decreased to 19.92, 59.63 and 95.87 percent respectively. In the case of Muslim community it is seen that the percentage has been increasing continuously. On the basis of the analysis of the data Dhuburi is ranked 1 and Dhemaji is at the bottom in terms of percentage of Muslim population. Similarly, when we observe district wise percentage for Hindu community, the Dhemaji district is found to be highest and Dhuburi district is the lowest i.e. the rank is 27.

Here, eight variables have been considered for the analysis of decadal growth rate of population. The logistic model has been fitted to decadal growth rate and population growth of Hindus and Muslims respectively. The model [66] is

$$Y = \frac{k}{1 + \exp(A + Bt)} \quad (2.1)$$

The parameters A, B and k has been estimated for the four variables (i.e. Hindu and Muslim for both Decadal growth rate and Total population). The fitting of the model along with corresponding computed χ^2 values are presented in Table 2.3. The model gives a good fit with (Chi-Square) χ^2 values 0.5602, 0.1551, 0.0378 and 0.0212 respectively.

Table 2.3: Fitting of Logistic model along with the estimated parameter

Year	Decadal growth rate				The total population			
	Hindu		Muslim		Hindu		Muslim	
	Observed	Expected	Observed	Expected	Observed	Expected	Observed	Expected
1961	20.76		32.49		80.71		27.66	
1981	24.07	21.66	30.78	31.63	134.00	134.03	49.30	48.79
1991	22.71	20.91	32.88	31.07	160.41	160.00	63.73	64.38
2001	19.92	19.42	29.52	29.24	184.15	184.02	82.41	83.62
2011	17.40	17.40	25.58	25.58	204.90	204.71	106.79	106.51
A =	-5.1081		-7.4785		0.7791		2.5064	
B =	0.1601		0.2530		-0.0791		-0.0658	
k =	22.3043		31.8498		266.4650		358.5770	
$\chi^2 =$	0.5602		0.1551		0.0378		0.0212	

Based on Logistic model (equation 2.1) using the estimated parameters A, B and k , the predicted decadal growth rate of Hindus and Muslims will be 12.84 and 15.04 percent respectively in 2021. The proportion of Muslims to the total population will be 37.46 percent in 2021.

It is more alarming that the literacy rate among the Muslim women is very low. As per the 2001 census, the female literacy rate among the Muslims was a near 50.1 percent, far below than the national average. It is a common fact that the population growth rate is always higher among the illiterate people. The

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Fig.2.3 shows the growth rate of literacy of Assam since 1951. It is believed that the female literacy rate plays a key role in the growth of population. Female education can be expected to reduce family size for a number of reasons. According to ranking of districts based on census data of 2001, the Jorhat district has the highest literacy rate i.e. rank is 1 while district Dhuburi has lowest literacy rate [21, 34]. Of course, from the report of 2011, it is seen that the Kamrup(M) has got the highest literacy status and in that district the total fertility rate is lowest for both the communities. Hence, it may be noted that when female literacy rate is high, the religion wise growth of population percentage is low.

The multiple regression equation has been fitted using the following variables:

Y: Decadal Growth rate of population

X₁: CBR of Hindu

X₂: CBR of Muslim

X₃: TFR of Hindu

X₄: TFR of Muslim

X₅: Below legal age at marriage (boys)

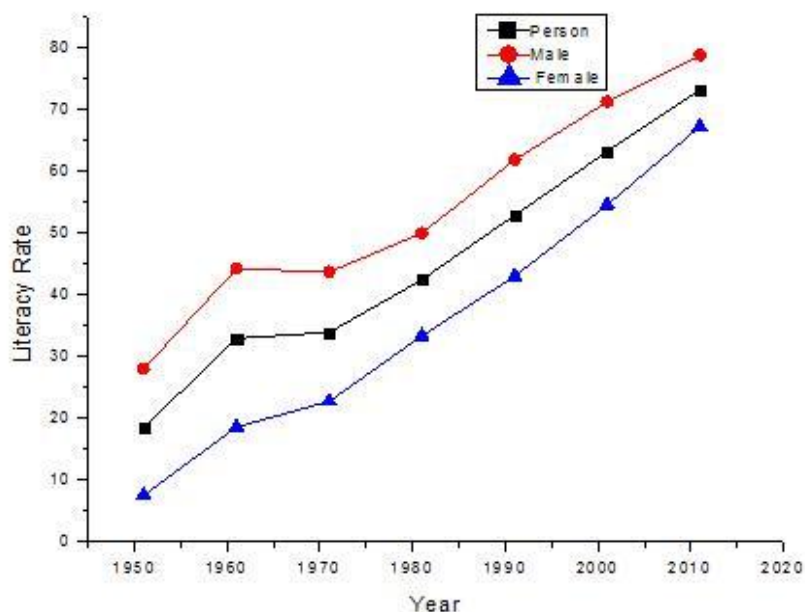
X₆: Below legal age at marriage (girls)

X₇: Sex ratio

X₈: Female literacy rate

$$Y = 77.772 + 5.3 (0.16)X_1 - 0.046(0.0021)X_2 - 30.574(9.18)X_3 + 2.404(0.31)X_4 + 0.064(0.0081)X_5 + 0.137(0.0112)X_6 - 0.127 (0.000053)X_7 + 0.070(0.0028)X_8$$

The t-values corresponding to the regression coefficients are given in brackets. It is worthwhile to observe that TFR of Hindu's decreases significantly and that of Muslim is found to be increased.

Fig. 2.3: The literacy growth rate of Assam since 1951 to 2011.

Source: Census Report of India, Government of India, 2011

Again, it has been observed that according to census data of 2011, the CBR for Muslim is the highest in Bongaigaon district (27.94) while for Hindu it is lowest in Baksa district (12.63) of Assam. In this respect we can support the argument that the high growth rate among Muslim is due to their high fertility rate. The following Table 2.4 shows the ranking of CBR and Decadal Growth Rate of Assam based on 2011 Census.

Table 2.4: The ranking of the districts based on CBR and Decadal growth rate

Districts	Crude Birth Rate	Decadal Growth Rate	Ranking of Districts	
			CBR	Decadal Growth Rate
Kokrajhar	23.4	5.21	15.5	27
Dhuburi	31.8	24.44	1	1
Goalpara	27.6	22.74	8	3
Barpeta	27.8	21.4	6.5	8
Morigaon	28.3	23.39	3	2
Nagaon	26.4	22.09	9	4
Sonitpur	22.5	15.55	17	15

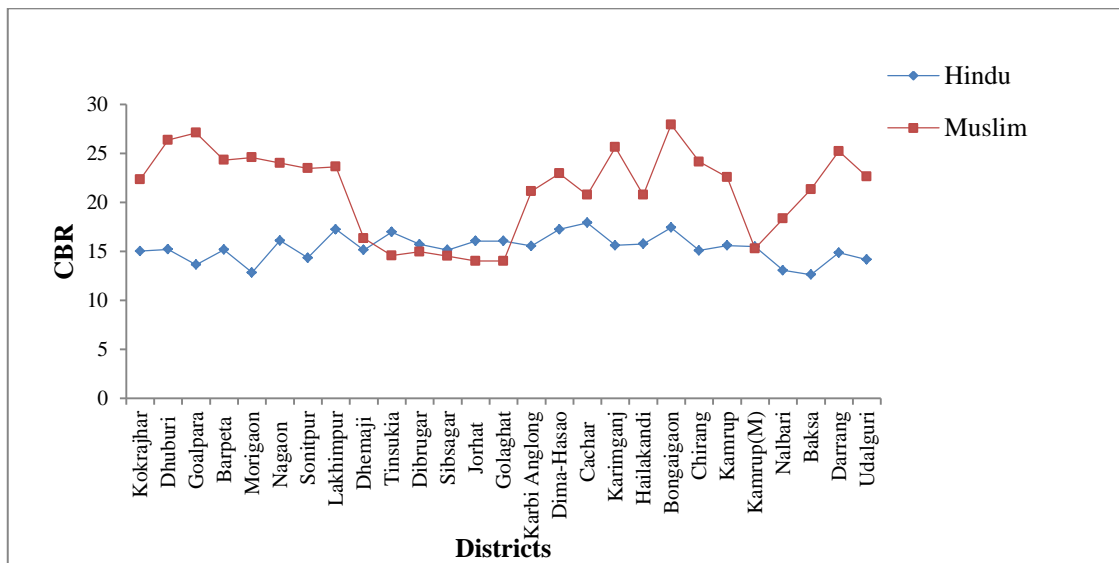
Lakhimpur	23.9	17.06	12	14
Dhemaji	24.1	19.97	11	9
Tinsukia	21	20.3	19	17
Dibrugarh	18.2	11.92	25	19
Sibsagar	18.5	9.44	24	24
Jorhat	16.7	9.37	26	25
Golaghat	19.2	9.21	22	26
Karbi-Anglong	31.4	11.88	2	20
Dima-Hasao	23.8	18.69	13	13
Cachar	23.6	13.53	14	18
Karimganj	28.2	21.90	4	5
Hailakandi	27.9	21.45	5	6
Bongaigaon	26.2	21.44	10	7
Chirang	23.4	19.58	15.5	10
Kamrup	20.7	11.26	20	22
Kamrup(M)	15.6	18.34	27	15
Nalbari	18.9	18.95	23	12
Baksa	19.8	11.74	21	21
Darrang	27.8	11.17	6.5	23
Udalguri	21.2	19.51	18	11

Source: (a) Statistical Hand Book of Assam-2011

(b) Census Report of India, Government of India, 2011

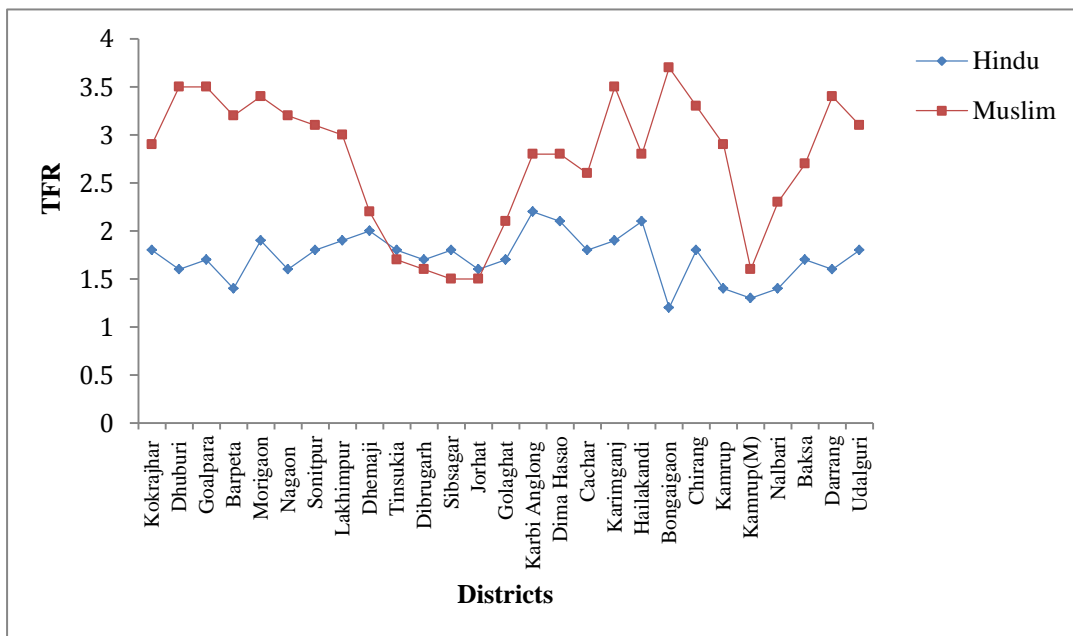
From the Table 2.4 it is distinctly perceived that the Crude Birth Rate and Decadal Growth Rate are highest in Dhuburi which is a Muslim dominated district. Again, the Crude Birth Rate and Decadal Growth Rate is lowest in Kamrup(M) and Kokrajhar district. According to census report of 2011, it is observed that the literacy rate by sex is highest in Kamrup(M). Thus, it may be believed that there is a close relationship between literacy and birth rate. The CBR and TFR have been estimated and district wise variation is plotted as given in Fig.2.4 and Fig. 2.5 of 27 districts for both Hindu and Muslim communities.

Fig. 2.4: District wise variation of CBR



Source: Census Report of India, Government of India, 2011

Fig.2.5: District wise variation of TFR



Source: Census Report of India, Government of India, 2011

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It has been observed from Fig.2.4 that the CBR for Muslim is high in all other districts except the districts Tinsukia, Dibrugarh, Sibsagar, Jorhat and Golaghat. Same phenomenon has been observed in the case of TFR. Fig.2.5 indicates that the TFR for Muslim is high in all districts except the four districts viz. Tinsukia, Dibrugarh, Sibsagar and Jorhat. The classification of CBR and TFR has been made using the Statistical package SPSS for two major communities of 27 districts of Assam. These are recorded in Table 2.5 and Table 2.7. The ranges of each category are given in Table 2.6 and Table 2.8 respectively.

Table 2.5: Classification of CBR for Hindu and Muslim

Low		Medium		High	
Hindu	Muslim	Hindu	Muslim	Hindu	Muslim
[3],[5],[24],[25]	[9],[10],[11],[12],[13],[14],[23]	[1],[2],[4],[6],[7],[9],[11],[12],[13],[14],[15],[18],[19],[21],[22],[23],[26],[27]	[1],[4],[5],[6],[7],[8],[15],[16],[17],[19],[21],[22],[24],[25],[26],[27]	[7],[8],[10],[16],[20]	[2],[3],[18],[20]

The CBR for Hindu community is low in four districts Goalpara^[3], Morigaon^[5], Nalbari^[24], Baksa^[25] while for Muslim community the CBR is low in the seven districts Tinsukia^[10], Dibrugarh^[11], Sibsagar^[12], Jorhat^[13], Golaghat^[14], Dhemaji^[9] and Kamrup(M)^[23]. Again, CBR for Hindu is high in five districts viz. Sonitpur^[7], Lakhimpur^[8], Tinsukia^[10], DimaHasao^[16] and Bongaigaon^[20] while for Muslim community the CBR is high in Dhuburi^[2], Goalpara^[3], Karimganj^[18] and Bongaigaon^[20]. Other districts are classified as a medium for both the communities.

Table 2.6: Classification ranges for CBR

Hindu	Muslim
Low : Below 14.02	Low : Below 16.846
Medium : 14.023-16.733	Medium : 16.846-25.598
High : Above 16.733	High : Above 25.598

It is seen from the Table 2.6 that the low range of CBR for Muslim (below 16.846) is higher than the high range of Hindu (above 16.733). Hence we can conclude that the CBR for Muslim is higher than the Hindu community. The Table 2.7 shows the classifications of TFR of two major communities.

Table 2.7: Classification of TFR for Hindu and Muslim

Low		Medium		High	
Hindu	Muslim	Hindu	Muslim	Hindu	Muslim
[4],[20], [22],[23], [24]	[10],[11], [12],[13], [22],[23]	[1],[2],[3],[5], [6],[7],[8],[10], [11], [12],[13], [14],[17], [18], [21], [25],[26], [27]	[1],[8],[9], [14],[15], [16], [17], [19], [24], [25]	[9],[15], [16],[19]	[2],[3],[4], [5],[6],[7], [18],[21], [20], [26], [27]

In case of TFR for two major communities five districts for Hindu Barpeta^[4], Bongaigaon^[20], Nalbari^[24], Kamrup^[22], Kamrup(M)^[23] and for Muslim Tinsukia^[10], Dibrugarh^[11], Sibsagar^[12], Jorhat^[13], Kamrup^[22] and Kamrup(M)^[23] are classified as a low. It is to be noted that according to 2011 Census report, the district wise literacy rate is high in Kamrup(M)^[23] district. It implies that there is a relationship between literacy and fertility. Again, four districts for Hindu community Dhemaji^[9], Karbi-Anglong^[15], Dima Hasao^[16], Hailakandi^[19] and for eleven districts for Muslim community Dhuburi^[2], Morigaon^[5], Nagaon^[6], Sonitpur^[7], Karimganj^[18], Chirang^[21], Bongaigaon^[20], Goalpare^[3], Barpeta^[4], Udalguri^[27], Darrang^[26] are classified as high. Other districts may be classified as medium.

Table 2.8: Classification ranges for TFR

Hindu	Muslim
Low : Below 1.48	Low : Below 2.05
Medium : 1.48-1.97	Medium : 2.05-3.05
High : Above 1.97	High : Above 3.05

Both TFR and CBR is found to be low for Muslim in the districts Dibrugarh^[11], Sibsagar^[12], Jorhat^[13], Tinsukia^[10]. Similarly, in the lower Assam the TFR and CBR is high in four districts- Dhuburi^[2], Goalpare^[3], Karimganj^[18] and Bongaigaon^[20]. Again, for Hindu community the TFR and CBR is high only in district of Dima-Hasao^[16] while it is low in Nalbari^[24] district.

There are already indications that several districts of Assam have shown a very low rate of growth, while Muslim dominant districts like Dhuburi^[2], Goalpare^[3], Barpeta^[4], Nagaon^[6], Karimganj^[18] etc. have grown at a much higher rate. According to population census of 2001, religion wise percentage distribution of population reveals that out of total population in the state, Hindu form 64.89 percentage and Muslim forms 30.92 percent. During 1971-91 and 1991-2001 the average annual growth (per thousand) of Muslim in Assam was 38.7 and 29.3 respectively. During the period 1971-1991, the highest growth (per thousand) in the border belt district of N.C.Hillsis 205 and lowest in Sibsagar district with 36.3[54]. Hence the growth of Muslim population is inordinately high in Assam in the said period.

The following Fig. 2.6 and Fig. 2.7 have been showed the classification of the districts of Assam based on Total Fertility Rate (TFR) for Hindu and Muslim.

Fig. 2.6: Classification of districts based on TFR for Hindu

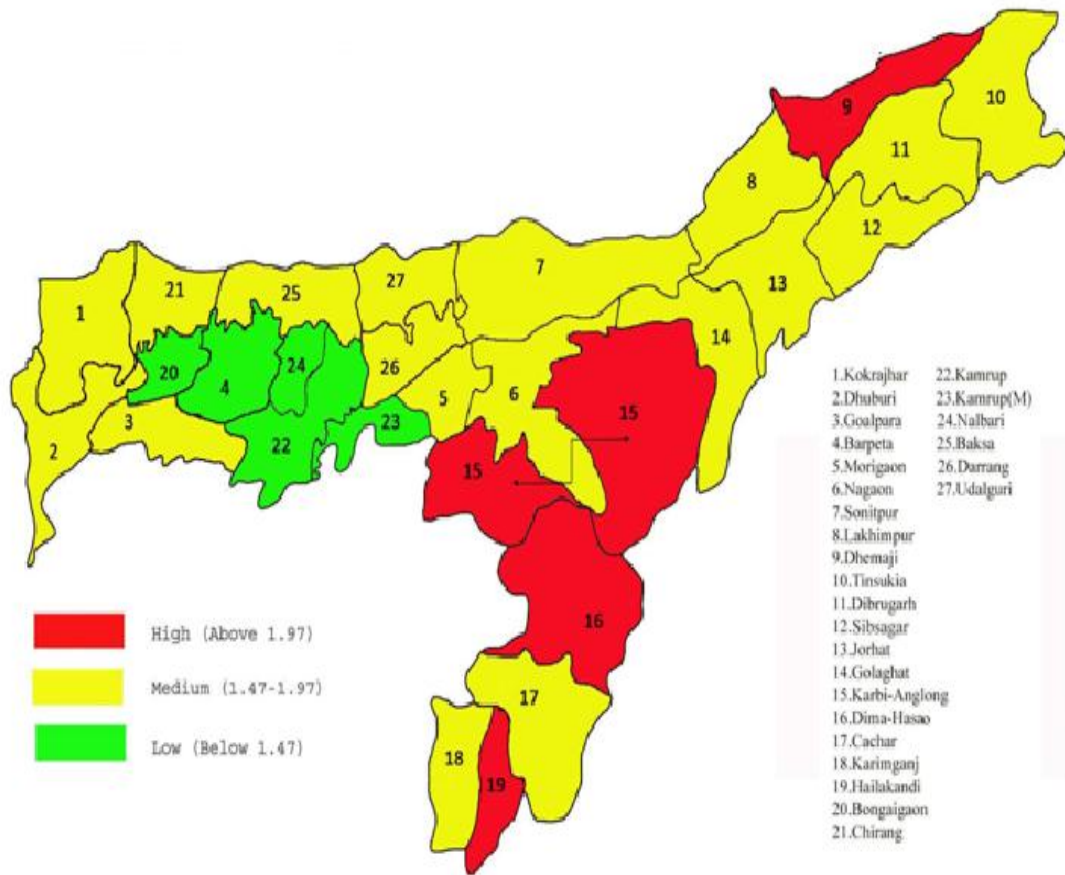
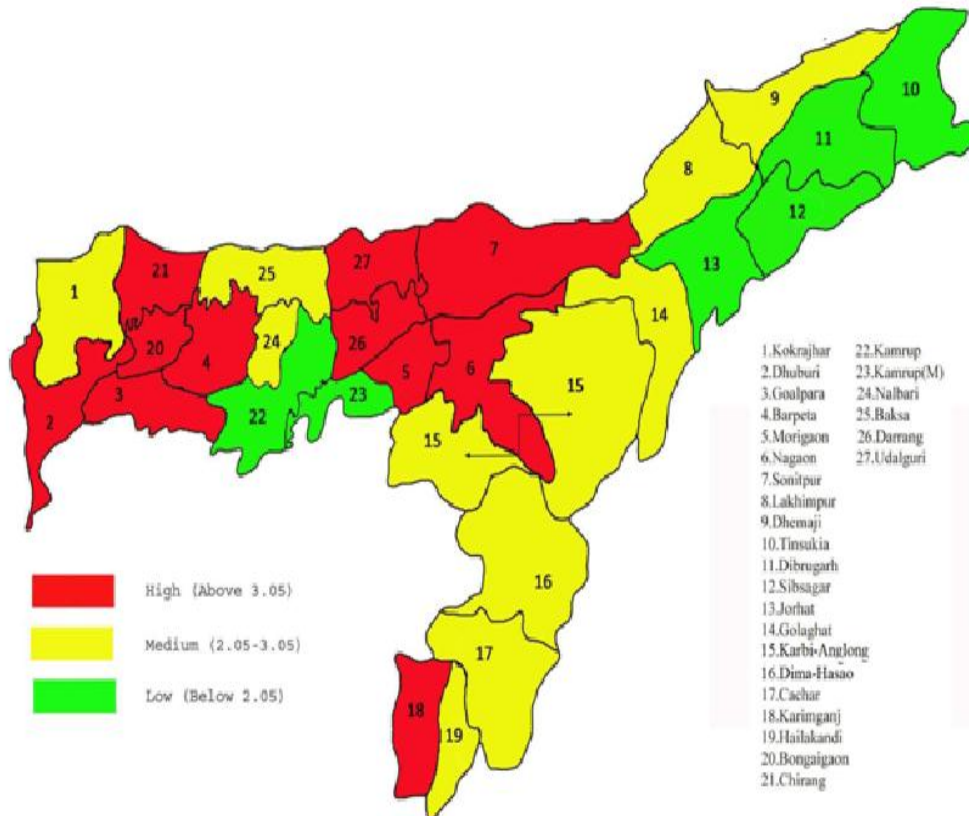


Fig.2.7: Classification of districts based on TFR for Muslim



2.5 Conclusion

From what has been found in above we have come into conclusion that Assam, being a Hindu majority state, doubts that it will become Muslim subjugated state. From the higher rate of CBR and TFR for Muslims we can justify and authenticate it. It is therefore essential to analyze the cause and effects of changing demography of different religious groups in Assam. When we throw our attention towards the census report of 2001 and 2011 it is seen that despite a rise in the Hindu population, their percentage had gone down. However, in the 2001 census, the Hindu population of Bangladesh was 9.2 percent while the Muslim population was 89.7 percent and was increased to 90.4 percent in 2011. Hence we can presume that the growth of Muslims in the Western and Southern districts of Assam is high primarily due to the incursion of people from Bangladesh [6].

From the work of Rajan[56], it was confirmed that the pattern of growth rate of Muslims in north-east India was increasing up to the 2001. Our works is well agreed with this result. Moreover, we can supplement our result of growing Muslim population up to the census of 2011. There was an argument in the work of Bhagat and Praharaj [8] that due to illiteracy and poverty [62,63] being minority status in society, the fertility of Muslims are affected. From the investigations of us we can also sum up that more work is needed on the complex interaction between religion reproduction and fertility differential in Assam. In view of this fact, the next chapter, we shall transmit our investigation towards the analysis of fertility differentials of Hindu and Muslim of Assam.