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Actual and ideal fertility differential among natives, immigrants, and descendants of immigrants in a northeastern state of India

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Abstract

Little research has been conducted on the native-immigrant fertility differential in low-income settings. The objective of our paper is to examine the actual and ideal fertility differential of native and immigrant families in Assam. We used the data from a primary quantitative survey carried out in 52 villages in five districts of Assam during 2014–2015. We performed bivariate analysis and used a multilevel mixed-effects linear regression model to analyse the actual and ideal fertility differential by type of village. The average number of children ever-born is the lowest in native villages in contrast to the highest average number of children ever-born in immigrant villages. The likelihood of having more children is also the highest among women in immigrant villages. However, the effect of religion surpasses the effect of the type of village the women reside in.

KEYWORDS

Assam, fertility, immigrants, India, native, religion

1 | INTRODUCTION

The importance of examining the native–immigrant fertility differential across countries has been growing tremendously in recent years for several reasons. *First*, a high level of immigration is said to have permanently altered the ancestry of some national populations due to the domestic population's persistently low level of fertility and high level of emigration (Coleman, 2006). Indeed, a third demographic transition is said to be under way in industrialised countries, given the rapid changes observed in the composition of the population due to immigration's direct and indirect effects, the potential reduction of countries' original populations to minority status in the future, and if such population transformations prove to be permanent and general (Coleman, 2006). Understanding immigration and the fertility behaviour of immigrants is thus essential for understanding the future population dynamics in migrant destination countries. *Secondly*, the fertility of immigrants and their descendants can be an important indicator of social integration over time (Dubuc, 2012). Immigrants often come from high-fertility countries and have a higher level of fertility than the native-born population (Dubuc, 2012). The native–immigrant fertility differential diminishes over time, the longer the migrants stay in the destination country (Andersson, 2004; Milewski, 2010; Sobotka, 2008). *Thirdly*, the native–immigrant fertility differential is of interest both to academics and policymakers, as it is closely linked to the overall economic and social impacts of immigration. For instance, although immigration can make a positive contribution to the economic growth of a country, a higher level of fertility on the part of immigrants can also create a need for greater social provision and investment.

For the reasons discussed above, there is a large body of literature on the native–immigrant fertility differential in the context of advanced and economically prosperous countries. It is found that, on average, immigrant women in the United States have more children

than native-born groups (Carter, 2000); foreign-born women in the United States have disproportionately more children than their native-born counterparts (Livingston & Cohn, 2012); immigrant Muslims to Europe have a higher fertility rate than second-generation Muslims (Stonawski, Potančoková, & Skirbekk, 2016); immigrants to Europe generally have a higher fertility rate than native Europeans (Coleman, 1994; Dubuc & Haskey, 2010; Sobotka, 2008); recent immigrants to Canada currently have a higher fertility rate than second-generation immigrants (Woldemicael & Roderic, 2010), and so on. In the United Kingdom, a few studies show that the fertility levels of descendants of immigrants from high-fertility countries are usually lower in the second generation, but that, for some ethnic groups, for example, Bangladeshis and Pakistanis, fertility remains relatively high (Coleman & Dubuc, 2010; Sobotka, 2008).

But what do we know about the native–immigrant fertility differential in low- or middle-income countries? The literature on the relationship between migration and fertility in developing countries mainly focuses on migrant fertility within a country, rather than on the fertility differential between immigrants and the native-born. We found limited evidence of differential fertility between the native-born and immigrant population in the developing country context. A study conducted with respect to Afghan immigrants in Iran demonstrated that the fertility behaviour of immigrants is very different from that of native Iranians, at least initially (Abbasi-Shavazi, Sadeghi, Mahmoudian, & Jamshidiha, 2012). Immigrant fertility behaviours also do not resemble those of nonmigrants back in the country of origin. Immigrants' fertility behaviour eventually starts resembling that of the native-born population at the migration destination with, inter alia, time and educational advancements (Abbasi-Shavazi et al., 2012; Abbasi-Shavazi & Sadeghi, 2015). A study conducted in rural South Africa found that Mozambican self-settled refugees are adopting the childbearing patterns of South African women. The decline in Mozambican fertility has occurred alongside socioeconomic gains on their part (Williams et al., 2013). The aim of the present study is to contribute knowledge on the native-born and immigrant fertility differential in the developing country of India.

1.1 | Theoretical background on linkages between fertility and migration

The literature summarises four main theoretical perspectives to explain differentials in fertility behaviours and attitudes between migrants and non-migrants (Abbasi-Shavazi & Sadeghi, 2015; Majelantle & Navaneetham, 2013). The causes of the native–migrant fertility differential can be condensed into four basic hypotheses, namely, *socialization or generational*, *selectivity*, *adaptation*, and *disruption* (Abbasi-Shavazi & Sadeghi, 2015; Kulu, 2005).

The socialisation hypothesis is based on the understanding that if there is a difference in fertility behaviour between the immigrant and the native-born population, and assuming that immigrants' fertility rates are higher than that of natives, it takes at least a *generation* for the former to be able to imitate the fertility behaviour of the latter. This perspective also suggests that even if immigrants start imitating the behaviour of the native-born population irrespective of their duration of stay, then the culture, norms, and values prevalent in the place of origin nevertheless continue to impact the behaviour of the immigrants, even after migration to a relatively low-fertility region (Chattopadhyay, White, & Debpuur, 2006). Some studies in the United States found that first-generation immigrants maintain the fertility behaviour of their sending country, whereas second-generation immigrants have fertility behaviour that is similar to that of the receiving country (Kahn, 1988; Stephen & Bean, 1992).

The *selectivity* perspective is based on the hypothesis that "immigrants are self-selected and represent a non-random sample." Because migrants typically constitute a selected group (in terms of age education, marital status, etc.), they can be expected to possess different fertility preferences from those of the overall population and more similar to the fertility preferences in the destination country (Hervitz, 1985). Under this hypothesis, however, it is important to consider who migrates, how, and when (Genereux, 2007). For example, migrants with a preference for smaller families are expected to migrate to low-fertility areas, where it is easier to raise small families, and high-fertility areas should attract migrants who prefer larger families (Hervitz, 1985).

The *adaptation* hypothesis explains that with the passage of time, the fertility of the immigrants and natives will converge and that the fertility rates of recent immigrants will be higher than that of older immigrants. Adaptation theory identifies two major factors that impact fertility behaviour: *resources* and *cultural norms*. Although resources indicate the living and opportunity costs associated with the receiving community, new cultural norms among immigrants, formed through interaction with friends, peers, coworkers, and others in the new environment, shape individual beliefs and desires that influence parenthood and the value placed on children (Kulu, 2005).

However, a similar stand is maintained by the *disruptive* hypothesis, which states that although migration as a process may involve a drop in fertility rates before and upon arrival in the receiving country, because of the disruption to immigrants' life, these rates eventually rise once the immigrants have settled down at their destination (Abbasi-Shavazi & Sadeghi, 2015).

1.2 | Immigration in Assam: A brief geographical and historical account

Assam, a state in Northeast India, shares an international border with Bhutan in the north and Bangladesh in the south. It is connected to the rest of India by the Siliguri Corridor in the state of West Bengal, a narrow strip of land, 22 km long, known familiarly as the *Chicken's Neck*. Table 1 presents the basic demographic and socioeconomic profile of Assam compared with India. Assam constitutes about 2.6% of India's total population (2011). The annual exponential decadal growth rate of Assam is slightly lower than India's, but the population density is higher. Assam has high mortality and low urbanisation compared with the national Indian level, indicating the demographic backwardness of the state. About 32% of the total population of Assam lives

TABLE 1 Basic demographic and socioeconomic profile of Assam compared with India, 2011

Indicators	India	Assam
Population (in millions)[a]	1,210.85	31.21
Annual exponential growth rate (2001–2011)[a]	1.631	1.576
Population density (per square km)[a]	382	398
Percentage of Hindu[a]	79.7	61.4
Percentage of Muslim[a]	14.2	34.2
Percentage of other religion[a]	5.9	4.1
Percentage of ST population[a]	8.6	12.4
Percentage of SC population[a]	16.6	7.1
Percentage of literacy[a]	72.9	72.1
Percentage of urban population[a]	31.1	14.0
Mean number of children ever-born per 1,000 women[a]	230	235
Total fertility rate (2015)[b]	2.3	2.3
Infant mortality rate, 2015[b]	37	47
Maternal mortality ratio (maternal deaths/100,000 live births)[b]	130	237
Life expectancy at birth male, 2011–2015[c]	66.9	63.5
Life expectancy at birth female, 2011–2015[c]	70.0	66.2
Population below poverty line (in percent), 2012[d]	22.0	32.0
Poverty Headcount Ratio[e] 2009–2010	29.3	37.9

Sources:

[a]Census of India 2011.

[b]Sample registration system data (Office of the Registrar General, & Census Commissioner, India, 2015).

[c]Sample registration system based life tables 2011–2015 (Office of the Registrar General, & Census Commissioner, India, 2017).

[d]World Bank 2017.

[e]NITI AAYOG.

below the poverty line compared with the national average of 22%. Table 1 also demonstrates a higher per capita poverty ratio in Assam compared with India.

Assam was, for centuries, a gateway for the successive Mongol hordes sweeping in from Southeast Asia (Gait, 1906). In the Middle Ages, India was ruled by the mighty Mughal emperors, but the territory of present-day Assam used to consist (1206–1826) of five distinct kingdoms: Kamata, Bhuyan, Ahom, Chuiya, and Kachari. Although Assam was repeatedly invaded by the Mughals, the Ahom kings (with outside support) managed to repel these attempts, and by the end of the seventeenth century, the Ahoms had taken over the other four kingdoms. During 1817–1826 the Burmese invaded Ahom, the British intervened, and in 1826 the British and the Burmese signed a peace treaty, the Treaty of Yandabo, under which Assam was annexed to the Bengal Presidency, the largest subdivision of British India. In 1874, the Assam region was separated from the Bengal Presidency and Sylhet, part of eastern Bengal, was added to it; Assam's status was upgraded to a Chief Commissioner's Province. In 1905, Bengal was partitioned into East Bengal (largely Muslim areas in the east, currently known as Bangladesh) and West Bengal (largely Hindu areas in the west, currently known as the West Bengal state of India) with Assam being included in East Bengal. When India gained independence from the British in 1947, Assam (except for the Sylhet district) was included in India, although Pakistan wanted Assam to be part of East Pakistan (currently Bangladesh).

During British rule, Assam, experienced two significant waves of in-migration from the neighbouring state of Bengal linked to the introduction of tea plantations and related agriculture in Assam by the British in 1840 (Davis, 1951). In this period, Assam was sparsely populated and lacked landless labourers. The indigenous Assamese were unwilling to leave their farms and villages to work in the tea plantations. *The first wave* of in-migration came to Assam via the importation of indentured and landless labourers (*coolies*) from central eastern India by the colonial rulers. *The second wave* of in-migration to Assam came during the British colonial period from East Bengal[1] (Davis, 1951; Superintendent of Census Operations, Assam, 1912; Superintendent of Census Operations, Assam. 1923; Superintendent of Census Operations, Assam & Mullan, 1932; Superintendent of Census Operations, R. B. V. 1954) and later in the post-Independence period, from East Pakistan (future Bangladesh)—this is well documented (Samaddar, 1999; Hazarika, 2000; van Schendel, 2005; Saikia, Saha, Bora, & Joe, 2016).

This second wave of in-migration to Assam, also known as *farmer migration*, began in 1891 as a result of long-standing population pressure and scarcity of land in some districts of East Bengal on the one hand, and the considerable amount of wasteland and fallow land available in Assam on the other. (A later pull factor for in-migration was the

[1]During British rule, immigration from East Bengal to Assam was internal migration, as both Assam and East Bengal were within India. After the independence and partition of India, East Bengal became part of Pakistan; in 1971 East Bengal became independent from Pakistan and was renamed Bangladesh.

"Grow More Food" program introduced in 1942–1943, encouraged by the British and the then Muslim League governments to support the workers in the tea plantations.) The mass migration of Bengali Muslim peasants and cultivators from East Bengal districts to Assam was first reported in the 1911 census, and thereafter, the number of Bengali-born people not living in tea plantation areas (resulting from farmer migration) rose continuously in successive censuses. For instance, in 1911 and 1921, the number of people born in Bengal but living in Assam was 159,000 and 348,000, respectively, excluding tea-plantation workers (Superintendent of Census Operations, Assam, 1912; Superintendent of Census Operations, Assam, 1923). A table of Bengal-born people in Assam is presented in Appendix A1. A higher level of in-migration from East Bengal to some selected districts of Assam has significantly influenced the ethnic or religious composition of those districts. The percentage of Muslim population in the erstwhile Nowgong (currently known as Morigaon and Nagaon) district, for example, has risen from less than 4.8% to about 40.5% between 1901 and 1951 (Allen, 1905; Superintendent of Census Operations, 1954).

This stream of in-migration from East Bengal to Assam continued even after the separation of East Bengal from India in 1947 because of similar push and pull factors in both the origin and destination countries (Superintendent of Census Operations, 1954; Weiner, 1983; Nath & Nath, 2011; Nath, Nath, & Bhattachaya, 2012; Saikia, Joe, et al., 2016). Immigration is being facilitated by the vast open porous border between India and Bangladesh. As Assam lacks robust vital registration-system data, and as census-based information on immigration data is highly underreported (Census commissioner of Assam, 1961; Saikia, Saha, et al., 2016), there have been several attempts to estimate the number of immigrants and their descendants during the post-Independence era. Estimates as to the magnitude of immigrants in Assam vary among independent studies, yet all studies agree on the presence of a significant number of immigrants from East Pakistan or current Bangladesh to Assam. A table of various estimates of immigrants and their descendants in Assam is presented in Appendix A2.

Historically, the migrants from East Bengal encroached the wastelands in Assam, which existed either in forest areas or near rivers (popularly known as *Chars* or sandbars) (Superintendent of Census Operations, 1954). They also encroached the government wastelands reserved for developmental schemes, known as *khas land* (Superintendent of Census Operations, 1954). They always settled in groups with families rather than singly (Superintendent of Census Operations, 1954). It has been documented that during 1930–1950, about 15,088 thousand acres of land were settled with migrants from East Bengal (Superintendent of Census Operations, 1954). In the post independent period, encroachment was extended to Village Grazing Reserves, Professional Grazing reserves, underutilised land owned by Vaishnava Monastries (known as *Satra*) and temples, land of the tribal belt, etc. (Baruah, Bhattacharyya, Dutta, & Borpatragohain, 2017; Sharma, 2012), where immigrants created their villages.

Large-scale immigration, coupled with the faster growth of the population of immigrant origin in most of the districts of Assam, triggered confrontations in many areas—the most important issues being linguistic (Assamese versus Bengali), religious (Hindu versus Muslims), and ethnicity (indigenous or those who were in Assam in the pre-colonial era versus non-indigenous). Conflict between the native-born population and immigrants was documented as early as 1951 (Davis, 1951). However, in 1979 following a sudden rise of registered voters from 6.3 million in 1971 to 8.7 million on the electoral roll in 1979, a student-led anti-immigrant movement began and continued until 1985 (Weiner, 1983). The movement, known as the *Assam movement* or *Assam agitation* demanded that illegal Bengali immigrants to Assam be identified and expelled (Saikia, Joe, Saha, & Chutia, 2016; Weiner, 1983). The movement continued for 6 years and ended in 1985 with a memorandum of settlement called the *Assam accord* between the government of India and the leaders of the Assam movement. The two principal promises (or clauses) of the Assam accord were to detect and expel the immigrants who entered after 1966 and to give constitutional, legislative, and administrative safeguards to the Assamese people (Government of Assam, 2019). This movement has had several long-term political, economic, and social consequences in the state, but the main clauses of the Assam accord remains unaddressed and is a highly debated issue to this day.

As noted earlier, there are a couple of studies estimating the magnitude of immigrants in Assam. However, there has not, to our knowledge, been any empirical research comparing demographic aspects such as the fertility, mortality, or health of the native-born and immigrant populations of Assam. The aim of this paper is thus to compare the actual and ideal fertility differential by migration status.

2 | DATA AND METHODS

2.1 | Data

A primary quantitative survey was carried out in 52 villages in five districts of Assam during 2015–2016 as part of the project "Cross Border Migration in Assam during 1951–2011: Process, Magnitude, and Socioeconomic Consequences," funded by the Indian Council of Social Science Research, New Delhi. We sampled only rural villages, given that the percentage of the rural population in Assam is about 86% of the total population. A three-stage sampling was adopted to select eligible women aged 15–49. In the first stage, we selected five districts, namely, Barpeta, Dhubri, Kokrajhar, Morigaon, and Nagaon on the basis of two criteria: first, the districts had to have experienced a very high population growth rate in the postindependence period, and secondly, the districts had to have a record of high in-migration in the census data of East Bengal (current Bangladesh) prior to Indian independence. In the second stage, we selected 52 villages, classified into the following categories:

1. *Villages consisting primarily of native-born*: The inhabitants of these villages are indigenous to Assam; they consist of General Caste Assamese Hindus and Assamese Muslims; Other Backward Caste populations such as tea plantation workers, Ahoms, and Koch-Rajbanshis; and Scheduled Tribe (ST) populations including the

Bodo, Karbi, Rabha, and Tiwa people. Fifteen villages from this group were surveyed. In our analysis, we refer to this group as *native*.

2. *Villages of old settlers/descendants of immigrants*: Villages comprising both Hindu and Muslim immigrants from East Bengal/Bangladesh settled in Assam for more than 20 years. Thirteen villages from this group were surveyed. In our analysis, we refer to this group as *descendants of immigrants*.
3. *Villages with mixed population*: Villages comprising natives, descendants of immigrants, and immigrants (as defined below), namely, villages with all population groups. Fourteen villages from this group were surveyed.
4. *Villages of immigrants*: Villages comprising immigrants from Bangladesh, settled in Assam for less than 20 years. Ten villages from this group were surveyed. In our analysis, we refer to this group as *immigrants*.

As the reporting of immigration status is a sensitive issue in Assam, we carried out qualitative research (focus group discussions, key informant interviews, and in-depth interviews) to identify the village types. We obtained a representative sample of villages by selecting villages both near district headquarters and distant from it, villages near the Assam–Bangladesh border, villages in tea plantations, villages near the National Parks, and villages in the Bodoland Territorial Council.

In the third stage, we selected an average of 32 households per village through a systematic random sampling procedure. Thus, in 52 villages in five districts, we surveyed 1,693 households consisting of 8,209 members. The questionnaire for women was administered in 1,262 households lived in by eligible women (i.e., of reproductive age) aged 15–49.

The exact questions regarding the fertility level were (a) How many *ever-born* children (boys and girls) do you have? (b) In your opinion, what is the ideal number of children for a married couple to have? Of this number, how many boys and how many girls are ideal?

2.1.1 | Methods

Two outcome variables interested us: the actual number of children ever-born at the time of the survey and the ideal number of children, as reported by women of reproductive age. By "actual number of children ever-born," we indicate the total number of children born alive to the respondent at the time of the survey. By ideal number of children, we indicate the general family size ideals perceived by the respondents. Our survey question (as mentioned in the data section) was motivated by the findings of a detailed study in many European countries by Sobotka and Beaujouan (2014).

There are numerous studies addressing socioeconomic factors affecting fertility in developing countries. In general, it is found that there is an inverse relationship between women's education and childbearing (Basu, 2002; Kravdal, 2002). Social status expressed either through religion (Bhat & Zavier, 2005) or castes (Murthi, Guio, & Dreze, 1995) is a significant determinant of the fertility of Indian women; and in most of the models of fertility analysis—from Thomas Malthus in the 18th century to the more recent models of Gary S. Becker and John Caldwell—economic status plays a central role in childbearing. Following the literature review and depending on the availability of information in our data, we chose the exposure variables at two levels: the individual level and the village level. The individual level variables are (a) age of mother at birth of the first child, (b) age of the respondent at the time of survey, and the age square (c) education (illiterate, primary, middle school, high school, and above), (d) work status (not working outside the home/housewife only; working outside the home), (e) source of water (unsafe and safe sources), (f) type of cooking fuel (unclean and clean fuel), and (g) wealth tercile (poor, middle-income, and rich). The village-level variables are listed as (a) percentage belonging to deprived social groups such as Scheduled Caste/Scheduled Tribe (SC/ST), (b) percentage of children that have died in the village, (c) percentage of Muslim women, and (d) type of village (native, old settlers, mixed population, and immigrant population). All this information was obtained from the survey administered to the respondents.

We generated an asset-based index, *wealth tercile*[2]as a proxy of the economic status of the household using a principal component analysis of the household's various assets.

As native–migration status is a village-level variable in our sample, the application of the ordinary least squares model to our data was not appropriate due to the clustering of women within a certain village type. We thus conducted two-level mixed-effects linear modelling to examine the association between fertility outcome (actual and ideal) and type of village. We categorised all the independent variables into variables at the women's level and at the village level (Tables 3 and 4).

A two-level mixed-effects model is

$$y_{ij} = \beta_0 + \sum_{p=1}^{p}\beta_p x_{pij} + \sum_{q=1}^{q}\gamma_q u_{qj} + \left(u_{aj} + e_{ij}\right), \quad (1)$$

where

y_{ij}=number of children ever-born/ideal number of children for *i*th women of *j*th village

x_{pij} is the *p*th independent variable at individual level

u_{qj} is the *q*th independent variable at village level

$\beta_0 + \beta_p + \gamma_q$= the fixed part

$\mu_{oj} + e_{ij}$=the random part

We carried out all analysis in STATA S.E. 15.0.

[2]The detailed list of the variables included is shown in Appendix (B1). Principal component analysis is a statistical technique used to reduce the number of variables into a smaller data set. We used information regarding ownership of furniture, electrical devices and appliances, vehicles, and land. We used factor scoring, with each variable from first principle components as weights, to generate a socioeconomic indicator for each household (Vyas & Kumaranayake, 2006). The index was then coded into three terciles, namely, poor (bottom 33.33% of the households), middle (intermediate 33.33%), and rich (top 33.33%).

3 | RESULTS

3.1 | Basic demographic and socioeconomic profile of Assam and sample description

Table 2 presents the socioeconomic and demographic characteristics of the overall sample and those by type of villages. Approximately one-fifth (21%) of the sample belong to native communities, and about 22% belong to an immigrant population group; 29% of women belong to mixed communities and 28% are descendants of immigrants. About 40% of the total sample was illiterate. Women from native villages have a relatively higher share in terms of having a high school education or above, compared with women from the immigrant villages (28% vs. 12%). In general, 51% of women deliver their first child by the age of 19. However, 58% of women belonging to immigrant villages deliver their first baby aged between 15 and 19 compared with 40% of women from native villages. Approximately 65% of the women are Muslim, and one-seventh (14%) belong to the SC/ST population. Nearly all immigrants belong to the Muslim religion (immigrant villages: 97% and immigrant descendant villages: 81%), whereas the opposite holds true for natives. Two-thirds of the women from native villages belong to deprived social groups, in

TABLE 2 Sample description of eligible women by background characteristics and by type of village, Assam, 2014–2015

Background variables	Native	Immigrants' descendants	Mixed	Immigrants	Total
Education					
Illiterate	38.58	42.37	37.85	43.01	40.41
Primary	14.61	24.58	16.02	22.58	19.57
Middle school	18.73	20.06	24.03	22.58	21.47
High school and above	28.09	12.99	22.1	11.83	18.54
Age at birth of first child					
15–19	39.70	54.52	51.38	58.42	51.35
20–24	29.96	32.49	33.7	27.60	31.22
25+	30.34	12.99	14.92	13.98	17.43
Religion					
Non-Muslim	91.01	19.21	33.43	2.51	34.79
Muslim	8.99	80.79	66.57	97.49	65.21
Social group					
Scheduled Caste/Scheduled Tribe (SC/ST)	40.45	11.30	9.67	0.00	14.50
Other backward castes (OBC)	29.96	0.56	14.09	0.36	10.62
General	29.59	88.14	76.24	99.64	74.88
Work status					
Housewife	83.15	92.09	92.27	93.55	90.57
Working	16.85	7.91	7.73	6.45	9.43
Sources of water					
Unsafe source (pond, open well, and others)	21.72	5.93	14.64	11.11	12.92
Safe source (tube well)	78.28	94.07	85.36	88.89	87.08
Type of cooking fuel					
Unclean fuel (Firewood etc.)	86.14	95.76	90.88	96.77	92.55
Clean (LPG, biogas etc.)	13.86	4.24	9.12	3.23	7.45
Wealth tercile					
Poor	29.21	27.97	37.29	39.43	33.44
Middle	23.22	38.98	33.98	35.48	33.44
Rich	47.57	33.05	28.73	25.09	33.12
Children ever-born					
3 or less	86.52	76.84	78.73	68.46	77.58
4 and above	13.48	23.16	21.27	31.54	22.42
Ideal number of children					
3 or less	59.77	51.56	46.96	39.13	49.24
4 and above	40.23	48.44	53.04	60.87	50.76
N	267 (21.16)	354(28.05)	362(28.68)	279(22.11)	1,262

Source: Field survey, Assam, 2015–2016.

other words, the Other Backward Caste/SC/ST population. An overwhelming percentage of women report themselves as housewives (90%) in our study sample and the variation in work status across village type is nearly negligible.

Although most of the women from all villages have access to safe water (87%), 92% of the sample uses unclean fuel such as firewood for cooking. A higher percentage of women from immigrant villages have access to safe water (89%) compared with those from native villages (78%). As we categorised households' economic status per wealth tercile, about one-third of the sample belongs to one of the three categories of wealth status. The percentages of women belonging to poor wealth terciles varies from 29 to 39% in all types of villages.

Table 2 also presents the percentage of women reporting the number of children ever-born and the ideal number of children. At the time of the survey, 78% of the women had a family with three or less children, and only 49% of the women perceived the ideal family as comprising three children or less. This indicates that a substantial percentage of women with three or less children perceive the ideal size of the family as being more than three. This may be because many of them have not reached the end of their reproductive life. Across village type, about 32% of women belonging to immigrant villages reported having four or more children, whereas only 13% of women belonging to native villages reported the same. We see a similar differential in the reporting of the ideal number of children as four and above (40% among women from native villages versus 61% among women from immigrant villages).

Figure 1 presents the average number of children ever-born (a) and the ideal number of children (b) by type of village. It is found that the average number of children ever-born is the lowest in the native villages in contrast with the average number of children ever-born being the highest in the immigrant villages. The average number of children ever-born among villages of old settlers and mixed population lies midway between the native and immigrant villages. As far as the ideal number of children is concerned, the average ideal family size for women is marginally higher in native villages than in villages of old settlers and mixed population. At the same time, the average ideal number of children in immigrant villages is higher than in the rest of the villages. Application of the Chi square test shows that the variation in the average number of children ever-born and the ideal number of children by village type is statistically significant ($p < 0.01$).

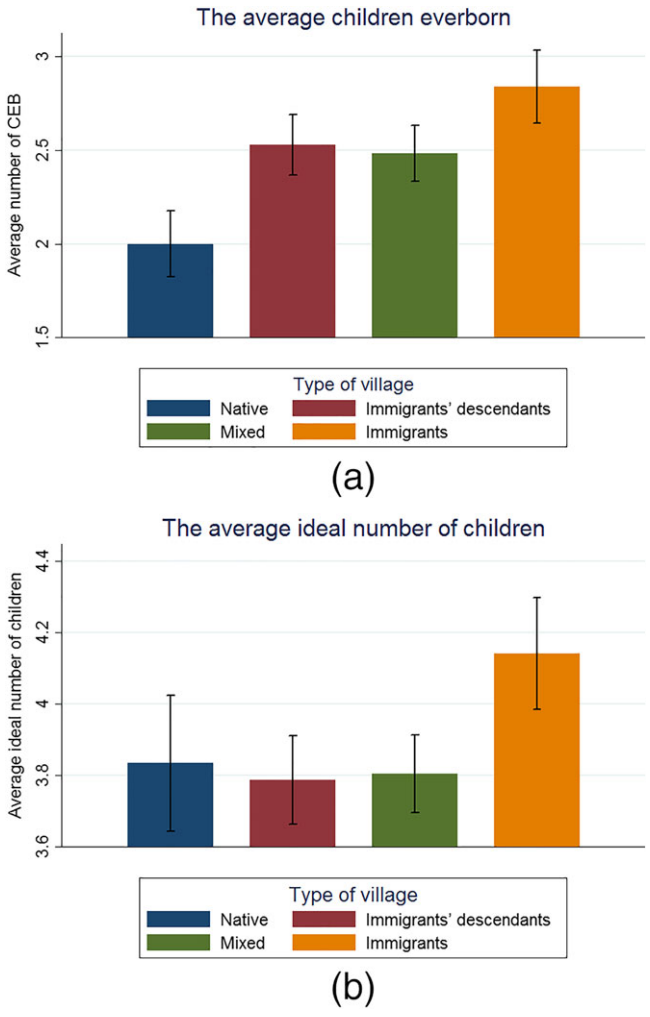

FIGURE 1 The average number of children ever born (a) and average ideal number of children (b) by type of village in Assam, 2014–2015

3.2 | Determinants of actual and ideal fertility of immigrant and native families

We used four stepwise multilevel mixed-effects models to examine the significance of village type for the actual number of children born to women and for the perceived ideal number of children, as reported by them. In Table 3, Model-I presents the coefficients of association of type of village with the dependent variable, along with the overall mean number of children ever-born and random effects parameters (adjusted for age and age square of the respondent). This model shows the mean number of children ever-born to women when we account only for the village-level clustering of women together with age and type of village. The variation in fertility at the women's level ($SD = 1.404$) is much higher than that at the village level ($SD = 0.429$). The intraclass correlation coefficient shows that about 8.6% of the variations in fertility are due to the village-level clustering of women, adjusted for type of villages. These results clearly show that women coming from villages of immigrants, immigrants' descendants, and mixed type have a higher likelihood of having a greater number of children than women belonging to native villages (immigrants $\beta = 0.926$, $p < 0.01$; immigrants' descendants $\beta = 0.653$, $p < 0.01$; mixed $\beta = 0.653$, $p < 0.01$).

In Model 2, we controlled for the effect of socioeconomic characteristics other than religion. Even after controlling for the demographic and socioeconomic characteristics of women at individual and village level, the likelihood of having fewer children is highest among women in native villages. However, we observed a statistically significant coefficient only with respect to women belonging to immigrant villages, confirming that they have a higher level of fertility ($\beta = 0.448$, $p < 0.01$). In model 3, we controlled for the effect of socioeconomic

TABLE 3 Results of multilevel mixed effects linear regression model assessing demographic and socioeconomic determinants of the number of children ever-born in Assam, 2014–2015

Variables	Model 1	Model 2	Model 3	Model 4
Intercept	0.331 (0.205)	1.898***(0.281)	1.721***(0.279)	1.723***(0.284)
Random effects parameters				
Standard deviation of village mean from intercept	0.429 (0.064)	0.243 (0.052)	0.219 (0.052)	0.209(0.058)
Standard deviation of residual	1.404 (0.029)	1.252 (0.025)	1.252 (0.025)	1.252(0.025)
Individual level characteristics				
Age of the respondent	0.048***(0.004)	0.044***(0.004)	0.045***(0.004)	0.045***(0.004)
Age squared	−0.000***(0.000)	−.0000***(0.000)	−0.000***(0.000)	−0.000***(0.000)
Age at birth of first child		−0.034***(0.002)	−0.033***(0.002)	−0.033***(0.002)
Education				
Illiterate				
Primary		−0.282***(0.104)	−0.275***(0.104)	−0.272***(0.104)
Middle school		−0.385***(0.104)	−0.364***(0.104)	−0.367***(0.104)
High school and higher		−0.637***(0.117)	−0.606***(0.117)	−0.609***(0.117)
Work status				
Not working/housewife				
Working		−0.204 (0.126)	−0.198 (0.126)	−0.199 (0.126)
Wealth tercile				
Poor				
Middle		0.121 (0.091)	0.125 (0.091)	0.131 (0.091)
Rich		−0.151 (0.102)	−0.118 (0.102)	−0.11 (0.102)
Sources of water				
Unsafe				
Safe		0.098 (0.121)	0.063 (0.119)	0.076 (0.119)
Type of cooking fuel				
Unclean				
Clean		−0.185 (0.151)	−0.141 (0.151)	−0.143 (0.15)
Village level characteristics				
Percentage of SC/ST population in village		−0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
Percentage of children who died in village		0.034***(0.01)	0.028***(0.009)	0.029***(0.009)
Percentage of Muslim population			0.006***(0.002)	0.006***(0.002)
Type of village				
Native				
Immigrants' descendants	0.653***(0.202)	0.171 (0.156)		−0.13 (0.18)
Mixed	0.653***(0.198)	0.233 (0.152)		−0.011 (0.165)
Immigrants	0.926***(0.217)	0.448***(0.173)		0.076 (0.207)
Residual intraclass correlation coefficient	0.086 (0.024)	0.036(0.015)	0.03*(0.014)	0.027(0.013)

Standard error is in parentheses.

Note. Significance levels:

*$p < 0.10$. ***$p < 0.01$.

characteristics other than the type of villages. In this model, we observed that there is a statistically significant association of the dependent variable with the age-related variables, education of women, percentage of children that died, and the percentage of Muslim population in the village. In the final model, we also controlled for the effect of religion as a village-level variable. The likelihood of having a larger number of children increases as the percentage of Muslim women increases ($\beta = 0.006$, $p < 0.01$). In the final model, the presence of the religion variable surpasses the effect of the type of village, confirming that religion is the main driver of the fertility differential between women from native and immigrant villages. After controlling for the role of individual- and village-level variables, the residual intraclass correlation coefficient drops significantly (from 0.086 in model 1 to 0.027 in Model 4).

Among other variables, we found that the age of the respondent, age at birth of first child, education, and working status of women are associated with the actual number of children born to women in a statistically significant way. As the age of the respondent increases, the

TABLE 4 Results of multilevel mixed effects linear regression model assessing demographic and socioeconomic determinants of the ideal number of children, Assam, 2014–2015

Variables	Model 1	Model 2	Model 3	Model 4
Intercept	3.723***(0.168)	2.524***(0.189)	2.36***(0.183)	2.355***(0.183)
Random effects parameters				
Standard deviation of village mean from intercept	0.277 (0.056)	0.198 (0.036)	0.156 (0.035)	0.127 (0.037)
Standard of residual	1.247 (0.025)	0.812 (0.017)	0.812 (0.017)	0.812 (0.017)
individual level characteristics				
Age of the respondent	0.004 (0.004)	−0.001 (0.003)	−0.001 (0.003)	−0.001 (0.003)
Age squared	0.000 (0.000)	0.000 (000)	0.000(0.000)	0.000 (0.000)
Age at birth of first child		0.053***(0.001)	0.054***(0.001)	0.053***(0.001)
Education				
Illiterate				
Primary		−0.12*(0.068)	−0.113*(0.067)	−0.109 (0.067)
Middle school		−0.191***(0.068)	−0.166**(0.068)	−0.165**(0.067)
High school and higher		−0.294***(0.077)	−0.26***(0.076)	−0.264***(0.076)
Work status				
Not working/housewife				
Working		−0.044 (0.082)	−0.04 (0.082)	
Wealth tercile				−0.04 (0.081)
Poor				
Middle		−0.102*(0.06)	−0.105*(0.059)	
Rich		−0.222***(0.067)	−0.2***(0.067)	−0.102*(0.059)
Sources of water				−0.192***(0.066)
Unsafe				
Safe		0.089 (0.08)	0.047 (0.078)	0.058 (0.077)
Type of cooking fuel				
Unclean				
Clean		−0.174*(0.099)	−0.131 (0.098)	−0.132 (0.097)
Village level characteristics				
Percentage of SC/ST population in village		0.001 (0.001)	0.003**(0.001)	0.003**(0.001)
Percentage of children that died in village		0.013*(0.007)	0.007 (0.006)	0.008 (0.006)
Percentage of Muslim			0.006***(0.001)	0.006***(0.001)
Type of village				
Non-migrants				
Immigrants' descendants	−0.047 (0.149)	0.18 (0.112)		−0.166 (0.114)
Mixed	−0.022 (0.146)	0.296***(0.11)		0.013 (0.104)
Immigrants	0.329**(0.159)	0.509***(0.125)		0.078 (0.131)
Residual intraclass correlation	0.047(0.018)	0.056 (0.02)	0.035(0.016)	0.024(0.014)

Standard error is in parentheses.

Note: Significance levels:

*$p < 0.10$. ***$p < 0.01$.

likelihood of having more children also increases. With an increase in age at birth of first child, women are less likely to have more children. Similarly, as the educational attainment of women increases, the number of children ever-born decreases. Housewives have a greater number of children than women working outside the home, although the association is not statistically significant. Another interesting finding from model 4 in Table 3 is that the percentage of children dying in the village is positively associated with children ever-born ($\beta = 0.028$, $p < 0.01$).

Table 4 presents the results of a two-level mixed-effects linear regression model for the association between the ideal number of children and type of village, after controlling for the role of demographic and socioeconomic characteristics. Model-I presents the coefficients of type of village with ideal number of children along with the overall mean of children ever-born and random effects parameters (adjusted for age and age square of the respondent). Like the findings of actual number of children ever-born, Model 2 reveals that women belonging to villages of immigrants and mixed type report a higher ideal number

of children than women belonging to native villages (immigrants β = 0.509, $p < 0.01$; mixed β = 0.296, $p < 0.01$) and after controlling for all socioeconomic characteristics other than religion. In Model 3, we controlled for the effect of demographic and socioeconomic characteristics except the type of villages. In this model, we observed a statistically significant coefficient for women belonging to the villages with a higher Muslim and SC/ST population (percentage of Muslims: β = 0.006, $p < 0.01$; percentage SC/STs β = 0.003, $p < 0.01$) together with the education and wealth tercile of the households. In the final model, after controlling for the effect of all the socioeconomic variables together, the likelihood of having more children as *ideal* increases as the percentage of Muslim women increases at village level (β = 0.006, $p < 0.01$). Interestingly, religion again surpasses the effect of the type of village in the final model.

4 | DISCUSSION AND CONCLUSION

It has become increasingly important to understand the patterns and consequences of international migration. Despite the fact that *south–south migration* (also termed as *poor-to-poor-country* migration) is one of international migration's most prominent trends (United Nations, 2016), the literature on immigration issues concentrates heavily on northern countries. Moreover, within India, the northeastern states are poorly represented in the demographic literature. Although there are frequent debates on immigration and growth in the number of people of immigrant origin in Northeast India, we found empirical evidence to be limited in terms of helping to explain population dynamics in this part of the country. The aim of the present study was thus to contribute knowledge on the fertility differential by migration status in areas neglected by researchers that, nonetheless, are of substantial demographic and socioeconomic importance. A native–migrant comparison of fertility differentials is particularly significant for Assam, the biggest state in Northeast India, as it indicates the future population dynamics of this region. Using the data from a recently conducted primary sample survey, the present study investigated actual and ideal fertility behaviour among women from four distinct types of villages in Assam, namely, native Assamese villages, immigrant villages, immigrant descendants' villages, and villages of mixed population. To our knowledge, no similar study has been conducted on the native–immigrant fertility differential in any Indian state (namely, Assam or West Bengal) or those widely documented as Bangladeshi migrant-receiving states (Samaddar, 1999; van Schendel, 2005).

Our study demonstrates that even in low-income situations where both natives and immigrants are relatively poor, the fertility difference between women from native and immigrant villages resembles to a great extent what, in high-income countries, is already an established fact. Our results show that both the actual and ideal level of fertility among women from immigrant villages is substantially higher than those from native villages. At the same time, the difference in both actual and ideal fertility behaviour between the native- and descendants of immigrant villages is much smaller than that between native and immigrant villages, indicating an assimilation of demographic behaviours by the second-generation immigrants. Thus, the descendants of immigrants tend to have a higher fertility level than natives but a lower one than immigrants. Our study reveals that after controlling for the important variable, the socioeconomic status of women, women belonging to immigrant or immigrant descendants' villages have higher fertility than the rest. However, this effect vanishes once the role of religion at village level is controlled for. This finding is different from those observed in high-income countries (Kulu et al., 2017; Kulu & Hannemann, 2016) where the effect of migration status remains after controlling for the effect of religion.

In light of the immigration and fertility theories discussed earlier, we may infer that the fertility differential by migration status in Assam resembles the hypothesis of socialisation and adaptation. In common with socialisation theory, which derived from the experiences of Western countries, immigration has, in our study area too, been taking place from a densely populated area (East Bengal or Bangladesh) as a result of high fertility to a relatively less populated area (Das, 2016; Davis, 1951). In the literature, it is argued that if immigrants from high-fertility countries are able to maintain the subculture of their country of origin, their fertility remains higher than that of the native-born population. Together with cultural norms, education and employment opportunities play an important role in the fertility behaviour of immigrants and their descendants in high-income countries (Kulu et al., 2017). In general, immigration to Assam is a poverty-induced phenomenon (Das, 2016; Siddiqui, 2003), indicating that the immigrants belong to poorer socioeconomic strata compared with old settlers or natives. Immigrants are often involved in agriculture or allied activities in the unorganised sector, which demands manual labour. Children supply labour by helping parents' economic activities and contributing to family income. As a result, parents may see having a higher number of children as an economic asset. However, the longer immigrants stay at their new destination, the more they may try to imitate the behaviour of the native-born population through observation and through interaction with people in the new environment. They may replicate the behaviour of the native-born residents by sending their children to school, which increases the cost of raising children. This may lead to lower fertility among second-generation immigrants. At the same time, the fact that immigrants in Assam belong to poorer socioeconomic strata is one among several dimensions of the *selectivity* issue discussed in the introduction.

Our analysis shows that the effect of village type vanishes once we control for the effect of religion. As the percentage of Muslim women in a village increases, so too does the fertility after all background characteristics are controlled for. The final model thus shows that religious traits are more important than the migration characteristics of the study population. The findings of this study further contribute to the ongoing debate on whether differences in socioeconomic characteristics between Muslim and non-Muslim populations entirely explain the difference in fertility between these two population subgroups. Although some literature demonstrates that a higher level of fertility among the Muslim population is not entirely due to religious affiliation (Westoff & Frejka, 2007), some others resolved that socioeconomic factors does not entirely explain the

higher level of fertility among Muslims in India (Bhat, 2005; Bhat & Zavier, 2005; Dharmalingam & Morgan, 2004; Kulkarni & Alagarajan, 2005; Mishra, 2004; Morgan, Stash, Smith, & Mason, 2002). Our findings are consistent with previous studies conducted in India (Balasubramanian, 1984; Bhat & Zavier, 2005; Dharmalingam & Morgan, 2004; Pasupuleti, Pathak, & Jatrana, 2017), which repeatedly found Muslim women in India to have higher fertility than Hindu women, independent of socioeconomic condition. It has been said that although both Islam and Hinduism are pro-natalist religions, their beliefs differ greatly with respect to marriage, reproductive behaviour, and fertility control, and this has different effects on the intermediate variables of fertility (Balasubramanian, 1984). The role of religion or pro-natal religious leaders is crucial when the role of the healthcare system is minimal. This is particularly true of our study area. According to the National Family Health Survey (NFHS, 2015–2016), maternal and child healthcare service utilisation and the quality of family planning services throughout Assam is very poor (IIPS and ICF, 2017).[3] Poor knowledge and access to family planning, together with religious superstition, have aggravated the situation relating to the reproductive choice of immigrant women with low educational attainment.

Another reason for high fertility among women from immigrant villages can be linked to the local political environment. Political leaders of immigrant origin may promote higher fertility to increase the numbers of their voters, which is crucial for negotiating welfare benefits in a democratic system. A study found that local political leaders in Assam depend on the immigrants to sustain their power (Goswami, 2010; Saikia et al 2016). They may also encourage more births to increase the political power of people of immigrant origin in the future. Because of geographic proximity, the historical context (Indian Partition), and over-population in East Bengal, the former political leaders of Pakistan always wanted Assam to be part of East Pakistan or East Bengal (current Bangladesh) (Bhutto, 1969; Jinnah, 1947). The local political leaders of immigrant origin can be influenced by expansionist political ideology (Hussain, 2004), which, in turn, encourages a higher level of fertility.

The religious determinant of fertility and its consequences for native–immigrant differentials emerging in our study agree with studies pertaining to European countries. For example, a recent study in Europe (Stonawski et al., 2016) concluded that the fertility rates of Muslims (both native and immigrant) are higher than those of non-Muslims. The authors also inferred that fertility rates are higher in countries where most of the Muslims were immigrants. Our findings are also consistent with the findings of previous studies conducted in the United Kingdom and the rest of Europe (Coleman & Dubuc, 2010; Kulu et al., 2017; Kulu & Hannemann, 2016). The fertility level of Bangladeshi or Pakistani immigrant women is also found to be substantially higher than that of native women in high-income countries like the United Kingdom, despite a declining trend over the years.

[3]According to NFHS-4, the percentage of mothers who had full antenatal care (at least four antenatal visits, at least one tetanus injection, and iron and folic acid pills/syrup taken for 100 or more days) is as low as 18%; of nonusers, only 17.2% women were told about family planning methods by health workers.

Following the findings of this study, it is crucial to discuss the possible impact of the relatively higher level of fertility among immigrants (and immigrants' descendants) on the size and composition of the host population. In general, if the total size of the immigrant population is found to be small, a small difference in fertility between natives and immigrants can have a minor impact on the overall size of the population. In the context of Assam, immigrants or their descendants constitute nearly 16% of the population (Saikia, Saha, et al., 2016). The existing size of the immigrant population together with differential fertility might have been affecting the total size of the population in Assam. In addition, it has a significant impact on the ethnic or religious composition, particularly at district level as discussed previously (The Governor of Assam, 1998).

The present study has a few limitations. First, our sample is not representative of the entire state of Assam; it represents mainly the central and western districts. On the basis of other studies using census data (Singh, Kumar, Pathak, Chauhan, & Banerjee, 2017), the fertility rate is found to be much lower in the eastern districts of Assam where the native population is dominant. We may thus speculate that the native–immigrant differential will be even higher if the fertility level of the districts where immigration is relatively less pronounced had been taken into account. Secondly, we could not include the husbands of the women in our analysis, as we did not collect any data related to them. Particularly in the Indian context, husbands may influence the fertility decision. However, we did include the major socioeconomic characteristics of the household, which may be a substitute for the husband's role in fertility decision making. Thirdly, our study is based on cross-sectional data despite much of the previous literature on the present topic being based on longitudinal data. This is because of the paucity of longitudinal data in the study area. Despite these limitations, the present study provides crucial scientific evidence on the native-immigrant fertility differential in low-income and high-fertility settings.

To reduce fertility and improve the quality of life of women of immigrant origin, the educational level, particularly of females, must be increased. Knowledge of, and access to, modern family planning methods should be increased in immigrant villages through an expansion of healthcare facilities.

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REFERENCES

Abbasi-Shavazi, M. J., & Sadeghi, R. (2015). Socio-cultural adaptation of second-generation Afghans in Iran. *International Migration*, *53*(6), 89–110. https://doi.org/10.1111/imig.12148

Abbasi-Shavazi, M. J., Sadeghi, R., Mahmoudian, H., & Jamshidiha, G. (2012). Marriage and family formation of the second-generation Afghans in Iran: Insights from a qualitative study. *International Migration Review*, *46*(4), 828–860. https://doi.org/10.1111/imre.12002

Allen, B. C. (1905). *Assam District Gazetteers. Volume VI Nowgong*. Calcutta: The City Press.

Andersson, G. (2004). Childbearing after migration: Fertility patterns of foreign-born women in Sweden. *International Migration Review*, *38*(2), 747–774. https://doi.org/10.1111/j.1747-7379.2004.tb00216.x

Balasubramanian, K. (1984). Hindu-Muslim differentials in fertility and population growth in India: Role of proximate variables. *Artha Vijnana*, *26*, 189–216. https://doi.org/10.21648/arthavij/1984/v26/i3/116369

Baruah, R.K., Bhattacharyya, A.K., Dutta, A.K. and Borpatragohain, R. (2017). Final report submitted by Brahma Committee (M), Commitee for protection of land rights of indigenous people of Assam 2017.

Basu, A. M. (2002). Why does education lead to lower fertility? A critical review of some of the possibilities. *World Development*, *30*(10), 1779–1790. https://doi.org/10.1016/S0305-750X(02)00072-4

Bhat, P. M. (2005). Trivialising religion: Causes of higher Muslim fertility. *Economic and Political Weekly*, *40*(13), 1376–1379.

Bhat, P. M., & Zavier, A. F. (2005). Role of religion in fertility decline: The case of Indian Muslims. *Economic and Political Weekly*, *40*(5), 385–402.

Bhutto, Z. A. (1969). *The myth of independence* (pp. 66–69). London: oxford university press. Member Sindh Council, PPP

Carter, M. (2000). Fertility of Mexican immigrant women in the US: A closer look. *Social Science Quarterly*, *81*(4), 1073–1086.

Census commissioner (1961). *Census of India 1961* (ed., Vol. III) (pp. 123–124). Assam: Part I-A General Report. 72

Chattopadhyay, A., White, M. J., & Debpuur, C. (2006). Migrant fertility in Ghana: Selection versus adaptation and disruption as causal mechanisms. *Population Studies*, *60*(2), 189–203. https://doi.org/10.1080/00324720600646287

Coleman, D. (2006). Immigration and ethnic change in low-fertility countries: A third demographic transition. *Population and Development Review*, *32*(3), 401–446. https://doi.org/10.1111/j.1728-4457.2006.00131.x

Coleman, D. A. (1994). Trends in fertility and intermarriage among immigrant populations in Western Europe as measures of integration. *Journal of Biosocial Science*, *26*(1), 107–136.

Coleman, D. A., & Dubuc, S. (2010). The fertility of ethnic minorities in the UK, 1960s–2006. *Population Studies*, *64*(1), 19–41. https://doi.org/10.1080/00324720903391201

Das, P. (2016). *Illigal migration from Bangladesh. Deportation, border fences and work permit. IDSA Monograph Series. No 56, December 2016*. New Delhi. Retrieved from https://idsa.in/monograph/illegal-migration-from-bangladesh_pdas: Institute for Defence Studies and Analyses. Accessed on 21st August 2018

Davis, K. (1951). *The population of India and Pakistan Kingsley Davis*. Princeton, N. J: Princeton Univ. Press.

Dharmalingam, A., & Morgan, S. P. (2004). Pervasive Muslim-Hindu fertility differences in India. *Demography*, *41*(3), 529–545. https://doi.org/10.1353/dem.2004.0020

Dubuc, S. (2012). Immigration to the UK from high-fertility countries: Intergenerational adaptation and fertility convergence. *Population and Development Review*, *38*(2), 353–368. https://doi.org/10.1111/j.1728-4457.2012.00496.x

Dubuc, S., & Haskey, J. (2010). Ethnicity and fertility in the United Kingdom. In *Ethnicity and integration* (pp. 63–81). Dordrecht: Springer.

Gait, A. (1906). *A history of Assam*. Calcutta: Thacker, Spink & co.

Genereux, A. (2007). A review of migration and fertility theory through the lens of African immigrant fertility in France. Max Planck Institute for Demographic Research, Working Paper 2007, 8.

Goswami, N. (2010). Bangladeshi illegal migration into Assam: Issues and concerns from the Field Institute for Defence Studies and Analyses issue brief. Retrieved from https://idsa.in/issuebrief/BangladeshiIllegalMigrationintoAssam_ngoswami_140110 Accessed on 19th November 2018.

Government of Assam (2019). Assam accord and its clauses. Retrieved from https://assamaccord.assam.gov.in/portlets/assam-accord-and-its-clauses Accessed on 11th January 2019.

Hazarika, S. (2000). *Rites of passage: Border crossings, imagined homelands, India's East and Bangladesh*. New Delhi: Penguin Books.

Hervitz, H. M. (1985). Selectivity, adaptation, or disruption? A comparison of alternative hypotheses on the effects of migration on fertility: The case of Brazil. *International Migration Review*, *19*, 293–292, 317.

Hussain W. (2004). Assam: Demographic jitters. Retrieved from https://www.outlookindia.com/website/story/demographic-jitters/225190 Accessed on 19th November 2018.

IIPS (International Institute for Population Sciences) and ICF (2017). National Family Health Survey (NFHS-4), 2015–16: India.Mumbai: IIPS.

Jinnah A. (1947). Move to partition Punjab and Bengal. Retrieved from http://www.nationalarchives.gov.uk/education/resources/the-road-to-partition/jinnah-partition/ Accessed on 19th November 2018.

Kahn, J. R. (1988). Immigrant selectivity and fertility adaptation in the United States. *Social Forces*, *67*(1), 108–128. https://doi.org/10.1093/sf/67.1.108

Kravdal, Ø. (2002). Education and fertility in sub-Saharan Africa: Individual and community effects. *Demography*, *39*(2), 233–250.

Kulkarni, P. M., & Alagarajan, M. (2005). Population growth, fertility, and religion in India. *Economic and Political Weekly*, *40*(5), 403–410.

Kulu, H. (2005). Migration and fertility: Competing hypotheses re-examined. *European Journal of Population/Revue européenne de Démographie*, *21*(1), 51–87. https://doi.org/10.1007/s10680-005-3581-8

Kulu, H., & Hannemann, T. (2016). Why does fertility remain high among certain UK-born ethnic minority women? *Demographic Research*, *35*, 1441–1488. https://doi.org/10.4054/DemRes.2016.35.49

Kulu, H., Hannemann, T., Pailhé, A., Neels, K., Krapf, S., González-Ferrer, A., & Andersson, G. (2017). Fertility by birth order among the descendants of immigrants in selected European countries. *Population and Development Review*, *43*(1), 31–60. https://doi.org/10.1111/padr.12037

Livingston, G., & Cohn, D. (2012). US birth rate falls to a record low: Decline is greatest among immigrants. Pew Research Center Social and Demographic Trends.

Majelantle, R. G., & Navaneetham, K. (2013). Migration and fertility: A review of theories and evidences. *Journal of Global Economy*, *1*(101), 2.

Milewski, N. (2010). Immigrant fertility in West Germany: Is there a socialization effect in transitions to second and third births? *European Journal of Population/Revue européenne de Démographie*, *26*(3), 297–323. https://doi.org/10.1007/s10680-010-9211-0

Mishra, V. K. (2004). Muslim/non-Muslim differentials in fertility and family planning in India. Avaialable at https://scholarspace.manoa.hawaii.edu/handle/10125/3749

Morgan, S. P., Stash, S., Smith, H. L., & Mason, K. O. (2002). Muslim and non-Muslim differences in female autonomy and fertility: evidence

from four Asian countries. *Population and Development Review*, *28*(3), 515–537. https://doi.org/10.1111/j.1728-4457.2002.00515.x

Murthi, M., Guio, A. C., & Dreze, J. (1995). Mortality, fertility, and gender bias in India: A district-level analysis. *Population and Development Review*, *21*, 745–782. https://doi.org/10.2307/2137773

Nath, B. K., Nath, D. C., & Bhattachaya, B. (2012). Undocumented migration in the State of Assam in North East India: Estimates since 1971 to 2001. *Asian Journal of Applied Sciences*, *5*(3), 164–173. https://doi.org/10.3923/ajaps.2012.164.173

Nath, H. K., & Nath, S. K. (2011). Illegal migration into Assam: Magnitude, causes, and economic consequences.

Office of the Registrar General & Census Commissioner, India. (2015). *Sample registration system statistical report 2015* (Annual). New Delhi: MINISTRY OF HOME AFFAIRS, Government of India. Retrieved from http://www.censusindia.gov.in/vital_statistics/SRS_Reports_2015.html Accessed on 19th November 2018.

Office of the Registrar General & Census Commissioner, India. (2017). *SRS based abridged life tables 2011–15*. New Delhi. Retrieved from http://www.censusindia.gov.in/Vital_Statistics/SRS_Life_Table/Srs_life_Table_2011-15.html Accessed on 19th November 2018.

Pasupuleti, S. S. R., Pathak, P., & Jatrana, S. (2017). Hindu–muslim fertility differential in india: A cohort approach. *Journal of Biosocial Science*, *49*(2), 147–172. https://doi.org/10.1017/S0021932016000262

Saikia N., Joe W., Saha, A. and Chutia, U. (2016). Cross border migration in Assam during 1951–2011: Process, magnitude, and socio-economic consequences. Project report submitted to ICSSR: Delhi.

Saikia N., Saha, A., Bora, J.K. and Joe, W.. (2016). Trends in immigration from Bangladesh to Assam, 1951-2001 Evidence from direct and indirect demographic estimation. *International Migration and Diaspora Studies (IMDS) Working paper series*, Working paper no 91. ISSN 0976-271X published by IMDS project, Zakir Husain Centre for Educational Studies, JNU, New Delhi

Samaddar, R. (1999). *The marginal nation: Transborder migration from Bangladesh to West Bengal*. Delhi: Sage.

Sharma, C. K. (2012). The immigration issue in Assam and conflicts around it. *Asian Ethnicity*, *13*(3), 287–309. https://doi.org/10.1080/14631369.2012.676235

Siddiqui, T. (2003). *Migration as a livelihood strategy of the poor: The Bangladesh case*. Bangladesh: Refugee and Migratory Movements Research Unit, Dhaka University.

Singh, A., Kumar, K., Pathak, P. K., Chauhan, R. K., & Banerjee, A. (2017). Spatial patterns and determinants of fertility in India. *Population*, *72*(3), 505–526.

Sobotka, T. (2008). Overview Chapter 7: The rising importance of migrants for childbearing in Europe. *Demographic Research*, *19*(9), 225–248. https://doi.org/10.4054/DemRes.2008.19.9

Sobotka, T., & Beaujouan, É. (2014). Two Is best? The persistence of a two-child family ideal in Europe. *Population and Development Review*, *40*(3), 391–419. https://doi.org/10.1111/j.1728-4457.2014.00691.x

Stephen, E. H., & Bean, F. D. (1992). Assimilation, disruption and the fertility of Mexican-origin women in the United States. *International Migration Review*, *26*(1), 67–88. https://doi.org/10.1177/019791839202600104

Stonawski, M., Potančoková, M., & Skirbekk, V. (2016). Fertility patterns of native and migrant Muslims in Europe. *Population, Space and Place*, *22*(6), 552–567. https://doi.org/10.1002/psp.1941

Superintendent of Census Operations, Assam. (1912). Census of India 1911 Volume III Assam Part I Report. The Government Press Assam, Shillong.

Superintendent of Census Operations, Assam. (1923). Census of India 1921 Volume III Assam Part I Report. The Government Press Assam.

Superintendent of Census Operations, Assam and Mullan C. S. (1932). Census of India 1931 Volume III Assam Part I Report. The Government Press Assam, Shillong.

Superintendent of Census Operations, R. B. V. (1954). *Census of India, 1951 Volume XII Assam, Manipur and Tripura Part I-A:Report* (Vols. 1–XII). Shilong: The Municipal Printing Press, Bombay.

The Governor of Assam (Sinha, S.K) (1998). Report on illegal migration into Assam, Submitted to The President of India by The Governor of Assam. Retrieved from http://www.satp.org/satporgtp/countries/india/states/assam/documents/papers/illegal_migration_in_assam.htm Accessed on 19th November 2018.

United Nations. (2016). *International migration report 2015*. Retrieved from http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2015.pdf

van Schendel, W. (2005). *The Bengal borderland: Beyond state and nation in South Asia*. London: Anthem Press.

Vyas, S., & Kumaranayake, L. (2006). Constructing socio-economic status indices: How to use principal components analysis. *Health Policy and Planning*, *21*(6), 459–468. https://doi.org/10.1093/heapol/czl029

Weiner, M. (1983). The political demography of Assam's anti-immigrant movement. *Population and Development Review*, *9*, 279–292. https://doi.org/10.2307/1973053

Westoff, C. F., & Frejka, T. (2007). Religiousness and fertility among European Muslims. *Population and Development Review*, *33*(4), 785–809. https://doi.org/10.1111/j.1728-4457.2007.00197.x

Williams, J., Ibisomi, L., Sartorius, B., Kahn, K., Collinson, M., Tollman, S., & Garenne, M. (2013). Convergence in fertility of South Africans and Mozambicans in rural South Africa, 1993–2009. *Global Health Action*, *6*(1), 19236. https://doi.org/10.3402/gha.v6i0.19236

Woldemicael, G., & Roderic, B. (2010). Fertility behavior of immigrants in Canada: Converging trends. *PSC Discussion Papers Series*, *24*(5), 1.

World Bank. 2017. Assam - Poverty, growth, and inequality (English). India state briefs. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/545361504000062662/Assam-Poverty-growth-and-inequality

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APPENDIX A

TABLE A1 Bengal born people in Assam, 1891–1951

Year	Persons
1891	418,360
1901	503,876
1911	191,612
1921	375,583
1931	575,000
1941	Not available
1951	833,000

Note. Sources: For 1891 and 1901: Subsidiary Table III, Page 38, Census of India 1901 Vol IV Assam Part I-Report; for 1991: page 34, Subsidiary Table V, Part II, Census of India 1911, Volume III; for 1921: Subsidiary Table IV Part 1, Page 47, Census of India 1921Volume III Assam Part I Report; for 1931: Page 44, 51; Census of India, Volume III, Assam Part 1 Report; 1951 Census: Table 1.23, Page 74, Census of India, 1951, Volume XII, Part 1-A report.

TABLE A2 Comparison of estimates of immigrants in Assam taken from previous quantitative studies, 1983–2017

Author/s	Time period	Estimates in millions
Weiner (1983)	1901–1981	10.4
Goswami et al. (2003)	1951–1991	2.8
Nath, Nath, and Bhattachaya (2012)	1971–1991	0.8
Saikia et al. (2016)	1951–2001	4.2

APPENDIX B

B1 LIST OF THE VARIABLES USED TO GENERATE WEALTH SCORE OF THE HOUSEHOLD

1. Mattress	2. Pressure cooker
3. Almirah, dressing table	4. Refrigerator
5. Chair, stool, bench, table	6. Water purifier
7. Suitcase, trunk, box, handbag	8. Electric iron, heater, oven or other electrical items
9. Carpet and floor matting	10. Bicycle
11. Other furniture and fixtures (couch, sofa etc.)	12. Motor cycle, scooter
13. Electric fan	14. Four-wheel motor car, jeep
15. Radio or transistor	16. Rickshaw
17. Colour television	18. Computer/laptop
19. VCR/VCD/DVD player	20. Mobile handset
21. Camera and photographic equipment	22. Telephone instrument
23. Wall clock, hand watch	24. Tractor
25. Air conditioner, air cooler	26. Irrigation pump
27. Sewing machine	28. Any other vehicle (auto, rickshaw/bus/truck/etc.)
29. Washing machine	30. Average land owned

REFERENCES OF APPENDIX

Weiner, M. (1983). The political demography of Assam's anti-immigrant movement. *Population and Development Review*, 279–292.

Goswami, A., A. Saikia & H. Goswami (2003). Population Growth in Assam 1951–1991 with Focus on Migration, Akansha Publishing House, New Delhi.

Nath, B. K., Nath, D. C., & Bhattacharya, B. (2012). Undocumented migration in the State of Assam in North East India: Estimates since 1971 to 2001. *Asian Journal of Applied Sciences*, *5*(3), 164–173.

Saikia N, Saha, A, Bora, J.K. and Joe, W. (2016). Trends in immigration from Bangladesh to Assam, 1951–2001 Evidence from direct and indirect demograph

ic estimation. International Migration and Diaspora Studies (IMDS) working paper series, Working paper no 91. ISSN 0976-271X published by IMDS project, Zakir Husain Centre for Educational Studies, JNU, New Delhi.