

Livelihood Diversification and Food Security for Sustainable Development : The Approaches for 2030

A peer reviewed edited book



Editors
Dr. Surabi Dutta
Suprity Shyam

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Fertility and Women Empowerment in India: An Empirical Investigation using Factsheet Data from NFHS – 5

Susmita Das*
Ritwik Mazumder**

Abstract

Using fourth and fifth rounds of NFHS fact sheet data we have empirically investigated how fertility across Indian states is influenced by socio-economic factors, specially those related to women empowerment and gender bias. Findings based on correlation and regressions suggest that fertility is significantly lower in the relatively richer and more urbanized states of India compared to relatively poorer agricultural states. Moreover, factors associated with women empowerment significantly lower fertility while gender bias has muted effects. We concluded that fertility decline can be achieved through formal education and skill formation of women, controlling the rate of early marriage and encouraging women's work participation. We are of the view that the focus has to be on the Hindi heartland states where gender bias and patriarchy are severe and women's autonomy within the household is low, specially when it comes to family planning or birth control related decisions.

Keywords: *Fertility, family planning, gender bias and women empowerment.*

JEL classification: *B54, C10, J13.*

Introduction

The fundamental objective of family planning in India has traditionally been fertility control. But family planning measures are not equally accepted and implemented throughout all states and regions of the country on account of a host of factors including that women empowerment. Consequently, the decline in fertility is very unequal across India and wide variations in achievements on this front are evident. In this paper, we address a crucial research question and that is, "can we explain the variations in fertility across Indian states based on women empowerment?" In our view, a systematic and statistically credible answer to this question can be provided by analysing the NFHS -5 factsheet data which provides us with several dimensions of women empowerment as well as state-level fertility for both the 5th and the 4th rounds of the NFHS survey. This paper views a drop in fertility as an outcome of women's empowerment and improvement in other dimensions of socio-economic development across states of India.

Fertility decline has several positive outcomes from the viewpoint of women and child health and the overall development of a nation. First, it aids in improving maternal health and child survival, second, it helps to reduce the number of abortions, especially unsafe abortions, third preventing sexually transmitted infections (STIs), including HIV/AIDS, fourth empowering women and finally promoting socio economic development & security. India has been a very high fertility country throughout the period 1951 – 81, naturally having high population growth rates and high population density (total population being almost 1.4 billion, only second to China). In 1950 India's TFR was 5.9 (Census of India, 1951) whereas currently, according to the NFHS-5 survey report it has declined to 2.0, which is below the replacement levels. Quite naturally the drop across states has not been equal. It is precisely the point of focus in this paper.

The key aspect we study in this paper is the impact or influence of women empowerment on fertility among women in the reproductive age group in India. The NFHS-4 and 5 give us fact sheet data on TFR across Indian states and union territories. There are in fact a 'priori reasons to believe that adoption of fertility decline is something that is endogenously determined by socio-economic factors although there could be exogenous influencing factors like the government's birth control policies. We can point out some potential factors affecting fertility as well as its decline over time. First, educationally accomplished women are likely to be aware of the economic hardships of raising a child without compromising on the child's health, basic education and skill development. Second, economically empowered women are naturally more likely to go for active family planning because fewer children make work participation easier. The third crucial point is that optimum spacing

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between two births is required more by working women as childbirth in quick succession hampers the employment prospects apart from its obvious fallouts on the mother's health. Exogenously imposed government policies through active and vigilant family planning can also influence fertility. But the success rate of exogenously imposed policies is likely to depend on empowerment levels of married women in the household along with education and awareness of the woman as well as her intimate partner.

But due to lack of education and awareness, empowerment levels fall. With lower empowerment comes economic dependence on in-laws, the intimate partner and women lose autonomy in intra-household decision making. Resistance against birth control measures from the intimate partner that is the husband and in-laws along with lack of autonomy in decision making are potential obstacles in the path of successful family planning practices by married women leading to higher fertility. In other words, gender bias and patriarchy are empowerment suppressing factors and hence are likely to play negative roles in the adoption of family planning methods finally resulting in higher fertility.

But a pertinent question, which are the states and regions of India that are under the scanner when it comes to studies on fertility, fertility decline and family planning? Obviously, the richer and more urbanised states and regions of the country with high human development indicators are already under a very low fertility rate regime with low birth and death rates, low infant mortality and maternal mortality rates. Such states hardly have an opportunity to lower the fertility. The levels of education and awareness among women in particular in these states are quite at par with those of OECD countries.

Concerning fertility decline, the focus of policymakers is usually on the BIMARU states and along with it, states like Odisha, Jharkhand, Chhattisgarh and a few others where fertility rates are high along with infant and maternal mortalities. These Hindi-heartland states are still comparatively socio-economically backward with typically low levels of PCNSDP, low female education, high gender gaps in education, poor sex ratio and low levels of women empowerment with very little autonomy in household-level decision making (Ghosh and Keshri, 2020).

As a passing note, it is worth mentioning that the level of gender bias and the level of economic development of the state or region concerned must be controlled while examining the impact of women empowerment indicators on the rate of fertility decline among married women in the reproductive age group. Our central research question addressed in this paper is, 'do women empowerment at the state level lead to lower fertility in India'? To examine this empirically based on recent evidence, we make use of NFHS 4th and 5th round state-level fact sheet data along with a few Census of India, 2011 sources in this paper. Simple statistical tools of ordinary correlation and regression are used for ease of interpretation and analysis without compromising issues related to econometric robustness. An obvious drawback of the study is that the focus is entirely on the role of women's empowerment in fertility thereby neglecting the role of men. The male members (husbands mostly) have a very crucial role to play in women's family planning decisions and thus total fertility which is avoided here.

The paper is organised in the following sections. After having presented a brief introduction and objectives in section I, section II presents a brief overview of existing influential literature on the topic. Section III deals with methodology and data sources while section IV analyses our empirical results. Finally, we conclude with a few policy suggestions in section V.

Review of Literature

Over the years numerous studies have been conducted on the role of women empowerment on fertility both at household levels as well as district and state levels. Cross-country studies are also available. A few significant studies are reviewed in this paper, especially those which are particularly relevant from our research standpoint.

Papers based on reviews of work done are important. Upadhyay et al. (2014) present a comprehensive overview of the literature on studies examining the relationships between women's empowerment and several fertility-related factors. Among the 60 studies identified, the majority were for South Asia ($n = 35$) and used household decision-making as a measure of empowerment ($n = 37$). The majority of studies found positive associations between women's empowerment and lower fertility, longer birth intervals, and lower rates of unintended pregnancy. In several studies, results differed based on the measure of empowerment used, socio-political or gender environment, or sub-population studied.

Susuman et al. (2011) studied female literacy and fertility levels in Kerala using the 2011 census data. Arriaga's approach is used for the estimation of age-specific fertility rates to show that women's empowerment gets as much importance as physical facilities and family planning programs in fertility decline. In a theoretical

argument, Phan (2013) identifies four major pathways in which women's empowerment affects women's fertility. Four aspects of women's empowerment that usually have effects on fertility include female education, labour force participation, participation in the decision-making process and women's use of contraceptives. Patriarchy and the preference for sons are common factors affecting women's empowerment and fertility. An increase in women's empowerment is often associated with lower fertility levels, whereas patriarchal cultural factors are often associated with a lower level of women's empowerment and higher fertility.

Patidar (2018) observes declining fertility in India because of socio-economic development. The author finds that tribals in India have relatively high fertility because of their traditional socio-cultural practices and poor economic condition. This study examined the role of women's empowerment on fertility behaviour based on primary data collected from ten tribal-dominated districts of Rajasthan. Results revealed that women's empowerment is negatively associated with fertility behaviour. Women's education, employability, decision making, exposure to media and spousal communication have significant impacts on fertility decline. Pande et al. (2012) analysed the relationship between fertility decline, changes in women's lives, gender equality and gender relations in Tamil Nadu over the last fifty years. The authors examined how fertility decline in Tamil Nadu manifested in changes in the social and economic value of children and the decrease in women's lifespan devoted to childbearing. The study found that women's lives have improved following fertility decline in the realms of higher education, marriage spousal choice and employment opportunities. They further claim that gender inequality also decreased in education and employment during the study period.

Larsen and Hollos (2003) explored the connection between the empowerment of women and fertility outcomes through an ethnographic study, a community-based survey and in-depth interviews in a rural area of Kilimanjaro Region, Tanzania. Their major hypothesis was that the decline in fertility had been due to the empowerment of women, particularly to gender equity within families. Findings showed age at first birth increased and the progression from having one child to the next child declined. This pattern was evident during the 1980's and stronger in the 1990s. The factors associated with this phenomenon are those related to the status of women particularly partner choice, female education and family wealth.

Our present study is different on two accounts. First, it is based on state-level NFHS factsheet data covering both 4th and 5th rounds which make the analysis aggregative at the state level. Although the NFHS data is household survey-based, but we have not used household data or unit level data here. Second, our two-period panel data analysis with correlation and regression makes our paper unique. It is a clear addition to the existing literature as we incorporate state-level structural and socio-economic factors to explain fertility differentials across states. We use several reduced form regressions to explain the interstate variations of infertility. Although numerous studies view women empowerment as the outcome of fertility decline. We on the contrary view declining fertility as the outcome of women empowerment. Further, we see the urban-rural bias in fertility behaviour across Indian states in recent years.

Research Methodology

Data and Variables

Our principal data source is the state level factsheets from National Family Health Survey- 4 & 5 (NFHS- 4 and 5). We take 33 states and union territories leaving out Lakshadweep, Ladakh and take the union territories of Dadra & Nagar Haveli, Daman & Diu as a single unit for statistical convenience. Our dependent variable throughout the analysis is the NFHS factsheet defined Total fertility rate (TFR) at the state level. The total fertility rate (TFR) can be taken as a proxy for the socioeconomic status of women (Malhotra, et al. 1995). Next, we include explanatory variables like per capita net state domestic product (PCNSDP), percentage share of agriculture, allied activities in state domestic product (AGRI) and the percentage of population below the poverty line (BPL). We draw the data from secondary sources including the Census of India (1991, 2001 and 2011).

Among the variables related to women empowerment, we include the percentage of females with at least 10 years of schooling (SCHOOL), the percentage of females engaged in economically gainful occupation (or WORK, i.e., working for wage/salary over the last 1 year, from NFHS-5), percentage of women who hold bank accounts (BANK) and operate personally and the state level sex ratio (SEX). The literacy gap (LITGAP) across males and females is assumed to capture the gender gap in educational attainments. In addition, early marriage (EM) as measured by the percentage of females married before the age of 18 years; currently in the 20-24 years age group is taken as an explanatory factor. Higher incidences of EM usually result in early pregnancy leading to higher TFR and higher TFR implicates a higher birth rate which is quite contrary to the very objective of family planning in India. EM among females is perhaps an indication of patriarchy, gender bias,

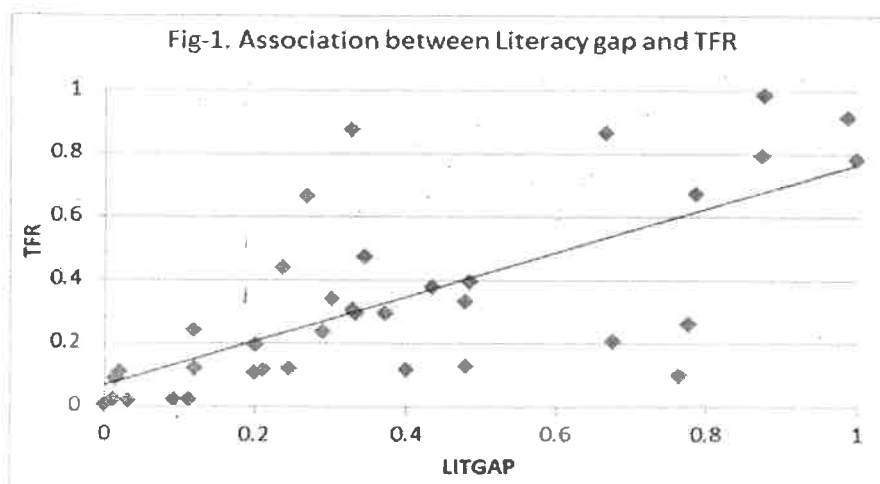
low female educational attainments and finally lower levels of empowerment. Although this issue, in particular, is beyond the scope of the present paper, states with higher incidences of EM are expected to have poorer family planning practices and thus is a very vital policy variable in the context of the present study. Family planning services (FPS) is a government policy initiated exogenous measure for birth control and is thus included as an exogenous regressor. In the present paper, we take the NFHS factsheet provided by FPS as “health worker ever talked to female non-users about family planning (%)”.

We subsequently include the proportions of adult females who possess a mobile phone for personal use (MOBILE). The MOBILE essentially signifies women’s social connectivity and awareness. They can be taken as instruments that foster the freedom to communicate. Since all variables are provided across urban and rural areas separately, we introduce an urban dummy variable (U-dummy, assigning 1 for urban observations and 0 for others) as an independent regressor. Moreover, since we use a two-period data set, NFHS-5 is taken as another dummy independent variable that assigns 1 for NFHS-5 observations and 0 for others. This is done to statistically differentiate between NFHS-4 and NFHS-5 observations.

Statistical Methods

To begin with, we present a scatter diagram showing the association between TFR and LITGAP and the fertility rates across states for NFHS-4 and 5. For the sake of compatibility and comparability, both variables are expressed on a 0 to 1 scale using the HDI-UNDP type attainment index transformation¹. Ordinary correlation and regression analysis are used throughout the paper in a two-period panel data setup. All variable definitions along with data sources are provided in the appendix. We begin with a simple linear correlation analysis across all pairs of variables except our binary dummy variables. Next, we run a family of reduced-form regression models to explain our key dependent variable, namely TFR. Although our primary objective is to show how women empowerment influences fertility behaviour it is necessary to incorporate some crucial control factors like PCNSDP (capturing overall economic well-being of the state), AGRI (the percentage of state domestic product from agriculture and allied activities) capturing the structural feature of the state, and BPL (which is the headcount poverty ratio) which captures overall poverty at the state level. All variables except binary dummies are in a natural logarithm. All estimations are done based on 33 times 2 or 66 pooled observations.

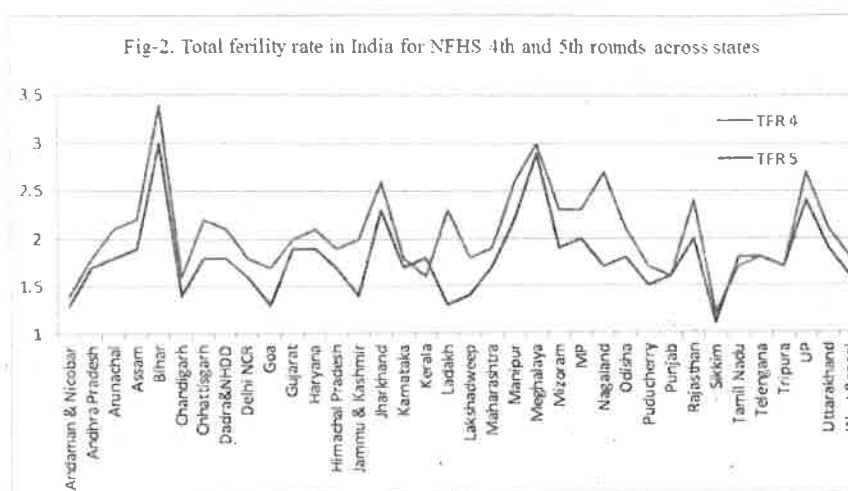
Results



Source: Plotted by the authors based on NFHS-5 factsheet data for states and union territories of India.

As a prelude to the regression analysis, we present the pairwise ordinary correlations across key variables leaving out the dummy variables. But we start our empirical analysis with a very alarming scatter diagram. Figure 1 presents the scatter diagram showing a positive association between LITGAP, a measure of gender bias and the TFR. As the correlation matrix in table 1 validates, the ordinary correlation between these two variables is 0.313 which is significant at 6.3 per cent. Thus greater the gender bias, the higher the TFR. There could be several reasons behind this. High gender bias could mean low women empowerment and patriarchy although we do not have a direct measure to capture this in this paper. Also, high LITGAP states tend to have lower female secondary schooling (as suggested by the negative correlation between LITGAP and SCHOOL in table 1) implying lower empowerment of women within the household. Moreover, FP has negatively associated with LITGAP meaning that family planning practices are significantly poorer among higher literacy gap states. Thus high gender bias, lower formal education and patriarchy are likely to result in lower autonomy and decision making

power for married women stripping them of their rights to family planning and birth control. Moreover, SCHOOL and WORK are positively related meaning that poorer schooling would result in lower work participation and hence lower economic empowerment for women. Conceivably all these reasons culminate in a positive association between TFR and LITGAP.



Source: NFHS-5 factsheet available at http://rchiips.org/nfhs/NFHS-5_FCTS

Figure 2 shows the state-wise behaviour of TFR across NFHS-4 and 5. Currently, six states are still experiencing a TFR value of 2.0 or more (2.1 being the replacement level) with Bihar having a TFR of almost 3.0 as per NFHS-5 data. At the other extreme Sikkim has a TFR value of just 1.1 as per the latest data. Kerala is the only state which has experienced a rise in TFR from 1.6 to 1.8 although it remains still very much below the replacement level. Currently, as many as 30 states and union territories are lying below the replacement level TFR. Several states like Himachal Pradesh, Jammu and Kashmir, Ladakh, Chhattisgarh, Madhya Pradesh, Goa, Nagaland Odisha and a few others have experienced significant declines in TFR in the 5th NFHS round compared to the 4th. In the south Asian context Sri Lanka has a TFR (as per World Bank 2019-20 figures) of 2.19, the Maldives at 1.84, Pakistan at 3.45, Afghanistan at 4.32, Nepal at 1.88, Bhutan at 1.95 and Bangladesh at 2.01. India's TFR is 2.0 as per NFHS-5 which is close to that of Bangladesh and Bhutan. We now turn to correlations.

Our pair-wise correlation matrixes are in tables 1 and 2. TFR is negatively correlated with women empowerment variables but positively correlated with gender bias as already analysed. Early marriage is positively associated with TFR which gives us a case for deferring the time of marriage for girls or rising the median age at marriage for women at the state level. Agriculturally dominant states have higher TFR as is suggested by the positive correlation value. High TFR states are also seen to have lower FP which is anticipated. Table 2 also shows that TFR is negatively associated with women's empowerment. But in addition, TFR is significantly negatively associated with PCNSDP implying thereby that richer states tend to have lower fertility. Again, the correlation between TFR and MOBILE is significantly negative implying that states where women have better access to cell phone connectivity also have lower fertility. This is possible owing to the influence of urbanization where urban regions of India have higher density and mobile networking density. Urban dominated states are expected to have better female literacy and work participation. Most importantly these bi-variate correlations give us a direction about the nature of the dependence of TFR with its associated factors.

Coming to the regression results in table 3, we must mention, to begin with, that all variables are not used in all models. The correlation matrices already give us a preliminary understanding of the direction of association between TFR, women empowerment variables and other state-level socioeconomic factors. We estimate a set of seven log-linear models for estimating LOG (TFR). Apart from our binary dummy variables, all explanatory variables are in a natural logarithm. Our core women empowerment indicators like SCHOOL, WORK and BANK are statistically significant across models although the coefficient of BANK is negative but insignificant at 10 per cent. The coefficient of FPS is insignificant across models showing that government initiated family planning services have no impact on fertility decline. At the household level fertility decline is the outcome of several socio-economic factors and FPS may have an insignificant role for states where women are relatively more empowered households but perhaps FPS would have a pivotal role in states where women are relatively more unempowered. Without a district level or village level analysis it would be difficult to assess the effectiveness of FPS on fertility decline across socio-economic strata of households.

EM has a positive and significant coefficient implying that the incidence of early marriage of girls (below 18 years) has a fertility raising effect at the state level. In other words, deferring the time of marriage or raising the median age at marriage for females at the state level should help to reduce TFR. LITGAP, a measure of gender bias in education has significantly positive coefficients wherever it is used as a regressor. Thus higher gender gaps in education lead to higher levels of TFR. If we use LITGAP as an overall proxy for gender bias, not just in education, then higher gender bias leads to higher fertility, a phenomenon that we discussed already.

Both BPL and AGRI have positive coefficients although the coefficient of BPL is insignificant at 10 per cent. Other things are unchanged as the level of agricultural share in GDP rises, fertility rises. Similar could be the interpretations based on poverty headcount ratio or percentage of BPL population at the state level.

Per capita, NSDP has a negative and significant (at 10%) coefficient implying that other things remaining equal, richer states in terms of per capita incomes tend to have lower fertility. This is consistent with our findings regarding BPL where poverty raises fertility. Mobile usage has a negative and significant coefficient across models implying that the higher the percentage of women with cell phone connectivity, the lower the inclination towards childbearing. The coefficient of sex ratio (SEX) is negative and has consistent values across models but turns out to be statistically insignificant. We thus cannot claim for certain that better sex-ratio states have significantly lower fertility, other things equal.

Table 1. Ordinary correlations between TFR and women empowerment indicators across Indian states

Variables	TFR	SEX	SCHOOL	WORK	BANK	EM	AGRI	LITGAP	FP
TFR	1.000								
SEX	-0.142 (0.406)	1.000							
SCHOOL	-0.384 (0.022)	0.371 (0.030)	1.000						
WORK	-0.282 (0.099)	0.267 (0.115)	0.290 (0.266)	1.000					
BANK	-0.289 (0.095)	0.241 (0.157)	0.223 (0.191)	0.121 (0.482)	1.000				
EM	0.202 (0.236)	-0.259 (0.145)	-0.736 (0.000)	-0.134 (0.434)	0.015 (0.930)	1.000			
AGRI	0.288 (0.096)	-0.111 (0.519)	-0.312 (0.064)	0.213 (0.211)	0.073 (0.673)	0.406 (0.014)	1.000		
LITGAP	0.313 (0.063)	-0.258 (0.147)	-0.333 (0.058)	-0.269 (0.112)	-0.073 (0.670)	0.198 (0.269)	0.377 (0.055)	1.000	
FP	-0.383 (0.021)	0.273 (0.107)	0.092 (0.593)	0.265 (0.109)	0.172 (0.317)	-0.135 (0.432)	-0.548 (0.000)	-0.336 (0.052)	1.000

Source: Computed by the authors on the basis of secondary data.

Notes: These are computed based on 33 states and union territories of India. P-values are in parentheses.

Table 2. Associations between fertility, economic development and women empowerment indicators across the Indian States

Variables	TFR	PCNSDP	SCHOOL	BANK	WORK	MOBILE
TFR	1.000					
PCNSDP	-0.388 (0.002)	1.000				
SCHOOL	-0.287 (0.083)	0.377 (0.028)	1.000			
BANK	-0.233 (0.112)	0.183 (0.300)	0.190 (0.281)	1.000		
WORK	-0.291 (0.091)	0.226 (0.198)	0.301 (0.084)	0.146 (0.409)	1.000	
MOBILE	-0.311 (0.074)	0.622 (0.000)	0.299 (0.087)	0.111 (0.532)	0.281 (0.107)	1.000

Source: Computed by the authors based on secondary data.

Notes: These are computed based on data on 33 states and union territories of India. P-values are in parentheses.

Next, FP has a significant and positive coefficient implying that controlling for other factors, higher family planning practices among married women, whatever might be the methods, leads to lower TFR levels. It may also be argued in the contrary that a lack of adequate FP adoptions results in high TFR. Finally, the coefficients of the U-dummy and NFHS-5 are both negative and statistically significant implying fertility levels in urban areas are significantly lower than in rural areas across states in India. Moreover, NFHS-5 survey factsheet results show a significant drop in fertility in 2019-20 over NFHS-4, i.e., relative to 2015-16. The following section concludes the paper with a few policy observations.

Table 3. Explanation of the total fertility rate based on women's empowerment indicators in India
[Dependent Variable: LOG(TFR)]

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	1.117 (1.029)	0.098 (-0.911)	1.001 (0.974)	0.997 (0.956)	1.121 (1.212)	0.983 (-0.866)	1.179 (0.923)
SCHOOL	-0.086* (-1.896)				-0.091* (-1.921)		
WORK		-0.057* (-1.733)	-0.066 (-1.584)			-0.059* (-1.744)	
BANK		-0.030 (-1.644)		-0.029 (-1.598)			-0.028 (-1.577)
EM			1.009* (1.977)		0.973* (1.689)		
FPS		-0.099 (-0.973)					-0.102 (-1.001)
LITGAP			0.233** (1.966)			0.219* (1.889)	
AGRI	0.087* (2.001)			0.071** (1.929)			
BPL			0.001 (1.500)			0.002 (1.499)	
PCNSDP		-0.989* (-1.799)			-0.932* (-1.776)		
MOBILE	-1.002* (-1.982)			-1.001* (-1.889)			-1.121* (-1.880)
SEX	-0.015 (-1.432)		-0.017 (-1.397)			-0.022 (-1.409)	
FP		-0.223* (-1.689)		-0.026* (-1.799)			-0.019* (-1.778)
U-dummy	-0.898** (-2.112)				-0.867** (-2.011)	-0.809** (-1.990)	
NFHS-5	-0.003** (-1.997)		-0.006** (-1.990)				0.001** (1.993)
R-Squared	0.398	0.382	0.463	0.326	0.397	0.399	0.459
Adj. R-Square	0.299	0.287	0.359	0.234	0.298	0.301	0.361
F-Statistic	4.832**	4.739**	4.999**	4.021**	4.860**	4.006**	4.235**
Durbin-Watson	2.333	2.332	2.343	2.301	2.308	2.311	2.310

Source: Estimated by authors based on state-level secondary data for India.

Notes: (1) t-values are in parenthesis. HAC adjusted standard errors are used throughout.

(2) *, ** and *** respectively represent significance at 10%, 5% and 1% levels.

(3) Cross-section consists of 33 states and UTs for 2 periods giving 66 pooled observations. Results are EViews 10 generated. \

(4) HAC adjusted standard errors are used throughout. (5) All independent variables are in a natural log except the dummy variables.

Conclusion

In this exploratory paper, we study how the total fertility rate across Indian states is influenced by women empowerment factors, after controlling for economic development indicators and gender bias. We use the fourth and fifth rounds of NFHS survey-based fact sheet data for this purpose. The key focus of the paper is the factors that have led to 'fertility decline' in NFHS-5. Findings based on correlation and the two-period panel regressions suggest that fertility levels are significantly lower in the more urbanized and relatively richer states of India while relatively poorer and agricultural states are lagging. We do not observe any insignificant impacts of family planning services of state health departments. Above all, the big finding of the study is that factors related to women empowerment significantly reduce fertility while aggravated gender bias mutes it. An encouraging observation is that the adoption of family planning methods has had a significant impact on fertility decline. But a significant rural-urban divide in total fertility still exists. Another remarkable observation is that early marriage of females is a severely impeding factor in the path of fertility decline.

Based on this two-period state-level analysis we conclude that fertility decline among women in the reproductive age group can be significantly enhanced firstly through higher rates of formal education and skill formation of women, secondly by raising the minimum age at marriage for females and thirdly by encouraging women to participate in economically gainful work, especially in the formal sector. We are of the view that the challenge lies in the Hindi heartland states where gender bias is severe, patriarchy is blatant and where women's autonomy in intra-household decision making is dismally low.

Appendix: Variable definitions and data sources

AGRI – Percentage contribution of State Domestic Product from agriculture and allied activities, compiled from RBI Handbook of Statistics on Indian Economy available at <https://www.rbi.org.in/scripts/AnnualPublications.aspx>? (Table 8: Net State Value Added by Economic Activity at Constant Prices, Base: 2011-2012)

BPL - Percentage of population below the poverty line at the state level based on Tendulkar Methodology. State-level figures for combined poverty estimates were obtained from <https://niti.gov.in/state-statistics> (Data Source: Planning Commission).

FP - percentage of married women in the age group 15-49 years who have adopted any method of family planning during the survey year; compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

FPS - Family planning services (FPS) is taken from NFHS fact sheet defined as health worker ever talked to female non-users of any birth control measure about family planning (%) compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml.

LITGAP - Gender gap in literacy (total literacy rate for males minus total literacy rate for females), for the Census years, 1991, 2001 and 2011, obtained from <https://www.census.gov/data/tables>.

PCNSDP – Per capita NSDP for 1992-2018, at 2011-12 prices, compiled from RBI Handbook of Statistics on Indian Economy available at <https://www.rbi.org.in/scripts/PublicationsView.aspx?id=19743>. [Source: National Statistical Office (NSO)].

SEX - Sex Ratio defined the number of females per 1000 males, from census 1991, 2001 and 2011, obtained from <https://www.census.gov/data/tables>.

SCHOOL – percentage of women with 10 or more years of schooling, compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

EM - Early marriage, measured by the percentage of women in the 20-24 years age group who were married before age 18 years, compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

BANK – percentage of women having a bank account or savings account that they use, compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

WORK – percentage of women in the working-age group (15-59 years) who have worked in the last 12 months and were paid in cash, compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20,

published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

TFR- Total Fertility Rate defined as the average number of children that would be born to a woman over her lifetime, compiled from Fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

MOBILE- Women having a mobile phone that they use (per cent), compiled from fact Sheets of National Family Health Survey (NFHS-5) 2019-20, published by the Ministry of Health and Family Welfare Government of India available at: chiips.org/nfhs/factsheet_NFHS-5.shtml

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