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Female Labour Force Participation Rate

**An Observational Analysis of the
Periodic Labour Force Survey (PLFS)
from 2017-18 to 2022-23**



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Dr. Shamika Ravi & Dr. Mudit Kapoor

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Dr. Shamika Ravi (Member, EAC to PM)
Dr. Mudit Kapoor (EPU, ISI–Delhi Center)

Executive Summary

The female labour force participation rate (LFPR) is a crucial indicator of women’s economic empowerment and overall economic inclusiveness. This research paper presents econometric analysis highlighting a significant resurgence in female LFPR across Indian states, especially in rural areas, since 2017-18. There are three broad themes for the empirical analysis: (1) Recent trends in female LFPR, (2) The effects of marital status and parenthood on LFPR, and (3) LFPR variations with age and gender across all regions and states of India.

The data used in this study is from the Periodic Labour Force Survey (PLFS) across all available rounds (2017-18 to 2022–2023). PLFS provides detailed employment and demographic data for over 2.5 million individuals, enabling analysis of trends and variations at national, state, and rural/urban levels. LFPR is calculated as the percentage of employed and unemployed individuals (seeking or available for work) relative to the total population aged 15 years and above.

The statistical method used in the analysis is Generalized Additive Models (GAMs) with two specifications: Model 1 focused on nonlinear and interaction effects of age, sector (rural/urban), marital status and presence of children within the household; and Model 2 which extended Model 1 by adding three-way and four-way interaction terms for greater flexibility in capturing complex relationships. The decision arrived was to use Model 2 if it showed significant improvement ($p \leq 0.05$ in Likelihood Ratio Test and lower Bayesian Information Criterion). Otherwise, Model 1 was chosen for simplicity.

The results are presented in three sections. The first set of results show the trends in female LFPR from 2017–18 to 2022–23. At the national level, rural female LFPR surged from 24.6% to 41.5% (~69% growth), while urban LFPR rose modestly from 20.4% to 25.4% (~25%

growth). There are significant interstate variations. In rural areas, significant increases are seen in states like Jharkhand (~233% growth) and Bihar (~6x growth). Northeastern states also showed remarkable growth (example, Nagaland: 15.7% to 71.1%). At the national level, urban areas witnessed modest increases overall. However there is notable growth in urban Gujarat (16.2% to 26.4%, ~63% growth) and marginal changes in urban Tamil Nadu (27.6% to 28.8%).

The second set of results, presents the female LFPR by Age, Marital Status, and Household Composition, in particular the presence of children below 14 years of age. The general trends show that female LFPR has increased in almost all states, with rural areas seeing larger gains than urban areas. We also find that married women in rural areas showed higher participation growth compared to unmarried women. States like Rajasthan and Jharkhand displayed significant growth, particularly among married women. There are, however, significant regional and interstate variations. Among the northern states, Punjab and Haryana continued to have low female LFPR. Among the eastern state, rural Bihar had the lowest LFPR in the country, but has shown significant improvements in the recent years – especially for rural married women. Among the Northeastern states, there have been remarkable growth in rural areas with Nagaland and Arunachal Pradesh leading. Urban areas of the northeast have showed moderate increases among married women, unlike elsewhere in the country where urban areas have witnessed marginal increase for married women. Across the western and southern states, growth in LFPR is largely concentrated among rural women while urban areas have seen only modest increase. Andhra Pradesh stands out with a major *decline* in LFPR of urban women with children.

The third set of results presents the differences in LFPR across gender and age, and analyses how marital status and presence of children makes a difference for each category. The overall results show that female LFPR forms a bell-shaped curve, peaking at 30–40 years of age and declining sharply after. The male LFPR, on the other hand, remains high (~100%) from ages 30–50, declining gradually thereafter. Marital status is a significant determinant of LFPR- for both, women and men. Married men consistently exhibit higher LFPR across states and age groups, while marriage significantly reduces female LFPR, especially in urban areas. The presence of children under 14 years of age affects female LFPR significantly, especially for younger women (20–35 years) and more strongly in urban areas.

India has witnessed a substantial rise in female LFPR, particularly in rural areas, from 2017–18 to 2022–23. There have been numerous schemes of the Government, especially targeting rural women over the last ten years. These include Mudra loans, the “Drone Didi” scheme and SHGs mobilised under Deendayal Antyodaya Yojana to name a few major initiatives for rural women. There are many other initiatives that have been aligned with the vision of women-led development across India. Our paper measures the final outcome of these initiatives as a cumulative and significant growth in female LFPR across India and in particular in rural areas. Rigorous research, however, is needed to evaluate these programs’ impacts and to explore the persistent inter-state and rural-urban disparities in India’s female LFPR.

1. Introduction

The female labour force participation rate (LFPR) is essential to women's economic empowerment and is a common metric to gauge the inclusiveness of an overall economy. In his vision for Viksit Bharat in 2047, the Prime Minister has articulated that India's development would be a women-led development, where women would play an instrumental role in India's economic, social, political, and cultural sphere. In light of this, assessing recent trends in the female labour force participation rate across India becomes an imperative exercise to understand 'how things stand' on the ground today.

Our rigorous empirical exercise yields clear results which show that there is a major resurgence of female LFPR across all states of India in the last few years. This is particularly driven by significant improvements across rural areas of the country. This is a major developmental phenomenon that needs thorough measuring and documentation. From a policy perspective, it is critical to do this at disaggregated levels (states, regions and rural/urban areas), beyond the all-India changes.

In this essay, we wish to address the following questions concerning the female labour force participation rate:

- a) What is the recent trend in female LFPR in India?
- b) Does marital status affect LFPR? Is this effect different for men and women?
- c) Does having a child affect LFPR? Is this effect different for men and women?
- d) Does LFPR vary across age? Is this different for men and women?

Besides the national level trends, all our analyses are also done at the state level, while accounting for the variations across rural and urban areas. We focus on the states to highlight the socio-economic, political, and cultural diversity factors that are likely to affect an individual's participation in the market economy – particularly participation of women in labour markets.

2. Data

The data for our analysis comes from the Periodic Labour Force Survey (PLFS), conducted annually from 2017–18 by the Ministry of Statistics and Programme Implementation (MoSPI), Government of India¹. The primary objective of the PLFS is to estimate the critical employment and unemployment indicators, such as the labour force participation rate, worker-population ratio and unemployment. The estimate is available for the usual status, which gives the employment/unemployment picture for a given year preceding the survey, and the current weekly status, which offers the employment/unemployment picture for the week before the survey date. The PLFS is a nationally representative survey, and the sampling strategy allows for estimation at the state level across rural and urban areas.

The PLFS collects detailed data from the household, such as religion, social group, etc. For each household member, it collects data on age, gender, relationship to the head of the household, marital status, education level, whether the person has had vocational or technical training, the status of the person (whether the individual is a casual worker, regular wage or salaried or self-employed, attended educational institutions, attended domestic duties, etc.). For those in the workforce, the survey provides information on the industry, occupation, location of workplace, enterprise type, number of workers in the enterprise, type of job contract, availability of social benefits, etc. The survey also collects data on the number of hours worked in a week and the earnings received for the work for the current weekly status.

This paper focuses on the labour force participation rate (LFPR) according to the usual status. The LFPR is defined as,

$$LFPR = \frac{\text{number of employed persons} + \text{number of unemployed persons}}{\text{total population}} \times 100.$$

The number of employed people includes a person working in a household enterprise either as an own account worker, employer or unpaid helper in the household enterprise. It includes people employed as regular wage or salaried and casual wage labour. In addition, LFPR includes unemployed persons who are seeking work and/or are available for work. It also consists of those who did not seek work but were available for work.

¹ <https://www.mospi.gov.in/Periodic-Labour-Surveys>.

Our analysis is based on unit-level data of observations on 2,533,826 individuals across the PLFS from 2017–18 to 2022–23. However, this paper will present results based on the PLFS 2017–18 and 2022–23. Our analysis of the LFPR will be for persons above 15 years based on the usual status. We use 2017-18 as the base year for two reasons. Firstly, because this is the beginning of the PLFS series and secondly to be consistent with the recent literature which have extensively documented “secular decline” in India’s female LFPR from 2004-05 to 2017-18.²

Table 1: Periodic Labour Force Survey (2017-18 to 2022-23)

| PLFS | Number of Observations |
|---------|------------------------|
| 2017–18 | 433,339 |
| 2018–19 | 420,757 |
| 2019–20 | 418,288 |
| 2020–21 | 413,405 |
| 2021-22 | 428,525 |
| 2022-23 | 419,512 |

3. Statistical Methods

To investigate the relationship between labour force participation rate (LFPR) and various demographic and employment-related predictors, we employed generalized additive models (GAMs) to allow for both nonlinear and interactive effects. We estimated this relationship separately for every combination of PLFS, state, and gender. We considered two model specifications to evaluate the best-fitting approach for representing the underlying relationships in the data.

3.1 Model Specifications

The models (Model 1 and Model 2) were specified as follows: each term represents different combinations of smooth functions and interactions among the predictors.

² “Norms that matter: Exploring the distribution of women’s work between income generation, expenditure-saving and unpaid domestic responsibilities in India.” World Development, 174:106435

Model 1 included:

$LFPR \sim \text{constant} + s(\text{age}, \text{bs} = "ts") + s(\text{sector (rural or urban)}, \text{bs} = "re") + s(\text{age, sector}, \text{bs} = "re") + s(\text{currently married (yes or no)}, \text{bs} = "re") + s(\text{age, currently married}, \text{bs} = "re") + s(\text{child } (\leq 14 \text{ years}) \text{ in the household (yes or no)}, \text{bs} = "re") + s(\text{age, child in the household}, \text{bs} = "re")$

where:

- $s(\text{age}, \text{bs} = "ts")$: A smooth term for age using thin-plate spline basis, capturing nonlinear age effects on LFPR.
- $s(\text{sector (rural or urban)}, \text{bs} = "re")$, $s(\text{currently married (yes or no)}, \text{bs} = "re")$, and $s(\text{child } (\leq 14 \text{ years}) \text{ in the household (yes or no)}, \text{bs} = "re")$: Random effect smooth terms to account for categorical variables – sector (rural or urban), marital status (currently married or not), and presence of children (≤ 14 years) in the household.
- Interaction terms $s(\text{age, sector}, \text{bs} = "re")$, $s(\text{age, currently married}, \text{bs} = "re")$, and $s(\text{age, child in the household}, \text{bs} = "re")$: Allow the effect of age to vary across levels of each categorical predictor, capturing different age-based LFPR effects by sector, marital status, and presence of child in the household.

Model 2 extended Model 1 by including additional interaction terms:

$LFPR \sim \text{constant} + s(\text{age}, \text{bs} = "ts") + s(\text{sector (rural or urban)}, \text{bs} = "re") + s(\text{age, sector}, \text{bs} = "re") + s(\text{currently married (yes or no)}, \text{bs} = "re") + s(\text{age, currently married}, \text{bs} = "re") + s(\text{child } (\leq 14 \text{ years}) \text{ in the household (yes or no)}, \text{bs} = "re") + s(\text{age, child in the household}, \text{bs} = "re") + s(\text{sector, child in the household}, \text{bs} = "re") + s(\text{age, sector, child in the household}, \text{bs} = "re") + s(\text{sector, currently married}, \text{bs} = "re") + s(\text{age, sector, currently married}, \text{bs} = "re") + s(\text{child in the household, currently married}, \text{bs} = "re") + s(\text{age, child in the household, currently married}, \text{bs} = "re") + s(\text{sector, child in the household, currently married}, \text{bs} = "re") + s(\text{age, sector, child in the household, currently married}, \text{bs} = "re")$

- These additional terms include three-way and four-way interactions, capturing potential dependencies among age, sector, marital status, and presence of children in the household. These interactions allow for highly flexible modelling of LFPR, accounting for intricate relationships among predictors.

3.2 Model Fitting

Each model was fitted using the *mgcv*³ package in *R*⁴ with the following configuration:

$$LFPR \sim \text{binomial}(\pi), \quad \text{logit}(\pi) = \text{linear predictor},$$

where the LFPR was modelled as a binary outcome with a binomial distribution and a logit link function. Each observation was weighted by survey weights, which were normalized. Models were estimated using Restricted Maximum Likelihood (REML).

3.3 Model Comparison and Selection

Two criteria were used for comparison to select the model that best balances complexity and goodness-of-fit.

1. **Likelihood Ratio Test (LRT):** This test compares the log-likelihoods of Models 1 and 2 to assess if the added interactions in Model 2 significantly improve the model's fit. A p -value ≤ 0.05 from the likelihood ratio test would indicate that the additional complexity in Model 2 provides a statistically significant improvement in model fit.

2. **Bayesian Information Criterion (BIC):** BIC is calculated for each model to account for goodness-of-fit and complexity. The model with the lower BIC is considered preferable, as it provides a better fit while avoiding unnecessary complexity.

3.4 Model Selection Decision: The final model was selected based on the LRT and BIC criteria. If Model 2 showed a significant LRT result ($p \leq 0.05$) and a lower BIC than Model 1, it was selected as the final model. If not, Model 1 was chosen for its parsimony. The results of the model selection for each combination of PLFS, state, and gender are reported in the following table.

³ Wood SN (2011). "Fast stable restricted maximum likelihood and marginal likelihood estimation of semiparametric generalized linear models." *Journal of the Royal Statistical Society (B)*, 73(1), 3-36.

Wood S, N., Pya, Säfken B (2016). "Smoothing parameter and model selection for general smooth models (with discussion)." *Journal of the American Statistical Association*, 111, 1548-1575.

Wood SN (2004). "Stable and efficient multiple smoothing parameter estimation for generalized additive models." *Journal of the American Statistical Association*, 99(467), 673-686.

Wood S (2017). *Generalized Additive Models: An Introduction with R*, 2 edition. Chapman and Hall/CRC.

Wood SN (2003). "Thin-plate regression splines." *Journal of the Royal Statistical Society (B)*, 65(1), 95-114.

Wood, S.N. (2023). *mgcv: Mixed GAM Computation Vehicle with Automatic Smoothness Estimation*. R package version 1.8-42. URL: <https://CRAN.R-project.org/package=mgcv>

⁴ R Core Team (2023). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>

Table 2: Model Selection

| | PLFS [2017-18] | | PLFS [2022-23] | |
|-------------------|----------------|---------|----------------|---------|
| | Female | Male* | Female | Male* |
| North | | | | |
| Jammu & Kashmir | Model 1 | Model 1 | Model 1 | Model 2 |
| Himachal Pradesh | Model 1 | Model 1 | Model 2 | Model 2 |
| Punjab | Model 1 | Model 1 | Model 1 | Model 1 |
| Uttarakhand | Model 1 | Model 1 | Model 1 | Model 1 |
| Haryana | Model 1 | Model 1 | Model 1 | Model 1 |
| Rajasthan | Model 2 | Model 1 | Model 2 | Model 1 |
| Central | | | | |
| Uttar Pradesh | Model 1 | Model 1 | Model 1 | Model 1 |
| Chhattisgarh | Model 2 | Model 1 | Model 2 | Model 1 |
| Madhya Pradesh | Model 2 | Model 1 | Model 2 | Model 1 |
| East | | | | |
| Bihar | Model 2 | Model 1 | Model 1 | Model 1 |
| West Bengal | Model 1 | Model 1 | Model 2 | Model 1 |
| Jharkhand | Model 1 | Model 1 | Model 1 | Model 1 |
| Odisha | Model 1 | Model 1 | Model 1 | Model 1 |
| Northeast | | | | |
| Sikkim | Model 1 | Model 1 | Model 1 | Model 2 |
| Arunachal Pradesh | Model 1 | Model 1 | Model 1 | Model 2 |
| Nagaland | Model 1 | Model 2 | Model 1 | Model 1 |
| Manipur | Model 2 | Model 2 | Model 1 | Model 2 |
| Mizoram | Model 2 | Model 2 | Model 1 | Model 1 |
| Tripura | Model 1 | Model 2 | Model 1 | Model 2 |
| Meghalaya | Model 1 | Model 1 | Model 1 | Model 1 |
| Assam | Model 1 | Model 2 | Model 2 | Model 1 |
| West | | | | |
| Gujarat | Model 1 | Model 1 | Model 1 | Model 2 |
| Maharashtra | Model 2 | Model 1 | Model 2 | Model 2 |
| South | | | | |
| Andhra Pradesh | Model 2 | Model 1 | Model 2 | Model 1 |
| Karnataka | Model 2 | Model 1 | Model 2 | Model 2 |
| Kerala | Model 1 | Model 1 | Model 1 | Model 1 |
| Tamil Nadu | Model 1 | Model 1 | Model 2 | Model 1 |
| Telangana | Model 1 | Model 2 | Model 1 | Model 1 |

* Similar to the PLFS reports published on the MoSPI, transgenders are included in males.

4. Results

Result 1: Changes in Female Labour Force Participation Rate across States and Union Territories from 2017–18 to 2022–23

Our first set of results report the changes in the female labour force participation rate (LFPR) from 2017–18 to 2022–23 for the rural and urban sector. *At the all-India level, we estimated the female LFPR to increase from 24.6% in 2017–18 to 41.5% in 2022–23 in rural areas, a growth of almost 69%. In urban areas, the female LFPR increased from 20.4% to 25.4% during the same period, a growth of nearly 25%.*

However, there were significant variations across states, both in rural and urban areas. For example, among the large states in rural areas, Jharkhand experienced an increase in female LFPR from 15.7% in 2017–18 to 52.4% (growth of ~233%), while West Bengal, which had a higher female LFPR than Jharkhand in 2017–18, it increased from 19.8% to 36.5% (growth of ~84%) during the same period. For Bihar, which had a female LFPR in rural areas at 3.9% in 2017–18, it increased to 23.3% in 2022–23, nearly six times higher than in 2017–18. In the smaller, northeastern states of Arunachal Pradesh (AR) and Nagaland (NL), we estimate an increase in female LFPR from 15.3% and 15.7%, respectively, to 62.7% and 71.1% in 2022–23, respectively (an increase of nearly four times for AR and increase of almost four and a half time for NL).

Even though female LFPR has increased in almost all the states from 2017–18 to 2022–23, it has declined during the same period for rural areas in the small state of Goa and Union Territory Lakshadweep.

Compared to rural areas, urban areas experienced relatively modest increase in the female LFPR during the same period. In some large states, such as Gujarat, the female LFPR increased from 16.2% in 2017–18 to 26.4% in 2022–23 (growth of ~63%). However, for West Bengal, which had a higher female LFPR in 2017–18 at 23.0%, it increased to 27.4% in 2022–23 (a growth of nearly 19%). It is essential to highlight that in Tamil Nadu urban areas, female LFPR has marginally increased from 27.6% to 28.8% (growth of ~4%) during the same period.

It is interesting to note that for the small northeastern states of Arunachal Pradesh and Nagaland, in urban areas, the female LFPR increased from 11.7% and 19.0%, respectively in

2017–18 to 37.4% and 50.2%, respectively, in 2022–23. We also found that in the union territories of Chandigarh and Lakshadweep, the female LFPR declined from 2017–18 to 2022–23.

Figure 1: Labour Force Participation Rate - Rural

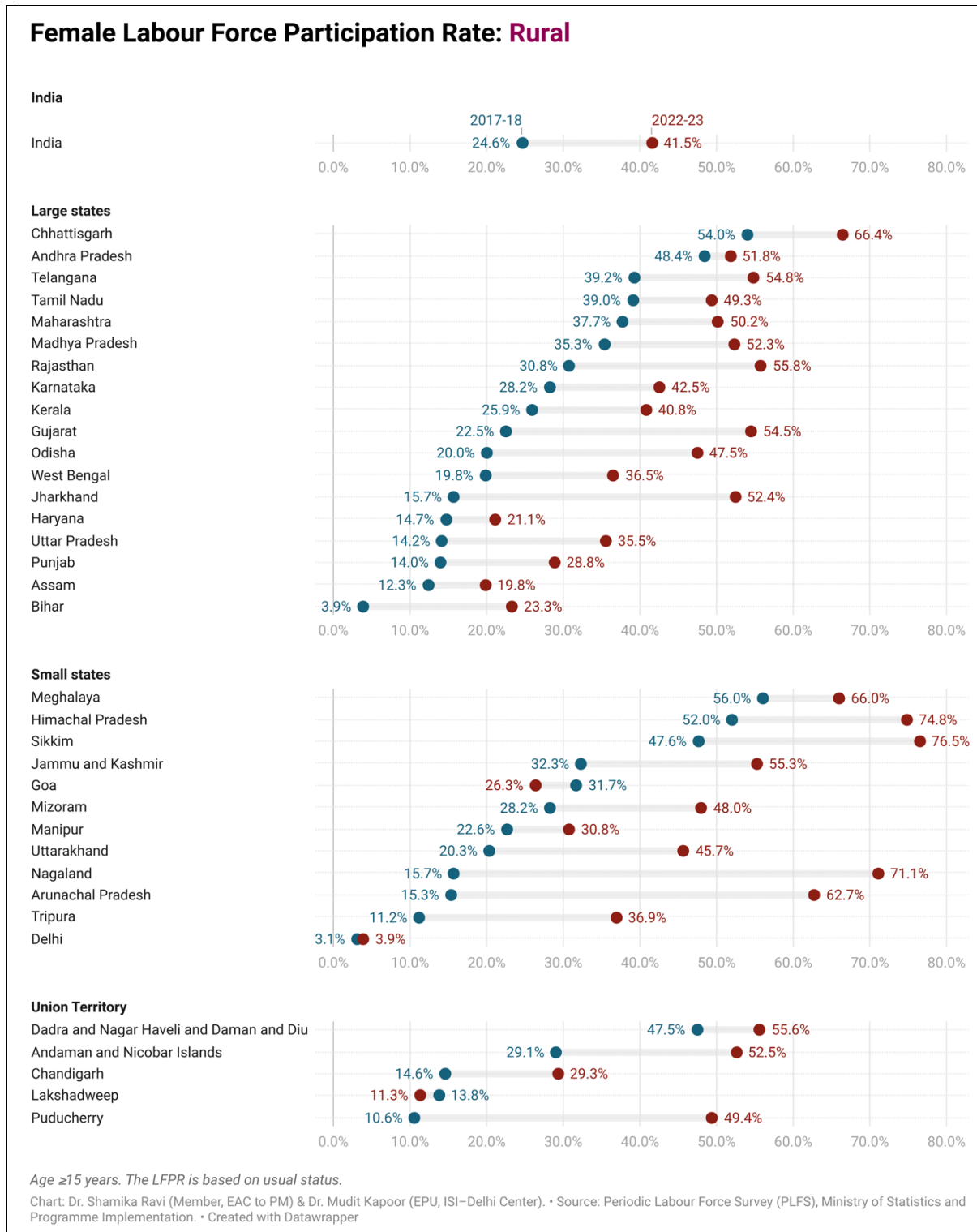
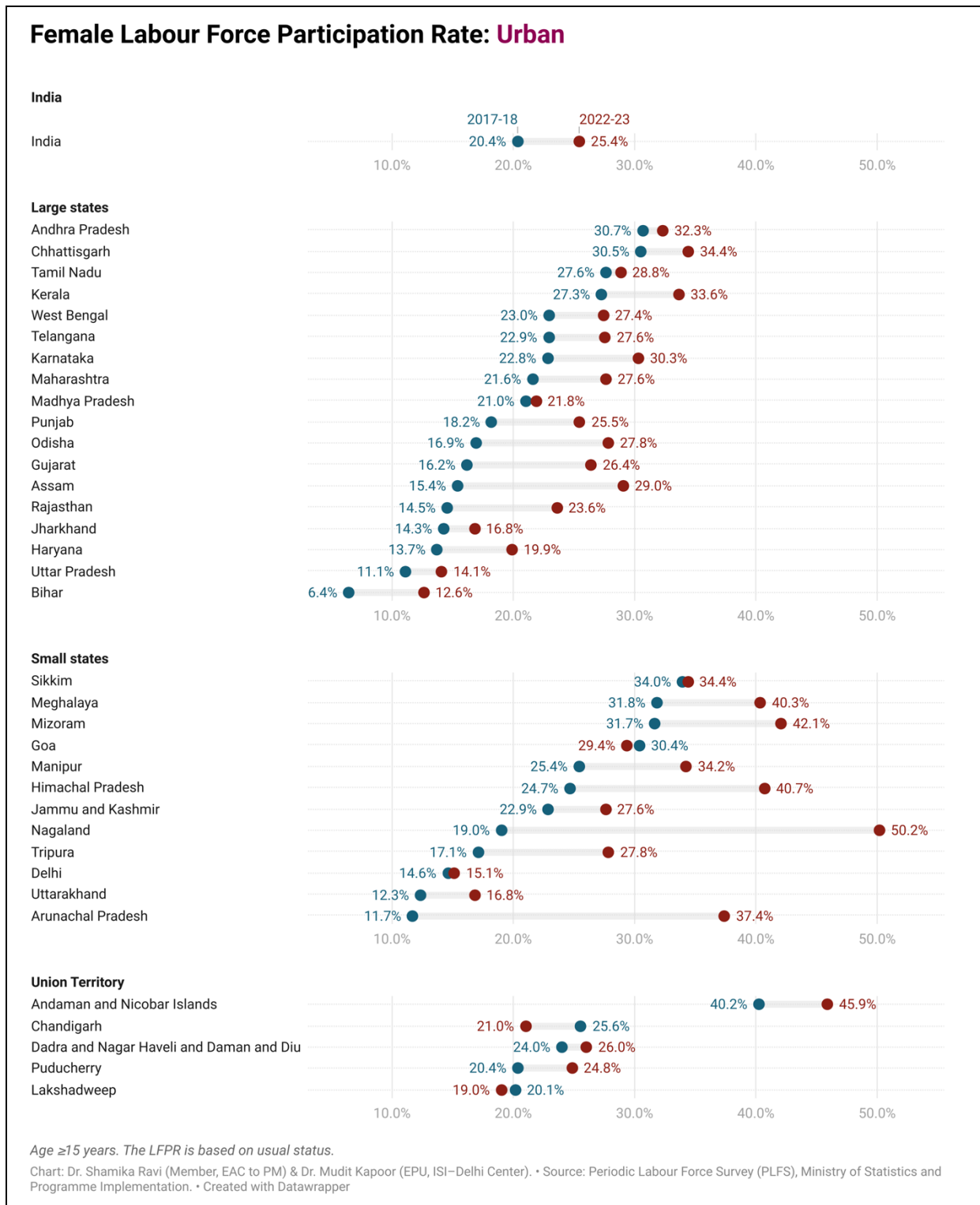


Figure 2: Labour Force Participation Rate – Urban



Result 2: Changes in Female Labour Force Participation Rate by Age (in years) across States – with Emphasis on Marital Status and Children in the Household

This section examines the Female Labour Force Participation Rate (FLFPR) across various states in rural and urban areas, comparing data from 2017–18 (green line) and 2022–23 (red line). This analysis emphasizes changes in LFPR between these periods, interstate differences, variations between marital status (currently married or not), whether the female is in a household with children less than fourteen years, and the dynamic nature of LFPR with age.

Overall, we observe that female LFPR has increased significantly in (almost) all states of India and predominantly in the rural areas of all states from 2017–18 to 2022–23. The increase is more pronounced in states like Gujarat, Rajasthan, Uttar Pradesh, Jharkhand, Odisha, Assam, Telangana and North-eastern states of Arunachal Pradesh and Nagaland. But across all these states, rural areas have witnessed major improvements while urban areas have only witnessed modest rise. The only two places where female LFPR seems to have declined marginally are Goa and Lakshadweep.

Inter-State Differences

Northern and Central Regions: Compared to 2017–18, *we see a more pronounced increase in rural female LFPR in 2022–23, typically among those who are currently married, while the growth is relatively more modest among those who are not currently married.* In Uttarakhand and Chhattisgarh, among the women who are currently not married, the female LFPR in 2022–23 is similar to that in 2017–18. *We also observed that in Punjab and Haryana, female LFPR is typically lower than in other states in the region.*

In urban areas, the female LFPR has shown a modest increase between 2017–18 and 2022–23 across all states except for Himachal Pradesh, where it has had a relatively higher increase, while in Uttarakhand, among the women currently not married, the results indicate that female LFPR was lower in 2022–23 than in 2017–18.

Eastern Region: *In rural areas, we see a significant increase in female LFPR across all the states from 2017–18 to 2022–23. However, the growth is more pronounced for women who are currently married.* We observed that in West Bengal, the female LFPR in 2022–23 for women currently not married with a child less than 14 years in the household is similar to what it was

in 2017–18. We also observed that for Bihar, the female LFPR in 2017–18 among women currently married was the lowest among all the states.

In urban areas, there was a modest increase in female LFPR between 2017–18 and 2022–23, except for Jharkhand, where for women currently not married, the LFPR was lower in 2022–23 than in 2017–18.

Northeast Region: *In rural areas, we observed a significant increase in female LFPR from 2017–18 to 2022–23 in Arunachal Pradesh and Nagaland, while in Meghalaya, which has historically had a higher female LFPR, there has been little change during the same period. For Tripura and Assam, we observed a significant increase in female LFPR between 2017–18 and 2022–23 for women who are currently married.*

In urban areas, the most significant increase in the female LFPR has been for women currently married in Arunachal Pradesh, Nagaland, Tripura, Mizoram, and Assam.

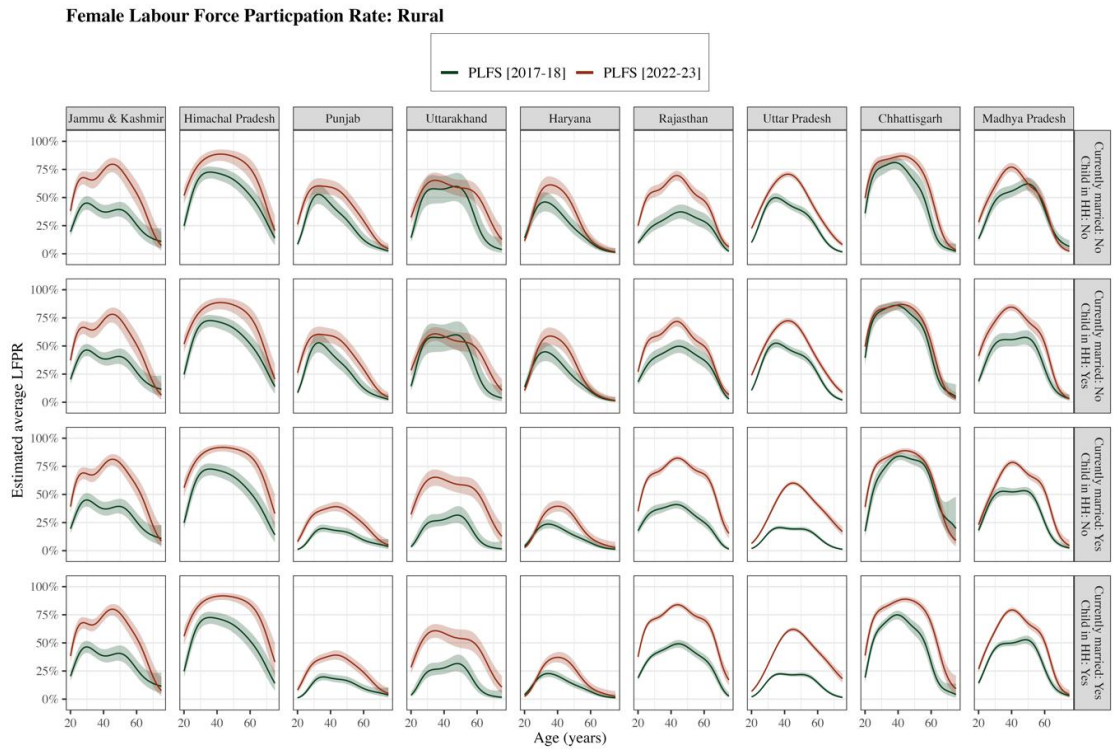
West and Southern Region: *In the rural areas, except for Andhra Pradesh, we observed a significant increase in female LFPR from 2017–18 to 2022–23. The growth is more pronounced for women who are currently married. In the case of Kerala, we observed that the increase in female LFPR was relatively higher for presently married women without any child in the household than with children.*

Relative to rural areas, urban regions saw a modest increase in female LFPR between 2017–18 and 2022–23. However, *for Gujarat, for currently married women, there was significant growth in female LFPR during the same period. For Kerala and Karnataka, the increase was more pronounced for presently married women without any children in the household.*

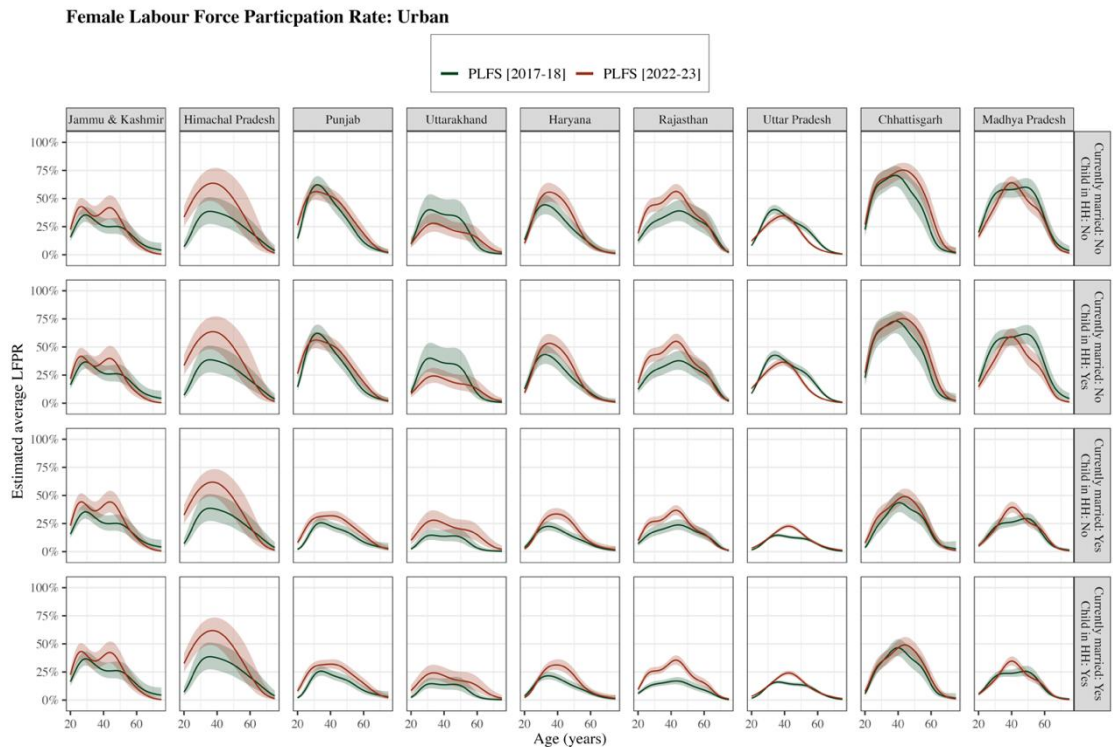
Overall, we observed that across most states, the highest growth in female LFPR has been in rural areas among presently married women. However, the magnitude of change varies across states, and in some states, such as Kerala, the presence of children in the household has dampened the growth in the female LFPR.

Figure 3: Female Labour Force Participation Rate across States, 2017–18 and 2022–23

Figure 3a: North and Central States

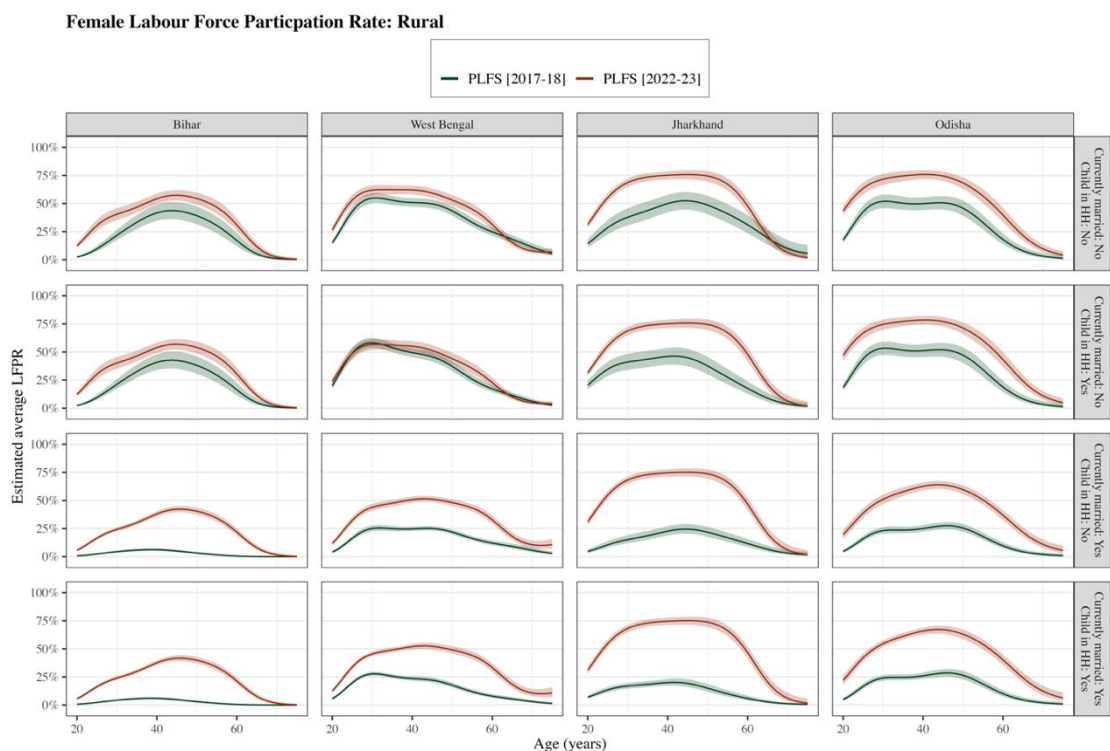


Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
Ministry of Statistics & Programme Implementation (MoSPI).
Dr. Shamika Ravi (Member, EAC-PM) & Dr. Maditi Kapoor (EPU, ISI-Delhi Center).

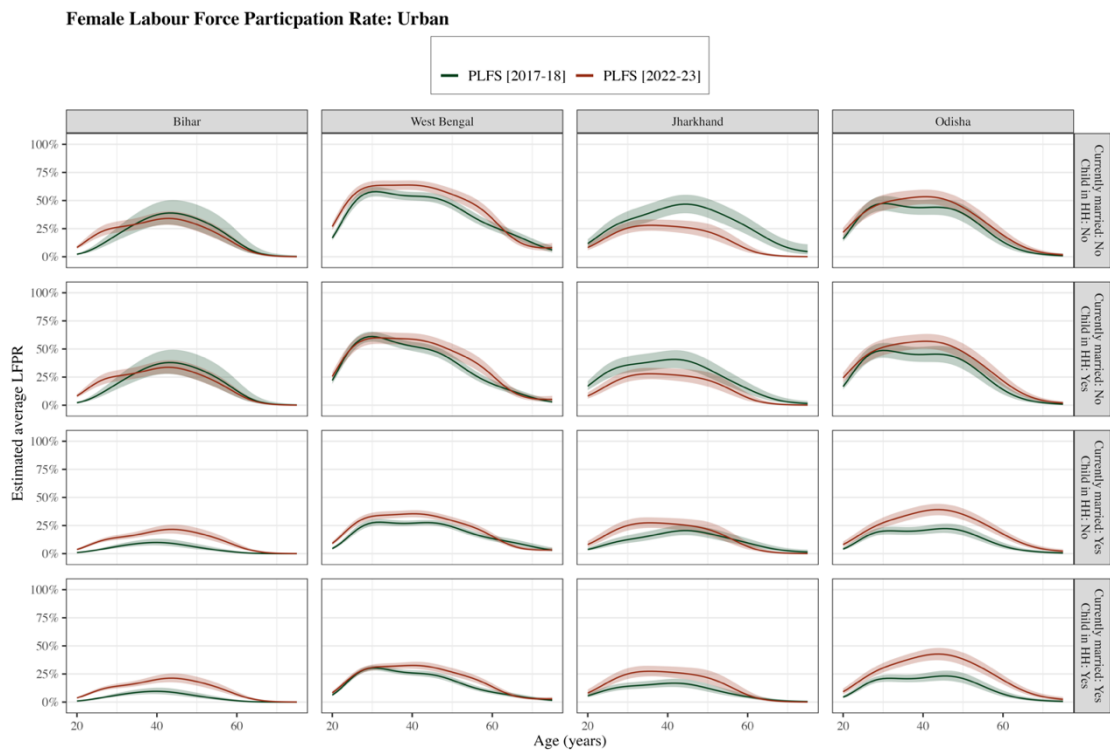


Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
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Figure 3b: Eastern States

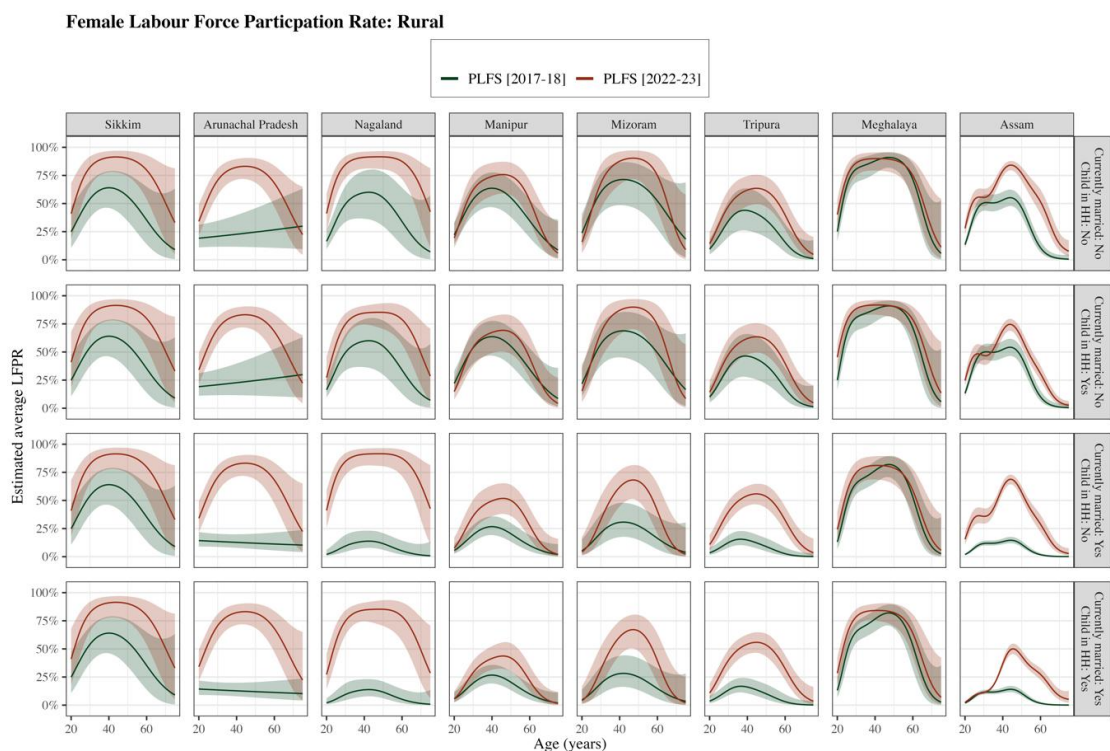


Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
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Figure 3c: North Eastern States

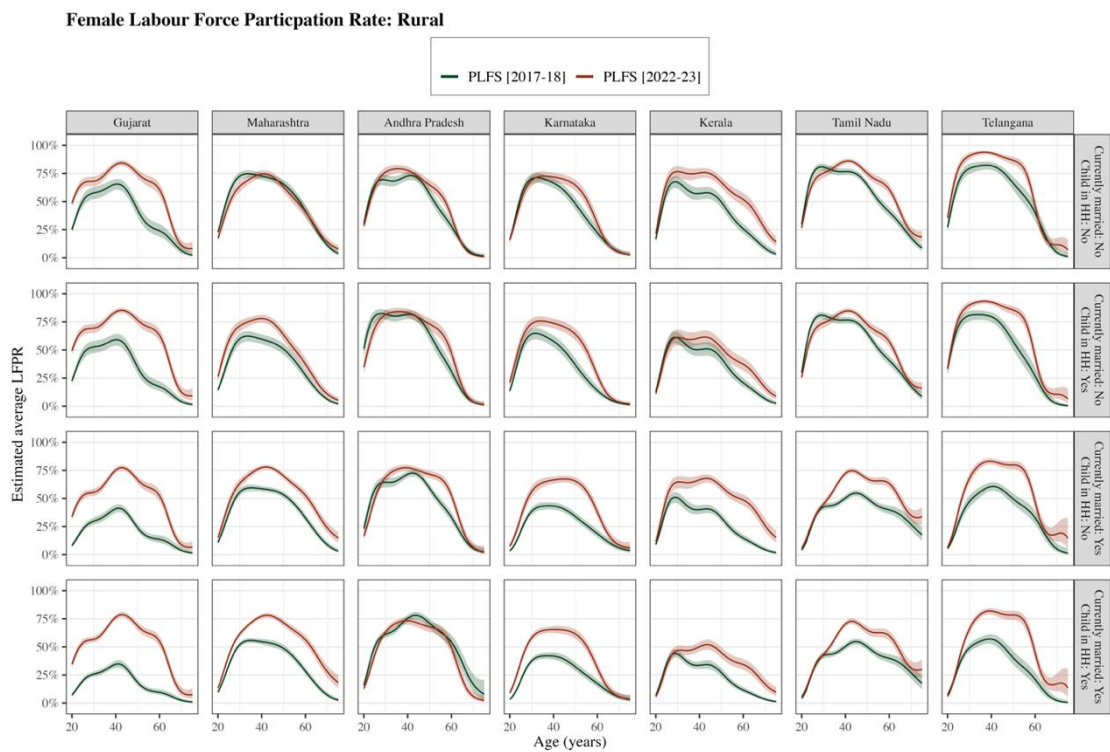


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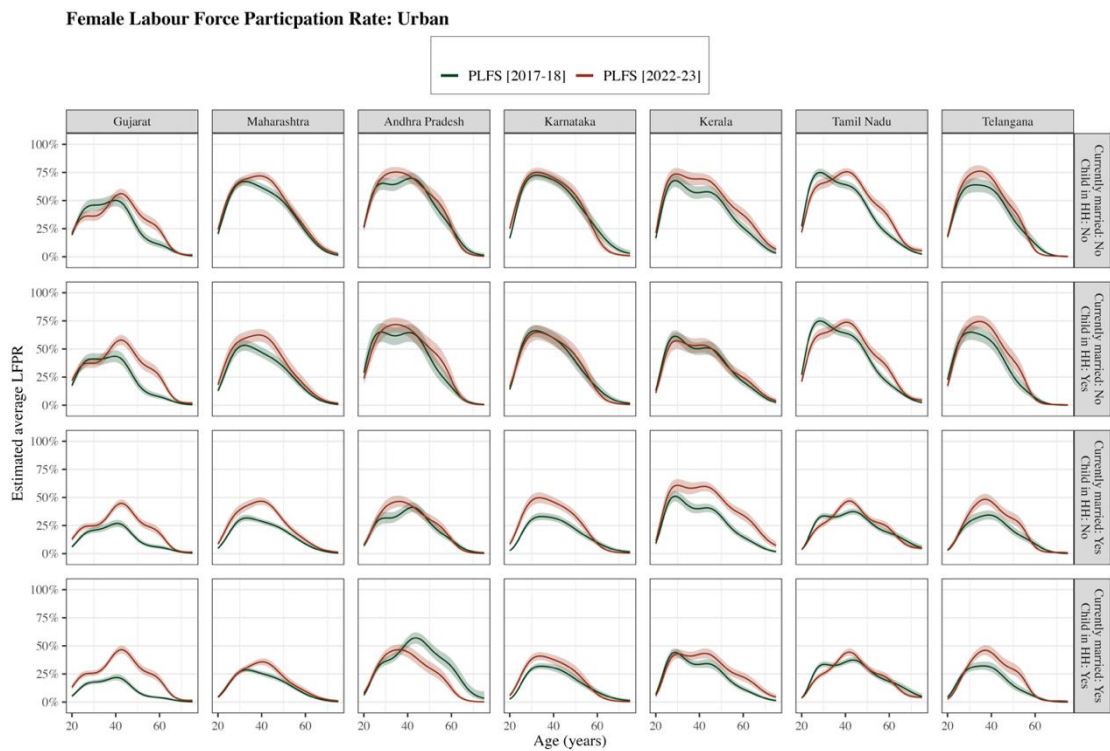


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Figure 3d: West and Southern States



Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
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Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
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Result 3: Changes in Female and Male Labour Force Participation Rate by Age (in years) across States with Emphasis on Marital Status and Children in the Household

This analysis focuses on the Labour Force Participation Rate (LFPR) among different states in India, stratified by gender, marital status, and presence of children in the household. The analysis shows rich differences across states, yet there are some striking common features:

- *Female LFPR typically shows a bell-shaped curve across most states. Participation increases during early adulthood (20–30 years), peaks in middle adulthood (30–40 years), and declines steadily after 40. In contrast, male LFPR across states rises sharply during early adulthood (20–30 years), and it is relatively flat and high (close to 100%) from 30 until 50 years, after which it declines gradually.*
- *Married men have significantly higher LFPR across all ages – and across rural and urban areas – in all states of India; while married women have significantly lower LFPR across all ages – in all states of India, except the rural areas of Rajasthan, Maharashtra and to lesser extent in rural Chhattisgarh and rural Madhya Pradesh.*
- *Marriage lowers LFPR of women significantly – but the decline is much higher in urban areas compared to rural areas.*
- *Unmarried men, across all states of India, not only have lower LFPR – but are also late to enter the labour force and early to exit – compared to married men of all ages.*
- *The presence of children (below 14 years of age) in the family does not affect male LFPR in any perceptible way, whereas it does affect female LFPR in distinct ways across several states. For example, presence of children in the household is correlated with higher LFPR for married women in rural areas of West Bengal and Maharashtra. While the presence of children is correlated with sharply falling female LFPR in Kerala for married as well as unmarried women.*

North and Central States: Jammu and Kashmir, Himachal Pradesh, and Chhattisgarh have a higher female LFPR, while it is significantly lower in Punjab and Haryana. Across all the states in this region, female LFPR is lower in urban areas than in rural areas. Furthermore, in Punjab and Haryana, we observed that women who are currently married are less likely to participate in the labour force across ages, both in rural and urban areas. In Rajasthan, we observed that currently married women are more likely to participate in the labour force in rural areas.

However, it is the reverse in urban areas, where currently married women are less likely to participate in the labour force. In urban areas of Chhattisgarh and Madhya Pradesh, currently married women are less likely to participate in the labour force.

Across all the states, currently married men are more likely to participate in the labour force than those not currently married. However, this gap is much lower compared to women.

Eastern States: A notable feature in this region is that *Bihar has the lowest female LFPR in rural and urban areas compared to all other states in the country.* Across all the states in this region except for Jharkhand, currently married women are less likely to participate in the labour force. It is also interesting to note that in rural areas of West Bengal, currently married women with children in the household are more likely to participate in the labour force post 40–50 years than women who are not currently married.

Among the males, *currently married men are more likely to participate in the labour force than others.* The gap between those currently married and those who are not is higher in the age group 20–30 years. For some states, such as West Bengal and Odisha, the gap in the labour force participation rate between men who are not currently married and those who are not widens post 50 years.

Northeastern States: In rural areas of Sikkim, Arunachal Pradesh, Nagaland, and Meghalaya, we observed a significantly higher female LFPR than all other states in the region and across India. While in these states, there is no difference in female LFPR between those currently married or not, in other states such as Manipur, Mizoram, Tripura, and Assam, currently married women are less likely to participate in the labour force. We also observed that among the age group of 20 to 40 years, female labour force participation among married women with children in the household is lower, particularly in Manipur and Assam.

Male LFPR is marginally lower for men not currently married in Manipur, Meghalaya and Assam. The gap is higher in the younger age group of 20–30 years.

West and Southern States: The gap in female LFPR between currently married women and those not is typically higher in urban areas than in rural areas across all the states in this region. In Kerala, we also observed that female LFPR is generally lower when there are children in the household, irrespective of whether the women are currently married or not.

Male LFPR is generally lower for those who are currently not married than those who are currently married. The gap is most pronounced in rural areas of Karnataka.

Figure 4: Female and Male Labour Participation Rate across States, 2022–23

Figure 4a: North and Central States

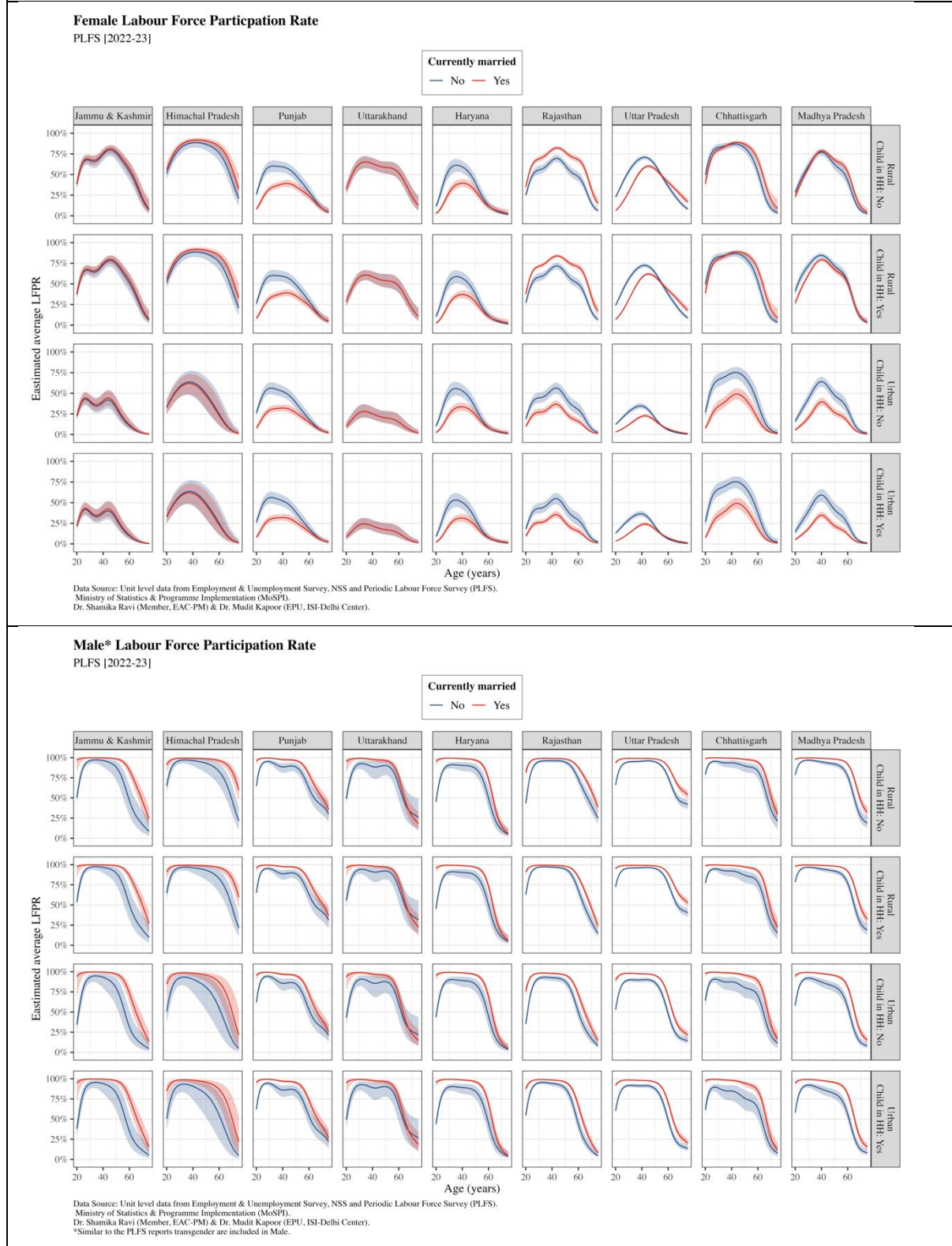
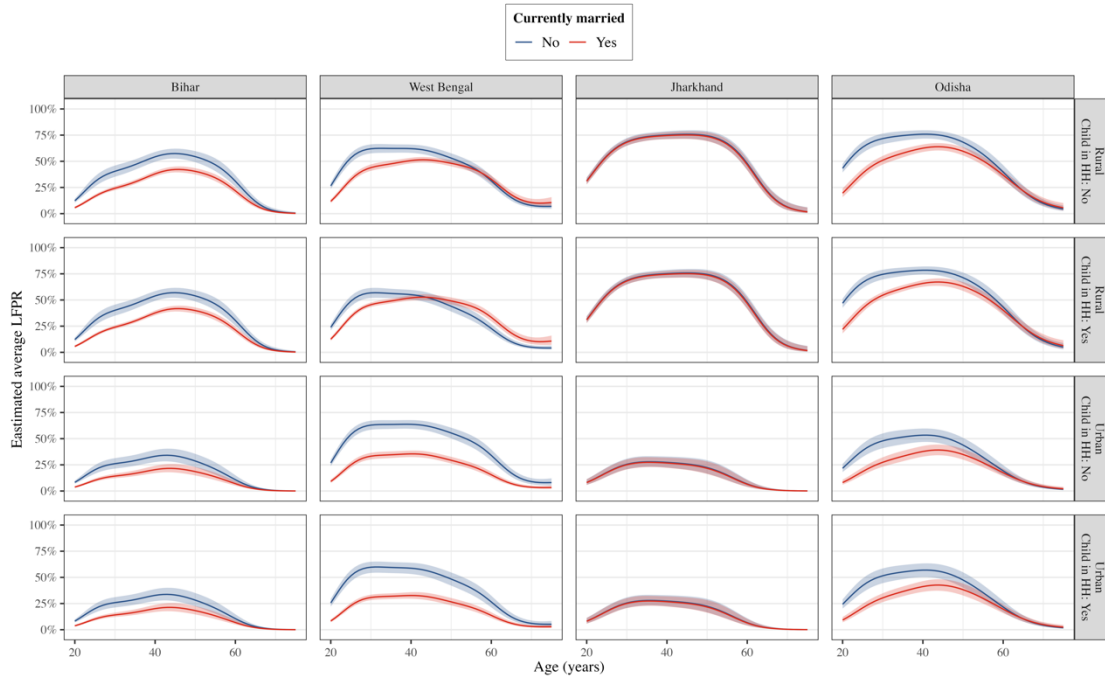


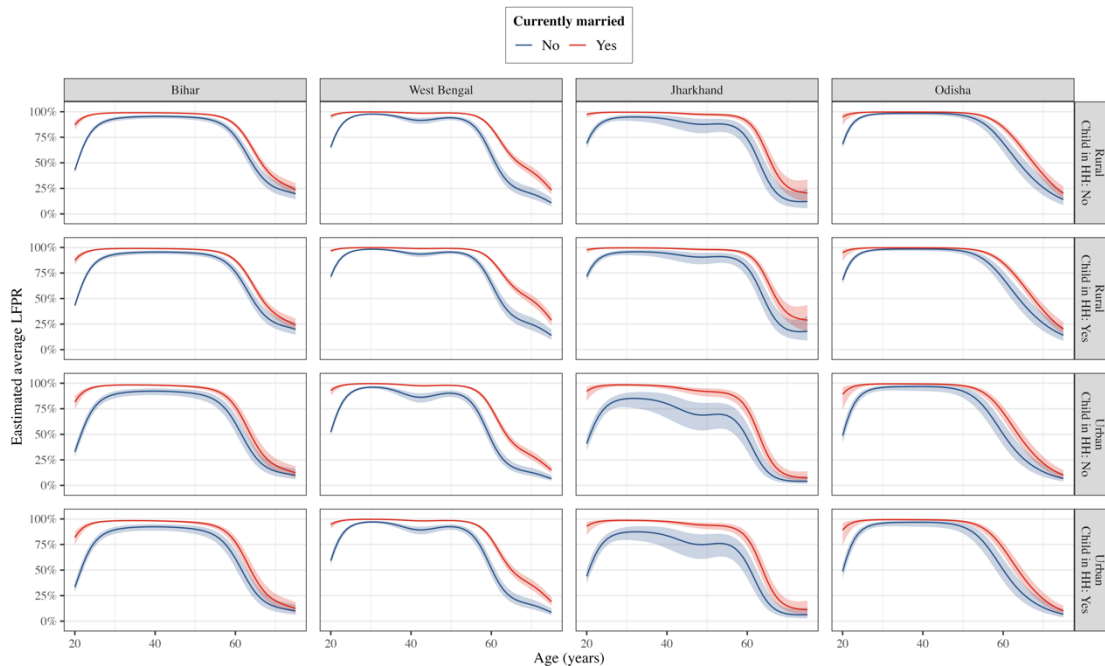
Figure 4b: Eastern States

Female Labour Force Participation Rate
PLFS [2022-23]



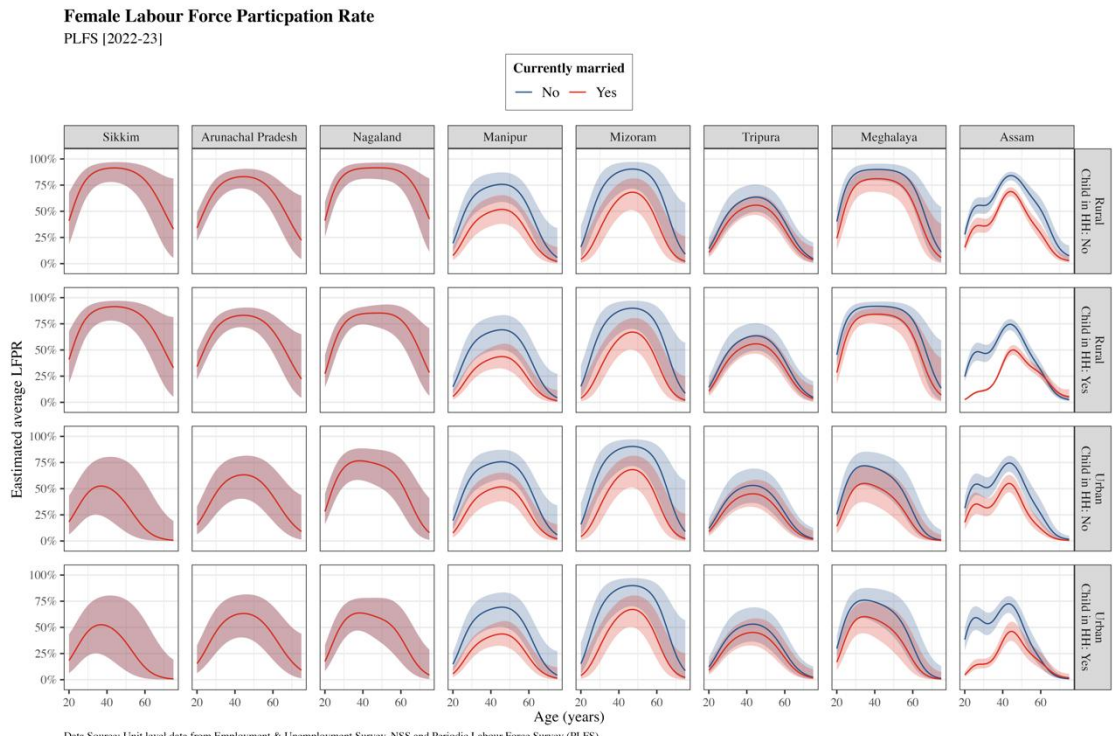
Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
Ministry of Statistics & Programme Implementation (MoSPI).
Dr. Shamika Ravi (Member, EAC-PM) & Dr. Mudit Kapoor (EPU, ISI-Delhi Center).

Male* Labour Force Participation Rate
PLFS [2022-23]

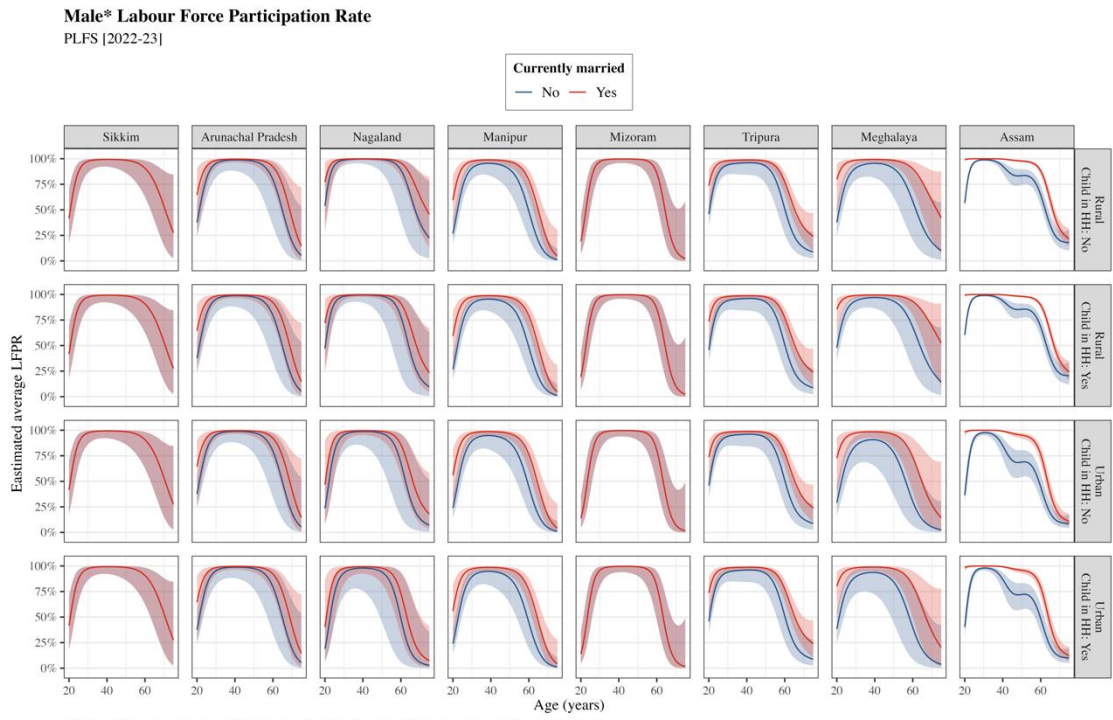


Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
Ministry of Statistics & Programme Implementation (MoSPI).
Dr. Shamika Ravi (Member, EAC-PM) & Dr. Mudit Kapoor (EPU, ISI-Delhi Center).
*Similar to the PLFS reports transgender are included in Male.

Figure 4c: Northeastern States

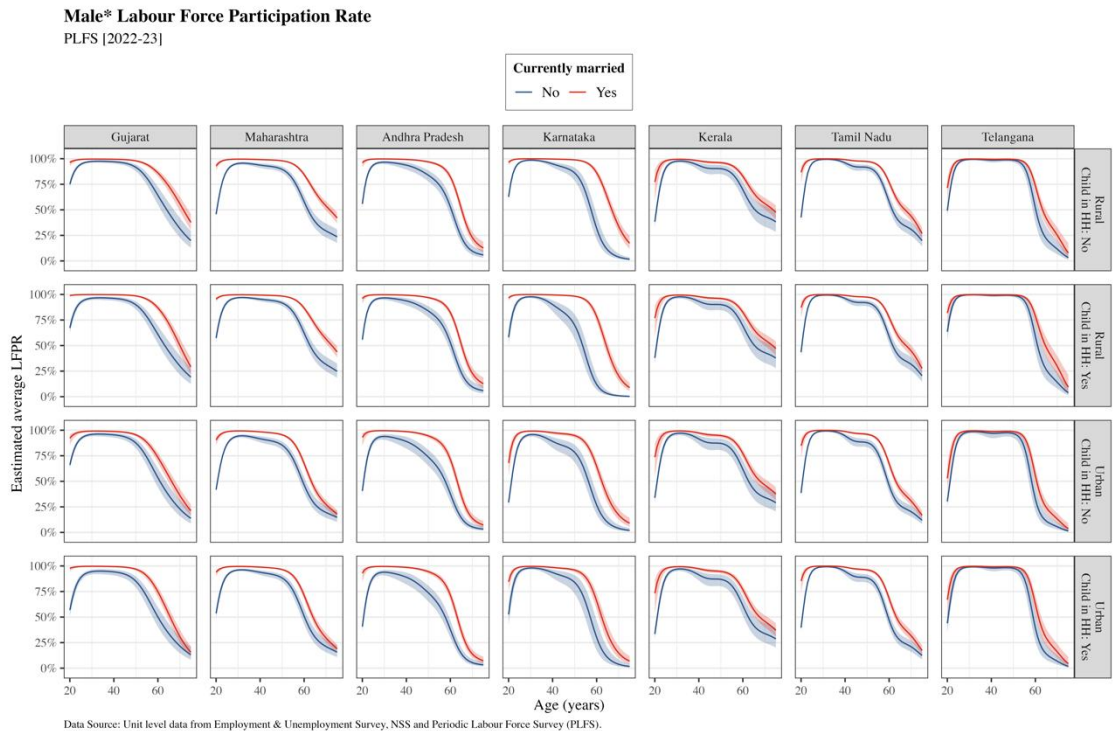
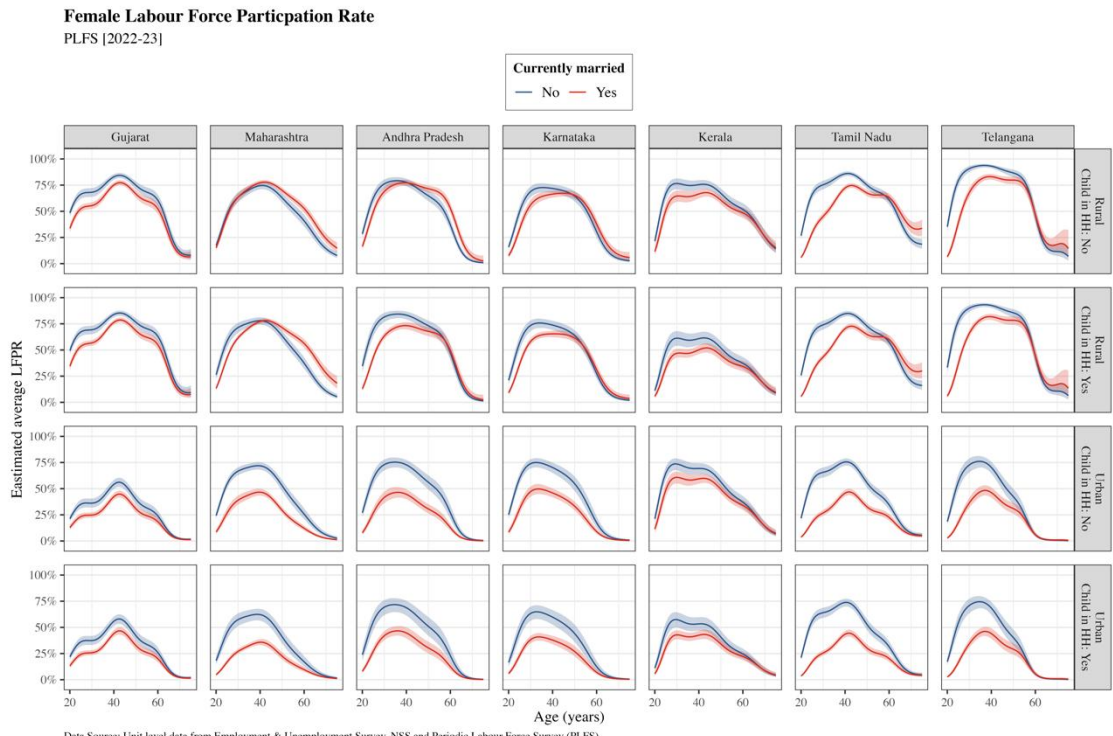


Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
Ministry of Statistics & Programme Implementation (MoSPI).
Dr. Shamika Ravi (Member, EAC-PM) & Dr. Mudit Kapoor (EPU, ISI-Delhi Center).



Data Source: Unit level data from Employment & Unemployment Survey, NSS and Periodic Labour Force Survey (PLFS).
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*Similar to the PLFS reports transgender are included in Male.

Figure 4d: West and Southern States



5. Discussion

Over the last decade, several papers have been published on the theme of female labour force participation rate in India. While many of these papers have been focused on issues of measurements⁵, there are several others that have attempted to explain the steady decline in India's female LFPR from 2004-05 onwards. Our paper is a descriptive empirical analysis which rigorously analyses and documents the recent changes in female and male labour force participation rate between 2017–18 and 2022–23 across India. We provide all-India analyses, but more relevantly, also present detailed state and region level results, disaggregated for urban and rural areas. This paper also makes a contribution to the literature by analyzing the systematic relationship of LFPR across age, gender and marital status for all states of India.

We found a significant increase in female LFPR in rural areas from 24.6% in 2017–18 to 41.5% in 2022–23, while in urban areas, there was a more modest increase from 20.4% to 25.4% during the same period. We document significant inter-state variations that reflect the social, economic, political and cultural diversity, which must be acknowledged while reflecting upon the female LFPR. Though this paper limits itself to the period 2017–18 and 2022–23, it is essential to mention that there has been extensive literature in the Indian context that has documented a "secular decline" in female LFPR between 2004–05 and 2017–18, particularly in rural areas. Some papers have examined supply-side explanations, while others have focused on demand-side explanations. This literature has been extensively summarized in Deshpande and Kabeer (2024)⁶, Deshpande and Singh (2024, 2021)^{7,8}.

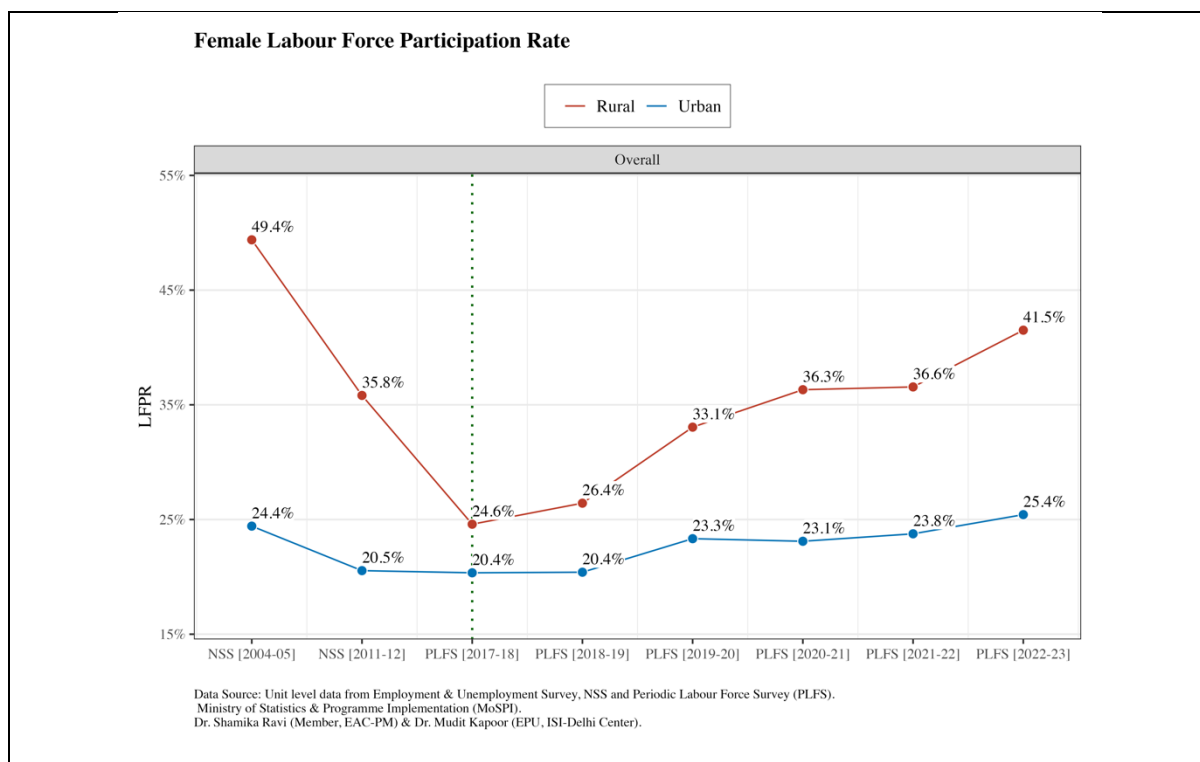
⁵ "Reversing the Gaze: Re-examining Estimates of India's Development Indicators by International Organisations." EAC-PM Working Paper Series, March 2023

⁶ "Norms that matter: Exploring the distribution of women's work between income generation, expenditure-saving and unpaid domestic responsibilities in India." *World Development*, 174:106435.

⁷ "Dropping out, being pushed out or can't get in? decoding declining labour force participation of Indian women." IZA DP No. 14639.

⁸ "The Demand-Side Story: Structural Change and the Decline in Female Labour Force Participation in India." IZA DP No. 17368

Figure 5: Female Labour Force Participation Rate from 2004-05 (NSS) to 2022-23 (PLFS)

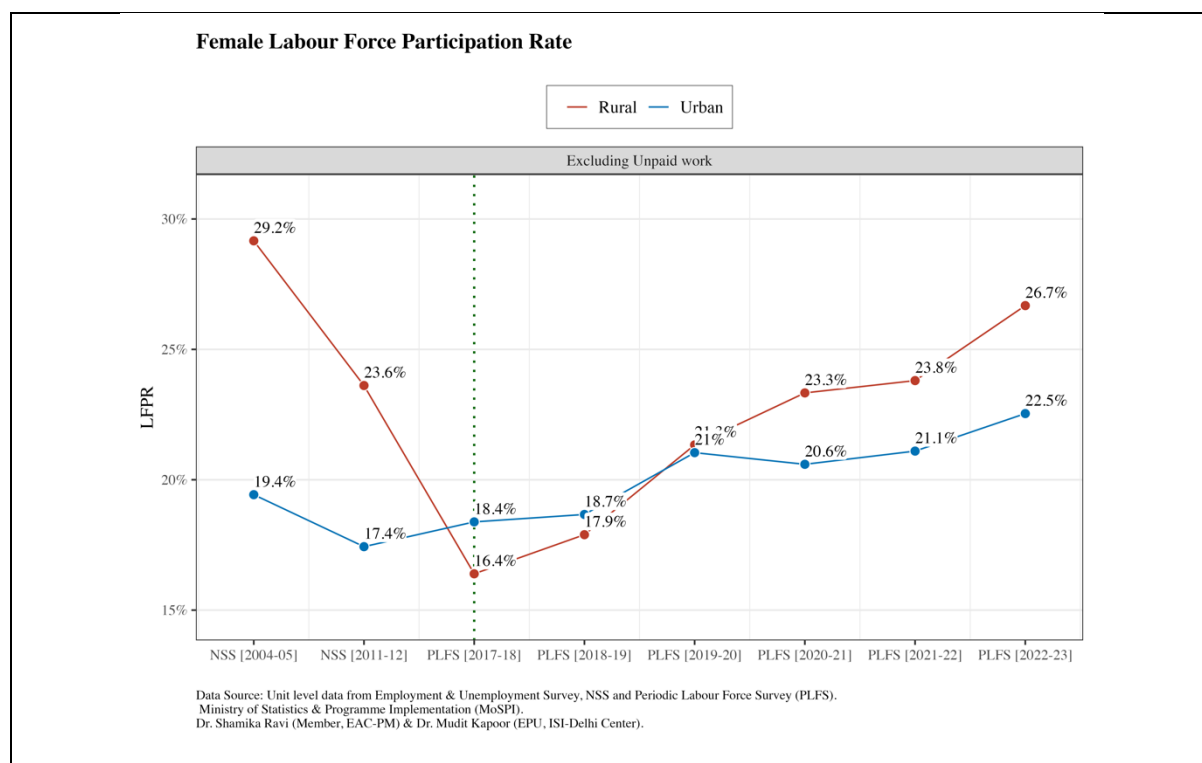


In sharp contrast to the period between 2004–05 and 2017–18, where the rural female LFPR declined significantly, the period between 2017–18 and 2022–23, witnessed a dramatic increase in female LFPR, particularly in rural areas. This trend is shown in Figure 5.

While commenting on the increase in female LFPR between 2018 and 2023, Deshpande and Singh (2024)⁹ have emphasized that better measurement of unpaid work is one of the reasons for the recent rise. *We explored this (Figure 6) and estimated the Female LFPR by excluding unpaid work from the analysis. We do this by excluding all those who worked as unpaid family worker or helper in household enterprise across all the surveys from 2004-05 until 2022-23. The overall trends remain as before. In fact, we find that there has been consistent rise in female LFPR post 2017–18 (even before the pandemic); and this rise is more pronounced in rural areas than in urban areas across India.*

⁹ “Dropping out, being pushed out or can’t get in? decoding declining labour force participation of Indian women.” IZA DP No. 14639.

Figure 6: Female Labour Force Participation Rate Excluding Unpaid Work (2004-05 to 2022-23)



A major contribution of this paper has been to highlight the inter-state differences in female LFPR, beyond looking at the phenomenon from an all-India perspective. While it is essential to look at average numbers for India, it is perhaps, more important to recognize the socio-economic, political, and cultural diversity across states of this vast country. These diversities play an important role, particularly in determining female LFPR. For example, states such as Bihar, Punjab, and Haryana have consistently reported very low levels of female LFPR. It is important to bear in mind that while Haryana and Punjab are among the richest states within India, Bihar is the poorest state. Similarly, the northeastern and southern states have consistently reported relatively higher female LFPR. Historically, the development and gender literature has offered cropping pattern as an important factor determining female LFPR. Rice cultivation is typically correlated highly with female LFPR across countries. There are likely to be several more explanations for such significant and persistent differences across states of India.

We also observed that female LFPR typically begins to decline much earlier than male LFPR in terms of age – and this result is consistent across states and areas (rural and urban). For

example, in most states, female LFPR peaks between 30 and 40 years and then decreases sharply, whereas male LFPR remains flat at nearly 100% between 30 and 50 years and begins to decline gradually thereafter.

Another striking result which is consistent across states and regions of India is that *married men are significantly more likely to participate in the labour force than men who are not currently married – and this result is persistent for all ages of men, across all states and areas (rural and urban).*

Another important finding is that the female LFPR in urban areas is - almost always and everywhere - lower than female LFPR in rural areas. This major gap between rural and urban areas reflects the pressures of household responsibilities. So, we explored this issue further by examining these differences across marital status and presence of children in the household. *We observed that currently married women, particularly in urban areas, are significantly less likely to participate in the labour force – compared to other cohorts (unmarried and rural women).* However, it is important to mention that there are significant inter-state differences in this regard. For example, in northern states such as Jammu and Kashmir, Himachal Pradesh, and northeastern states such as Sikkim and Arunachal Pradesh, the female LFPR does not vary across marital status. While married women in rural Rajasthan and Maharashtra are more likely to be within the labour force, especially after 40 years of age.

The presence of children in the household also affects LFPR of women in India. *The analysis reveals that female LFPR is lower among households with children under 14 years of age and this phenomenon is more pronounced in urban areas than in rural areas. We also find that the presence of children affects female LFPR more significantly in the age bracket of 20 to 35 years, compared to later years.* These results suggest that the significance of care provision in households, particularly in urban areas, significantly affects the female choice of entering the labour force.

6. Limitation

This paper uses the periodic labour force survey to document the change in female and male labour force participation rates (LFPR) from 2017–18 to 2022–23. It estimates the non-linear relationship between LFPR and age. A fundamental limitation of this paper is that it does not

explain the underlying causes of the dramatic increase in the female labour force participation rate between 2017–18 and 2022–23 across the states. Future research is needed to understand this phenomenon. It would be of particular interest to understand the factors that drove dramatic rise in female LFPR in states like Gujarat, Rajasthan, Jharkhand and some northeastern states like Nagaland and Arunachal Pradesh. Moreover, future research should explore the changes in female LFPR related to education, social groups, and the economic sector.

7. Conclusion

In his vision for Viksit Bharat in 2047, the Prime Minister has articulated an inclusive women-led development model. To fulfil this objective, the government has initiated several programmes, such as the Mudra scheme, the JAM trinity, which combines Jan Dhan accounts, Aadhar and Mobile, which is built on the digital public infrastructure, to make formal finance affordable and accessible to women for self-employment. The scheme has primarily targeted women in rural areas. In addition, the government has also initiated the innovative "NAMO Drone Didi", intending to provide drones to 15,000 women Self Help Groups, which could be rented for agricultural purposes. These initiatives reflect the government's intention to further the women-led development model. Rigorous future research would be needed to assess the impact of these programmes. However, our descriptive analysis does document a dramatic increase in female labour force employment between 2017–18 and 2022–23 across many states of India and particularly within rural areas.

Acknowledgement: We are grateful to late Dr Bibek Debroy who encouraged us to undertake this study on the popular theme of female labour force participation in India – to empirically “set the record straight” at a granular level. We hope that this study, in turn, will motivate more scholars to scrutinize the underlying factors that have driven the resurgence of female LFPR across India, particularly in rural areas. We also thank Sanjeev Sanyal and Suman Bery for thoughtful comments and suggestions that have helped improve this paper.