Explaining the Significant Hikes in Female Workforce Participation Rate in India in Recent Years and Some Thoughts on How to Raise It Further

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Abstract: PLFS data reveal that significant hikes in the female labour force and female workforce participation rates occurred between 2017-18 and 2022-23, contributing majorly to India's aggregate employment growth. These increases in female workers' employment have occurred chiefly in agriculture. There has been a fall in the share of regular wage/salaried workers in aggregate employment and an increase in the share of self-employed, particularly unpaid (family) workers/helpers. There is a view that the recent surge in female employment is primarily caused by economic distress among households, particularly rural households. It has also been claimed that the increase in the share of unpaid (family) workers reflects the economy's inability to generate enough productive and remunerative jobs and that such employment of unpaid female (family) workers signifies disguised unemployment. In this paper, we scrutinise both claims. We present empirical evidence to show that the surge in female workforce participation is not attributable to rural economic distress and that unpaid female (family) workers are not in unproductive and unremunerative jobs, i.e., they are not disguisedly unemployed. The results of our analysis indicate that the creation of a conducive environment for work (through containment of crime against women and other such steps) and a significant reduction in the burden of household unpaid work (done for family members) on working-age women will go a long way in enhancing the female workforce participation rate in India. We also find from our analysis that imparting technical education to young females in rural areas on a wide scale would significantly enhance the female workforce participation rate.

Explaining the Significant Hikes in Female Workforce Participation Rate in India in Recent Years and Some Thoughts on How to Raise It Further

1. Trends in Female Labour Force and Workforce Participation Rate

To realise India's vision of becoming a developed country by 2047, an average annual growth of 7 to 8% or higher in the economy is needed, which cannot be fulfilled unless there is a substantial increase in female participation in the labour force and the workforce in the next 25 years. Periodic Labour Force Survey[1] (PLFS) data reveal that significant progress on this count has been made recently. It would thus be appropriate to begin the discussion in the paper with an analysis of the recent trends in the female labour force participation rate (LFPR) and female workforce participation rate (WPR).

Figure 1 shows the female LFPR between 1983 and 2022-23 for select years. For preparing the graph, the results of the quinquennial Employment-Unemployment Surveys (EUS) of the NSSO (National Sample Survey Office) spanning 1983 to 2011-12 and the more recent annual PLFS data for 2017-18 to 2022-23 have been used. Since there is a serious issue of incomparability between EUS and PLFS, the concept of usual principal status (UPS) has been used for the trend analysis rather than the more commonly used concept of UPSS (usual principal and subsidiary status), as suggested/ recommended in Goldar and Aggarwal (2023a).[2]

Fig 1: Female Labour Force Participation Rate (UPS)
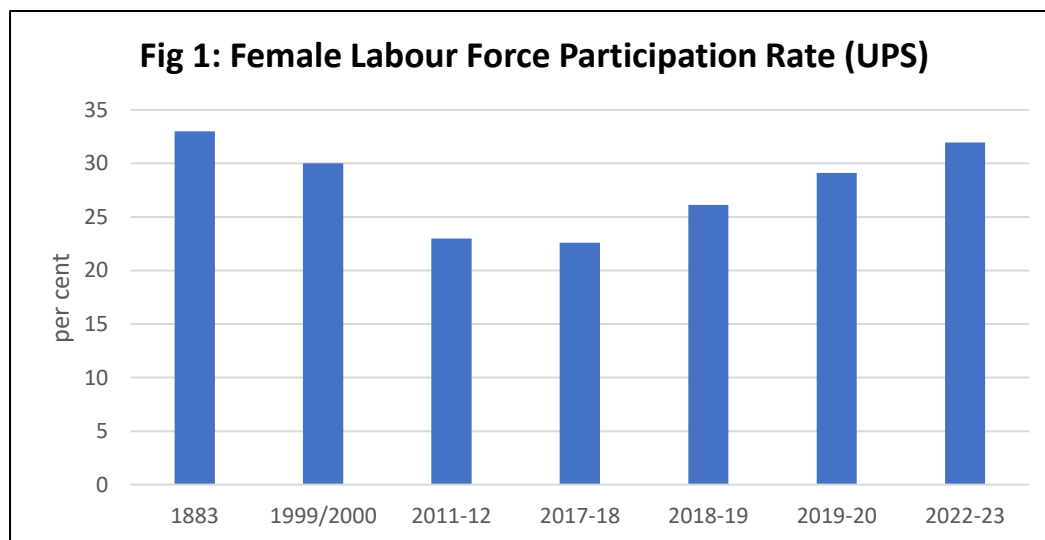
Source: Prepared by authors using EUS and PLFS.

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[1] National Sample Survey Office, Ministry of Statistics and Programme Implementation, Government of India.

[2] For a discussion on the issue of incomparability between EUS and PLFS in the context of manufacturing employment and how the growth in employment in manufacturing gets understated, see Goldar (2023).

Figure 1 shows that the female LFPR in India declined between 1983 and 2011-12. There was not much change between 2011-12 and 2017-18. Since 2017-18, there has been a significant increase. The female LFPR in 2022-23 reached almost the 1983 level.

It is known that there is a U-shaped relationship between female workforce participation and the level of economic development (see Rami, 2020; Fletcher et al., 2018; among others). In the initial phase of development, the female labour force and workforce participation rates tend to fall as the household incomes rise, and after a stage, with further rises in the level of economic development, there is an increase in the female labour force and workforce participation rates. One might think that Figure 1 depicts this phenomenon, i.e., the U-shaped pattern, for India. This is, however, not true, or at least does not appear to be true. While the fall in the female LFPR from 33% in 1983 to 23% in 2011-12 took nearly 30 years, *the movement along the rising part of the U-shaped pattern has taken only six years*. The rise of the per capita income level between these two years, 2017-18 and 2022-23, was from about US$ six thousand to about US$ seven thousand (at PPP). It is perhaps better to view this recent rise in the female LFPR as caused by certain factors peculiar to India's economic development since 2017-18 rather than treat it as a mere manifestation of an internationally observed regular U-shaped pattern.

Figure 2 shows the female WPR in select years between 1993-94 and 2020-23. In this figure, as in Figure 1, the UPS concept is used for the reason given above. It is seen in Figure 2 that the female workforce participation rate (FWPR) came down between 1993-94 and 2011-12, from about 32% in 1993-94 (a little higher in 1983) to about 20% in 2017-18. It has increased since 2017-18 and reached about 28%, close to the 1999/2000 level. Hopefully, if the trend continues in the next couple of years, the FWPR will reach the 1983 level (because the female LFPR has already reached a level close to that in 1983).

The increase in FWPR in rural areas between 2017-18 and 2022-23 was about 17 percentage points,[3] and in urban areas, it was about five percentage points. Thus, the observed increase in FWPR at the all-India level in recent years is mainly a result of the rise in FWPR in rural areas.

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[3] These estimates are based on the UPSS concept. When making a comparison of PLFS results for different years, the use of the UPSS concept is alright (in our opinion).

Fig. 2: Female Workforce Participaton Rate, UPS
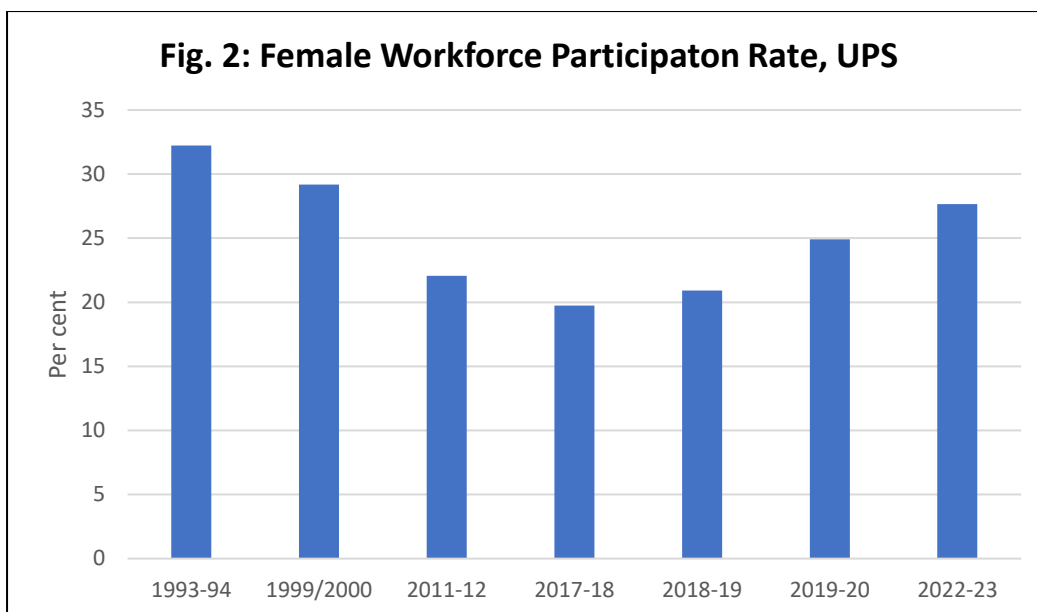
Source: Prepared by authors using EUS and PLFS

Of the total increase in female workers between 2017-18 and 2022-23, the agriculture sector accounts for about 60-70% (using the UPSS concept). The rest of the increase is traceable to female workers finding jobs in the non-agriculture sector – predominantly in manufacturing and services. The proportion of female workers engaged in non-agricultural activities has increased from about 9.5% in 2017-18 to about 13% in 2022-22 (see Figure 3). The proportion engaged in manufacturing has also increased.

Fig. 3: Ratio of female workers to working age population, Non-agriculture activities and manufacturing
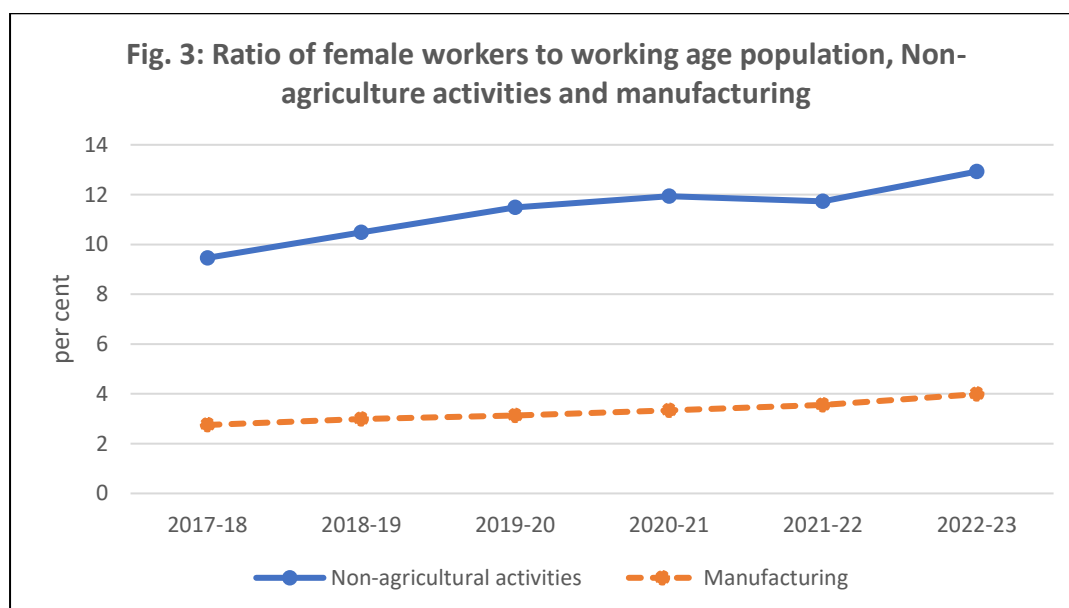
Source: Prepared by authors using PLFS data.

2.   A Pessimistic Interpretation of the Recent Hikes in FWPR

In several articles and news stories in the media and a recent Report, a view has been expressed that the hikes in the female WPR in recent years are primarily caused by households' economic distress, mainly among rural households. To quote from the *State of Working India Report, 2023*:[4] "Why did female employment rates rise at a time when growth is slowing down? The explanation is that it was mainly self-employment that rose, led by distress." (p.49). In another place in the Report, it is written: "After falling or being stagnant since 2004, female employment rates have risen since 2019 due to a distress-led increase in self-employment. Before Covid, 50% of women were self-employed. After Covid, this rose to 60%. As a result, earnings from self-employment declined in real terms over this period. Even two years after the 2020 lockdown, self-employment earnings were only 85% of what they were in the April-June 2019 quarter." (p.22).

In some articles and news stories in the media, some commentators have expressed the view that economic distress is reflected in the increased work demand under the MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act). In an article published in *Down to Earth* (dated 7 January 2022), the following is stated: "The demand for work under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005, has seen a spike since November 2021 — after falling to its lowest since the novel coronavirus disease (COVID-19) outbreak in September and October. This has pointed to rural distress despite the absence of COVID-19 restrictions on economic activities for the past few months."[5] One can find other articles in newspapers and other media in which such a remark has been made; it is pointed out that the work demand under MGNREGA has increased in 2021-22 to a level higher than that in 2019-20, which is treated as pointing to continuing rural destress. Putting the above two points together, one might claim that the increase in work demand under MGNREGA reflects economic distress in rural areas, [6] which is a prime reason for the observed significant hikes in rural FWPR.

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[4] State of Working India, 2023, Social Identities and Labour Market Outcomes, Centre for Sustainable Development, Azim Premji University, Bengaluru, Karnataka.
[5] https://www.downtoearth.org.in/news/economy/rural-distress-demand-for-mgnrega-work-sees-spike-again-81017
[6] V. Anantha Nageswaran and Deeksha Supyaal Bisht in their article in *Mint* (22 August 2022) questioned the view that there has been significant rural economic distress lately. They noted that the narrative of India's hurting rural economy is exaggerated if one juxtaposes this view with available

Another concern that has been raised is about the rise in the share of self-employment (particularly unpaid female workers belonging to the enterprise owner's family) and a fall in the share of regular wage/salary workers, which is believed or claimed to be reflecting the inability of the Indian economy to generate sufficient productive and remunerative forms of employment (see Box 1).

Box 1: Views on the increases in unpaid female (family) workers

In a paper, Surajit Deb states: "It is …observed that while the government policies are pushing self-employment as an answer to India's unemployment problem, the academic views have been quiet different that claimed self-employment as a form of disguised unemployment or self un(employment) in India." Surajit Deb, "Some Observations on the Rising Self-employment in India, 2022". Paper prepared for the 37th International Association for Research on Income and Wealth, General Conference, Luxembourg, August 22-26, 2022.

In her paper, Ashwini Deshpande states: "Had the decline in casual labour been reflected in an increase in regular salaried jobs, it would have indicated an improvement in job quality. However, that is not the case. The increase in self-employment in agriculture could reflect disguised unemployment or underemployment, which refers to a situation where too many workers are doing too few jobs. This essentially means that women are engaged in agriculture but not to their full productive capacity. This is reflected in the pattern of earnings over time." She also states: "The sustained increase reflects an increase in women in self-employment, which is a combination of paid work and disguised unemployment. There is, however, no increase in job availability in rural areas." [Ashwini Deshpande, "Illusory or real? Unpacking the recent increase in women's labour force participation in India," Centre for Economic Data and Analysis, Ashoka University, 15 December 2023, https://ceda.ashoka.edu.in/illusory-or-real-unpacking-the-recent-increase-in-womens-labour-force-participation-in-india/]

In an article in *Mint*, Radhicka Kapoor states: "....we find that in the period post 2018-19 there has in fact been a sharp increase in the share of usual-status workers who are reported as employed by SS. This increase is particularly steep for women, both in rural and urban areas. For rural women those engaged only in subsidiary status activities rose sharply from 14.1% in 2018-19 to 22.5% in 2021-22 and for urban women it rose from 5.9% to 10.3%. This suggests that though women are entering workforce, they are not engaged in productive employment. Rather they are engaged in marginal subsidiary work which is often unpaid. This may well be distress driven, and cannot be taken as a sure-shot indicator of an easing of the country's job crunch or an improving employment situation in the economy." [Radhicka Kapoor, "More unpaid work may be driving up India's employment statistics," *Mint*, April 24, 2023].

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data. They observed that most indicators concerning the health of rural women and children have improved. These outcome-oriented statistics reveal medium-term improvement in living standards in rural areas aided by government policies and programs. In their more recent article in *Mint* (21 November 2023), they point out various faults in the argument that the rise in female WPR is due to economic distress. They point out that within the rural female work force, there has been a structural shift from elementary agricultural labour using considerable physical efforts (down from 23.4% to 16.6%) to skilled agricultural labour (up from 48% in 2018-19 to 59.4% in 2022-23).

In what follows, we scrutinise the above-mentioned views, claims, or interpretations of the employment trends observed in PLFS and other associated data. The rest of the paper is organised as follows. In Section 3, we scrutinise the claim that the hikes in FWPR in rural areas in recent years are essentially driven by economic distress. We present empirical evidence that raises serious doubts about this view/claim/interpretation. In Section 4, we present our conjectures or hypotheses on the possible explanations for the observed hikes in rural FWPR. In Section 5, we scrutinise the claim that unpaid female (family) workers/helpers are in unproductive and unremunerative jobs. In this case, our analysis reveals that this claim is invalid. In Section 6, we go into the question of what can be done to raise FWPR further. Finally, Section 7 highlights the key findings of the study.

3. Distress-driven surge in female employment in rural areas: scrutinising the claim

Several pieces of empirical evidence are presented below, and associated arguments are made that rebut the claim that the sharp increase in rural female WPR observed for recent years in PLFS data is <u>primarily</u> due to economic distress among rural households.

Argument-1: female workers in agriculture absorbed in jobs vacated by male workers

Between 2019-20 and 2022-23, employment of rural males in agriculture fell by about 13.3 million. Their employment in non-agricultural activities increased by about 18 million. Between these two years, the increase in female workers engaged in agriculture in rural areas was about 22 million. Thus, more than half of these women took up the jobs vacated by male workers in rural areas who left in search of better employment opportunities in non-agricultural activities. It does not seem right to call this phenomenon distress-led female employment generation.

Through the above-mentioned indirect link, most of the new jobs for rural women in agriculture (self-employed or otherwise) arose from increasing job opportunities for rural males in non-agricultural activities in rural or urban areas. Thus, it is ultimately the growth in the manufacturing and services sectors and the creation of employment opportunities in these sectors that made male workers in agriculture shift to non-agricultural activities, thus creating job opportunities for female workers in rural areas.

It may be added here that it has been said that many young male persons in rural areas do not want to work on farms[7] , and this tendency is probably reflected in the rate of youth unemployment in rural areas.[8] Since these young male persons would have taken up a job on the farms and decided against it, this indirectly creates more farm jobs for women.

An additional point to be noted is that several articles and media reports are drawing attention to the labour shortage in Indian agriculture. Mahambare et al. (2021), in their article in *Mint* (25 March 2021), write: "Agriculture and allied sectors account for about 18% of the Indian economy, but around 40% of employment. How do we reconcile this with the reports we hear of shortages of farm labour? …. A decline of young people in agriculture work partly explain reports of shortages of agriculture labour." Similarly, Vaishnavi and Manisankar (2022) note the shortage of labour in Indian agriculture in recent years and review the available literature on the topic. Based on their review, they conclude that the strategies to overcome the labour scarcity in agriculture could be hiring agricultural machinery, cultivating less labour-requiring crops, efficiently utilising government subsidies, precision farming and intensive use of family labourers.

In a situation with a significant shortage of labour in agriculture, it is natural that those available for work would be drawn into agricultural activities. The hike we see in the women workers in agriculture is arguably far more a result of demand-pull than supply-push.[9]

Argument-2: Hike in rural FWPR is bigger among rich than poor households

The increase in FWPR in rural areas has been much larger among more affluent households than poor households. This may be seen in Table 1. The observed pattern militates against the view that rural economic distress is driving the increase in FWPR in rural areas because, in that

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[7] Sayantan Bera, "Rural youth prefer not to be farmers: Survey," *Mint*, 24 January 2018; Richard Mahapatra, "India's agrarian distress: Is farming a dying occupation," *Down to Earth*, 24 September 2020.

[8] Unemployment rate among rural male aged 15-29 years was 16% in 2018-19, 13.8% in 2019-20, 11.6% in 2020-21, 11.4% in 2021-22, 8.3% in 2022-23.

[9] Between 2017-18 and 2022-23, real gross value added in agriculture and allied activities grew at the rate of about four percent per annum. The growth rate in agricultural employment was about four percent per annum. Hence, employment elasticity was about one. By contrast, between 2011-12 and 2017-18, real gross value added in agriculture and allied activities rose by 3.4 percent per annum and there was a fall in agricultural employment. What caused a trend reversal in agricultural employment and what made employment elasticity in agriculture and allied activities reach a high level between 2017-18 and 2022-23 is an interesting question. However, this is beyond the scope of the present paper. The important point to note is that there was a rapid growth in demand for labour in agriculture during 2017-2022, and thus the increased female workforce participation in agriculture is mostly demand driven rather than cause by any supply side factor.

situation, the increase should have been greater for the lower-income deciles than higher-income deciles.

Table 1: Female Workforce Participation Rate by decile class according to usual monthly per capita expenditure (UMPCE), 2017-18 and 2021-22

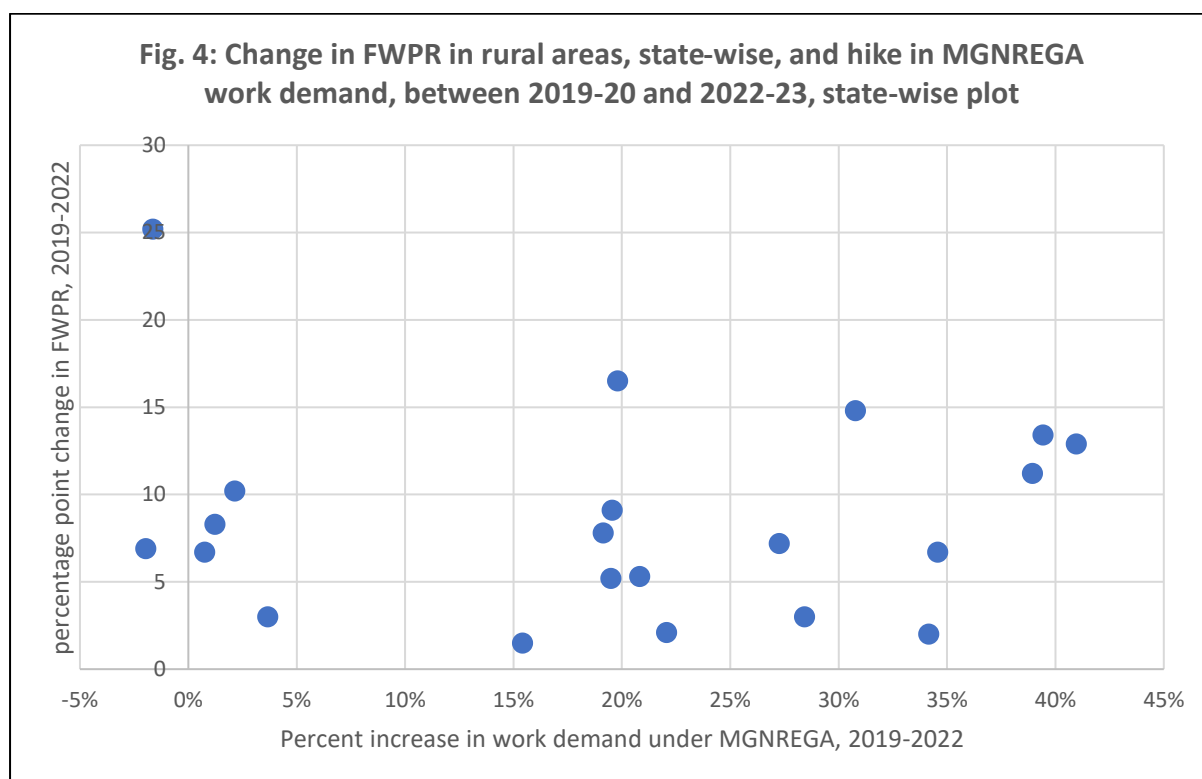| Decile class of population by UMPCE	2017-18 (%)	2021-22 (%)	Change (percentage points)
0-10	16.5	19.9	3.4
10-20	16.0	22.0	6.0
20-30	16.2	23.4	7.2
30-40	15.2	24.4	9.2
40-50	16.7	25.9	9.2
50-60	16.0	27.1	11.1
60-70	19.1	28.4	9.3
70-80	20.2	29.7	9.5
80-90	19.4	32.6	13.2
90-100	19.7	33.4	13.7
All	17.5	26.6	9.1

Source: Prepared by Authors using PLFS annual reports for 2017-18 (statement 12) and 2021-22 (statement 10)

The pattern seen in Table 1 is consistent with the observation of Nageswaran and Bisht in their article in *Mint* (21 November 2023) that within the rural female workforce, there has been a structural shift from elementary agricultural labour using considerable physical efforts (down from 23.4% to 16.6%) to skilled agricultural labour (up from 48% in 2018-19 to 59.4% in 2022-23). We believe the skilled female agricultural labour belongs far more to higher rather than to lower income deciles.

Argument-3: Weak correlation between change in work demand under MGNREGA and increases in rural FWPR

Between 2019-20 and 2022-23, work demand under MGNREGA increased by about 10%. FWPR in rural areas increased by about 8.5 percentage points. Do these two facts establish a direct link between the two developments? This does not seem right to infer. Analysing state-wise increases in work demand under MGNREGA and state-wise increases in FWPR in rural areas, we do not find a positive correlation, let alone a statistically significant positive correlation. The states where FWPR in rural areas increased significantly are often not those that experienced a substantial increase in work demand under MGNREGA, which would have

linked economic distress to work demand under MGNREGA and then to an increase in female WFPR rate. Instead, a slight negative correlation of (-)0.05 is found, as shown in Figure 4.

Fig. 4: Change in FWPR in rural areas, state-wise, and hike in MGNREGA work demand, between 2019-20 and 2022-23, state-wise plot

y-axis: percentage point change in FWPR, 2019-2022
*x-axis: Percent increase in work demand under MGNREGA, 2019-2022*

Note: There was a sharp fall (80%) in work demand under MGNREGA in West Bengal in 2022-23. Hence, the growth in the two variables between 2019-20 and 2021-22 has been considered for this state.
Source: Prepared by authors using PLFS data and official data on MGNREGA.

For preparing Figure 4, data have been taken for relatively bigger states, with an estimated population of at least 50 lakhs as of April 1, 2023. As clarified above, there should be a significant positive correlation between the two variables considered in Figure 4 to justify the claim that economic distress manifested in higher demand for work under MGNREGA has led to hikes in FWPR in rural areas. However, such a positive correlation is not found. Instead, the correlation coefficient is (-)0.05.

Figure 5 investigates the relation between the change in person-days of work of women in MGNREGA as per PLFS data and the change in rural FWPR. In a situation of economic distress in rural areas, one would expect an increase in the share of women in person-days of work under MGNREGA to be correlated with women's participation in work in the farms. This pattern is, however, not visible. The figure considers the change between 2019-20 and 2022-23. There is no strong positive correlation between the two variables. The correlation

coefficient is 0.04. Accordingly, it seems there is not enough basis to argue that rural economic distress is reflected in rising MGNREGA work by women, which is reflected in increases in rural FWPR.

Fig. 5: Change in person-days of work in MGNREGA and increase in RFWPR, between 2019-20 and 2022-23, state-wise plot
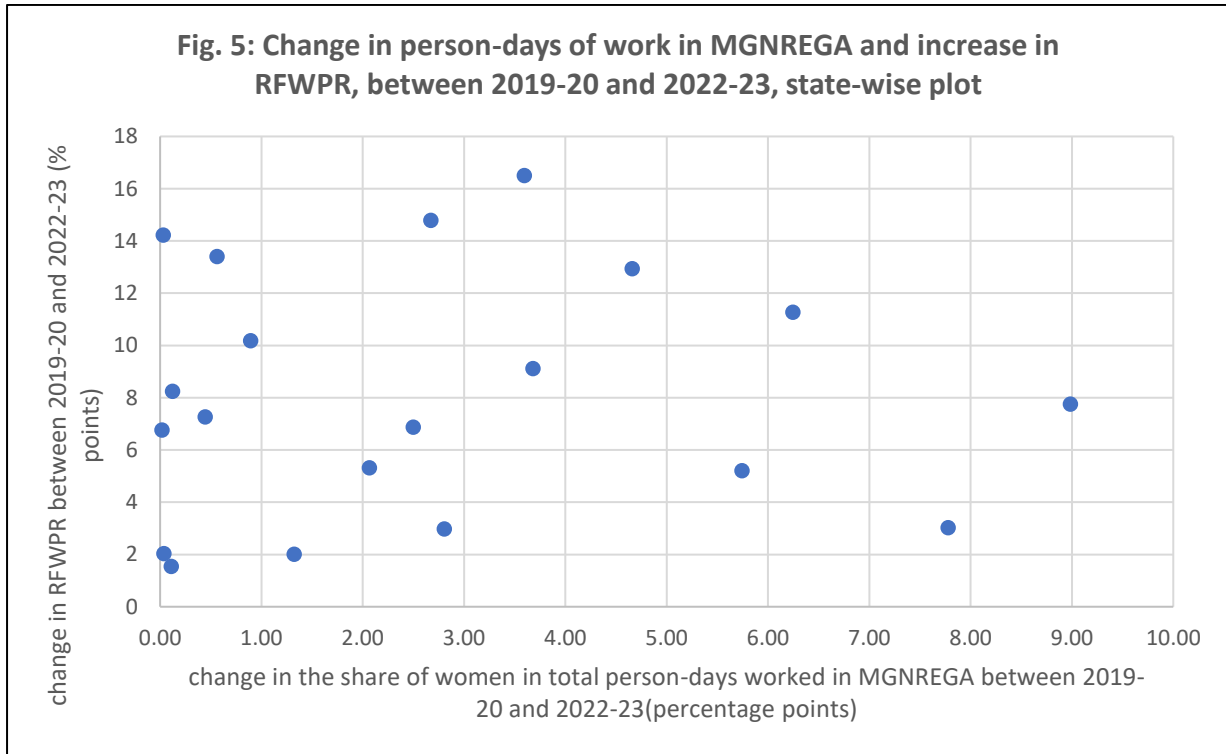
Source: Prepared by authors using PLFS data.

Argument-4: No downward trend in rural wages despite the claimed distress-led FWPR rise, presumably leading to the augmentation of the agricultural labour supply

If rural women's distress-led hike in workforce participation, occurring mostly in agriculture, has caused an over-supply of labour in agricultural labour markets, then there should have been downward pressure on rural wages. The data on rural wages in India published by the Ministry of Rural Development, Government of India, show that there was no noticeable fall in rural wages deflated by CPI-RL in recent years, post-2019. This trend may be seen in Figure 6.

Fig. 6: Rural wage rate in India (deflated by CPI-RL)
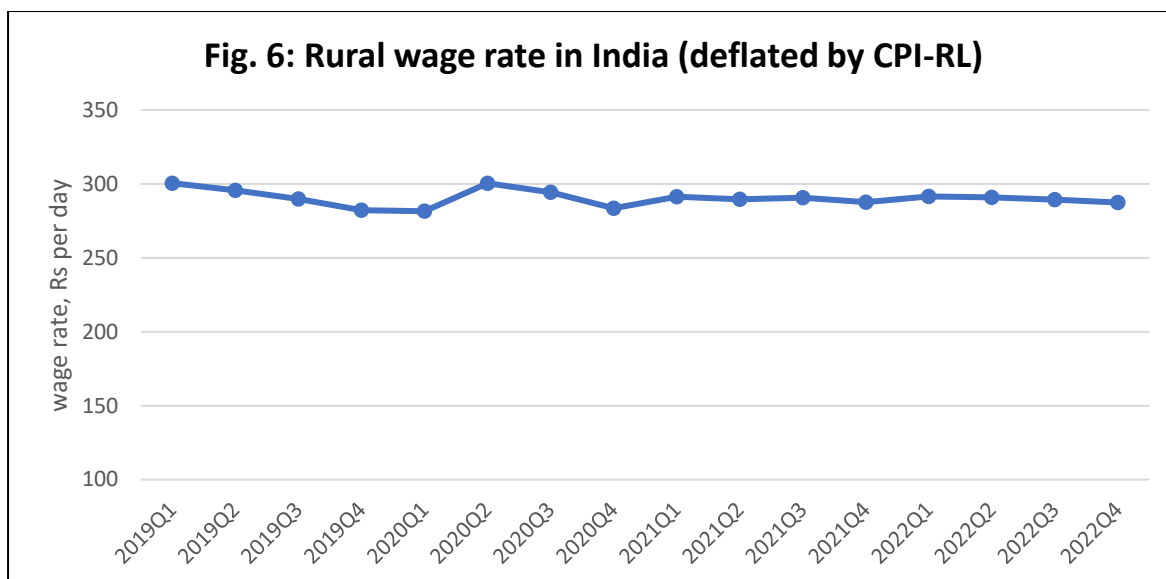
Note: For 2020Q2 and 2021Q2, the wage rate in June is taken. CPI has been rebased. The index value for 2019 is taken as 100.
Source: Prepared by authors using data on rural wages taken from the website of the Ministry of Rural Development, Government of India

Argument-5: Increase in the wage rate of female casual workers in rural areas not correlated with the increase in FWPR in rural areas

Figure 7 presents a plot of the change in the wage rate of female casual workers in rural areas between 2019-20 and 2022-23 and the increase in FWPR in rural areas between these two years. The data have been taken from the PLFS reports for 2019-20 and 2022-23.

If distress-led increases in FWPR in rural areas cause an excess supply of labour, this should find reflection in a fall in the wage rate. Hence, a negative correlation should arise between the change in wage rate and the change in FWPR across states, which is, however, not found. Instead, the correlation coefficient is a small positive number. The finding of a very low correlation coefficient is inconsistent with the claim that rural economic distress is the prime cause of increases in the work participation rate of rural women because, as explained, a negative correlation across states should have arisen between the change in wage rate and the increase in FWPR in rural areas.

Attention should be drawn to the fact that there has been a significant increase in the wage rate of female casual workers in many states. The average increase is about 40 percent or slightly lower. This may have incentivised farmers to substitute paid labour by unpaid family workers.

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Fig. 7: Changes in wages of female casual workers and in FWPR in rural areas between 2019-20 and 2022-23, state-wise plot
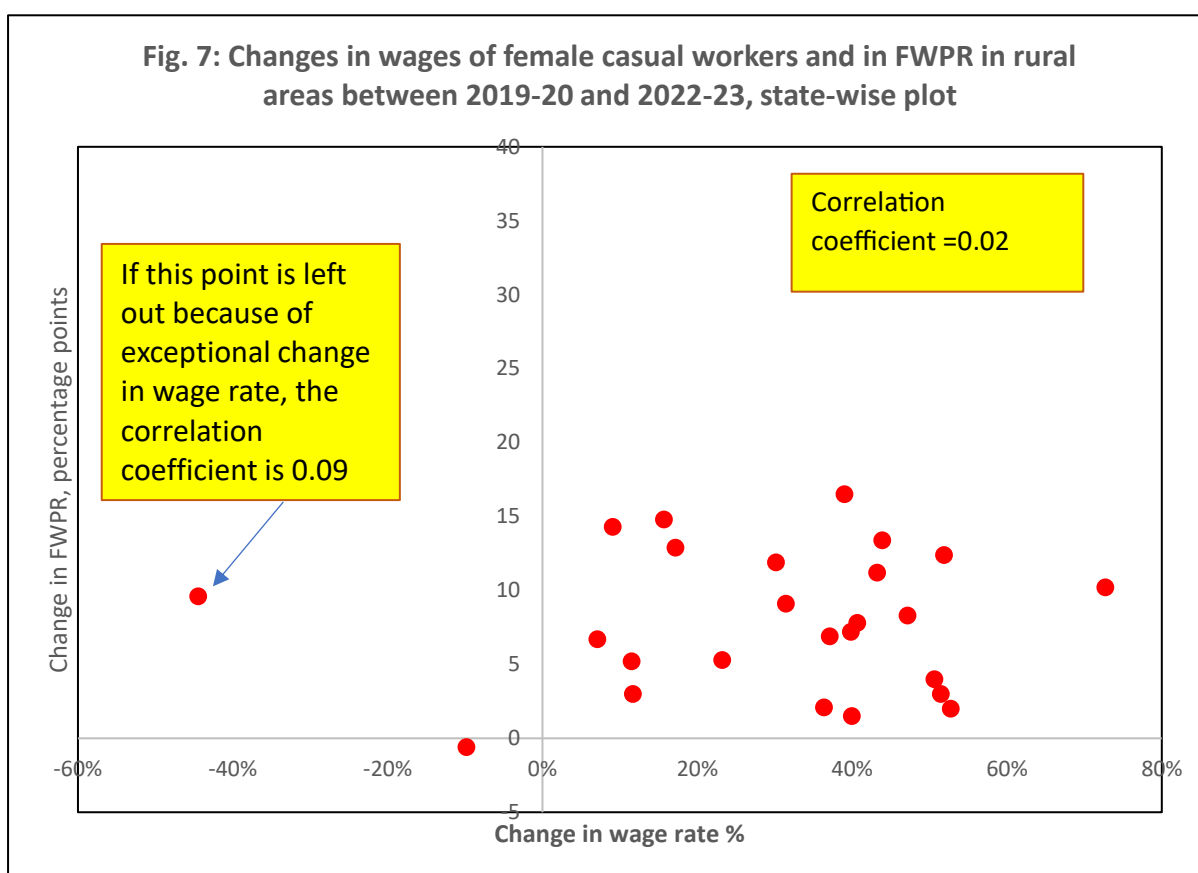
Note: For each financial year, the July to March period is considered because of the COVID-related lockdown in April-May 2020.

Source: Authors' computations based on PLFS.

In our assessment, the five pieces of empirical evidence presented above cast serious doubts on the view expressed in some articles that the recent surge in FWPR in rural areas is primarily caused by economic distress in rural areas. What is the alternate explanation if this is not the explanation for the hikes in FWPR observed in PLFS data? We briefly discuss the possible alternate explanations in the next section, i.e., Section 4. We then move to the other assertion made that the rise in the share of self-employment (particularly unpaid female workers belonging to the enterprise owner's family) and a fall in the share of regular wage/salary workers in recent years reflects the inability of the economy to generate sufficient productive and remunerative forms of employment. The claim is that unpaid female family workers in enterprises/farms are commonly in less productive and unremunerative jobs, amounting to disguised unemployment. We scrutinise this claim in Section 5 of the paper.

4. Alternate Explanation for the Hike in FWPR in Recent Years

4.1 Explaining the significant increase in FWPR in agriculture

As noted above, jobs in agriculture account for 60 to 70% of the increase in female workforce participation in rural areas in recent years. This is attributable to significant increases in work opportunities in agriculture that have arisen from (a) rapid growth in the agriculture sector output (about 4% annual growth) creating extra demand for labour, (b) a fall in employment of rural males in agriculture by about 13.3 million between 2019-20 and 2022-23, caused by their decision to shift to non-agricultural activities in rural and urban areas thereby vacating jobs that could be taken up by female workers, and (c) the reluctance of a section of young male persons in rural areas to work on the farms which has contributed to creation of employment opportunities for female workers.

4.2 Explaining the increase in FWPR in non-agriculture activities, particularly manufacturing

In our opinion, the easing of labour regulations, impressive progress in financial inclusion, improvement in ease of doing business, infrastructure development, a rapidly growing digital economy, and other such developments are enhancing employment in non-agricultural enterprises, even in small and tiny enterprises. These forces give momentum to an intense process of formalisation of informal enterprises in India aided by digitalisation and GST, which leads to concomitant employment gains for males and females.

Other factors that have probably contributed to increases in women's employment in the non-agricultural sector, particularly manufacturing, include skill development programs, and policies and laws for workplace safety. The amendments to the Factories Act made by some states to allow women to work in the night shift in the factories contributed to women's employment in manufacturing. Amendments made to the Industrial Disputes Act (IDA) by many states in the second half of the 2010s and such reforms during 2020/2021 have contributed to increases in manufacturing employment and the share of women employment in manufacturing.

It is not easy to prove the above assertions, although there are reasons to believe them to be true. Thus, the above statements about the alternative explanation may be treated as our conjectures or hypotheses. Establishing the assertions (testing the hypotheses) with data is left for a future paper. Yet, it is essential that some evidence, even if sketchy, be provided in support of the assertions made. Hence, some empirical evidence supporting the alternative explanation is given below.

First, the impact of the reforms mentioned above and other developments is visible in manufacturing employment, which grew by about 4.7% in 2020-21 and 8.2% in 2021-22, which is unprecedented (see Goldar and Aggarwal, 2023b, 2023c). The growth rate in employment was about 25% a year for enterprises with 10-19 workers, reflecting, in our opinion, a robust process of formalisation.

A related point is that KVIC (Khadi and Village Industries Commission) forms a significant part of unorganised manufacturing in terms of employment. Real sales of this sector have grown by about 10-15% each year in the last ten years. There has been a 28% hike in employment between 2015 and 2022. This increase in jobs in KVIC enterprises should have created employment opportunities for women.

Second, a study by Chakraborty and Mahajan (2023) finds that the easing of labour regulations (Factories Act and IDA) in some states raised the proportion of women workers in organised manufacturing, which occurred through a reforms-led increase in the size of industrial firms and more significant expenses on staff welfare. Since many states have undertaken such reforms relating to the Factories Act and IDA during 2017-2021, this could be an important factor in enhancing female employment in organised manufacturing. Similar findings have been reported by Das et al. (2015). Their analysis of female employment in India reveals: "More flexible labor markets are associated with higher female participation in the labor force, as well as with a higher probability of being employed." These findings point towards the role of labour reforms in enhancing FWPR in India from 2017 to 18.

Box-2: Estimation of Manufacturing Employment based on PLFS

Our estimates of employment growth in manufacturing differ from those presented in some other studies. In Goldar and Aggarwal (2023c), it has been pointed out that the difference probably arises from (a) the population estimates used, (b) the economic activities included under manufacturing, and (c) at what level the apportioning of aggregate employment into different industries is done. It would be appropriate to explain the method we have followed and why.

We have used the same definition of manufacturing as is used by the NSSO in EUS (Employment-Unemployment Survey).[10] We have made the employment estimates in two steps. In the first step, we take the workforce participation rates for rural male, rural female, urban male, and urban female and multiply these rates with estimated rural male, rural female, urban male, and urban female projected population taken from *Population Projections for India and states 2011 – 2036*: *Report of the Technical Group on Population Projections*, July 2020, National Commission on Population, Ministry of Health & Family Welfare, Government of India. In the second step, we have taken (a) total rural employment and total urban employment, then (b) split rural and urban aggregate employment into industry divisions separately, (c) derived manufacturing employment in rural areas and that in urban areas, and (d) then added rural manufacturing employment and urban manufacturing employment to obtain total manufacturing employment in the country.

A simple method to adopt is to take the estimate of total employment in the country obtained in the first step and allocate it to different industries according to the proportions reported in PLFS at the all-India level. We feel that the share of manufacturing in total employment at the All-India level, rural and urban areas combined, is a weighted average of the proportions for rural and urban areas with PLFS generated rural and urban population as weights. Since we did not use the population estimates of PLFS in the first step, we feel we should not do that implicitly in the second step.

An alternative is to change the unit-level data multipliers to match the population projections in the Report of the Technical Group mentioned above. This has been done in some studies, including Goldar et al. (2023). After applying this method, the growth rates in manufacturing employment are about 4.5% for 2020-21 and 7.5% for 2021-22.

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[10] The definition of manufacturing in India KLEMS database is different from the definition we adopt here since India KLEMS data are aligned with national accounts and thus use the definition of manufacturing adopted in National Accounts Statistics. Custom tailoring is included in our definition of manufacturing but is taken as a part of services in the definition adopted in National Accounts and hence in India KLEMS database.

4.3 Role of Mobiles and Internet

The digital infrastructure associated with the growing digital economy has been a strong enabling factor for women to participate in the workforce in India. This point is brought out by a recent paper by Fernandez and Puri (2023). They note that there is literature on how digital infrastructure (internet and mobile phones) contributes to female employment, and in the case of India, there has been a huge penetration of internet and mobile phone facilities among people. Using NSS 78th round data for urban areas and estimating an econometric model, they find that the "overall access to mobile phones increases the probability of a woman entering the labour force in urban India by 29%" (detailed analysis available in the paper). Although this paper by Fernandez and Puri (2023) is about female labour force participation in urban areas, the conclusions drawn will likely apply to rural areas as well. Thus, a part of the increase in FWPR in rural areas may reasonably be attributed to increased availability of mobile phone facilities and the internet.[11] One may ask, how do mobiles and the internet help in raising female participation in the labour force? The answer is that it provides information about jobs, facilitates digital payment of wages, and allows women to take care of the children (at least to some extent) still being at work through regular communication (these are findings of several studies such as Ngan and Ma, 2008; Aker and Mbiti, 2010; and Ureta, 2008, cited in the paper by Fernandez and Puri, 2023).

4.4 Impact of reductions in time spent by rural women on household chores – the role of JJM

Reductions in time spent by women on household chores and unpaid care work positively impact women's WPR. This is known in the literature and is discussed again in Section 6.2 of the paper. The present sub-section deals with the contribution made by the Jal Jeevan Mission (JJM) in reducing the time spent by rural women on household chores and thereby contributing to an increased WPR of rural women.[12]

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[11] According to *Annual Status of Education Report*, 2022 [https://asercentre.org/aser-2022] the proportion of rural households with a smart mobile phone has increased from 36% in 2018 to 74.8% in 2022. Almost all rural households had a mobile phone in 2022. According to the Report of the NSS 78th round multiple indicator survey, conducted during 2020-21, about 84% of males of age 18 year or above in rural areas used a mobile phone at least once in three months preceding the date of the survey and about 52% of females of age 18 year or above in rural areas had done so.

[12] In a similar manner, the Pradhan Mantri Ujjwala Yojana, providing clean cooking fuel such as LPG to rural and deprived households, and the sanitation program help free up rural women's time to enable them to take up employment. This is noted by Nageswaran and Bisht in their recent article in *Mint* (21 November 2023).

Jal Jeevan Mission increased tap water connection to rural homes from 3.23 crore on August 15, 2019 to 13.98 crore by January 3, 2024. In our opinion, this has reduced time spent by rural women on water collection by, say, one to two hours a day and thus contributed to increases in FLPR and FWPR in rural areas. Additionally, the health benefits of tap water cut down the time women spend caring for ill children or aged family members.

Before presenting evidence on the impact of JJM on rural FWPR, it is essential to note that even if the time spent by women on household chores and unpaid care activities at home is reduced by one or two hours, it has a significant impact on WLPR and WFPR. This may be seen in Figure 8 (a plot based on district-level data). The figure suggests that a reduction of 100 minutes in unpaid domestic services raises FWPR by about ten percentage points.

Figure 8: Relationship between unpaid domestic work for household members and workforce participation rate in rural areas

Panel A
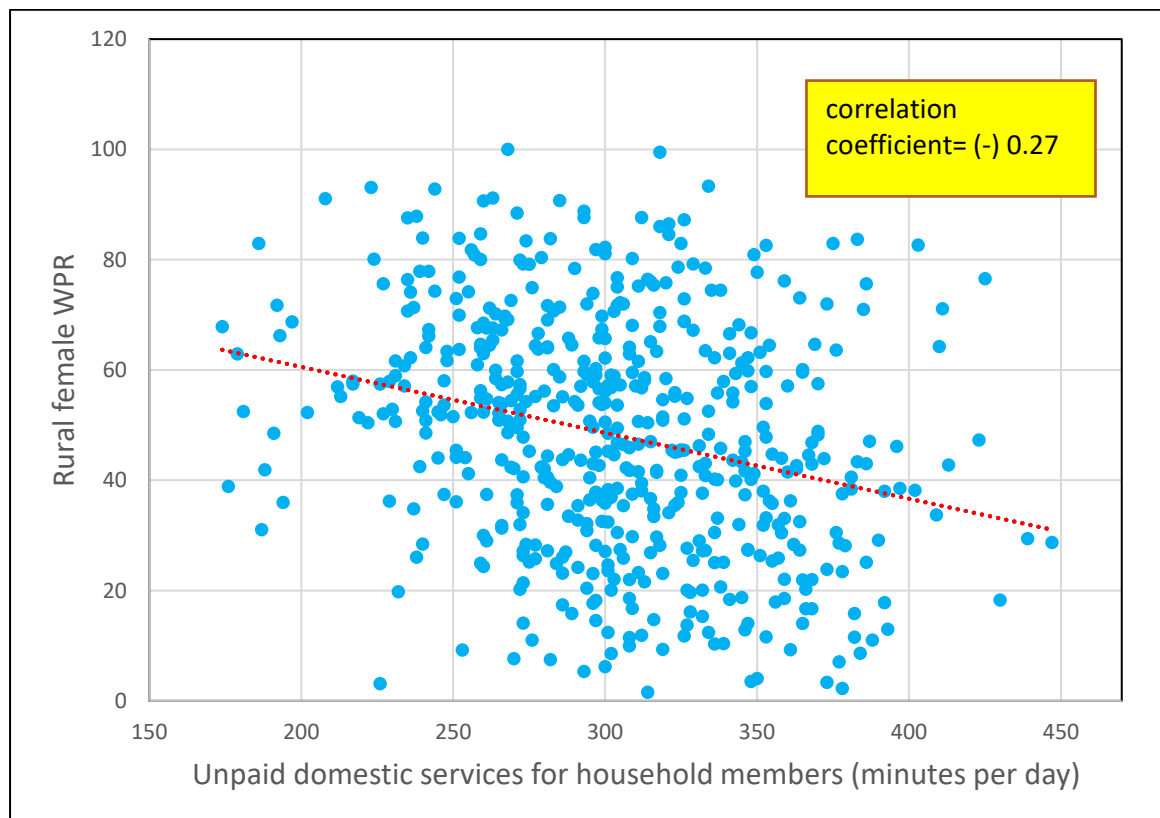
Panel B
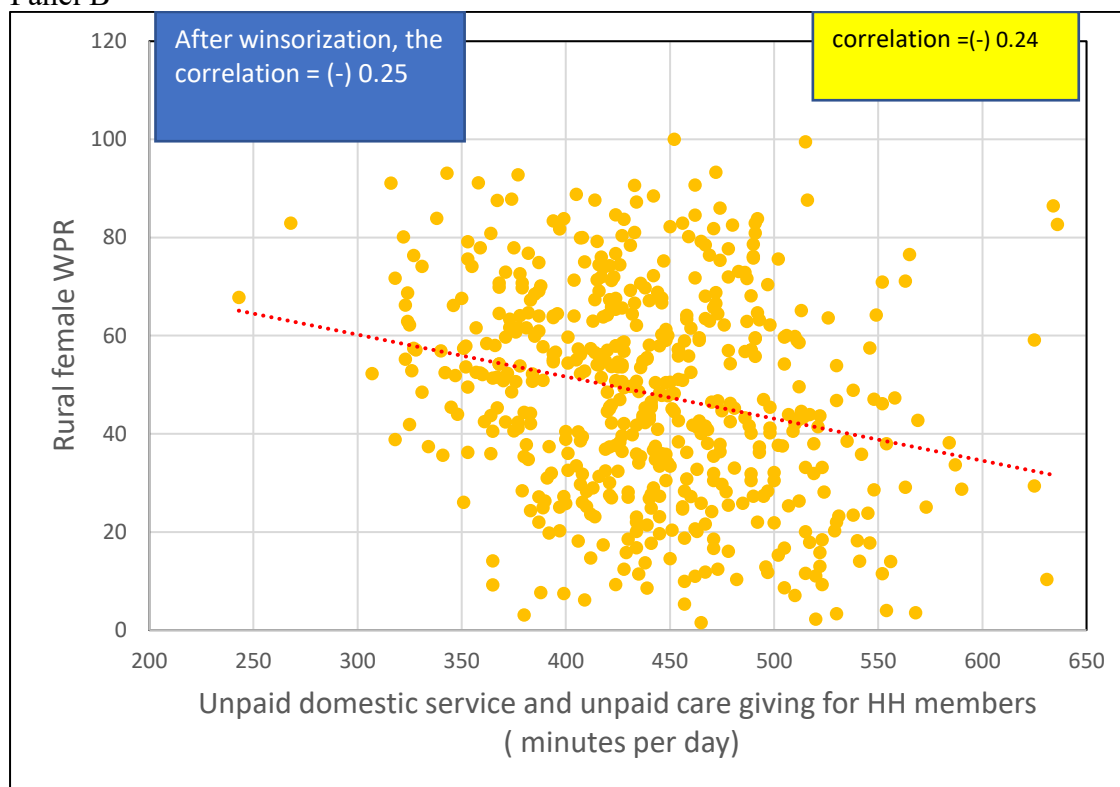
Source: Authors' computations based on PLFS and Time Use Survey.

Turning now to the impact of the JJM, a comparison is presented below (Figure 9) between two categories of districts for Uttar Pradesh – one in which 90% or more than 90% of rural households have tap water at home (ten districts) and the other where less than 50% of rural households have tap water at home (six districts). The message from the figure is straightforward and does not require to be stated in words. It shows the vital role tap water supply to rural households may play in enhancing FWPR. Based on Figure 9, it seems reasonable to argue that a part of the increase in FWPR between 2017-18 and 2022-23 may be attributed to increased coverage of rural households with the piped water supply at home by the JJM. To verify this finding, data on FWPR and the percentage of rural households with the piped water supply have been taken for Chhattisgarh, Himachal Pradesh, Jharkhand, Odisha, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Uttarakhand. Rural FWPRs in the districts with 90% or more rural households are compared with those in the districts with less than 50% rural households with piped water supply. In the former group, the average rural FWPR is about 44%, and in the latter, the average rural FWPR is about 37%. The difference is not as sharp as in Figure 9. Nonetheless, a difference in rural FWPR is indicated. The indication is that providing piped water supply to rural homes helps enhance rural FWPR.

Fig. 9: FWPR in rural areas in Uttar Pradesh, 2022-23, comparison among groups of districts (average FWPR of the districts shown) according to coverage of tap water supply at home
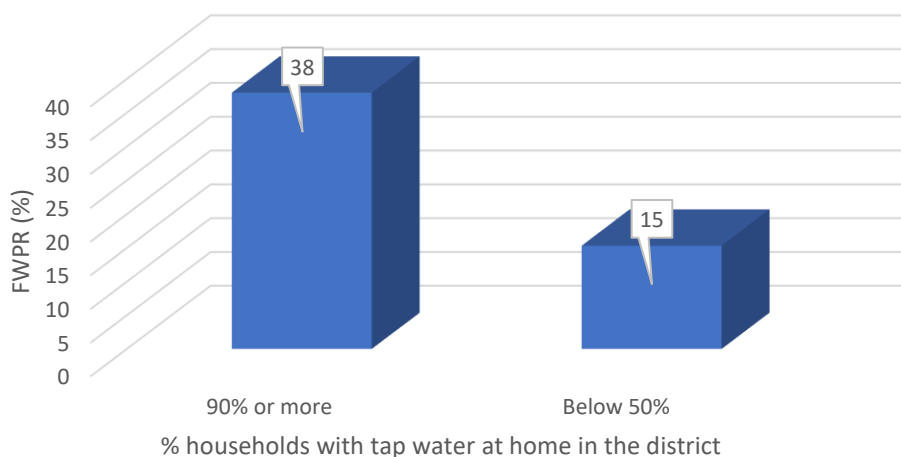
Source: Authors computations. Data source: PLFS unit-level data, and Jal Jivan Mission Website, https://ejalshakti.gov.in/jjmreport/JJMState.aspx

A more detailed analysis is presented next for Madhya Pradesh. In this case, the data on the proportion of rural households connected to tap water obtained from the JJM Website are used along with the data on benefiaries from a report on 'Functionality Assessment' of the household tap connections in Madhya Pradesh.[13] The survey duration was from February to April 2022. A total of 853 villages across all districts and 20164 households were randomly sampled for the survey. The Report provides district-wise information, and these data are combined with district-wise FWPR for 2022-23 obtained from unit-level data of PLFS for the analysis. FWPR is regressed on the percentage of households in the district reporting that they are getting regular water supply. The regression equation is estimated for different sub-sets of districts according to (a) the percentage of households with a piped water supply and (b) the percentage of households reporting that they get 55 LPCD (litres per capita per day) or more. The regression results are presented in Table 2. A positive effect of piped water supply on FWPR in rural areas is evident from the results.

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[13] Functionality Assessment of Household Tap Connection under National Jal Jeevan Mission – 2022, https://jaljeevanmission.gov.in/sites/default/files/2022-10/FA-State-Report-Madhya-Pradesh.pdf

Table 2: Estimated regression coefficient, cross-district regression analysis of the impact of regular piped water supply on FWPR in rural areas

	40% HH or more get 55LPCD+	60% HH or more get 55LPCD+	70% HH or more get 55LPCD+
40%+ HH with tap water	0.165 (0.090)* (n=36)	0.176 (0.092)*	0.223(0.102)**
60%+ HH with tap water	0.233(0.115)**	0.383(0.099)***	0.371(0.085)***
70%+ HH with tap water	0.332(0.145)***	0.380(0.147)***	0.356 (0.132)** (n=7)

Note: HH= households. Estimated for different sub-samples (sets of districts of M.P.).

*, **, *** prob<0.1, 0.05, 0.01

Source: Authors' computations based on data explained in the text.

5. Examination of the claim that unpaid female workers are in unproductive jobs

Consider two identical families in rural areas in terms of the number of family members, the age distribution of family members, and the number of working family members. In one of them, Family A, all workers are paid workers. In the other one, Family B, there are one or more unpaid female workers. Which family is likely to have a higher level of income? Going by the claim that unpaid female (family) workers are often in unproductive and unremunerative jobs (and are thus disguisedly unemployed, at least partly), it may be hypothesised that the monthly income of Family B is relatively lower. PLFS data, however, rejects this hypothesis and shows that there is no statistically significant difference between the two types of families. Rather, the income of families with unpaid female worker(s) is slightly higher than that of families without unpaid female workers. The reason is that, for family members to be unpaid workers, the family must have land or other assets. A family of landless labourers has no land or other assets, and their family income is likely to be low. A family in rural areas owning vast amounts of land is likely to have most family members, including women, as unpaid workers, and the family income is expected to be high. In what sense are the working members of the second family with unpaid female workers doing unproductive and unremunerative jobs?

The empirical evidence is presented in Figure 10. Unit-level PLFS data, 2022-23, for households in rural areas are used for the analysis. Households are matched according to the total number of workers they have. The analysis is done separately for households with two

workers, three workers, four workers and five workers. A comparison of per capita monthly expenditure (PCME) is made between the households that do not have any unpaid female workers and those with one or more unpaid female workers. The kernel density distribution of PCME is shown in the figure for the two categories of households, with and without unpaid female worker(s). The distributions are found to be very similar.


Panel A

Panel B

Panel C

Panel D
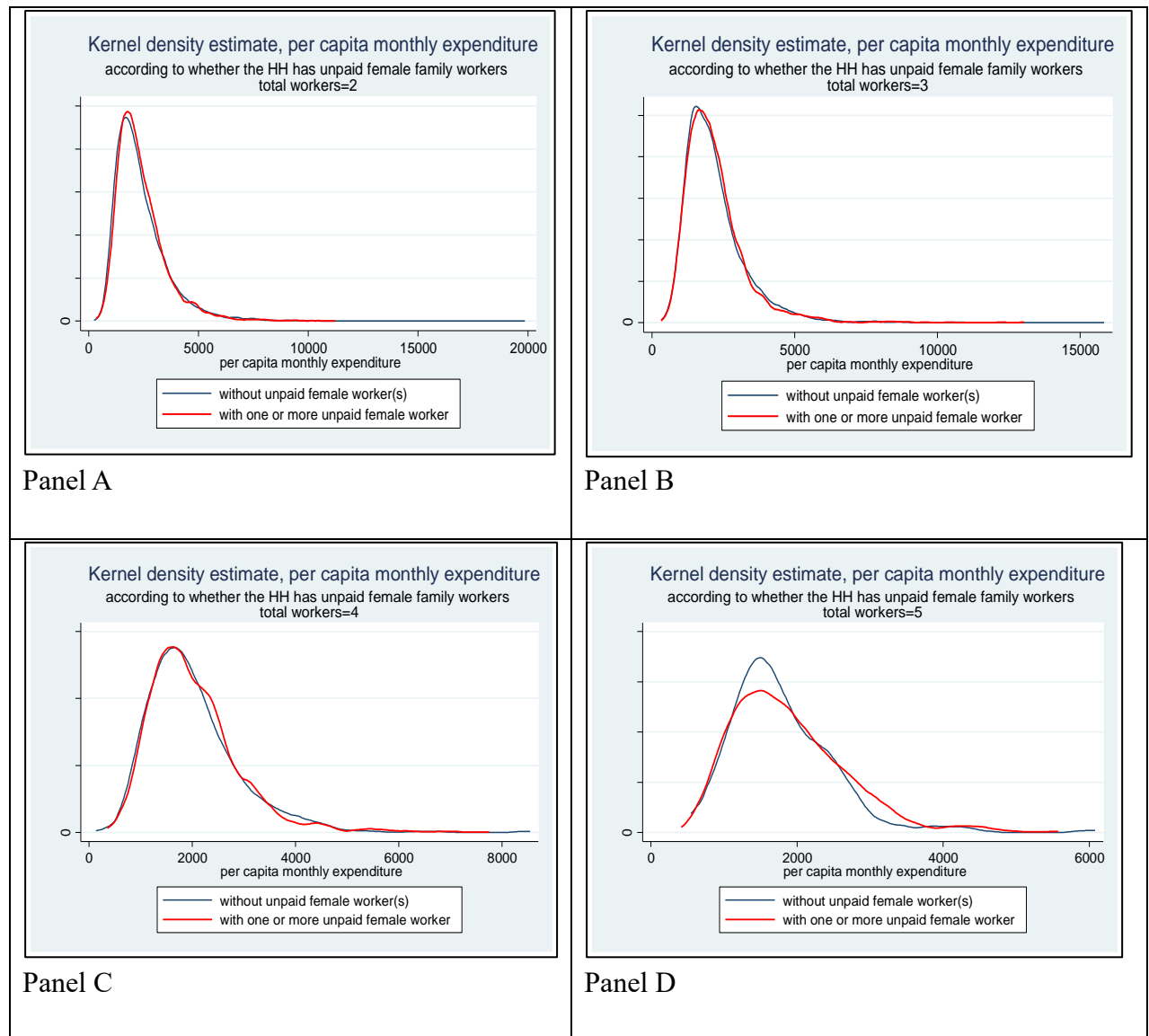
Figure 10: Kernel density estimates, per capita monthly expenditure, rural households categorised according to the total number of workers in the household, 2022-23

Source: Prepared by the authors using unit-level PLFS data.

After applying the Kolmogorov-Smirnov test for equality of distribution functions, we find that the test indicates no statistically significant difference between the two distributions. The exception is the distribution shown in Panel A for households with two working members. In this case, because of the long tail of the distribution, a statistically significant difference is found between the two distributions. However, this does not mean that the average income of households with unpaid female workers is relatively low. Instead, the opposite is found; the average PCME for households with unpaid female workers is about Rs 100 more than that of households without unpaid female workers. The same holds for Panel D, households with five workers. The average PCME for households with unpaid female worker(s) is about Rs 100 more than that of the households without unpaid female workers.

Another piece of empirical evidence pertinent to the issue under discussion is presented in Figure 11, which deals with the hours of work done by unpaid female workers. The figure shows the work hours of paid and unpaid workers in agriculture based on data from PLFS 2022-23. We find that the average hours worked per day by female paid workers (all codes from 11-51 except 21) and unpaid workers (code 21) in agriculture (based on Current Weekly Status) are 4.5 hours and 5.1 hours, respectively. There is no big difference (this finding is consistent with the pattern shown in Figure 10). Hence, to think that there is a great deal of work sharing or to consider unpaid female workers as disguisedly unemployed does not seem correct.

Fig. 11: Hours worked per day (average), female paid and unpaid workers in agriculture, 2022-23 (based on CWS)
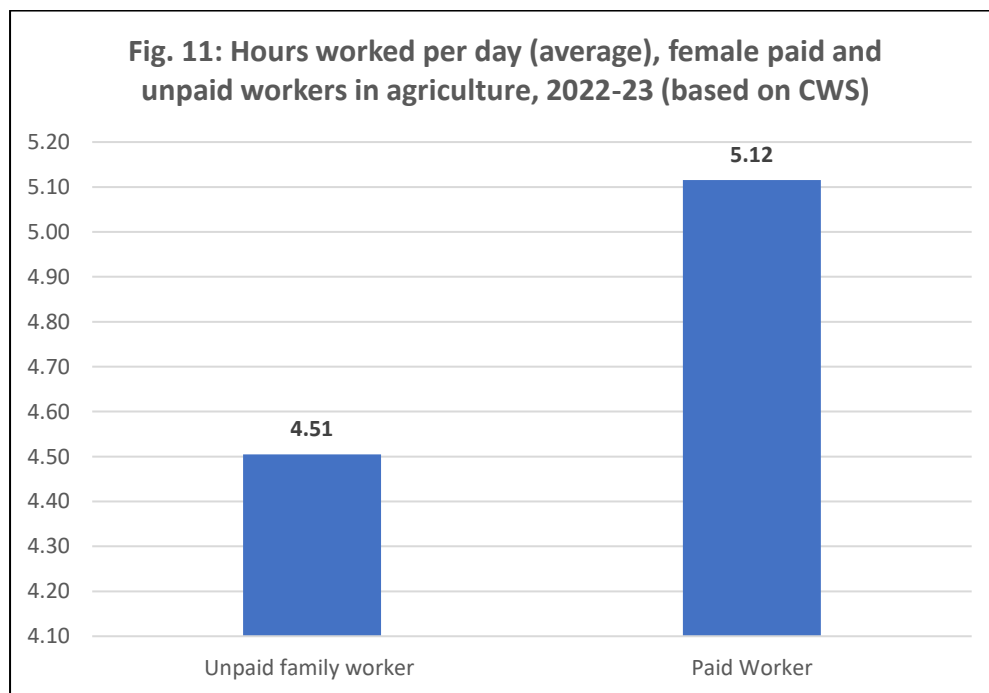
Source: Authors' computations based on unit-level data of PLFS, 2022-23.

Data from the NSS Time Use Survey 2019 shows that rural females engaged in agriculture spend about 360 minutes on employment and related activities and an additional 250 minutes per day on unpaid domestic services for household members. The implication is that a typical unpaid family helper spends 4.5 hours per day working on the farm (only half an hour less than paid workers) and about four hours a day on unpaid domestic services for household members. We leave it to the readers to decide if her job can be called unproductive.[14]

The following quote from Bhalla and Kaur (2011) is apt and relevant here: "The unpaid nature of the jobs is shown [*in the paper*] to be an artefact of the NSS data which does not collect information on incomes received from self-employment. If more women work on family farms, or in family firms (e.g. shops) then it will artificially appear to be the case that a greater proportion of women are in unpaid jobs. Close examination of the NSS data for twenty-five years reveals that there is little difference in the unpaid/paid nature of jobs between men and women."[italics added by us]

To sum up the key point made in this section, a narrative has emerged that despite the large increase in employment, a significant increase in FWPR, and a marked reduction in the unemployment rate, the performance of the Indian economy in terms of job creation remains unsatisfactory because the share of workers with regular jobs is falling and that of unpaid female workers is rising. This view has been questioned in this section. It seems from the evidence presented above that the productivity and remunerativeness of unpaid female workers' jobs are no less than that of jobs of paid workers. Perhaps more research is needed on this issue. However, one should not assume that an unpaid female worker is necessarily less productive.

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[14] It seems to us that it is possible to analyse the issue of productivity of unpaid female workers in agriculture theoretically. The marginal hour spend by that worker involves sacrifices and opportunity cost in terms of the burden it imposes on other family members in carrying out household chores and care work (even time lost by children in doing household chores instead of devoting time to education). The same applies to a paid female worker in agriculture. Note that both spend by and large the same amount of time in working on farms each day. If the gain from working an additional hour is less than the opportunity cost, why should that marginal hour of work be done? If the opportunity cost of working on farm is about the same for an unpaid female worker and a paid female worker, can the renumerations (in terms of augmentation of family income) be much different? Note further that an unpaid worker may take up a paid job if she is not adding signficanly to family income, but a paid worker does not have the option of becoming an unpaid worker (barring some exceptional circumstances).

6. How to raise FWPR further?

6.1 Impact of a secure and conducive work environment

In this sub-section, we examine the determinants of female worker intensity in manufacturing and services with a relatively greater focus on manufacturing. The object is to understand the factors determining female employment in non-agricultural activities and find out if a secure and conducive work environment leads to a significant increase in the employment of female workers.

Table 3 shows the proportion of female workers in organised and unorganised manufacturing. We use ASI (Annual Survey of Industries[15]) data and PLFS data. A comparison is made between two groups of states: (1) southern states and north-eastern hilly states, and (2) other states/UTs (union territories). There is a sharp difference in women worker intensity between the two groups of states in organised manufacturing. In the case of unorganised manufacturing, the difference is less marked but is present. The differences noted in Table 3 are probably connected with some cultural differences, although there may be other factors underlying the difference observed.

Table 3: Women Worker Intensity, Indian Manufacturing, 2018-19

	Share of women workers among all workers, manufacturing	
	Organised (regular workers)	Unorganised
Southern states and north-eastern hilly states	39.2%	33.9%
Other states	7.4%	20.2%

Source: Authors' computations based on ASI data and PLFS data.

To study the determinants of women worker intensity in organised manufacturing, a Tobit model has been estimated using plant-level data of ASI (*Annual Survey of Industries*) for 2018-19 (the choice of the model is dictated by the fact that the dependent variable takes the value of zero is a sizeable portion of the observations). Plant size is one of the explanatory variables considered, measured by the logarithm of gross value added. Another explanatory

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variable considered is the rate of crime against women[16] in the state in which the industrial plant is located (crime rate is measured by the number of cases of crimes committed against women per million female population in the state). Certain other explanatory variables have been included in the regression equation estimated. The results of the regression analysis are presented in Table 4.

It is seen in Table 4 that the size of the plant has a positive relationship with the women worker intensity of the plant. This finding is consistent with the findings of Chakraborty and Mahajan (2023). A positive effect of exporting and ICT investment on the employment of female workers in organised manufacturing is found. This finding about the impact of ICT is consistent with the assertion made in Section 4 above that a rapidly growing digital economy in India is contributing to increases in female employment in the non-agricultural sector.

Table 4: Determinants of Women Worker Intensity, India's Organized Manufacturing, 2018-19, Tobit Model

Dependent variable: Women workers share in total regular workers (%)

Explanatory variable	Coefficient	t-value
Logarithm of gross value added (plant size)	0.42	3.11***
Crime rate against women	-0.05	-45.28***
Share of exports (%) in production	0.11	8.89***
Share of ICT assets in total fixed assets (%)	0.76	5.81***
The plant has an R&D unit (dummy variable)	1.73	1.45
No. of observations	43,941	
Pseudo R-squared	0.19	
LR chi-square and prob.	10011 (0.0000)	

*** statistically significant at one percent level. Industry dummies at 3-digit NIC included.

Source: Authors' computations based on ASI unit-level data.

A strong negative relationship is found between the rate of crime against women and the share of female workers in organised manufacturing.[17] This relationship is depicted more

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[16] We thank Dr. Yashobanta Parida for providing us data on the rate of crime against women in Indian states.

[17] One might raise a question about the accuracy of data on crime against women and advance an argument that there is under-reporting. Econometric theory tells us that if there is error in the measurement of an explanatory variable, there will be downward bias in the (absolute value of) estimated coefficient. Even though a variable is an important determinant, this fact may not be seen in the econometric results because of error in the

clearly in Table 5. The table has been prepared using the estimated coefficient of the Tobit model (in Table 4) to control for plant size, export intensity, ICT investment and the presence of an R&D unit. The table shows that as the crime rate against women is reduced from over 800 per million female population to below 100 female population, the share of women workers among all regular workers in organised manufacturing increases from 2.9% to 24%. Evidently, creating a secure environment at the workplace is very important for enhancing FWPR. According to the analysis here, this finding applies to manufacturing. However, it probably applies also to other economic activities, including services sector firms. The steps taken by the government in this regard in the last five to ten years must have contributed to the enhancement of FWPR.

Table 5: Crime rate and women worker intensity in organised manufacturing

Rate of crime against women in the state in which the plant is located (cases of crime against women per million female population)	Women workers % of all regular workers in organised manufacturing (plant size, type of industry controlled)
Below 100	24.0%
100 to 300	12.6%
300 to 800	9.4%
Above 800	2.9%

Source: Authors' computations.

Since the crime rate against women is found to be an important factor influencing women worker intensity in organised manufacturing in the regression analysis presented above, a similar analysis has been carried out for unorganised (unincorporated) manufacturing and services. The results are presented in Table 6. A Tobit model has been estimated (as the dependent variable takes the value of zero in a sizeable portion of the observations). The dependent variable is the share of women workers out of all workers employed.

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measurement of the explanatory variable. Note, however, that despite the downward bias caused by errors in measurement, the coefficient of the crime rate variable is found to be statistically significant with the highest t-value.

Table 6: Determinants of Women Worker Intensity, India's Unorganized Manufacturing and Services, 2015-16, Tobit Model

Dependent variable: Women workers share in total workers (%)

Explanatory variable	Manufacturing	Trade and other services
The logarithm of the total number of workers in the enterprise (enterprise size)	18.38 (35.98)***	39.81(85.15)***
Crime rate (against women)	-0.03 (-19.11)***	-0.04 (-35.81)***
Have received government assistance	5.23(2.30)**	
Located in urban areas	-11.67 (-15.73)***	-12.36 (-35.54)***
Women-owned enterprise	253.62 (152.29)***	213.95(192.43)
Industry dummies	Included	Included
No. of observations	88,993	201,983
Pseudo R-squared	0.56	0.42
LR chi-square and prob.	91,945 (0.0000)	101,073 (0.0000)

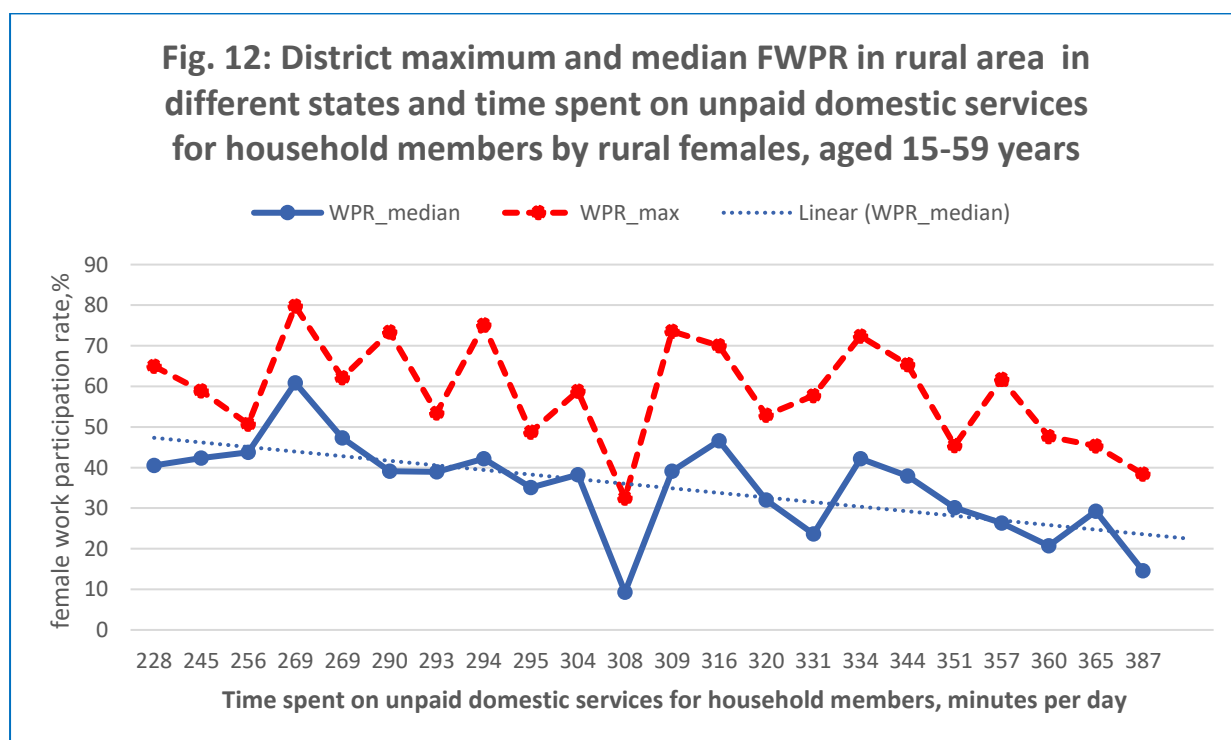**,*** statistically significant at five and one percent level, respectively.

Source: Authors' computations based on ASI unit-level data.

It is seen in Table 6 that the size of the enterprise has a positive effect on its women worker intensity. Other things remaining the same, the bigger the enterprise's size, the higher the share of women workers (including working owners) in the total number of workers. The proportion of women workers is significantly higher in women-owned enterprises. The crime rate against women has a significant negative effect (as in the regression results for organised manufacturing in Table 4). This result indicates that, other things remaining the same, an enterprise in a state in which the crime rate against women is high will have a relatively smaller proportion of female workers. The same pattern is found for the two groups of economic activities considered: manufacturing as one group and trade and other services as the other group. To interpret the numerical coefficient of the crime rate variable, it may be inferred that if the rate of crime against women goes down from about 500 per million female population (close to the average across states in 2015) to 200 per million female population, the share of women workers in an unorganised manufacturing enterprise will go up by about nine percentage points, and the increase in unorganised trade and other services will be about 12 percentage points. These are significant increases, particularly for trade and other services, because the NSS 73rd round data for 2015-16 show that the share of female workers in total

employment was about 29% in unorganised manufacturing (on average, across enterprises) and about 14% in unorganised enterprises belonging to trade and other services.

6.2 How a reduction in domestic unpaid work will help raise FWPR in Rural Areas

One important factor impacting FWPR is the amount of time working-age females spend at home for domestic work for family members, which has a negative effect. This fact is known in the literature, and some empirical evidence indicating such a relationship has been presented in Figure 8 in Section 4 above. Some more empirical evidence is presented in Figure 12. The figure shows along the x-axis the amount of time rural women spend on unpaid domestic services for their family members – state-level averages have been taken and shown in the figure, measured in minutes per day. The FWPR in rural areas has been computed for each state for different districts. The median FWPR and the maximum FWPR among different state districts are shown in the figure along the y-axis.

Fig. 12: District maximum and median FWPR in rural area in different states and time spent on unpaid domestic services for household members by rural females, aged 15-59 years

Note and Source: District maximum and median FWPR in rural areas in different states are shown against time spent on unpaid domestic services for household members, rural females aged 15-59 years. The analysis is confined to major states. The authors prepared the graph using PLFS and NSSO Time Use Survey. Time-use survey data are for 2019, and FWPR are for 2022-23.

Interestingly, the maximum FWPR is well above the median FWPR (across districts of a state) in many states. The fact that, in certain districts within a state, a very high rate of FWPR could be achieved compared to the median across districts of the state implies that useful lessons may be learnt by examining why this peak FWPR occurred in that district. To put it differently, Figure 12 shows considerable potential for raising FWPR with appropriate policies.

The second point to be noted is that FWRP negatively correlates with the time working-age females spend on unpaid domestic work. The correlation coefficient is (-)0.62 if the median FWPR is considered and (-)0.37 if the maximum FWPR is considered. The graph shows that even a one-hour reduction in a day in the time spent by working-age females on unpaid domestic work can raise FWPR by about ten percentage points (based on the trend line shown in the graph).[18] The relationship between unpaid domestic work for family members and WPR observed in Figure 12 is reinforced by the plots shown in Figure 8 in Section 4, which used district-level data.[19]

6.3 Role of vocational training

Next, we consider the impact of vocational training of women on FWPR. A positive impact is expected. Fletcher et al. (2018) note in their study that vocational training is correlated with a higher probability of working among women in India. Their analysis of Indian data reveals that for a given level of general education, the labour force participation rate is higher for working-age women with formal or informal vocational training.

To study the impact of technical training on FWPR in rural areas, we have undertaken a cross-district (510 districts) regression analysis using PLFS unit-level data for 2022-23. The

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[18] The significance of a reduction in the time spent by working age females on unpaid household work for raising FWPR has been noted by Poonam Gupta in her recent article ("India Needs a Gender Strategy," *Business Standard*, October 19, 2023). She writes: "Indian women are unable to join the formal workforce because their days are occupied from dawn to dusk with unpaid care work. Developing a care economy to cater to the young, the ailing, and the elderly can be transformational. This not only has the potential to generate a large number of direct employment across genders, but will also free up women to join the formal workforce." She also observes: "safety is one of the primary reasons for the low engagement of women in paid work in India. Our cities and workplaces must be made safer. This would necessitate the presence of a critical mass of women in public spaces, and deployment of more women as security staff, in the police force, and as transport operators (in buses, autos, taxis, metros, or trains)." This comment about safely finds resonance in the analysis based on crime rate against women presented earlier in this paper.

[19] The inter-state variation in FWPR observed in Figure 12 is not caused only or mainly by variation in time spent on household chores and unpaid care work. Cultural factors and other socio-economic factors play an important role.

dependent variable is the FWPR at the district level. The following explanatory variables have been used (at district level):

A. The proportion of working-age women in rural areas (in the district) who are in the age bracket of 15 to 29 years;
B. The proportion of working-age women in rural areas who are currently married;
C. The proportion of working-age women in rural areas who have a technical degree in agriculture, engineering/ technology, medicine, crafts, and other subjects, or those who have a diploma or certificate (below graduate level) in agriculture, engineering/technology, medicine, crafts, or other subjects;
D. Mean monthly consumption expenditure of the households surveyed in the district (taken in logarithm); and
E. The proportion of unincorporated (read, unorganised sector) manufacturing, trade, and services enterprises in the district which are owned by women. This variable is treated as a proxy for the socio-cultural-economic milieu, which is likely to have an influence on women's decision to participate in the labour market.

Data on variables A to D have been taken from PLFS, 2022-23. Data on E have been taken from NSS 73rd round and thus relate to 2015-16. The regression results are presented in Table 7. Regression-1 is based on the Ordinary Least Squares (OLS) method. Regression-2 through Regression-4 are based on quantile regression. The estimates for the median, first quartile, and third quartile are shown.

The results indicate that FWPR tends to go down with an increase in the income level.[20] This is expected. Conditions that foster women's entrepreneurship in a district also seem to be boosting FWPR in the district. However, once the FWPR reaches a high level, this factor does not seem to have much additional impact. A positive impact of technical education on the FWPR rate is found. This impact becomes more assertive as a relatively higher level of FWPR is reached in the district.

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[20] From their analysis of the Indian data, Das et al. (2015) conclude: "Income has a dampening effect on female labor force participation rates, with participation rates higher among low-income households due to largely economic necessity." Our regression results are consistent with their finding.

Table 7: Determinants of FWPR, Cross-district Regression, 2022-23 (n=510)

Explanatory variables	OLS	Quantile Regression		
	Regression-1	Regression-2, for 25th percentile	Regression-3, for 50th percentile	Regression-4, for 75th percentile
Proportion of working age rural women, in 15-29 age bracket	65.9 (8.67)***	57.6 (4.29)***	105.8 (9.96)***	98.5 (10.62)***
Proportion of working age rural women, currently married	23.8 (2.54)**	30.7 (1.86)*	37.8 (2.89)***	5.19 (0.45)
Proportion of working age women in rural areas with low and middle level technical training	81.8 (2.74)***	49.8 (0.94)	122.0 (2.92)***	154.6 (4.24)***
Mean monthly consumption expenditure of the households (in logarithms)	-6.61 (-1.92)*	-5.04 (-0.83)	-9.81 (-2.03)**	-10.41 (-2.47)**
Proportion of unincorporated enterprises owned by women in the district	22.8 (2.71)***	34.2 (2.20)**	36.0 (3.06)***	9.27 (0.90)
R-squared/Pseudo R-square	0.14	0.07	0.11	0.15
F-value and prob.	16.2 (0.000)			

Source: Authors computations.

t-values in parentheses. *. **, *** statistically significant at 10%, 5% and 1% respectively.

7. Conclusion

The main conclusions of the study are as follows:

- It is doubtful if distress-led employment in rural areas explains the recent hikes in the Female Workforce Participation Rate (FWPR). Instead, the explanation should be sought in the easing of labour regulations, impressive progress in financial inclusion, improvement in ease of doing business, a rapidly growing digital economy, increase in household access to mobiles and internet, and other such developments that are enhancing employment in non-agricultural enterprises, even in small and tiny enterprises. As regards the large increase in female employment in agriculture that has taken place in recent years, the explanation probably lies in rapid growth in agricultural production, a growing labour shortage, a significant shift of rural male workers from agriculture to non-agricultural activities and other such developments. The Jal Jeevan Mission has significantly contributed to FWPR in rural areas by cutting down the time rural women spend on water collection.

- A negative view should not be taken of the increase in employment of unpaid female workers and the rise in the share of self-employment. The productivity of such workers does not fall much short of that of hired workers.

- To increase the employment of women in manufacturing, job opportunities need to be created speedily on a large scale, and the jobs should be made more rewarding. Technology (ICT adoption and Industry 4.0) may play a decisive role in this regard.

- Vocational training contributes significantly to the increase in FWPR. Appropriate policy action is needed for imparting such training to a substantially higher proportion of rural women. Policies are needed to increase safety at the workplace and amenities to make it convenient for women to work in formal sector enterprises. Ensuring greater women's safety in everyday life is also very important. Policies and programs that cut down the time the working-age women are required to spend on unpaid household work will raise FWPR.

References:

Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of economic Perspectives*, *24*(3), 207-232.

Bhalla, Surjit and Kaur, Ravinder (2011). *Labour force participation of women in India: some facts, some queries.* Working Paper (40). Asia Research Centre, London School of Economics and Political Science, London, UK.

Chakraborty, Pubali, and Kanika Mahajan (2023). Firm Size and Female Employment. Economics Discussion Paper no. 103, Ashoka University, NCR, Sonepat, Haryana.

Das, Sonali, Sonali Jain-Chandra, Kalpana Kochhar, and Naresh Kumar (2015). Women Workers in India: Why So Few Among So Many? IMF Working Paper no. WP/15/55, International Monetary Fund.

Fernandez, Cledwyn, and Havishaye Puri (2023). Does Access to Digital Infrastructure and Increasing Digital Inclusion Spur Female Labour Force Participation: Evidence from Urban India. Paper presented at ACGED, Indian Statistical Institute, New Delhi, December 2023.

Fletcher, Erin K., Rohini Pande, and Charity Troyer Moore (2018). Women and Work in India: Descriptive Evidence and a Review of Potential Policies. India Policy Forum.

Goldar, Bishwanath (2023). Estimates of Manufacturing Jobs Growth in India in the 2010s: Data Discrepancy and Concern about Comparability between EUS and PLFS. Available at SSRN: https://ssrn.com/abstract=4498033 or http://dx.doi.org/10.2139/ssrn.4498033

Goldar, Bishwanath and Suresh Chand Aggarwal (2023a). Incomparability between EUS and PLFS and possible solutions. Available at ResearchGate, DOI: 10.13140/RG.2.2.18147.12327.

Goldar, Bishwanath and Suresh Chand Aggarwal (2023b). Behind Rising Manufacturing Employment, *Financial Express*, April 1, 2023, https://www.financialexpress.com/opinion/behind-rising-manufacturing-employment/3029195/

Goldar, Bishwanath, and Suresh Chand Aggarwal (2023c). Trends in Employment, Productivity, Real Wages and Labour Standards in Indian Manufacturing in Recent Years. *Indian Journal of Labour Economics, 66: 561-81*. https://link.springer.com/article/10.1007/s41027-023-00442-9 .

Goldar, Bishwanath, Prateek Kukreja and Havishaye Puri (2023). Labour Reforms and Growth in Manufacturing Employment in India. Available at SSRN. Abstract=4455629.

Mahambare, Vidya, Sowmya Dhanaraj and Sankalp Sharma (2021). Workers are moving off Indian farms but where are they going? *Mint*, 25 March 2021.

Ngan, R., and S. Ma (2008). The Relationship of Mobile Telephony to Job Mobility in China's Pearl River Delta, *Knowledge Technology & Policy*, 21(2):55-63

Rami, Gaurang (2020). Determinants and Forecasting of Female Labour Force Participation Rate in India: Testing of Feminization U hypothesis. ICDD Working Paper No. 29, International Center for Development and Decent Work, University of Kassel, Germany.

Ureta, S. (2008). To move or not to move? Social exclusion, accessibility and daily mobility among the low-income population in Santiago, Chile. *Mobilities*, *3*(2), 269-289

Vaishnavi, P., and G. Manisankar (2022). Labour scarcity in agriculture: A review, *Pharma Innovation Journal*, SP-11(4): 2087-2090.

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