# Enhancing Quality in Higher Education: Women's Workforce Participation and Sex Ratio in West Bengal amid 1971-2011 

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#### Abstract

To promote higher standard in education, there must be equal participation of men and women in higher education. Since female participation in workforce is very low both at national and state level in comparison to male, it requires appropriate measures. In this paper, we attempt to investigate the nature of trends in the female workforce participation rate and the sex ratio to comprehend quality enhancement in Higher Education system. Moreover, we hypothesize that there is a significant relationship between female workforce participation rate and the sex ratio. We study the Indian scenario of the aforementioned trends during 1971-2011, with special reference to West Bengal. Furthermore, by identifying the dependent variable (Female Workforce Participation Rate) and independent variable (Sex Ratio), Pearson Co-relation coefficient is applied to test the statistical significance. The test result shows slight positive significant association ( $r=0.46671$ and $p=0.42810>0.05$ ) in case for India but a very strong and positive significant association ( $\mathrm{r}=0.91868$ and $\mathrm{p}=0.02749<0.05$ ) found for West Bengal.


Keywords : Quality enhancement in higher education, female workforce participation rate, sex ratio, Pearson Co-relation coefficient test.

## I. INTRODUCTION

Enhancing quality in higher education is very decisive to enrich educational system and the society as a whole. It can also be considered as one of the most important indicators of development index of a country. Equal contribution from both male and female population in all aspects of life and activities ensures toward the path and goal of development. Thus, equal participation in higher education system is prerequisite to promote higher standard in education. Further, it is imperative to reduce gender gap, engagement of more women as an employee in higher education is worthwhile. Srivastava and Srivastava (2010), made a valuable remark on the nature of employment of women that raising their living conditions and well-being is essential and it may possibly be improve with their engagement in high paying work (Rao, Kumar, Kotaih and Naik, 2016). To identify obstacles to women's advancement and to achieve gender balanced professional equality, it is required that current recruitment and promotion procedures be investigated (Ghara, 2016). Indian constitution enshrined democratic rights and opportunities (equality and equal) for women and men in every aspect of life and activity. However, women witness with negligence and discrimination in all matters relating to household activities, education, wealth and power, wage \& employment, legal status etc. In patriarchal society like India, women hold subordinate position and have been deprived from many civic amenities in the past. Despite improvement at certain level, the disparity in access to opportunities for women and men still prevails in every sphere of life and activity. Discrimination of women in access to opportunities is a barrier to participate in economic activities and thereby elevating their social status. The work participation rate is the proportion of a country's working population to its total population. Equal rate of participation in workforce by the sexes indicates a productive economy. It can fulfil the laid down strategies of development. As per the report from NIPCCD (2010), women account for roughly half of a country's labour force, thereby their participation rate is vital to its economic development (Rao, Kumar, Kotaih and Naik, 2016). But only one fourth of the women population to the total population actively participated in workforce. Women's participation in workforce is extremely desirable for balanced growth of the country. Thus, to ensure development direct involvement of female workers with a significant share in economic activity is crucial (Goswami \& Kumar, 2013). Mammen and Paxson (2000) observed that engagement of women in the labour force can be interpreted as a sign of decreasing discrimination and increasing female empowerment which is crucial for potential growth for the country (Mahapatro, 2013, Mammen and Paxson, 2000). Participation of women into workforce concerns complex legal, socio-cultural, educational, economic and demographic issues. Further, Srivastava and Srivastava (2010), find association between a variety of different factors including social, cultural, religious, demographic and reproductive with participation of women into workforce (Chatterjee, and Vanneman, 2018, Srivastava and Srivastava, 2010). Therefore, these factors influence women's work participation and the vice versa. Demographic changes in India have significant impact in alternation in participation into labour force and thereby economic changes in recent years (Mahapatro, 2013). Sex ratio (SR) being one of the most important demographic indicators greatly affects various aspects of socio-economic development of a country. It was never been favourable for Indian women and has been mentioned as an important characteristic of India's demographic scenario. Sharma (1985) finds a positive correlation between women work and sex ratio. He observed an adverse effect of trends into the increasing male sex ratio, on decreasing trends of women's participation into labour force throughout the period of 1901-1971 and its effects directed Indian housewife in search for distinct role (Olsen and Mehta, 2006, Sharma, 1985). Likewise, Das (2003) interpreted that increasing or decreasing of female participation in work relies on increasing or decreasing of sex ratio in a population (Das, 2003). Further, numerous scholars
acknowledged significant association between women's participation in work in economic activities with sex ratio (ibid, Bardhan, 1974, Miller, 1981, Murthi et al., 1995, Agnihotri, 2000).

In this paper, we attempt to explore and comprehend the nature of the trends of female workforce participation rate (Female WPR) and sex ratio (SR). Further, we hypothesize a significant correlation between female WPR and SR. We study the Indian scenario of the trends (1971-2011) of female WPR and SR with special reference to West Bengal. Here, female WPR is considered as the dependent variable and SR constitutes the independent variable. In this present work, we expect a positive correlation between the variables and try to argue reasons for their association.

## II. DATA AND METHODS

The study is purely based on secondary sources. The Census of India (2001 \& 2011), District Census Handbook, West Bengal (2011) and Statistical Profile on Women Labour (2012-2013) Labour Bureau, Government of India have been explored for the purpose to represent and analyse the data, facts and figures of the trends of female WPR and SR. The time period we consider for our study is last 5 census rounds from 1971 census to 2011 census. Further, Pearson Co-relation coefficient has been applied to test the statistical significance of the dependent (Female WPR) and independent (SR) variables.

## Objectives of the Study

The following objectives have been developed on the basis of empirical evidence.
i. To explore into the trends of Women workforce participation rate and Sex ratio in India and West Bengal during the study period.
ii. To examine the facts for such trends.
iii. To find the relationship between Women workforce participation and Sex ratio.

## Hypothesis

Based on the observed evidence, the following hypotheses have been formulated.
$\mathrm{H}_{0}: 1$ : There is no significant association between SR and female WPR in India.
$\mathrm{H}_{0}$ : 2: There is no significant association between SR and female WPR in West Bengal.

## III. DATA ANALYSIS

We analyze data in broader two sections. In the first section, we represent data in the forms of tables and charts relating to the trends in WPR (total, male, female, rural and urban) and SR (total, rural and urban) for India and West Bengal. Furthermore, in order to make a critical evaluation, we critically analyse the data and facts gathered from the trends. In the second section, we perform inferential statistical test using Pearson Co-relation Test to test the statistical significance of the dependent (Female WPR) and independent (SR) variables.

## Trends in Female Workforce Participation Rate in India

Based on most recent Census report (2011), India's total population in 2011 is estimated to be 1,21,05,69,573 persons, of which male and female population constitute $51.47 \%$ and $48.53 \%$ respectively. Rural India constitutes $68.85 \%$ of total India's population comprising 51.31 \% males and 48.69 females. Population in Urban India comprises $31.15 \%$ with $51.84 \%$ males and 48.16 \% females. As per the report from Labour Bureau, Government of India (2012-13), India accounts for 48,17,43,311 workers, with the shares of $68.89 \%$ and $31.11 \%$ of the workforce for male and female respectively. Rural India accounts for $72.36 \%$ of India's total workforce, with male and female shares of $65.05 \%$ and $34.95 \%$ respectively. In contrast, Urban India represents only $27.64 \%$ of share of the total workforce in India with male and female accounting $78.94 \%$ and $21.06 \%$ respectively. WPR in India represents $39.79 \%$ out of its total population. WPR of male and female constitutes 53.26 and $25.51 \%$ respectively out of the total male and female population in India. WPR in Urban India is $35.31 \%$ out of its total population. Out of the total male and female population in Urban India, WPR of male and female comprises 53.76 and $15.44 \%$ respectively. WPR in Rural India is $41.83 \%$ out of its total population. WPR of male and female constitutes 53.03 and $30.02 \%$ respectively out of the total male and female population in Rural India (Table-1), (Census, 2011). Historically trend of WPR in India had lower and had never been satisfactory. Though an increasing trend of WPR in India is observed in last five decades (1971-2011). Irrespective of post-independence India's fastest economic growth, it is observed a marginal improvement in WPR. In the long-term trend, it is observed that WPR in 1971 registered $33.08 \%$ and it increased to $39.8 \%$ in 2011. A fluctuating but less variation in the trend of male WPR is observed in India in all the five decades. It registered sharp decline of $1 \%$ in male WPR in 1991 from 1971 and again an increasing trend is observed which reached to 53.3 \% in 2011. Male WPR was always remained higher in Rural India in comparison to Urban India except for 2011 when difference of $0.80 \%$ was noticed. Worst participation of women in economic activity is one of the important characteristics of WPR in India. A significant difference in WPR for male and female can be observed in all the decades. The female WPR has doubled in 2011 that increased to 25.5 \% that of from 1971. Despite an increasing trend, female WPR remains significantly lower than male for both in rural and urban India and in India in total. In comparison to Urban India, the female WPR in Rural India has consistently been higher in all the decades. It is because of Urban India experienced marginal level of female participation into workforce in modern sector. India is one of the developing countries where, despite rising education levels, female WPR has declined in the modern sector (World Bank 1991; Swaminathan 1994, Chatterjee et al., 2018). Moreover, it is well acknowledged that women's work is ignored, underreported and unappreciated in the developing countries as women are generally treated beneficial economically over household activities (Beneria, 1982; Boserup, 1970; Donahoe, 1999, Chaudhary and Verick, 2014). Regardless of lower female WPR in India, overall, a gradual but increasing trend is noticeable in each of the decades (Table - 2, Fig. - 1 \& 2), (Census, 2011).

Table 1- Total Workers in India - 2011 Census

| Population/ Workers | Persons |  |  | Male |
| :---: | :---: | :---: | :---: | :---: |
| Population | Fotal | $1,21,05,69,573$ | $62,31,21,843$ | $58,74,47,730$ |
|  |  | $48,17,43,311$ | $33,18,65,930$ | $14,98,77,381$ |
| Workers |  | 39.79 | 53.26 | 25.51 |
| Percentage of Workers |  |  |  |  |


| Population | Rural | 83,34,63,448 | 42,76,32,643 | 40,58,30,805 |
| :---: | :---: | :---: | :---: | :---: |
| Workers |  | 34,85,97,535 | 22,67,63,068 | 12,18,34,467 |
| Percentage of Workers |  | 41.83 | 53.03 | 30.02 |
| Population | Urban | 37,71,06,125 | 19,54,89,200 | 18,16,16,925 |
| Workers |  | 13,31,45,776 | 10,51,02,862 | 2,80,42,914 |
| Percentage of Workers |  | 35.31 | 53.76 | 15.44 |

Source: Statistical Profile on Women Labour, 2012-2013, Labour Bureau, Government of India
Table 2 - Work Participation Rate (Main + Marginal) in India by Sex with Rural-Urban difference (1971-2011)

| Year | Work Participation Rate (\%) |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Total/ Rural/ Urban | Persons | Males | Females |
|  | Total | 33.08 | 52.61 | 12.11 |
|  | Rural | 34.03 | 53.62 | 13.42 |
|  | Urban | 29.34 | 48.82 | 6.68 |
| 1981 | Total | 36.70 | 52.62 | 19.67 |
|  | Rural | 38.79 | 53.77 | 23.06 |
|  | Urban | 29.99 | 49.06 | 8.31 |
|  | Total | 37.50 | 51.61 | 22.27 |
|  | Rural | 40.09 | 52.58 | 26.79 |
| 2011 | Urban | 30.16 | 48.92 | 9.19 |
|  | Total | 39.10 | 51.68 | 25.63 |
|  | Rural | 41.75 | 52.11 | 30.79 |
|  | Urban | 32.25 | 50.60 | 11.88 |

Source: Statistical Profile on Women Labour (2012-2013) Labour Bureau, Government of India
Work Participation Rate(\%) in India by Rural-Urban areas


Figure 1- Work Participation Rate (Main +Marginal) in India by Rural-Urban areas (1971-2011) Source: Statistical Profile on Women Labour (2012-2013) Labour Bureau, Government of India


Figure 2- Work Participation Rate (Main +Marginal) in India by sex (1971-2011)
Source: Statistical Profile on Women Labour (2012-2013) Labour Bureau, Government of India

## Trend in Female Workforce Participation Rate in West Bengal

Census report 2011, reveals that the total population of West Bengal is estimated to be $91,347,736$ persons, of which male and female population constitute $51.37 \%$ and $48.63 \%$ respectively. The population share of Rural and Urban West Bengal constitutes 68.13 and $31.87 \%$ of its total population respectively (Census, 2011). As per the report from District Census Handbook, West Bengal, 2011, WPR (including both main \& marginal workers) in West Bengal represents $38.1 \%$ out of its total population. WPR in Rural and Urban West Bengal accounts for 38.7 and $36.7 \%$ respectively of the total Rural and Urban population in West Bengal. The trend in WPR in West Bengal reflects relatively very lower level of worker's participation. Despite of an increasing trend in WPR over the last five decades (1971-2011), it has always been lower in West Bengal than in India. Since 1971, WPR in West Bengal has been observed to be on an upward trend that increased to $38.1 \%$ in 2011 which is significantly closer to WPR in India. Beside short fall in WPR in Urban West Bengal during 1981 and 1991 in comparison to WPR in 1971, it has recorded significantly an increasing trend during 2001 and 2011. WPR in Rural West Bengal has comparatively remained higher than in Urban West Bengal except for 1971 (Table - 3, Fig. - 3). It is very obvious that WPR be in favour of Rural West Bengal as, like most of the Indian states, large proportion of population ( $68.13 \%$ ) resides in Rural West Bengal and associated with agricultural economy. Further, Women perform significant roles in agricultural activities. In the beginning of $20^{\text {th }}$ century, women performed approximately $60 \%$ of total agricultural activities. Even now, the preference for female workers over male workers is in practice (M. Van Klaveren, K. Tijdens, M. Hughie-Williams and N. Ramos Martin, 2010). WPR (main workers) in West Bengal in 1991 is measured at $30.2 \%$ but significantly dropped in the succeeding decades. Surprisingly, the much similar trend can be observed for the male WPR during the last three decades. WPR for female has been extremely lower compare to male counterpart throughout all the decades. It has been observed that an alarming decline in female WPR is recorded over the decades because of underrepresented of women in the workforce. Despite, there is a slow but an increasing trend in female WPR in the recent years (Table - 4, Fig. - 4).

Table 3- Work Participation Rate (Main +Marginal) in West Bengal by Rural-Urban areas

| Year | Total | Rural | Urban |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 27.9 | 27.2 | 30.1 |  |  |
| 1971 | 30.2 | 30.3 | 29.8 |  |  |
| 1981 | 32.2 | 33.2 | 29.6 |  |  |
| 1991 | 36.8 | 37.9 | 33.9 |  |  |
| $\mathbf{2 0 0 1}$ | 38.1 | 38.7 | 36.7 |  |  |
| $\mathbf{2 0 1 1}$ |  | Work Participation Rate (\%) |  |  |  |

Source: District Census Handbook, West Bengal, 2011 Work Participation Rate(\%) in West Bengal by Rural-Urban areas


Figure 3 - Work Participation Rate (Main +Marginal) in West Bengal by Rural-Urban areas
Source: District Census Handbook, West Bengal, 2011
Table 4 - Work Participation Rate (Main) in West Bengal by Sex

| Year | Persons | Mark Participation Rate (\%) | Female |
| :---: | :---: | :---: | :---: |
|  |  | Male |  |


| 1971 | 27.9 | 48.8 | 4.4 |
| :---: | :---: | :---: | :---: |
| 1981 | 28.3 | 48.7 | 5.8 |
| 1991 | 30.2 | 50.7 | 8.0 |
| $\mathbf{2 0 0 1}$ | 28.7 | 47.0 | 9.1 |
| $\mathbf{2 0 1 1}$ | 28.1 | 46.3 | 9.0 |

Source: District Census Handbook, West Bengal, 2011


Figure-4: Work Participation Rate (Main) in West Bengal by Sex
Source: District Census Handbook, West Bengal, 2011

## Trend in Sex ratio in India

Sex ratio is one of the basic demographic tools to determine the characteristics of male and female population. It refers to the proportion of females to males in a given population. Hence, it is a useful resource for determining the female population and the ratio of female against male in India. As per Census 2011, the total population in India computed 1,21,05,69,573 persons, with males and females accounting for $62,31,21,843$ and $58,74,47,730$ persons respectively. The Census 2011, has revealed an upward trend in SR. It increased by 10 points in 2011 and reached at 943 from 933 since the last Census in 2001. Historically, the trend in SR in India has been negative and thereby unfavourable for females. Since the last five decades (1971-2011), the trends in SR were observed to be fluctuating and inconsistence. The highest SR (943) was recorded in the recent Census, though it has been observed moving around 930 in all the five decades. Despite, a marginal improvement over the last two of the decades, the trends of SR reflect an unsatisfactory Indian scenario. Rural India's SR has always been higher than that of Urban India and India as a whole. In the recent Census 2011, SR registered for Rural India is 949 , with difference of 20 and 6 points in SR respectively that of from Urban India and India as a whole. Urban India shows consistently an increasing trend of SR over the decades, while a fluctuating trend can be observed for Rural India. Further, it has been observed in trends that SR shifting in favour of Urban India, with a continuous increase in SR in each of the decades, reached at 929 (Table - 5, Fig. - 5).

Table - 5: Sex ratio in India (1971-2011)

| Year | Total/ Rural/ Urban | (Females per 1000 males) |
| :---: | :---: | :---: |
| 1971 | Total | 930 |
|  | Rural | 949 |
|  | 1981 | Urban |
|  |  | 858 |
| 1991 |  | 934 |
|  | Urban | 951 |
|  | Total | 879 |
|  | 2001 | Rural |
|  | Urban | 927 |
|  | Total | 938 |
|  | 2011 | Rural |
|  | Urban | 893 |
|  | Total | 933 |
|  | Rural | 946 |
|  | Urban | 900 |
|  | Sore | 943 |

Source: The Census of India, 2011


Figure 5 - Sex ratio in India (1971-2011)
Source: The Census of India, 2011

## Trend in Sex ratio in West Bengal

According to the 2011 Census, West Bengal has a total population of $91,276,115$ persons, with $46,809,027$ males and $44,467,088$ females respectively, and considered the ninth most populated state in the world. In 2001, total population in West Bengal calculated $80,176,197$ persons with males and females accounting for $41,465,985$ and $38,710,212$ persons respectively. Based on the report from District Census Handbook, West Bengal, 2011, overall SR in West Bengal represents consistently an increasing trend over the decades. In 2011, SR is increased by 16 points and reached at 950 from 934 since the previous Census in 2001. Moreover, it crosses the national level SR by 7 points in 2011. The SR of Rural West Bengal has always been greater than that of both Urban West Bengal and the entire state of West Bengal following the trends at national level. In the recent Census 2011, SR registered for Rural West Bengal is 953 , with difference of 9 and 3 points in SR respectively that of from Urban West Bengal and West Bengal state as a whole. Urban West Bengal shows consistently an increasing trend of SR over the decades, while a fluctuating trend can be observed for Rural India where inconsistency in trend observed in 1991. Furthermore, considering the weightage of trends of SR, Urban West Bengal experiencing significantly better improvement in SR than Rural West Bengal (Table - 6, Fig. - 6).

Table 6 - Sex ratio in West Bengal (1971-2011)

| Year | Total/ Rural/ Urban | (Females per 1000 males) |
| :---: | :---: | :---: |
| 1971 | Total | 891 |
|  | Rural | 942 |
|  | Urban | 751 |
| 1981 | Total | 911 |
|  | Rural | 947 |
|  | Urban | 819 |
| 1991 | Total | 917 |
|  | Rural | 940 |
|  | Urban | 858 |
| 2001 | Total | 934 |
|  | Rural | 950 |
|  | Urban | 893 |
| 2011 | Total | 950 |
|  | Rural | 953 |
|  | Urban | 944 |

Source: District Census Handbook, West Bengal, 2011


Figure 6 - Sex ratio in West Bengal (1971-2011)
Source: District Census Handbook, West Bengal, 2011

## Statistical analysis

In this section, we test the formulated hypotheses to find statistical significance with Pearson Co-relation Test on the dependent (Female WPR) and independent (SR) variables. The first formulated hypothesis is,
$\mathrm{H}_{0}$ : There is no significant association between SR and female WPR in India.
$\mathrm{H}_{1}$ : There is a significant association between SR and female WPR in India.
Table - 7, represents the association between female WPR and SR in India. The test result shows that there is positive but slight significant association between female WPR and SR in India ( $\mathrm{r}=0.46671$ and $\mathrm{p}=0.42810>0.05$ ). Hence, the null hypothesis $\left(\mathrm{H}_{0}\right)$ is accepted. This indicates that an increase in SR would not likely to increase female WPR in India positively.

Table 7 - Relationship between female WPR and SR in India


Figure 7 - Relationship between female WPR and SR in India
The second formulated hypothesis is,
$\mathrm{H}_{0}$ : There is no significant association between SR and female WPR in West Bengal.
$\mathrm{H}_{1}$ : There is a significant association between SR and female WPR in West Bengal.
Table -8 , represents the association between female WPR and SR in West Bengal. The test result displays that there is positive and very strong significant association between female WPR and SR in West Bengal ( $\mathrm{r}=0.91868$ and $\mathrm{p}=0.02749<0.05$ ). Hence, the null hypothesis $\left(\mathrm{H}_{0}\right)$ is rejected. This directs to conclude that an increase in SR would lead to increase female WPR in West Bengal.

Table 8 - Relationship between female WPR and SR in West Bengal


Figure 8 - Relationship between female WPR and SR in West Bengal

## IV. CONCLUSION

The deep-rooted problem associated with the quality enhancement in Higher Education system and the significant relationship between female WPR and SR were considered systematically. After exploring and analysing the trends of female WPR and SR and testing statistical significance, it has been concluded that, an increase in SR has direct effect on increasing female WPR in the State of West Bengal. However, in case of India as a whole, the effect of SR on female WPR and the vice-versa is not much functional. It might be of the reason that, India represents a large geographical entity with diverse demographic characteristics and economic structure. At the regional level, we find a very strong positive association between SR and Female WPR. To justify the association between SR and Female WPR, we argue that an increase in SR indicates a positive attitude toward women, women's empowerment, increasing Female WPR and overall development in a particular society.

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