LABOR SUPPLY, POVERTY AND EMPOWERMENT OF RURAL WOMEN IN INDIA SINCE 1990s

Thesis submitted to Jawaharlal Nehru University
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DECLARATION

This is to certify that the thesis entitled **"Labor Supply, Poverty and Empowerment of Rural Women in India Since 1990s"** is based on my original research work under the supervision of Prof. Amaresh Dubey. I hereby submit this thesis to Jawaharlal Nehru University, for the award of the degree of **Doctor of Philosophy**. This study has not been submitted in part or full, for any other diploma or degree of any other University, to the best of my knowledge.

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It is hereby recommended that this thesis may be placed before the examiners for evaluation.

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LIST OF ABBREVIATIONS

AGEGC:	Agriculture-related activities Excluding Crop production
AME:	Average Marginal Effect
APL:	Above Poverty Line
BPL :	Below Poverty Line
CAGR:	Compound Annual Growth Rate
CSO:	Central Statistics Office
EUS:	Employment and Unemployment Survey
FLFP:	Female Labor Force Participation
FLFPR:	Female Labor Force Participation Rate
GAD:	Gender and Development
GDP:	Gross Domestic Product
HH(hh):	Household
IHDS:	India Human Development Survey
IMR:	Inverse Mills Ratio
LFPR:	Labor Force Participation Rate
LFP:	Labor Force Participation
MGNREGA:	Mahatma Gandhi National Rural Employment Guarantee Act
MLR:	Multinomial Logit Regression
MPCE:	Monthly Per-capita Consumption Expenditure
NCAER:	National Council of Applied Economic Research
NCEUS:	National Commission for Enterprises in the Unorganised Sector

NCW:	National Commission for Women
NFHS:	National Family Health Survey
NIC:	National Industrial Classification
NSS:	National Sample Survey
UPS:	Usual Principal Status
WID:	Women In Development
WPR:	Work Participation Rate

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Chapter1

Introduction

1.1. Introduction

"For to be free is not merely to cast off one's chains, but to live in a way that respects and enhances the freedom of others" ~ Nelson Mandela

India attained its independence in 1947, but women of our country are not yet free. Being a woman in our country doesn't come easy, given the atrocities done to them each day, in various forms. The much prevalent gender bias towards them, exists at all fronts. For a woman residing in the rural area of our country, it gets even tougher in terms of access to employment opportunities, skill training and education. Thereby, the term 'rural woman' itself becomes a double whammy. Further, patriarchy affects the 'socio-economic dynamics' in India in numerous ways (Shah, 2018). A lot has improved with time, but a lot needs to be done. Our country has challenged many ills of the patriarchal structure existing in India, however it is still crippled with lot of problems, especially those related to women`s work participation and empowerment.

Many studies show that there has been a conspicuous slowdown in employment growth, especially for rural women in India, in the post-reform period (Kumari & Pandey, 2012). The World Bank data for India shows that Female Labor Force Participation Rate[1] (FLFPR) has declined from 35% in 1990 to 27% in 2014. Further, the rural FLFPR (Usual Principal Status[2] (UPS)) has been declining more or less consistently; from 32% in 1973 to 18% in 2012, except for the distress-affected year of 2004-05 (Abraham, 2013). This issue of 'de-feminization of labor' (ibid) in rural labor market is a growing concern among researchers and policy makers. With these trends in the labor market with respect to Female Labor Force Participation (FLFP), the need to understand the 'gender dimensions' of employment trends in India has become critical (Mazumdar & Neetha, 2011; Neff et al. 2012).

[1] LFPR is the number of persons in labor force (employed and unemployed) as a proportion of total population.

[2] Usual principal activity is based on majority time criterion (those who worked in an economic activity for more than 180 days in the reference year) (NSS, 61st Round, EUS).

Further, India has the second lowest[3] female work participation rates (WPRs) in South Asia (Saha, 2017). At the same time, it is the fastest growing economy in the world as of December, 2017 (Stacey & Kynge, 2018). ILO (2016) claims that India`s growth rate of GDP has increased from 5.6% in 2013 to 7.6% in 2016. Besides increase in growth rate, Kijima (2006) and Pieters`s (2010) studies show that in recent years, India has witnessed a fertility decline, increase in education and returns to education; and a decline in educational gender-gap (as cited in Klasen & Pieters, 2013). Amidst all these positive economic developments, FLFP in India continues to decline. This puzzling decline in FLFP, in the phase of high economic growth, calls upon the need to investigate the female labor supply with newer datasets to obtain better insight into their labor market behaviour.

"Gender equality is more than a goal in itself. It is a precondition for meeting the challenge of reducing poverty, promoting sustainable development and building good governance" ~ (*Kofi Annan)*

Across the globe, women have been discriminated which is keeping the countries poor (Indrawati, 2015). Despite various legislations and schemes to promote equal opportunity across gender, women continue to face discrimination with respect to access to resources, property, nutrition, health care, education and work. India has been ranked at a low of 108 out of 144 countries on the gender equality scale in 2017, which has fallen from 87th position in 2016 (World Economic Forum, 2017). Women's economic empowerment currently faces challenges like limited work opportunities; jobs available are mostly informal, low paid with poor working conditions and low value-addition (Krogh et al., 2009). Besides the economic context, the social context of women`s empowerment is equally important, which is inter-linked to their economic empowerment. Hence, it is important to understand the concept of 'hegemonic masculinity[4]' (Connell &

[3] China has 64% of its women working, one of the highest rates in the world (Dwivedi, 2017). In the US, it is over 56%. Further, Nepal and Bangladesh do much better than India; only Pakistan has a lower rate than India (ibid).

[4] Hegemonic masculinity is a gender order theory which justifies a man`s dominant position and a woman`s subordinate position in the society (Connel & Messerschmidt, 2005).

Messerschmidt, 2005) and how it has evolved to sustain a patriarchal structure, as that prevalent in India. The gender schemes in the society imposes men and women with different roles within the same household; and at different positions within the power structures (Brown, 1970; Bem, 1981). Under such a gendered framework, men are given the chief position as the 'bread earner' of the house and have a larger degree of autonomy. Women, on the other hand, are given a 'subordinate' position within the household. They are expected to compensate the economic contribution of their husband by fulfilling more reproductive roles in the form of child rearing and daily chores (Stacey, 2011; Leonardo & Lancaster, 2011).

The traditional division of labor across gender, clearly demarcates the role she is expected to play. This division restricted the women not just within the household domain; but also defined her mobility outside the household. Such an inequality derived by division of labor between the sexes, bound a woman to the notions of 'good woman'; 'good wife'; 'good mother' (Ramu, 1989) and a man to the notions of 'protector' and 'provider'. Likewise, marriage acts as an institution manufacturing cultural codes that internalizes these notions, across gender. This internalization and self-perception through normative lenses affect economic outcomes of women (Akerlof & Kranton, 2000) leading her to accept subordination and economic dependency (Kandiyoti, 1988; Stacey, 2011). "Woman's role as a home-maker while man's role as that of the primary bread-earner are assumed as rational decision-making choices under the assumption of harmonious household" (Floro & Meurs, 2009, p.9). The association of men with 'masculinity' and women with 'femininity' characterizes separate dimensions of power, which creates separate sense of roles and responsibilities within the same household (Ramu, 1989; Sourabh, 2007). Given the gender role framework, a married working woman tends to balance her work with other domestic roles. Hence, her work tends to be located closer to the home (ibid).

Many women seek employment opportunities with flexible working-hours as they have the dual responsibility of balancing family and work. Further, they are mostly engaged in activities which are low paid (Olsen &Mehta, 2006). Due to the emerging trend of nuclear families and the lack of institutional help in the form of hired help (even if available, may not be reliable enough), women may choose staying at home and not to work. Other reasons

that act as a barrier towards their work participation are safety, societal stigma (especially late-night work shifts), and work conditions that are more suited to men (Dwivedi, 2017). In the context of declining FLFP, the inter-linkages of rural women`s work, empowerment and household poverty have been investigated in this study, which has important policy implications both at micro and macro level.

Before investigating rural women`s work behavior and empowerment in India, it is important to understand what defines gender and what are the consequences of gender inequality at various fronts of the economic arena. Gender is a complex set of sociological, cultural and psychological relations (Kalpagam, 1986). The author argues that gender division into 'Male' and 'Female' is not merely a social division but is also an asymmetrical division as men are apportioned with higher status and power. In South Asia, gender continues to be the central theme for discrimination beyond caste and religion (Jejeebhoy & Sathar, 2001). Women's issues in the development context over the past, includes `Women In Development' (WID) and 'Gender and Development' (GAD) approaches (Razvi & Miller, 2005). They explain that WID approach in the early 1970s, focused only on women`s contribution in the productive sphere of economy and hence placed less emphasis on welfare issues. Thus, the need for GAD emerged wherein various aspects of gender relations (power structure/conflicts across gender) were taken into consideration while discussing women in the process of development (ibid).

Female employment improves not just women`s own quality of life but also of the entire household (Subbarao & Raney, 1993). Low FLFPR hinders Gross Domestic Product (GDP) growth and obstructs higher growth path. It has been estimated that India can boost its GDP by $700 billion in 2025, amounting to 1.4% (per year) of incremental GDP growth, by raising FLPR by just 10% (Arora, 2017). However, this requires us to bring in 68 million more women into the workforce (ibid). Many studies have highlighted the contribution of FLFP to economic development (Esteve-Volart, 2004; Klasen & Lamanna, 2009; Durand, 1975; Mathur, 1994; Goldin, 1994). Further, studies like Lagerlof (1999) and Klasen (2002) find that gender inequality in education and employment reduce economic growth. Klasen and Wink (2002); and Sen`s (1989) study show that women`s economic participation, increase their 'bargaining power' in the household (as cited in Klasen &

Lamanna, 2009). It also helps in building human capital for the next generation, which in-turn contributes to economic growth (Mammen & Paxson, 2000). Further, Desai et al. (2010) argues that the so-called 'demographic dividend' is likely to be small, if FLFP remains low. Hence, significant efforts should be made to increase employment opportunities and reduce labor market disadvantages (ibid). The "realization of their full economic potential can boost the growth rate and make it more inclusive" (Mehrotra & Sinha, 2017, p.54).

"Any society that fails to harness the energy and creativity of its women, is at a great disadvantage in the modern world" ~ (Tian Wei)

As per the studies of Fuchs (1989) and Bergmann (1989), the debate on labor market participation differentials among men and women, is divided between 'demand-driven' factors on one hand; socio-cultural factors (gender roles and norms), on the other hand (as cited in Eberharter, 2001). Further, Das et al. (2015) observe that various policy initiatives like investment in infrastructure, increased social spending and labor market flexibility, can help enhance the FLFP in India.

Rest of the chapter is broadly divided into the following sections: review of existing literature, research gap, research questions, objectives, hypothesis, conceptual framework and lastly, the organization of chapters.

1.2. Review of Literature

The literature pertaining to women`s work, poverty and empowerment can be broadly divided into the following sections.

1.2.1. Women`s Work Participation and Economic Development

Goldin (1995) investigates the 'U-shaped' relationship between FLFP and different phases of the economic development process. The author explains that in the initial stage, the economy is majorly agricultural and the income levels are low. At this stage, the FLFP is high, out of necessity to earn. As the economy develops and income rises, FLFP falls. However, FLFP rises again when female education levels improve and labor market returns are higher. This relationship reveals that at low levels of economic development, the 'income effect' dominates 'substitution effect', leading to a fall in FLFP. However, with higher levels of development and further rise in income, the substitution effect overpowers income effect and FLFP rises again. Likewise, Gaddis and Klasen (2014) find a 'U pattern' relationship between structural change of economy and FLFP.

1.2.2. Determinants of Female Labor Force Participation

Duryea et al. (2004) observes that various studies have provided empirical evidence with respect to factors affecting probability of FLFP. Likelihood to participate has been found to increase with increase in education, age and urban area of residence. However, it decreases with family responsibilities and better family income (as cited in Morrison et al., 2007). In yet another study, Semyonov (1980) demonstrate that FLFP is positively associated with economic development and divorce rate but negatively influenced by fertility and income inequality. However, the effect of economic development on FLFP depends on the 'composition of their family', especially the fertility aspects. Further, it has been observed that lower sections of caste and class have a higher economic participation, clearly out of economic necessity (Ramu, 1989). Kak (1994) observes that FLFP decision is a combination of socio-economic conditions entwined with the phases of development. Panda (2003) also shows that an interplay of both economic and cultural factors are important factors influencing their access to employment and their labor supply.

Wages have been found as a critical factor influencing female labor supply (Heckman & MaCurdy, 1980). However, changes in FLFP are explained better by factors like changes in 'family status' overtime (Killingsworth & Heckman, 1986) or employment decisions of family members (Neumark & Postlewhite, 1995) rather than economic factors like wages or income (as cited in Eberharter, 2001). Becker`s (1965) female labor supply model using 'time allocation' information reveals that women`s labor supply decisions are not merely based on 'leisure-labor' trade-off, but also on the opportunity cost of 'home-based production' of goods and services (as cited in Das et al., 2015).

1.2.3. Revisiting the Declining Female Labor Force Participation Debate

This section enquires into the possible reasons behind the declining FLFP, which are as follows:

(i) Women's **time allocation** to 'care' duties (Rahman & Islam, 2013) and other household activities like collection of water and firewood (Morrison et al., 2007).

(ii) **Incapacitated institutions** that are unable to ensure gender equality (Rahman & Islam, 2013); provide infrastructure to access productive assets (Rahman & Islam, 2013); ensure women`s safety (Sorsa, 2015).

(iii) ***Social norms***: The socio-cultural factors interact with other factors and amplify their effects on FLFP decision (Neff et al., 2012). Economic development, rising household income and socio-cultural attitudes lead to women`s exit from labor market and confine them to the 'domestic space' (Rahman & Islam, 2013; Sorsa, 2015). Women then substitute paid labor with 'status production' activities such as educating children and perform the 'care' duties for family members (Papanek, 1979). Substitution of paid labor with such 'status production' activities is evident among rural Indian women (Eswaran et al., 2013). Women from households with 'higher status' participate less in wage work, self-employment in agriculture or animal husbandry outside their home. It is considered 'honourable' for the family to confine them to the household domain where they are expected to perform their

traditionally assigned ‘reproductive’ and ‘household’ duties (Olsen & Mehta, 2006).

(iv) ***Limited employment opportunities among women***: Declining employment opportunities has been identified as one of factors for the falling trend in FLFP (Neff et al., 2012). It has been observed that due to occupational segregation across gender, women are clustered in certain occupations like agriculture, elementary services and handicraft manufacturing (ILO, 2013). Further, Kumar (1994) argues that with industrialization, women are being displaced from their traditional forms of employment like agriculture and household industry, due to relatively lower skill levels, education attainment and productive assets than men to cope up with the changing structure of employment.

(v) ***Education effect*:** This implies withdrawal from labor market due to pursuit of higher education among women (Neff et al., 2012; Mammen & Paxson, 2000). ILO (2013) observes that women in working age are enrolling in secondary school. Further, the education attainment of husband also has a strong negative influence on FLFP (Bhalla & Kaur, 2011). It has also been observed that in regions where women are less educated than men, FLFP is expected to be lower than if it was otherwise (Morrison et al., 2007).

(vi) ***Income effect***: This implies withdrawal from labor market due to rise in household incomes (Neff et al., 2012). Warunsiri and McNown (2010) identifies rising wages as the reason for declining FLFP, which allows women to forgo own market earnings as household income rises and spend more time to non-market activities like child rearing and caring activities. With the rise in husband’s income, house work becomes more attractive than poorly paid market work (Sorsa, 2015). In such cases, income effect dominates substitution effect. Further, it has been observed that decline in rural FLFP could be “mainly due to an income effect and partly due to an education effect” (Neff et al., 2012, p.1). The fact that the withdrawal of women from the labor force is more prominent in rural areas; from all age groups

indicates that there are reasons apart from their rising education levels which are responsible for the decline in FLFP (Sinha, 2014).

(vii) ***Low preference for farm work***: The fall in unpaid self-employment in agriculture accounted for most of the decline in FLFP since 2005 (OECD, 2014). Chand and Srivastava (2014) claim that women`s withdrawal from agricultural sector could be due to rise in income, pursuit for higher education and low preference for farm work.

(viii) ***Rising informality among women workers****:* Hirway (2012) claims that missing labor force may not be 'missing' in the real sense. They are not moving out of the labor market, and only a small part of labor force is actually withdrawing. They move to sectors which are 'difficult to measure', often low productive, as a coping strategy. This 'non-missing' labor force needs to be accounted for in the employment policies, as they are a part of the labor force. Similarly, Nayyar (1987) also claims that the problem is not that the women participation rates are declining rather it is the under-reporting of many 'working' women. Abraham (2013) also observes that mostly marginalized (at multiple levels) women are found participating in these informal sectors as low-paid and vulnerable workers.

Apart from the above reasons that explain the declining FLFP trend, Varma (2017) conducts a study in Kerala to find answers to the questions like 'where are the women who are not working'?; 'What are they doing'; and 'why are they shying away from entering the workforce'? The author finds that the working conditions in many organizations allow employers to hire only men, as those working conditions are not suitable for women (ibid). Further, those staying at home, were found to engage in activities like kitchen gardening or home tutoring in Kerala, unlike in other states who are mostly engaged in collection of water or fuel, etc. ILO (2013) states that there is need for sharpening the measurement tools used for analyzing women's work-participation and credible labor market information is needed to construct well-informed policies.

1.2.4. Work-force Transitions among Women

The only (and the most recent) study analyzing work-force transition among women in India estimate an endogenous switching model using IHDS panel data and observe that increase in unearned income (Total household income – women`s own wage earnings) lead to lower entry and higher exit probability among women, whereas, employment guarantee program like MGNREGA reduce the probability of exit from workforce for women (Sarkar et al., 2017).

Further, Long and Jones (1988) claim that married women were more likely to enter labor force after an interval of non-participation in the labor market, either if their earning capacity has increased with the rise in market wage rate, or if their husband's income has declined, or if they belong to a backward caste. On the other hand, the authors claim that the probability to exit is higher for women giving birth to a child and this probability rises when the family migrates out into a labor market, offering only few job options for women. Also, the knowledge of current earning potential is important in predicting a married women`s future labor market activity. If the woman is getting paid lesser than the men in the household, due to gender wage disparity in the labor market, then she may be pressured to quit the job, as it may not be profitable to the family ("Informalisation of women`s work", 2012). They could also be trapped in a 'low wage' cycle, owing to lesser work experience than men (Mincer & Polachek, 1974). Therefore, their low earning capacity reduces the probability of entering the labor force in future, which in turn reduces their expected future wages (ibid).

"Domestic duties, care work and the ideology of the marital household govern their entry and exit from the labor force to a large extent" (Mehrotra & Sinha, 2017, p.58). Further, in rural areas, proportion of rural women engaged in 'domestic' duties has increased to 59.7% in 2012 from 51.8% in 2005 (NSS, 61st and 68th round). This trend reflects the rising burden of women`s care duties, economic activities for domestic consumption and unpaid work (ibid). On the other hand, support of extended/joint families in developing countries can enable women to step out for work (Goodman & Kalpan, 2018). This observation is more

strong for women joining formal sector jobs, especially when day-care centres are few and expensive or when it is difficult to hire a maid (ibid).

1.2.5. Structural Transformation of Rural Economy and Role of MGNREGA

Reddy et al. (2014) claim that rural labor market has undergone major structural transformation with labor moving out from agriculture towards non-agricultural sector, which contributed around 65% to the 'Net Domestic Product' (NDP) of the rural economy in 2010. There was a 12% increase in non-farm employment (UPS measure of employment, NSS) in rural area, during 2000 to 2012. At the same time, the share of households with agriculture as main source of income, declined to 58% in 2013 from 63% in 2003 (ibid).

Further, they find that there has been a decline in agriculture employment across gender and this decline is much higher among women (ibid). The "diversification of the rural labor market is influenced by a set of complex factors such as the pattern of economic growth, inter-sectoral wage rate and worker productivity differentials, education, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and socio-cultural factors" (Chand & Srivastava, 2014, p.1). Engler and Ravi (2013) shows that MGNREGA employment rises during the lean season of agriculture. MGNREGA has particularly subdued the stagnating real rural wage rates and has brought 'inclusiveness' in economic growth (Chand & Srivastava, 2014).

1.2.6. Female Labor Supply and Household Poverty

Robbins (1930) explains the classical theory of labor supply. At low income levels, an upward sloping labor supply emerges due to the dominance of substitution effect. Whereas, at higher wage levels, a backward bending labor supply emerges due to the dominance of income effect. Further, Licona (2000) introduces into the classical model of labor supply, the notion of 'subsistence level consumption/income' which gives rise to different shapes of labor supply, according to the elasticity of substitution and level of 'non-labor' income. In classical labor supply model, the substitution effect shows positive relation between wages and labor supply, i.e., when wages are low, labor supply is less. However, when

wages are too low, then individual chooses not to participate, assuming the individual has other non-labor income to sustain the basic needs. However, if the individual doesn't have other non-labor income when real wage starts falling, then to sustain his basic needs, even at a very low wage, he will work. Once the basic needs are met, they reduce their labor supply as wages rise, thus resulting in a downward-sloping labor supply (ibid). Further, Dessing (2002) assumes FLFP is governed by traditional/social gender roles apart from the economic factors, for APL household. Whereas, only economic factors influence FLFP decision for women from BPL household. Various other studies reinforce Dessing`s assumption and find that these constraints might become stronger with rising income or with limited job opportunities (Chowdhury, 2011; Neff et al., 2012; Verick, 2013).

1.2.7. Female Labor Demand

The central theme of our study is female labor supply and its inter-linkages with poverty and empowerment. However, it is important to discuss the demand side arguments as well, to get better insight into the female labor demand and supply scenario in India. Chatterjee et al. (2015) claims that the definition of economic/productive work in urban and rural areas and the changing composition of employment are important reasons behind the declining FLFPR trend in India. The author observes that the supply-side factors explaining the decline in FLFPR are insufficient. Rising education and income are stated as the major sources of decline in FLFP. However, women who are not in school and in their 'prime' working-age have been found to account for the major part of decline in participation. This shows that there are reasons other than education and income effect, responsible for decline in FLFP.

Chatterjee et al. (2015) emphasizes that most explanations of low LFP in India focus on supply-side factors. However, a key determinant of FLFP is the availability of flexible and suitable job options for women that are located closer to their residence. Hence, the areas in India that have seen the greatest decline in FLFP in the last decade are those villages that have rapidly urbanized and are now part of towns and small cities. In fact, most of the decline in FLFPR is explained by the deficit of "suitable jobs at the local level" (ibid). Further, due to the structural and technological change; and gender differential in education

attainment, there is skill-biased demand for labor across gender (Mahapatro, 2013). The author finds that there has been an increasing willingness on the part of women to enter workforce as a result of social development, but the disposition of the economic structure has reduced the demand for female labor. Further, there aren't enough formal sector jobs for the fresh entrants in labor market (ibid). Sudershan (2009) claims that globalization has ensured that women's labor is further casualized.

1.2.8. Labor Supply and Empowerment of Women

Malhotra et al. (2002); and Upadhayay and Karasek (2007) claim that different terms like "autonomy, status, agency, power, patriarchy and gender equality are used interchangeably" to define empowerment (as cited in Assaad et al., 2014, p.3) Women's empowerment is not just defined at an individual level, but community also plays an important role (Mason, 2005). Further, 'household' well-being can be different from 'individual' well-being, as each member of the family may have different degree of control over resources (Rao, 2006).

Dimensions explaining empowerment are inter-related and overlapping (Basu, 1992; Visaria, 1996; Jejeebhoy, 2000). In a study conducted across three Indian states, majority of women believe that ownership of land/asset leads to their economic empowerment by increasing their decision making power over household income, expenses and savings ("Land, asset ownership", 2015). Further, studies have shown that "women's participation in group-based credit programs can improve a number of individual and household outcomes such as household per capita expenditure and labor supply (Pitt & Khandker, 1998), children's nutritional status (Pitt et. al., 2005), as well as self-reported measures of empowerment (Hashemi et al., 1996; Zaman, 1999)" (as cited in Khandker et al., 2008, p.2).

1.2.9. Linkages of women`s employment and education

Klasen and Pieters (2012) find that less educated women`s participation may be 'distress-induced' or 'forced'. Therefore, "illiterate women are more likely to be employed" (Das & Desai, 2003). In contrast, higher educated women are motivated to participate in workforce

only by higher wages (Klasen & Pieters, 2012). Improvement in education and skill of women will accelerate changes in the structure of the rural workforce (Nihila,1999); improve their productivity levels and make them suitable for non-agricultural jobs (Srivastava & Srivastava, 2010); improve the health, nutrition and economic status of a household (Sharmila & Dhas, 2010). However, Nihila (1999) observes there is in-built gender subordination in the society due to which employment generation may not necessarily translate into better welfare outcomes, especially for women, unless higher LFP is accompanied by higher education and/or assets (Srivastava & Srivastava, 2010).

1.3. Research Gap and Objectives

1.3.1 Statement of Problem, Research Gap and Research questions

In recent years, there is an evident slowdown in the growth rate of labor force, especially during the period 2005-2010 (Kannan & Raveendran, 2012; Rangarajan et al. 2011). The puzzling fall in FLFP, especially among rural women, during the phase of rising income and education, is a growing concern among the researchers and policymakers. Our questions emanate from this 'de-feminisation' trend of labor force (Abraham, 2013) with respect to rural women, which a lot of studies using cross-sectional (NSS) data have already indicated. The reason for their withdrawal has been mostly attributed to the definitional issues, which exclude a lot of informal activities that rural women are engaged into. Thereby, the missing labor force may not be actually 'missing' (Hirway, 2012). The other reasons may be rural women enrolling themselves for higher education and rising rural wages. There have been studies arguing the impact of income effect over education effect on FLFP decision and other studies which claim that neither income effect nor education effect is sufficient enough to justify the falling participation of women. To obtain greater insight into this puzzling decline in FLFP, this study re-investigates their labor market behaviour overtime, using the unique panel dataset of IHDS, rather than a cross-section study.

The use of panel data enables us to track the same rural women over a span of 7 years and investigate the socio-economic background of rural women who are changing their labor supply overtime, changing their work patterns with structural transformation of rural

economy; the role of female labor supply towards poverty transition of rural household. IHDS panel dataset provides us information on a variety of topics ranging from work, wages, attitudes on gender equality and poverty which enables such an analysis.

Further, it is important to note that labor supply (in terms of hours-of work supplied) hasn't been emphasized much in the Indian literature. This study investigates the dynamic nature of women`s labor supply using panel data which allows the causal analysis of change in various independent variables overtime, causing change in dependent variables overtime or at a point of time. Further, this study also re-examines the nature of labor supply of rural women, differentiated by household poverty status, using the IHDS dataset.

According to Sen (1989) 'working' women are generally better empowered with respect to social and political participation; and household decision making. However, Sen and Sen (1985) find that the trade-off between the reproductive tasks and their economically productive roles, depends more on the impoverished state of the household. In a country like India, women's work participation is more likely to be poverty-induced, thereby, work may not really lead to her empowerment. On the other hand, even if women are empowered, they may choose to remain out of workforce, due to lack of economic compulsions. Such inter-linkages between empowerment, poverty and labor supply is investigated in this study, using the IHDS panel data, in the context of the declining FLFP debate and the structural transformation of rural economy.

Based on the existing literature review, statement of problem and research gap, the **research questions** can be summarized as follows:

(i) Which factors influence rural women`s inter-temporal labor supply?

(ii) What are the patterns of occupational transition among rural women, in the context of structural transformation of rural economy?

(iii) Does labor supply of rural women and their household poverty status influence each other?

(iv) What are the inter-linkages of rural women`s labor supply, empowerment and household poverty?

1.3.2. Objectives

To answer the research questions posed above (section 1.3.1), this study has the following objectives:

(i) To analyze the trends and determinants of inter-temporal labor supply of rural women.

(ii) To study the patterns of occupational shift and determinants of participation in different types of work among rural women, when public programs like MGNREGA are made available, in the context of structural transformation in rural areas.

(iii) To examine how household poverty status shapes the nature of labor supply of rural women and to analyze the role of rural women`s labor supply in mitigating the household poverty risks overtime.

(iv) To analyze the factors affecting empowerment of rural married women and investigate the inter-linkages of their labor supply, empowerment and household poverty.

1.3.3. Hypotheses

Based on the objectives, the following hypothesis can be formulated.

(i) Rural women who are illiterate, from lower income quintile and backward caste, increase their labor supply overtime and are less likely to exit from workforce.

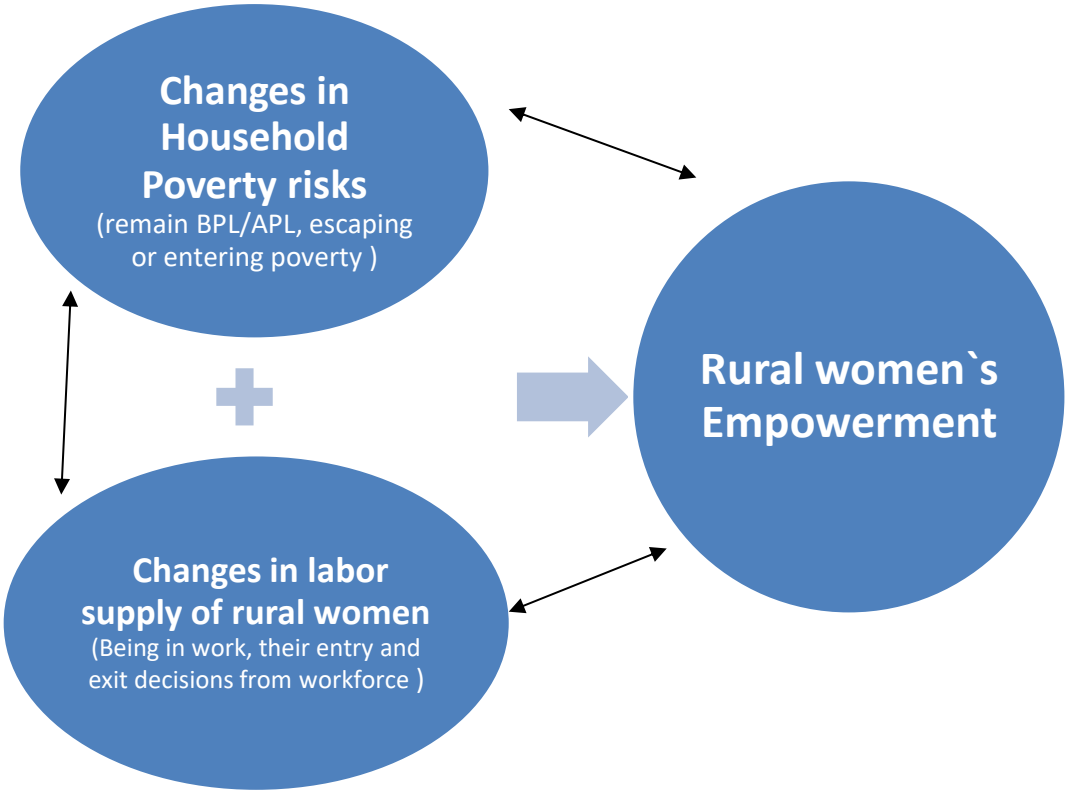
(ii) There is a shift away from farm sector towards non-farm sector among rural women workers, in the context of structural transformation in rural areas.

(iii) Household poverty shapes the nature of rural women`s labor supply. On the other hand, female labor supply helps in reducing the household poverty risks.

(iv) Rural married women`s empowerment and labor supply reinforce each other.

1.4. The Conceptual Framework

Poverty, empowerment and women`s labor supply have a bi-directional relation with each other. In this context, the role of poverty in establishing a link between empowerment and labor supply of rural women has been investigated in the study. A diagrammatical representation of the relationship between poverty, female labor supply and empowerment to be analyzed in the forthcoming chapters, can be expressed below:



1.5. Organization of chapters

The study is divided into 7 chapters as follows:

First chapter: The chapter broadly provides the literature review on factors affecting female labor supply and the linkages of empowerment, poverty and labor supply of women. Based on the literature review, research gaps are identified, research questions are framed and objectives are constructed to answer them.

Second Chapter: The chapter lists out the data sources used in the study and explains the methodologies that have been used to analyze each of the framed objectives.

Third Chapter: The chapter analyzes the trends and determinants of rural women`s labor supply; their entry, exit and continuity in workforce during 2005-2012 using panel data.

Fourth Chapter: The chapter examines the determinants of type of work undertaken by rural women and analyses the changing work patterns among them, when public programs like MGNREGA are implemented, in the context of structural transformation of rural economy.

Fifth Chapter: The chapter examines the factors affecting labor supply of rural women from APL and BPL household. It also investigates the role of female labor supply in influencing the changes in poverty risks among rural households.

Six Chapter: The chapter investigates the inter-linkages between empowerment, poverty and labor supply. It investigates the factors affecting empowerment among rural married women. It also examines the role of poverty and empowerment in influencing rural married women`s labor supply.

Seventh Chapter: The chapter concludes the study by providing a summary of major findings. It highlights the issues that need to be addressed at the individual, community and societal level with respect to enhancing women`s economic participation and empowerment.

Chapter 2

Data Sources and Methodology

2.1. Introduction

Having stated the research problem and outlined the consequent research questions, objectives and hypothesis of the study in Chapter 1; this chapter describes the data sources and methodology to achieve those objectives. This study relies only on secondary data sources which are as follows:

2.2. Data Sources

2.2.1. IHDS

The study utilises the India Human Development Survey (IHDS) spanning across wide range of socio-economic and cultural aspects in India. The survey has two waves, IHDS-I (2004-05) and IHDS-II (2011-12). The IHDS is a joint venture between the "National Council of Applied Economic Research (NCAER) and the University of Maryland", producing India's first panel data which is nationally representative ("India Human Development Survey", n.d.). IHDS-I surveyed around 41,554 households and IHDS–II surveyed 42,000 households. IHDS was conducted in 33 states and union territories (except in UTs of Andaman and Lakshadweep) over 1,503 villages and 971 urban settlements (ibid). "In 2011–12, all of the 2004–05 households as well as those households which separated from the root household but reside in the same area were selected for re-interviews" (Thorat et al., 2017, p.9). The aggregate re-contact rate of IHDS for the two rounds for rural areas was 90%. Around 83% of the original IHDS-I households were re-interviewed in IHDS-II, which constitute 92% of rural households and 76% of urban households (ibid).

The multiplier/weights[5] has been used for tabulations. However, for regressions, no multipliers are used. For the panel data analysis, weights of year 2005 (base year weight) are applied and for cross-section analysis, respective year`s weights are utilized. For all the tabulations and regressions, 15-65 years age-group is considered at the individual level for

[5] Weights are numerical values that are used in surveys to multiply by response values, in order to account for missing observations (missing in terms of either non-responses or pre-arranged sample design). In the case of sample designs, weights estimate the totals or means for data, based on a selected subset of the entire population (Knaub, 2007).

rural women. However, for empowerment analysis of rural married women, information is collected only for married women in the age-group of 15-49 years. Rural area constitutes 70% of the total sample of IHDS panel data (Table 2.1). Further, rural women constitute 48% of the rural (individual level) panel data sample (Table 2.2). Rural women`s individual sample shows that maximum proportion were illiterate; from backward caste; and in 40-60 age-group (Table 2.3). Rural household sample shows that maximum proportion were from backward caste, from lower income quintile, household`s main source of income is from farm work; and are 'illiterate' households (Table 2.4). These sample characteristics are similar to other large employment surveys like NSS.

Table 2.1. Sample size of panel data

Level of data	Rural	Urban	Total
Household	(29,436) 69.8	(12,716) 30 .17	(42152) 100
Individual	(108,132) 71.6	(42,856) 28.38	(150,988) 100

Source: IHDS- I (2004-05) & IHDS-II (2011-12)

Table 2.2. Rural panel (individual level) data

Gender	Sample	Percentage
Male	54,815	51.86
Female	50,861	48.14
Total	105,676	100

Source: IHDS- I (2004-05) & IHDS-II (2011-12)

Table 2.3. Percentage distribution of rural women across socio-economic variables (Panel Data)

Socio-economic variables	Percentage	
Age Categories	**2012**	**2005**
15-19	0.53	8.65
20-29	16.38	27.78
30-39	27.46	28.08
40-59	44.49	33.48
60 & above	11.14	2.01
Income quintiles		
Poorest	22	20.66
Second	22.39	22.41
Middle	20.61	21.45
Fourth	18.57	19.81
Richest	16.43	15.67
Socio- Religious Groups		
Forward caste	18.02	16.99
OBC	37.57	38.24
Dalit	22.95	23.43
Adivasi	9.98	9.02
Muslim	9.86	10.38
Christian, Sikh, Jain	1.63	1.95
Education Attainment		
Illiterate	56.99	58.16
Primary	7.87	7.86
Middle	24.27	24.53
Secondary	5.45	5.92
Higher Secondary	3.21	2.38
Graduation and Above	2.22	1.14

Source: IHDS- I (2004-05) & IHDS-II (2011-12)

Note: Rural women in the age-group 15-65 years have been taken in the panel data.

Table 2.4. Percentage distribution of rural households across socio-economic variables (Panel Data)

Highest education in the rural household	**2012**	**2005**
Illiterate	24.68	27.57
primary	7.36	9.48
middle	8.66	33.84
Secondary	25.54	Nil
Higher secondary	12.88	12.47
graduate	10.77	8.46
graduate and above	10.11	8.18
social-group		
Forward caste	17.18	16.08
OBC	37.09	37.89
Dalit	24.05	24.65
Adivasi	10.44	9.39
Muslim	9.61	10.06
Christian, Sikh, Jain	1.63	1.92
Main source of income		
Farm	34.82	38.06
Agricultural wage	15.39	19.95
Non-ag wage	23.82	16.96
Self-employment	8.34	7.37
Business	0.5	3.61
Salaried	9.84	9.93
Pension, Rent	3.97	1.9
Others	3.32	2.23
Income quintile		
First	25.8	22.9
Second	23.77	23.02
Middle	20.35	21.58
Fourth	16.92	18.98
Highest	13.16	13.53

Source: IHDS- I (2004-05) & IHDS-II (2011-12)

2.2.2. Other data sources

Few other secondary data sources are utilized to examine the trend in work-force participation, poverty ratios and empowerment dimensions of women since 1990s.

(i) NSS: The unit level data (50^{th}, 55^{th}, 61^{st}, 68^{th} rounds) of EUS (Employment & Unemployment Survey), has been utilized to analyze the employment trends of rural women workers.

(ii) Press note on poverty estimates (Planning Commission, GOI): To analyse the All India and state-wise poverty trends since 1990s.

(iii) NFHS: To analyse the trends in specific indicators of empowerment among married women at All India level.

2.3. Methodology

2.3.1. Vella and Verbeek`s (1999) methodology

The application of Heckman two-step methodology to counter sample selection bias is limited only to cross-section analysis. Hence, this study uses Vella and Verbeek`s (1999) two-step method to examine labour supply of rural women, using panel data. Few papers like Lester and Fitzpatrick (2008) and Sarkar et al. (2017) have applied Vella and Verbeek`s (1999) method to analyse labor supply and labor-force entry and exit decision of women. At the first stage, Inverse Mills Ratio **(**IMR[6]**)** are derived to deal with selection bias owing to panel attrition or due to the presence of women in the sample who don't participate in workforce. The second stage then runs logit or OLS regression on panel data set with IMRs as added explanatory variables.

Inclusion of Inverse Mills Ratio to correct for selection bias in panel data

[6] It is described as the ratio of probability density function (pdf=f(x)) to cumulative distribution function (CDF=F(x)) of a continuous random variable. Thus, IMR=f(x)/F(x)

To address the sample selection bias while analyzing employment transition and labor supply decision of rural women or poverty transition among rural households using panel data, IMRs are estimated. The selection bias needs to be corrected for, under two cases in this study. First, to correct for the bias owing to panel attrition at individual or household level. Attrition involves 'dropping out' of sample owing to occurrence of an event in between the rounds of sample collection like marriage, migration, death, etc. Hence, the same individual or household may not be available in both rounds. Second, to correct for the bias owing to 'unobserved individual heterogeneity', as the sample includes women for whom wages are not observed. In such cases, if the analysis doesn't correct for selection bias, it results in biased estimates. IMR are estimated through post-estimation checks after running Probit regression for attrition or regression on workforce participation decision by women.

(i) **Probit regression on attrition**: The dependent variable is a categorical variable which takes the value 1, if the individual or the household interviewed in 2005 is retained in the sample, over the two rounds. It takes the value 0, if it drops out of the sample by 2012. Independent variables for Probit regression need to include atleast two instrumental variables, apart from other explanatory variables affecting attrition (Sarkar et al., 2017). These instrumental variables should influence the attrition and may not directly influence the outcome variables like workforce entry-exit decisions of rural women or affect rural household poverty transition (ibid). In case of Probit regression on household attrition to analyse rural household`s poverty transition, the independent variable chosen were month of the interview, region, state, highest education attainment in the household, socio-religious group, household income. Whereas, in case of Probit regression on individual attrition to analyse entry/exit decisions of rural women in workforce, the independent variable chosen were age, age-squared, relationship with the head of the household, land/owned or cultivated, region, state.

(ii) **Probit regression on decision to participate in workforce by women:** Probit regression is run on women`s decision to participate in workforce. This regression is run on total women`s sample, at individual level. The total sample consists of women who supply zero hours of labor and thus wages of such women may not be observable. For

the labor supply analysis, only those women who participate in workforce and supply positive labor hours are required. IMR derived from this regression, are included in the second stage regression, which corrects for this bias. The dependent variable is a binary variable which takes the value 1, if women participates in workforce, else takes the value zero. The independent variables chosen were age, socio-religious group, marital status, education attainment of women, household income, etc.

2.3.2. What is a Binary Logistic Regression?

Logit regression is used when the dependent variable is binary, which takes values 0 or 1. Logit models estimate the log of odds of dependent variable. "Logits are the b-coefficients (the slope values) of the regression equation. Logistic regression calculates change in the log of odds[7] of the dependent variable (not changes in the dependent value as OLS regression does) due to one unit of change in X, keeping all other variables constant. If the value exceeds 1, then the odds of an outcome occurring increases; if the value is less than 1, the odds of the outcome occurring reduces" (Burns & Burns, 2008, p.573).

The term logit means log of odds which can be expressed as: $\ln\left[\frac{p}{1-p}\right]$.

Thus, $\ln\left[\frac{p}{1-p}\right] = \beta_0 + \beta_1.x_1 + \beta_2.x_2 + \beta_3.x_3 + \ldots$, i.e., the function of p is a linear function of the explanatory variables (ibid).

Note that the value of p, thus obtained, would always be between 0 and 1, as probability should be, but $\ln\left[\frac{p}{1-p}\right]$ varies between (-) ∞ and (+) ∞. In the current study, Average Marginal[8] Effects (AME[9]) have been used to analyze the effect of explanatory variables on dependent variables rather than the odds ratio.

[7]Odds is the probability of success of an event occurring to the probability of its failure.

[8] Marginal/ partial effect measures the effect of a change in one of the regressors on the conditional mean of y.

[9] AME is a marginal effect computed for each case, and the effects are then averaged.

2.3.3. Causal analysis with panel data

Steven (1995) explains that it is possible to use information about prior $X_{t-1,}$ current X_t and change in independent [$\Delta X = X_t - X_{t-1}$] variables in constructing and estimating causal models which influence the dependent variable (y) or a change in dependent variable ($\Delta Y = Y_t - Y_{t-1}$) while using panel data. However, the "choice of $X_{t-1,}$ X_t and/or ΔX as independent variables depends on length of time between panel observations and on different theoretical assumptions about the nature and timing of the causal lag from X to Y" (Steven, 1995, p.4).

Conditional change model has been applied in this study, which can be expressed as follows:

$$\Delta Y = \Delta \beta_0 + \beta_1 \Delta X + \Delta \mu$$

Where, β_1 is the slope coefficient and μ is the error term. Error term is assumed to be uncorrelated to independent variables. Based on the above model, independent variables have been added and dropped, depending on their correlation with other variables in the model and their significance to the model. It may include current values (2012), base year (2005) values and even change (difference between 2012 and 2005 values) in values of independent variables overtime.

2.3.4. Determinants of Rural Women`s Labor Supply

Vella and Verbeek`s (1999) two-step method is used to examine labour supply of rural women in 2012, using panel data (as explained in section 2.3.1).

At the first stage, two Probit regressions are run. One on employment decision of women in 2012 and another on individual level panel attrition, using total individual level sample in both rounds. IMRs derived from these regressions are included as added explanatory variables in the second stage regression, to correct for the bias. At the second stage, an OLS regression is run on hours worked by rural women, to analyse the determinants influencing their labor supply in 2012.

The dependent variable in the second stage, is not continuous. Hence, the application of a count data model is deemed necessary. In the context of female labor supply, two-step models like double hurdle model by Cragg (1971) and the labor supply model by Blundell, Ham and Meghir (1987) have been applied in the past. However, there are restrictive assumptions to them. The two step procedures to estimate models with sample selection can be categorized into three generations (Vella, 1998). "First was fully parameterized models like Heckman (1979). The second relaxes the distributional assumptions in at least one stage of estimation. The third is semi-parametric which relaxes the distributional assumptions" (as cited in Vella, 1998, p.133). Vella and Verbeek`s (1999) two step methodology relaxes parametric and distributional assumptions which can be efficiently utilized for panel data estimations. Hence, in this study, the dependent variable has been log transformed and Vella and Verbeek`s (1999) two step panel data estimation method has been applied, which takes into consideration, not just the sample selection owing to the presence of women supplying zero labor hours, but also accounts for the endogeneity owing to state dependence of lagged labor supply on current labor supply and the bias owing to sample attrition at the panel level.

The derivation of hours worked and wages are explained below:

(i) **Hours worked in each activity** = (number of hours worked per day) *(days worked in each activity). Number of hours worked per day and days worked in each activity is directly collected from respondents. These hours are then summed across all the types of work done by an individual during the reference year.

(ii) **Hourly wage**= (Pay rate/number of hours worked per day). Wages are adjusted for inflation.

(iii) **Daily wage**= (hourly wage) *8

(iv) **Days worked** = (sum of hours worked across jobs for an individual /8). Days are capped at 365 days per year.

2.3.5. Determinants of Rural Women`s Workforce Entry and Exit

Rural women in the age-group 15-65 years (in both rounds of IHDS) are considered for the analysis, inorder to include fresh entrants above 15 years of age and exclude those who have crossed age of 65 years in 2012. Vella and Verbeek`s methodology (as explained in section 2.3.1) has been used. At the first stage, two Probit regressions are run. One on initial employment decision of women and another on individual level panel attrition using total individual level sample in both rounds (Sarkar et al., 2017). Inverse Mills Ratio (IMR) derived from these two Probit regressions are added as explanatory variables in the second stage regression, to address selection bias.

At the second stage, two separate binomial logistic regressions are run, using IHDS panel data, to analyze the socio-economic factors influencing the entry and exit decisions of rural women workers in India using the same methodological approach as followed by Sarkar et al. (2017). The dependent variable for ENTRY regression is a binary variable that takes the value 1, if rural women participate in workforce in 2012 but were out of workforce in 2005. Else, the variable takes the value 0, if rural women remain out of workforce in both the rounds. Whereas, the dependent variable for EXIT regression is a binary variable that takes the value 1, if rural women participate in workforce in 2005 but withdraw from workforce by 2012. Else, the variable takes the value 0, if rural women remain in workforce in both the rounds. The explanatory variables are same for both the regressions which include change in women's own children below 10 years of age in the household, change in number of earning members in the household, age (2005), change in marital status, work type, socio-religious group (2005), change in education attainment, etc.

2.3.6. Determinants of Changes in Rural Women`s Labor Supply

A Dynamic Tobit Model is run to analyze the socio-economic factors influencing the changes in labor supply of rural women who remain in workforce during the period 2005-2012. Here, the targeted sample are those rural women in 15-65 age-group in 2005 and 22 to 65 age-group in 2012. The IHDS panel data is utilized for the analysis.

Many studies show that an individual who has experienced an event in the past is more likely to experience the same events in future too (Blank, 1989; Chay & Hyslop, 1998). This is known as inter-temporal 'true state dependence' which is different from 'spurious state dependence' which comprises of persistent individual heterogeneity. In order to account for spurious state dependence, a dynamic Tobit model with unobserved individual specific effects has been applied, to measure the changes in labor supplied by rural women overtime.

"The Tobit model is a censored regression model to estimate linear relationships between variables when there is either left or right censoring (also known as censoring from below and above, respectively) to the dependent variable. Censoring from above takes place when cases with a value at or above some threshold, all take on the value of that threshold, so that the true value might be equal to the threshold, but it might also be higher. In the case of censoring from below, values that fall at or below some threshold are censored" ("Tobit Analysis", n.d.). Islam (2007) argues that linear panel data estimation is inappropriate due to censoring nature of the sample which includes those who report zero hours of work. Apart from sample selectivity issue, the Random Tobit model allows for serial correlation in error, unobserved heterogeneity and first order state dependence (ibid). Further, in random effects model, unobserved individual heterogeneity is assumed to be random and uncorrelated with the independent variables.

The dependent variable of this model is a continuous variable in terms of log of labor hours supplied by rural women. The independent variables include hourly wage rate, age, type of work, socio-religious group, number of infants in the household, number of earning members in the household, income quintile, etc.

2.3.7. Determinants of Rural Women`s Participation in Different Types of Work

To analyze the socio-economic determinants of participation in different types of work among rural women, a MLR (as explained below) was run for rural women workers using cross-section data of IHDS-II (2011-2012). The dependent variable is a categorical variable with 5 outcomes and hence, 4 equations. Participation in farm work (own-farm or

agricultural wage work) is the base outcome. The other 4 categories are Non-farm work (non-agricultural wage work excluding MGNREGA, own (family) non-farm business, salaried work), combined (farm and non-farm work), MGNREGA work (exclusive); MGNREGA combined with farm work. Independent variables of 2012 include age, age-squared, marital status, socio-religious group, income quintile, etc.

The MLR can be explained as follows:

The dependent variable is a categorical variable, includes j outcomes which could range from 1, 2…m, hence there will be m-1 equations. Multinomial Logit Regression can be explained as follows:

Let P_{ij} be the probability of choosing j^{th} (j = 1, 2…m) outcome by i^{th} individual:

Then Multivariate Logistic Distribution will be of the following form:

$$P_{ij} = Pr\,(Y_{i=j}) = \frac{\exp\,(\beta j\, Xi)}{\sum_{m=1}^{3} \exp\,(\beta m\, Xi)}$$

It can also be represented in linear form:

$$\ln \frac{Pr(Yi=j)}{Pr(Yj=1)} = \beta j\, Xi$$

Hence, there are (m-1) log odds equations for j = 2,3; where j=1 is reference category.

2.3.8. Rural Women`s Participation in MGNREGA and other Non-farm work (non-farm work excluding MGNREGA)

A binomial logistic regression is run using IHDS panel data to see the likelihood of rural women participating in MGNREGA as opposed to other non-farm work (excluding MGNREGA). Here, two separate binomial logistic regressions are run. In the first regression, rural women`s participation in MGNREGA in 2012 is taken as the binary dependent variable. In the second regression, rural women`s participation in non-farm work (excluding MGNREGA) in 2012 is taken as the binary dependent variable. Factors explaining each of these regressions are same so as to promote comparison between the

two. The explanatory variables of IHDS-I (2004-05) chosen were as follows: age, age squared, socio-religious group, income-quintile, education attainment, type of work, number of earning members in the household, number of infants, etc.

2.3.9. Factors influencing labor supply of rural women differentiated by household poverty status

Vella and Verbeek`s (1999) two step methodology (as explained in section 2.3.1) has been used to analyze the factors influencing the labor supplied by rural women from APL and BPL households in 2012, using IHDS panel data. At the first stage, two Probit regressions are run. One on employment decision of women in 2012 and another on individual level panel attrition, using total individual level sample in both rounds. Two separate OLS regressions are run on labor hours supplied by rural women (differentiated by poverty status) at the second stage. The independent variables include hourly market wage (women`s own wage), number of earning members in the household, age, age squared, work type, socio-religious group, education attainment of rural women, etc. IMRs (derived in the first stage Probit regression) are also included as additional explanatory variables, correcting for selection bias due to individual attrition and due to the presence of women in the sample who supply zero labor hours.

2.3.10. Determinants of Entry and Escape from Poverty among Rural Households

Two separate Binary Logistic Regressions are run for poverty entry and exit. IHDS panel data is utilized for the same. For poverty EXIT regression, dependent variable is a binary variable which takes the value 1, if the rural household was poor[10] in 2005 but no longer poor in 2012. The variable takes the value zero, if the household remains in poverty in both the rounds. For poverty ENTRY regression, the dependent variable is a binary variable which takes the value 1, if the rural household was non-poor[11] in 2005 but poor in 2012.

[10] Poverty line cut offs are based on Tendulkar poverty lines for both years 2005 and 2012.

[11]Poverty line cut offs are based on Tendulkar poverty lines for both years 2005 and 2012.

Else, the variable takes value zero, if the household remains non-poor in both the rounds. The independent variables include social group (2005), asset owned (2005); change in average number of hours worked and change in average years of education of female members in the household; changes in income quintile, change in dependency[12] ratio, change in household size, etc. IMR derived from Probit regression (in the first stage) on household level panel attrition are included as additional explanatory variables, to correct for the bias, in the second stage.

2.3.11. Determinants of Empowerment among Rural Married Women

2.3.11.1. Factor Analysis

The sample of rural married women considered for the study includes women in 15-49 age-group in 2005 and 15 to 56 age-group in 2012. Firstly, factor analysis is conducted to identify factors defining empowerment of rural married woman. The following factors were taken into consideration to identify the major factors defining empowerment in 2012 and 2005: decision making regarding work, membership with organization (social representation), personal mobility, decision regarding number of children to have, decision with respect to household expenditure, financial autonomy and women's own attitudes towards gender equality.

2.3.11.2. Binary Logistic Regression

Regression was run on IHDS panel data to analyze the socio-economic determinants of empowerment of rural married women in 2012. The dependent variable is a binary variable which takes the value 1, if the rural married women is empowered in 2012 (based on the two major factors identified by factor analysis in year 2012). Else, takes the value 0. The independent variables were taken as follows: age of the rural married women, education attainment, income quintile, changes in income quintile, changes in education attainment

[12]Ratio of number of dependents (children less than 15 years of age and elderly aged more than 60 years) to working population (15-59years) in a household

level, highest education attainment in the family, number of children in the household, changes in poverty status, socio-religious category of the household, etc.

2.3.12. Rural Married Women`s Labor Supply

Vella and Verbeek`s (1999) two-step methodology is applied to determine the factors affecting rural married women`s labor supply in 2012, using panel data of IHDS. At the second stage, an OLS regression is run on hours worked by rural married women in 2012. The independent variables of second stage regression include: women`s own education attainment, number of children in the household, change in household poverty status overtime, income quintile, socio-religious group, etc. IMR (derived through Probit regression on individual attrition and regression on women`s decision to participate in workforce in 2012) obtained at the first stage are included as additional explanatory variables in the second stage regression (as explained in section 2.3.1)

2.3.13. Determinants of Rural Married Women`s Entry and Exit from Workforce

The Vella and Verbeek (1999) two-step selection model is applied (section 2.3.1). At the first stage, two Probit regressions are run to derive IMR(correcting for selection bias owing to individual attrition and for the bias owing to the presence of women who supply zero labor hours) which are then included in the second stage as additional explanatory variables. At the second stage, two separate binomial logistic regressions are run using IHDS panel data, to analyze the socio-economic factors influencing the entry and exit decisions of rural married women in India. The dependent variable for the ENTRY regression is a binary variable which takes the value 1, if a rural married woman is in workforce in 2012 but was not in workforce in 2005, else the variable takes the value 0, if they remain out of workforce in both the rounds. The dependent variable for the EXIT regression is a binary variable which takes the value 1, if a rural woman was in workforce in 2005 but withdraws from workforce in 2012, else the variable takes the value 0, if they remain in workforce in both the rounds. The explanatory variables are same for both the regressions which include change in real hourly wage (women`s own wage), number of children in the household, change in number of earning members in the household, age

(2005), age squared (2005), work type, socio-religious group (2005), change in education attainment, etc.

The next chapter examines the trends and determinants of changes in labor supplied by rural women, overtime.

Chapter 3

Rural Women`s Inter-Temporal Labor Supply

3.1. Introduction

Having described the data sources and methodology to be followed to achieve the objectives of this study, in the previous chapter; this chapter examines the trends and determinants of rural women`s labor supply in India.

There is extensive literature on FLFP in India that highlights that there are fewer women (than men) that participate in the labor market. The FLFP has been falling over the years, more starkly, for rural women in India. In addition, they argue that there has been a general slowdown in growth of labor force in recent times, especially during the period 2005-2010 (Chandrasekhar & Gosh, 2011; Rangarajan et al., 2011; Kannan & Raveendran, 2012).

Researchers have attributed several reasons for this falling workforce participation trend among women in the phase of high economic growth. Apart from rising income, the other reasons are: enrolment in higher education, socio-cultural norms against women working outside the household realm (Chaudhary & Verick, 2014); and the 'traditional gender roles' that may become active once the household crosses a threshold income limit (Dessing, 2002). It has also been attributed to the definitional issues with respect to 'work' which tend to exclude the informal[13] activities that rural women engage in and thereby the missing labor force may not be actually 'missing' from the labor force (Hirway, 2012; Abraham, 2013). Further, from the point of view of a demand side argument, the current rural labor market has limited employment opportunities available for rural women and is afflicted with a 'crash of employment' altogether (Chandrasekhar & Ghosh, 2011). There has been an overall reduction in employment opportunities in rural areas (Mazumdar & Neetha, 2011; Ahsan & Narain, 2010).

In the wake of the debate on the declining rural women`s participation over the years and at a time when all the existing evidences on women`s workforce participation are based on cross-section studies utilizing NSS or Census data, the need to re-investigate their labor market outcomes is even more pressing. This chapter fills the gap in literature with regard

[13] "The unorganized sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers" (NCEUS, 2009, p.3).

to rural women`s work participation by utilizing the IHDS panel data in two ways. Firstly, IHDS panel data tracks the same rural women over the span of 7 years which enables us to identify the socio-economic background of rural women who are moving in and out of workforce. Secondly, it helps in analysing determinants of changes in labor supplied (labor hours) by rural women who remain in workforce over the two rounds.

Further, this chapter utilises panel data to re-examine the factors affecting rural women`s labor supply in 2012 which was previously analysed by Dasgupta and Goldar (2005) at the cross-section level, using NSS data. Thus, re-investigation of their labor market outcomes with panel data provides greater insight into the puzzling debate on rural women's falling workforce participation. In addition to this, the IHDS provides us with the total household income information which enables us to create income quintiles and analyze the income effect on WPR of rural women. Existing studies based on NSS data use consumption expenditure variable as a proxy for income.

The objective of this chapter is to analyze the trends and determinants of inter-temporal labor supply of rural women. This chapter aims to test the hypothesis that rural women in workforce who are illiterate, from backward caste and from lower income class, increase their labor supply overtime and are less likely to exit from workforce. The rest of this chapter is broadly divided into the following sections. The second section summarizes the literature on determinants of FLFP. The third section describes the data sources and methodology. The fourth section analyses the results and the final section concludes the chapter.

3.2. Literature Review

3.2.1. Determinants of Female Labor Force Participation

According to Sundar (1981) the factors influencing the male and female WPR are different and non-economic factors are better explanatory variables for FLFP. The author observes that apart from their own market wage, the other factors influencing female work participation may include structural changes in economy, socio-cultural biases against women working outside the household, employment of the male members of the household and their wage rates. Further, Panda (2003) shows the interplay of economic and cultural

factors are important for women's participation and access to employment. In yet another study, Rahman and Islam (2013) identify a number of barriers to women's participation like access to productive assets and time allocation for household responsibilities.

"The trade-off between reproductive and paid work influences women's participation and access to decent work. Women tend to increase their total work time as they are unable to shift compensating amounts of reproductive work to men" (Floro & Meurs, 2009, p.4). Moreover, for a woman, there is always a conflict between earning income in labor market and attending to housework (Pradhan et al., 2014). This argument is strengthened by a study by Vella (1994), which shows that women have shorter spells of labor market presence due to the household responsibilities, which also influence their human capital investment decisions. Further, Neumark and Postlewhite (1995) find that family background influences married women`s LFP decision, hence their work-participation is dependent their unearned[14] income in the household. In yet another study, Heckman (1974) observes a strong effect of young children (especially children under six years) on their mother's labor supply.

Labor force participation decision comprises of two main labor supply decisions: 'participation decision' (decision to participate in the labor market or not) and 'hours-of-work' decision (how many labor-hours to supply) ("Labor Supply", n.d.). The 'hours-of-work decision' is less focussed in the literature pertaining to female labor supply in India (Klasen & Pieters, 2012). Bardhan's work (1979) was one of the first attempts to estimate labor supply function for poor agrarian households. The author suggests a positive relation between wage rate and labor days supplied by agricultural household as opposed to a horizontal labor supply curve often asserted in development literature. "Killingsworth (1983) divided the empirical studies of labor supply into first generation studies (FGS) and second generation studies (SGS). FGS (1930s to 1970s) used ordinary least squares (OLS) for labor supply estimation, assuming that the error term is randomly distributed" (as cited in El-Hamidi, 2003, p.8). FGS did not consider the sample selection problem owing to unobserved heterogeneity, which lead to the need for SGS. SGS recognised that many

[14] Total household income excluding women`s own earnings.

observations supply zero labor hours in labor supply estimation models, which needs to be accounted for (ibid). In this context, Wales and Woodland (1980) and Vella (1998) explain labor supply estimation methods when the sample consists of individuals who do not participate in workforce (their wages are observed to be zero).

3.2.2. Female Labor Force Participation: The U-shaped Hypothesis

Kelkar (2013) explains the education and income effect on WPR of rural women. When rural women who are engaged in higher education are not available for work, it is termed as an 'education effect'. Further, when rural households no longer require women to seek employment due to higher wage levels, it is termed as an 'income effect'. Both these effects could explain the reason for exit of women from the workforce.

Klasen and Pieters (2012) observe that there are various factors that contribute to the 'feminization U-curve' (as explained in section 1.2.1) hypothesised by Goldin (1995). These include social norms, household responsibilities, expected market wage, unearned income and household size. Further, Das and Desai (2003) explaining the U-curve of female WPR with respect to education attainment argue that the negative relationship of women`s WPR and their education attainment upto secondary education suggests that with increasing education standards, they are more likely to be married to economically well-off and educated men, which reduces their need to work. Further, the paucity of skilled jobs preferred by educated women discourages them to enter workforce. Whereas, after reaching a threshold level of education, the positive relationship of WPR and their education attainment indicates the availability of well-paid regular jobs. In India, the U-shaped hypothesis of FLFP holds true with respect to women`s education attainment but not with respect to income, according to the existing studies (Rao et al., 2010; Bhalla & Kaur, 2011). The income and work participation relationship doesn't show the typical U-shape for women in India, instead shows a negative relationship. Hence, this chapter re-investigates the income and education effect on WPR of rural women, to test the U-shaped hypothesis of women`s work participation, using IHDS data.

3.2.3. Entry and Exit Decisions of Women in the Labor market

This section discusses the various factors affecting the entry and exit decision of women in labor force. Sudarshan and Bhattacharya (2009) in their study claim that factors like domestic duties, care work, mobility and safety of women govern women`s entry and withdrawal from the labor force. Women's re-entry into labor force depends majorly upon the opportunity cost of attending to domestic duties and the earning capacity of other household members (ibid). The employment insecurity of other household members may influence their entry/exit decisions in labor market. Further, the 'added-worker[15]' hypothesis can be seen as an explanation for entry of women into labor force. However, since job opportunities among women are limited, the 'added-worker' effect by women may not be much (Chaudhary & Verick, 2014).

Further, Jeon (2007) observes that entry and exit are more prominent among young women. Childbirth triggers withdrawal from labor force, while divorce and reduction in household income triggers labor force entry among women. Husband's wage and unearned income were other determinants of their entry and exit in workforce (ibid). Further, various studies show that childcare and childbearing causes negative effect on FLFP (Nakamura & Nakamura, 1992; Chun & Oh, 2002; Francesconi, 2002). The work-participation preference by mothers is revealed by the changes in their work-patterns around the time of child-birth. Women who re-enter workforce after child-birth tend to be steady workers (Shapiro & Mott, 1994). Further, Gutierrez-Domenech (2005) find that women`s own level of education is a crucial factor so as to continue in the labor market, after childbirth. However, Bhalla and Kaur (2011) find that husband`s level of education attainment negatively affect FLFP.

3.2.4. Inter-Temporal Labor Supply of Women

In this section, studies affecting the changes in labor supplied by women have been reviewed. Eckstein and Lifshitz (2011) find that the rise in education levels and rise in wages account for half of the changes in labor supply. Further, Mizala et.al (1999) observe

[15] With the loss of job (or unemployment) among men, women increase their work-participation to recompense for the fall in family income.

that with a rise in women`s own wages, their labor supply increases, whereas, with a rise in their non-wage income, their labor supply falls. Further, Islam (2007) finds that hours worked were negatively related to fertility.

Changes in female labor supplied may be also influenced by changes in household income level. Dessing (2002) shows that the joint labor supply (sum of the labor of primary and secondary workers) decisions of a household can explain distress-induced 'feminization of work'. In a household, the primary worker is expected to be the 'bread-winner' who earns income for the entire family. The changes in labor supplied by 'secondary' workers may induce variation in total household labor supply. Secondary workers could include married women, children and elders whose labor supply is 'supplemental' (Abraham, 2009; Nakamura & Murayama, 2010).

Inter-temporal labor supply decisions are characterized by unobserved heterogeneity. Heckman (1978, p.36) suggests that "lagged participation might serve as a good proxy for the effect of heterogeneity. In Heckman's terminology lagged participation refers to whether or not a person worked for pay or profit in the previous year". Hence, it becomes important to include the lagged participation while investigating the factors influencing the changes in labor supplied by women.

3. 3. Data Source and Methodology

3.3.1. Data Sources

(i) For analyzing the socio-economic factors affecting rural women`s labor supply in 2012, panel data of IHDS (2005-2012) has been used to enable the inclusion of more explanatory variables that show the impact of base year variables(2005) or impact of changes in socio-economic variables overtime on rural women`s labor supply in 2012.

(ii) IHDS panel data set (at individual level) to analyze the determinants of entry, exit and continuity of rural women in workforce during 2005-2012.

(iii) Various rounds of NSS (EUS) to analyze the trends in work-participation of rural women since 1990s.

3.3.2. Methodology

3.3.2.1. Determinants of rural women`s labor supply

Vella and Verbeek`s (1999) two step method (as explained in section 2.3.1) has been used to analyze the factors influencing rural women`s labor supply in 2012, using IHDS panel data. In the first stage, IMR are derived by two Probit regression (one on individual panel attrition and another on decision of women to participate in workforce in 2012), which are used as additional explanatory variables in the second stage regression. An OLS regression is run with dependent variable as the log of hours worked by rural women in 2012, in the second stage.

The independent variables were as follows:

(i) **Hourly market wage (rural women`s own wage) in 2012:** It is assumed a-priori that as own wages of rural women rise, they supply more labor hours. Thus, labor supply has an upward sloping curve.

(ii) **Square of hourly wage in 2012:** This variable captures the non-linearity of wages with respect to the labor hours supplied.

(iii) **Marital status of rural women in 2012** is a categorical variable with reference category as married. The other categories are unmarried; and divorced/separated/widowed rural women. It is assumed a-priori that as compared to married rural women, unmarried rural women supply more labor hours as they don`t have additional burden of household responsibility.

(iv) **Number of children (below 15 years) in the household in 2012:** It is assumed a-priori that as the number of children increase, rural women supply lesser labor hours.

(v) **Number of lagged labor hours (2005)**: Log of labor hours supplied by rural women in 2005 is taken as a continuous variable. It is assumed that higher the labor hours supplied by rural women in the previous round (2005), higher were the labor

hours supplied in 2012. This variable is included to counter the effect of heterogeneity owing to state dependence in panel data analysis (as explained in section 2.3.6)

(vi) Earning members in the household in 2012: It is assumed a-priori that as the earning members in the household increase, rural women supply lesser labor hours.

(vii) Age 2012: It is assumed a-priori that as the age of the rural women increases, they were likely to supply more labor hours in the short run.

(viii) Age squared 2012: It is included in the regression to capture long run effect of age.

(ix) Work type in 2012: It is a categorical variable with farm work as the reference group. Non-farm wage work, salaried and own non-farm business as other categories. It is assumed a-priori that rural women engaged in farm work supply more labor hours as compared to other categories of work.

(x) Income quintile 2012: It is taken as a categorical variable with lowest (poorest) income quintile as the reference category. The other categories are second, middle, fourth and highest (richest) income quintile. It is assumed that rural women from lower income quintile supply more labor hours.

(xi) Change in income quintile is a categorical variable. Rural women who remain in the lower[16] income quintile in both rounds is taken as the reference category. Other categories are those who belong to higher[17] income quintile in both rounds, those who remain in middle quintile in both rounds, those who shifted from lower to middle quintile; and those who shifted from middle to higher quintile. With rise in education attainment, labor hours supplied by rural women conforms to the U-shaped hypothesis.

[16] Lower income quintile includes lowest and second income quintiles.

[17] Higher income quintile includes fourth and highest income quintiles.

(xii) **Socio-religious group in 2012**: It is a categorical variable with forward caste as reference category. The other categories are OBC, Adivasi, and Christian/Jain/Sikh. It is assumed a-priori that the backward caste supply more labor hours as compared to forward caste.

(xiii) **Education attainment level of rural women in 2012**: It is a categorical variable with reference group as rural women who are illiterate. Other categories are primary, middle, secondary, higher secondary; and graduation and above. It is assumed that illiterate rural women supply lesser labor hours.

(xiv) **Changes in education attainment[18] :** This variable is a categorical variable with reference group as rural women who 'remain illiterate' during 2005-2012 period. Other categories are those who remain up to middle level educated in both rounds; who remain secondary level educated; who remain graduate and above; who shift from illiterate to middle level educated; who shift from middle to secondary level educated; and who shift from secondary to graduate. It is assumed that rural women who remain illiterate, supply more labor hours.

(xv) **State dummy:** State dummy has been used to control for the regional differences in labor hours supplied by rural women.

(xvi) **IMR:** IMRs derived from Probit regression (on attrition and workforce participation decision by women in 2012) is taken as additional explanatory variables in the second stage OLS regression on labor hours supplied by rural women.

(xvii) **Predicted values of dependent variable from Probit regression on decision to participate in workforce:** Lester and Fitzpatrick (2008, p.19) claim that there is "endogeneity (due to dynamics and/or state dependency) which can be controlled by including a polynomial of predicted values of the dependent variable" of the first

[18]Education attainment of rural women are classified as primary (1-5th standard), middle (5-9th standard, secondary (10-11thstd), higher secondary; graduation and above.

stage Probit regression (on women`s decision to participate in workforce in 2012), as explanatory variables in the second stage OLS regression.

(xviii) Area of residence in 2012: It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages. More developed village is taken as the reference category. It is assumed that rural women from less developed villages supply more labor hours.

(xix) Changes in poverty status of rural household: It is taken as a categorical variable**.** Reference category are rural households that remain BPL. Other categories are households which remain APL; those which enter poverty; and those which escape poverty. It is assumed that rural women from households that remain in poverty supply more labor hours as compared to those from other categories.

(xx) Change in household size: The difference between the number of members in the household over the two rounds has been taken to reflect the change in household size. Higher the increase in number of members in the household over time, lower are the labor hours supplied by rural women.

(xxi) Education level of husband in 2012: It is taken as a categorical variable with reference variable as illiterate. The other categories are primary, middle, secondary, higher secondary, graduate and post graduate. It is assumed that higher the education attainment of the spouse, higher were the labor hours supplied by rural women.

3.3.2.2. Income and Education effect

In the context of entry and exit decision of rural women in workforce, the income and education effect on rural women`s WPR are estimated using the two cross-sectional rounds of IHDS-I (2004-05) & IHDS-II (2011-12).

3.3.2.3. Entry and Exit Decision of Rural women in Workforce

Vella and Verbeek`s (1999) two step methodology (as explained in section 2.3.1) has been used to examine the determinants of entry and exit from workforce among rural women. At the first stage, two Probit regression were run to address the selection bias. First regression is run to counter bias due to panel attrition at the individual level and second, to counter the bias occurring due to the presence of women in the sample who supply zero labor hours in 2005. IMR derived from these regressions are included as explanatory variables in the second stage. In the second stage, two separate binary logistic regressions are run for entry and exit decisions of rural women in workforce, using IHDS panel data.

Sample and Variables used:

The targeted sample of rural women utilized is 15-65 age-group[19] in both the rounds of IHDS panel dataset in order to study rural women`s entry and exit decision.

a) **Regression 1** (ENTRY)**:** Dependent variable is a binary variable which takes the value 1, if the rural woman is found working in 2012 but was out of workforce in 2005. The variable takes the value 0, if the rural woman stays out of workforce in both rounds.

b) **Regression 2 (**EXIT)**:** Dependent variable is a binary variable which takes the value 1, if the rural woman participates in workforce in 2005 but is out of workforce in 2012. The variable takes the value 0, if the rural woman remains in workforce in both rounds.

Explanatory variables are same for rural women`s workforce ENTRY and EXIT regressions which are as follows:

[19]This age-group is chosen inorder to include fresh entrants (above 15 years) in workforce in 2012 and exclude those who have crossed the age of 65 years.

(i) **Real[20] daily wage (women`s own wage):** Daily wages of rural women in 2012 have been used for entry regression and 2005 daily wages have been used for exit regressions. As market wages of the rural woman rise, it is expected to cause an entry among them, acting as an incentive to join workforce.

(ii) **Square of daily wages:** It is included to capture the non-linearity of wages with respect to entry and exit decision of rural women in workforce.

(iii) **Number of earning members in the household (2005):** It is assumed that higher the number of earning members in the household, lower is the probability for rural women to enter and higher is the probability to exit. The 2005 variable is used for both entry and exit regression.

(iv) **Change in household size:** The difference between the number of members in the household over the two rounds has been taken to reflect the change in household size. Higher the increase in number of members in the household over time, higher is the likelihood of exit and lower is the likelihood of entry of rural women into the workforce owing to increase in household responsibilities for women.

(v) **Change in income quintile** is a categorical variable. Rural women who remain in the lower[21] income quintile in both rounds is taken as the reference category. Other categories are those who belong to the higher[22] income quintile in both rounds, who remain in middle quintile in both rounds, who shifted from lower to middle quintile and who shifted from middle to higher quintile. It is assumed

[20] Nominal wages of year 2005 have been inflated using deflator for converting 2012 prices (CPI based, monthly adjusted). "Deflator is a variable that is used to adjust for price changes over time across different states. Deflator for rural areas is based on CPI for Agricultural Wage Labour and deflator for urban areas is based on CPI for Industrial Workers" ("India Human Development Survey", n.d.).

[21] Lower income quintile includes lowest and second income quintiles.

[22] Higher income quintile includes fourth and highest income quintiles.

that rural women who remain in lower income quintile in both rounds, are less likely to exit from workforce.

(vi) **Change in unearned[23] income** is taken as a continuous variable. It is the difference between unearned income of rural women over the two rounds (2005 prices have been inflated with CPI based deflator for 2012 prices). It is assumed that higher the increase in unearned income over the two rounds, higher is the likelihood to exit work force and lesser is the likelihood to enter workforce.

(vii) **Changes in number of (women`s own) children in the household (below 10 years)** It is taken as the difference between the number of children in the household, over the two rounds. It is assumed that higher the increase in the number of children in the household, higher is the probability for rural women to exit and lower is the probability to enter workforce.

(viii) **Age 2005** is included to capture short run effect of age of the rural women. It is assumed that higher the age of the rural women, higher is the probability to enter in the short run. The 2005 variable is taken for both entry and exit regressions.

(ix) **Age squared 2005** is included to capture long run effect of age of rural women on their entry and exit decisions in workforce.

(x) **Change in marital status** is a categorical variable with rural women who 'remain single' over the two rounds as the reference group. Other categories of this variable are those who remain married; whose marital status changed from 'single' to 'married'; and 'married' to 'single' overtime. It is assumed that rural women who witness a change in their marital status from 'single' to 'married' were more likely to exit.

(xi) **Work type** is a categorical variable. Work type categories of 2005 are used for exit regression and work type categories of 2012 are used for entry regression

[23] Unearned income is the non-labor income of women, i.e., total household income after deducting women`s own earnings

for rural women. The work type variable is a categorical variable with farm[24] work as the reference group. The other categories are salaried work, non-farm wage work and own (non-farm) business, for both the regressions. It is assumed that rural women were less likely to exit from farm work as majority are dependent on farm jobs for their living.

(xii) **Socio-Religious group of 2005:** This variable is a categorical variable with rural women from forward caste as the reference category. The other categories are OBC, Adivasi, Dalit, Muslim, and Christian/Jain/Sikh. It is assumed that the backward caste were less likely to exit and more likely to enter workforce. Socio-religious group of 2005 has been used for both entry and exit regressions.

(xiii) **Changes in education attainment[25] :** This variable is a categorical variable with reference group as rural women who 'remain illiterate' during 2005-2012 period. Other categories are those who remain up to middle level educated in both rounds; who remain secondary level educated; who remain graduate and above; who shift from illiterate to middle level educated; who shift from middle to secondary level educated; who shift from secondary to graduate. It is assumed that there is a high probability of entry for those who remain illiterate.

(xiv) **State dummy:** State dummy have been used to control for the regional differences in entry and exit rates of rural women.

(xv) **Family type (2005):** It is taken as a categorical variable with reference category as 'single' women. The other categories are couple, nuclear, joint family (without siblings); and joint family (with siblings). It is assumed that single women are more likely to enter workforce as they are devoid of any household responsibilities.

[24] Farm work includes own (family) farm work, agriculture wage work and animal care.

[25]Education attainment of rural women are classified as primary (1-5th standard), middle (5-9th standard, secondary (10-11thstd), higher secondary; graduation and above.

(xvi) **Highest education attainment in the family in 2005:** It is taken as a categorical variable. The reference category is taken as 'illiterate household', i.e., all members are illiterate. It is assumed that higher the maximum education attainment in the household, higher is the likelihood of rural woman to enter workforce and lesser is the likelihood to exit from workforce.

(xvii) **Inverse Mills Ratio:** It is a continuous variable which is included as an additional explanatory variable to correct for selection bias arising out of panel attrition and work participation decision by women in 2005 (as explained in section 2.3.1).

(xviii) **Changes in poverty status of rural household:** It is taken as a categorical variable**.** Reference category are rural households that remain BPL. Other categories are households which remain APL; those which enter poverty; and those which escape poverty. It is assumed that rural women from households that remain in poverty were least likely to exit from workforce.

(xix) **Income quintile (2005):** It is taken as a categorical variable with lowest (poorest) income quintile as the reference category. The other categories are second, middle, fourth and highest (richest) income quintile. It is assumed that rural women from lower income quintiles supply were less likely to exit.

(xx) **Education attainment level of rural women (2005)**: It is a categorical variable with reference group as rural women who are illiterate. Other categories are primary, middle, secondary, higher secondary and graduation and above. It is assumed that illiterate rural women have lesser probability to exit.

(xxi) **Area of residence (2005) :** It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages. More developed village is taken as the reference category. It is assumed that rural women from less developed villages are less likely to exit from workforce.

3.3.2.4. Inter-Temporal Labor Supply of Rural Women

In this section, Random effect Tobit model has been used to analyze the changes in labor supplied by rural women overtime who remain in workforce in both the rounds, using IHDS panel data. To investigate the determinants of dynamic labor supply of rural women the following variables were used. Dependent variable is change in log of labor hours supplied by rural women which is a continuous variable. Tobit model takes into account the selection bias, as the total sample also includes those women who were supplying zero hours. Apart from socio-religious group and the number of infants in 2005, all other independent variables change over time. Hence, this model estimates the change in labor supplied over time due to change in independent variables overtime, which explains the suitability of applying a Random effect model here.

Explanatory Variables:

(i) **Real[26](women`s own) hourly wage**: It is assumed that as own wages of rural women rise overtime, labor hours supplied also rise, thus upholding the classical labor supply theory.

(ii) **Square of hourly wages of rural women**: It is included to capture the non-linearity of wages with respect to the changes in labor hours supplied by rural women.

(iii) **Number of infants in the household in 2005**: It is assumed that with increase in the number of infants in the household in 2005, labor hours supplied by the women decreases overtime.

(iv) **Number of earning members in the household:** It is assumed that higher the increase in number of earning members in the household over the years, lower are the labor hours supplied by women of the rural household.

[26] Nominal wages of year 2005 have been inflated using deflator for converting 2012 prices (CPI based, monthly adjusted).

(v) **Age**: It is assumed that in the short run, higher the age of the rural women, higher is the increase in the labor hours supplied.

(vi) **Age squared:** It is included to capture the non-linearity of age with respect to labor hours supplied by rural women.

(vii) **Marital status (Reference: married):** It is taken as a categorical variable. The reference category is taken as those who 'remain married' overtime. The other categories are unmarried, widowed and divorced. It is assumed that married rural women decrease their labor hours overtime as compared to those who remain unmarried.

(viii) **Socio-religious group** is a categorical variable with Forward caste as the reference category. The other categories are OBC, Dalit, Adivasi, Muslims and Christians/Sikhs/Jains. It is assumed that rural women belonging to backward caste increase their labor hours overtime as compared to Forward caste.

(ix) **Type of work** is a categorical variable with own (family) farm work as the reference category. Other categories are agriculture wage labor, non-agriculture wage work, salaried work and own (family) non-farm business. It is assumed that the rural women engaged in farm work increase their labor hours overtime.

(x) **Education attainment of rural women** is taken as a categorical variable with 'illiterate' as the reference category. The other categories are primary, middle, secondary, higher secondary; graduate and above. It is assumed that illiterate rural women increase their labor hours overtime as compared to other categories.

(xi) **Number of lagged[27] labor hours**: The log of hours worked by rural women in 2005 is taken as a continuous variable. It is assumed that higher the labor hours by rural women in the previous round (2005), higher are the labor hours supplied by them in 2012 (owing to state dependency in panel data).

[27] Lagged labor hours are the labor hours supplied by rural women in 2005.

(xii) **Income quintile:** It is taken as a categorical variable with lowest (poorest) income quintile as the reference category. The other categories are second, middle, fourth and highest (richest) income quintile. It is assumed that rural women from lower income quintiles increase their labor hours overtime.

3.4. Results and Discussion

3.4.1. Trends in Labor Force Participation in India since 1990s : Cross-section view

The different rounds of NSSO (EUS) reveal that the gender gap (male-female) with respect to WPR has been increasing over time with urban gender gap more than rural gender gap but both rural as well as urban gender-gap of work participation is rising since 1990s. Further, Table A.3.1a & Table A.3.1b depicts the regional and gender disparities in WPRs overtime. It has been observed that since 1993, female WPR has fallen consistently, with year 2004 being the only exception. As can be observed from these tables, the fall is particularly more prominent among rural females (ibid). At the same time, rural men`s WPR hasn't fallen much and their WPR turns out to be much higher than rural women since 1990s. According to the Census estimates (Table A.3.1c) as well, WPR for rural women has declined from 2001 to 2011 period. Similarly, the LFPR is falling consistently for rural females over the years (Table A.3.2) using NSS data. Among the major states, Haryana and Bihar, show a drastic fall in rural women`s WPR as compared to rest of the Indian states, during the period 2005-2012. Among the Union territories, Daman and Diu; Dadra and Nagar Haveli and among the North East, Nagaland show a fall in WPR during the same period (Table A.3.3).

3.4.2. Trend in Rural Women`s WPR: Cross-sectional and Panel Data view

At the cross section level, IHDS and NSS show a falling trend with respect to WPR of rural women during 2005-2012 (Table 3.1). However, the WPR among rural women show a

marginal increase during 2005-2012 period at the IHDS panel level, in contrast to the entire debate on the falling FLFP (ibid). These differences in panel data and cross section trends within IHDS could be due to the nature of the IHDS dataset. "The sample for IHDS-I consists of 41,554 households located in 33 states and union territories of India. In IHDS-II, each of these household (as well as any split households) were re-interviewed with a re-contact rate of 84 per cent" ("India Human Development Survey", n.d.). Due to attrition the total sample of rural women has fallen in 2012. Therefore, an increase is observed in rural women`s WPR over time, using IHDS panel data, which tracks the same individual overtime. Further, the differences in WPRs across the two surveys could be due to the differences in nature of data and also due to the difference in definition of work utilized in NSS and IHDS. The NSS based WPR are estimated using the 'Usual status[28]' measure of employment, whereas IHDS uses a definition similar to Usual status which includes all those who worked for more than 30 days (240 hours). Unlike NSS definition, IHDS considers even taking care of animals as work.

3.4.3. Income and Education Effect on Rural women`s WPR

In the context of declining FLFP debate, the role of income and education effect act as important factors in influencing their entry and exit decisions in labor market. To assess the education and income effect on WPR of rural women, the working age group of 15-65 years has been taken for this analysis. Further, two cross-section rounds of IHDS i.e., IHDS-I (2004-05) and IHDS-II (2011-12) have been utilized for the same.

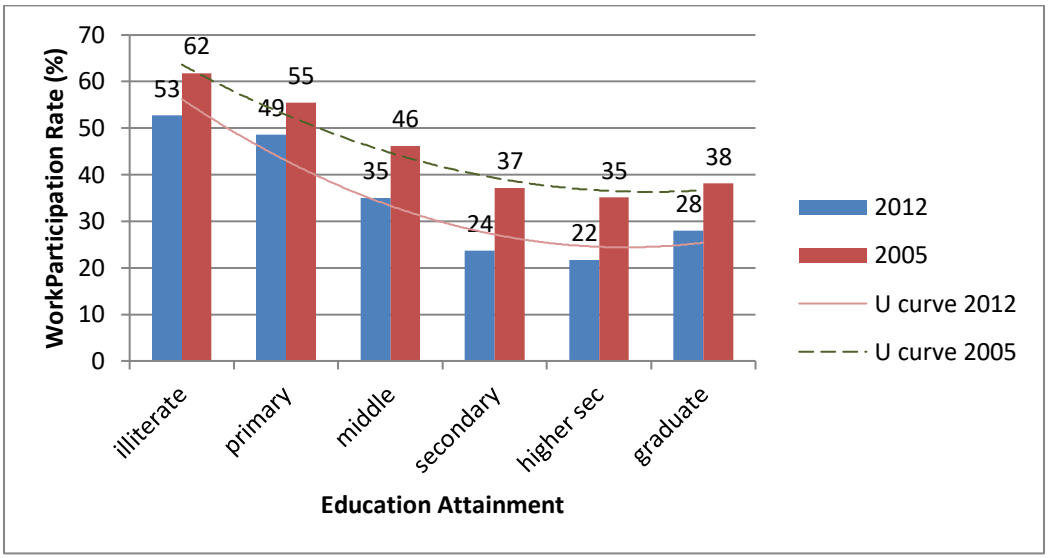
3.4.3.1. Education Effect on WPR of Rural Women

The education effect on WPR of rural women (Figure 3.1 & Table 3.1) can be explained as follows. In both the rounds, a U-shaped curve of WPR with respect to education attainment emerges for rural women, supporting the U-shaped hypothesis. The high

[28] "The usual status, determined on the basis of the usual principal activity (UPS) and usual subsidiary (USS) economic activity of a person taken together, i.e., those who perform some work activity either in the principal status or in the subsidiary status. Thus, a person who is not a worker in the usual principal status is also considered as a worker according to the usual status (ps+ss), if the person pursues some subsidiary economic activity for 30 days or more, during 365 days preceding the date of survey" (NSS 61st round, EUS report).

participation by illiterate rural women is out of sheer financial compulsion. As the level of education rises, their work-participation declines up-to a threshold level of education (higher secondary education) and thereafter WPR rises again, with higher levels of education. The decline in WPR of rural women could be due to the rise in household income, pursuit for higher education among rural women and availability of jobs for men (as compared to women). The increase in WPR at higher level of education could be due to the rise in economic status which enables women to join workforce as their traditional 'care responsibilities' of women tend to be taken care of. Also, the availability of better job opportunities with better pay at higher level of education, provides them an incentive to join workforce. The NSS data also depicts a similar trend with respect to education attainment and WPR of rural women in India (Table 3.1).

Figure 3.1. Education-wise WPR of rural women workers in 2005 and 2012



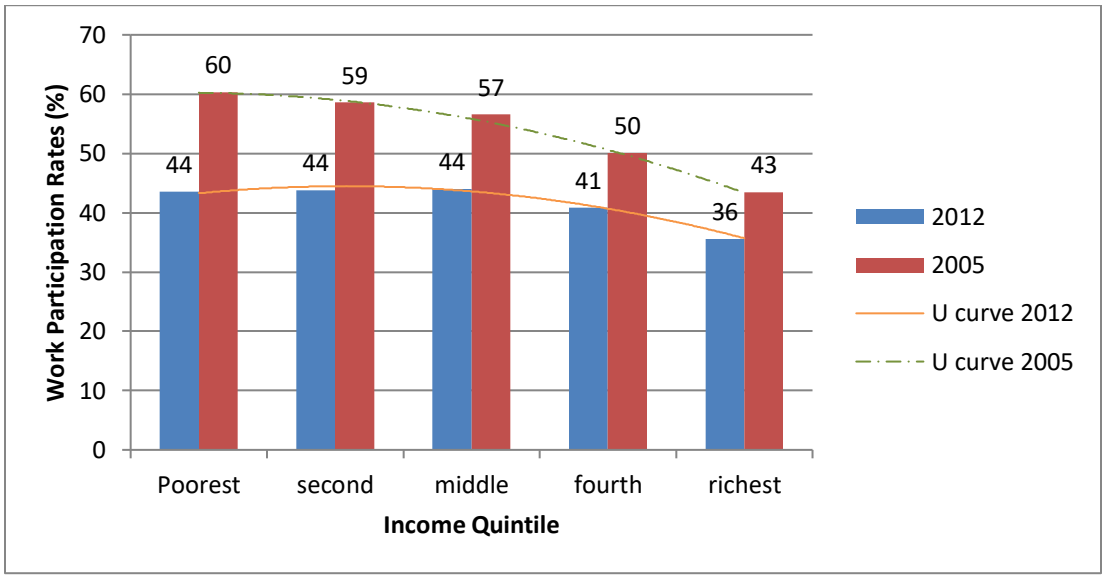
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

3.4.3.2. Income Effect on WPR of Rural women

For the income effect analysis, the total 'household income' information has been used from the IHDS data unlike the previous studies which use 'consumption expenditure' variable. The income effect on WPR of rural women using the two cross-section rounds of

IHDS can be explained as follows (Figure 3.2 & Table 3.1). It was observed that in the year 2005, as income quintile rises, the WPR of rural women falls. Whereas, in the year 2012, WPR of rural women rises up to middle income quintile, then falls. Thus, an inverted U-shaped pattern emerges with respect to the income effect on workforce participation for rural women which is similar to results of other studies in India (Rao et al., 2010; Bhalla & Kaur, 2011). As the household income level rises, it reduces the pressure for female members of the family to participate in workforce. The NSS data also depict a similar trend with respect to consumption expenditure and WPR relationship (Table 3.1) for rural women in India. Hence, U-shaped hypothesis doesn't hold true with regard to income and WPR relationship for rural women in India.

Figure 3.2. Income-wise WPR of rural women workers in 2005 and 2012



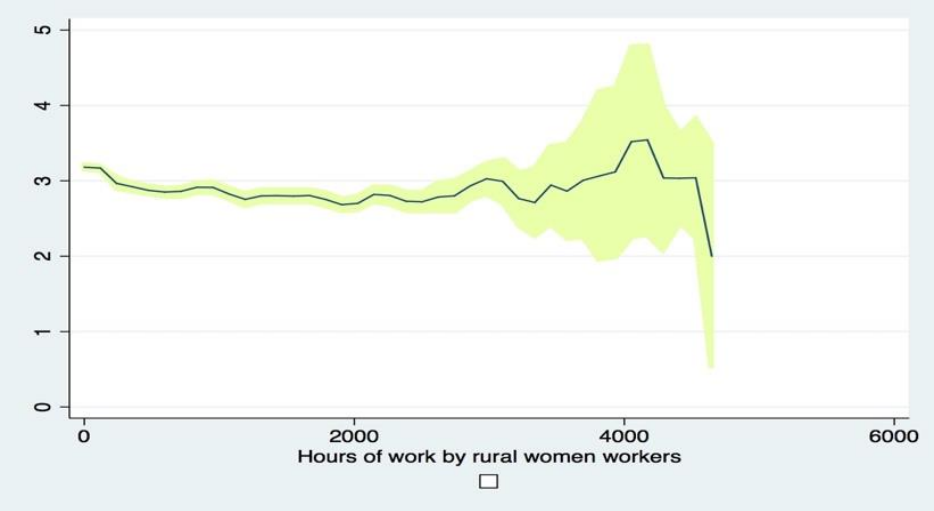
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

3.4.4. Determinants of Rural Women`s Labor Supply

The distribution of labor hours supplied by rural women exhibits a flattened U-curve upto a threshold level and falls thereafter, revealing that there are very few rural women supplying high labor hours (Figure 3.3a). With respect to age, the distribution of labor

hours supplied by rural women depicts an inverted U-shaped supply curve (Figure 3.3b). As age of the rural women increase, the labor hours also increase, but in the long run, labor hours supplied by rural women fall with rise in their age.

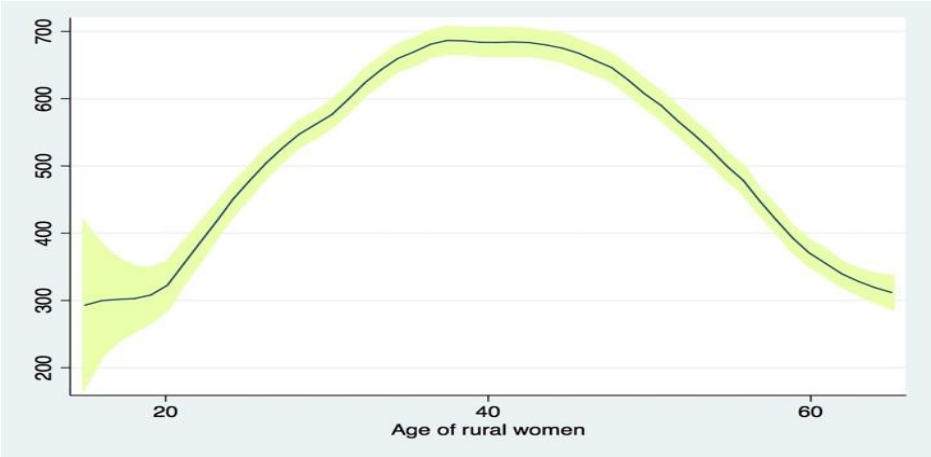
Figure 3.3.a. Distribution (polynomial smoothened)of rural women`s labor hours supplied in 2012



Source: IHDS-II (2011-12)

Note: Rural women sample in the age-group 15-65 years have been utilised

Figure 3.3b. Distribution(polynomial smoothened) of rural women`s labor hours supplied in 2012 across age



Source: IHDS-II (2011-12)

Note: Rural women sample in the age-group 15-65 years have been utilised

Vella and Verbeek`s (1999) methodology (as explained in section 2.3.1) has been utilized to analyze the factors affecting aggregate labor supply of rural women in 2012, using IHDS panel data. In the first stage, two Probit regression are run. One on workforce participation decision (Table 3.1a) by women in 2012 and another on individual attrition (Table A.3.7). IMR correcting for the selection bias from these two regressions and the polynomial of predicted values of dependent variable of the workforce participation decision regression are used as additional explanatory variables in the second stage. At the second stage, an OLS regression is run on labor hours supplied by rural women in 2012 (Table 3.1b). Type of work done in 2012 and income quintile of 2005 turn out to be important determinants of labor hours supplied by rural women in 2012.

Rural women`s own hourly wage rate shows a positive relationship with respect to the labor hours supplied by rural women. However, the wage coefficients have lower values with respect to having an impact on labor supply. Higher their hourly market wage rate, higher were the labor hours supplied by them, thus producing an upward sloping labor supply curve and upholding the classical theory of labor supply. Rural women who shifted from middle to higher income quintile supplied more labor hours in 2012. The income

coefficients have larger impact on labor supply. This indicates the higher availability of job opportunities for rural women from higher income quintiles as higher household income enables better standard of living and better education. However, higher the number of earning members in the household, lower are the labor hours supplied by rural women.

Further, using IHDS panel data, it has been observed that higher the labor supplied in the previous round, higher was the labor supply by rural women in 2012, reflecting the significance of accounting for 'state dependence' in panel data models (as explained in section 2.3.6). Previous period labor market activity of rural women significantly influences current year`s labor market performance. With respect to the type of work, rural women engaged in salaried work were observed to be supplying more labor hours. Although the WPR of rural women is highest in farm work, the labor hours supplied by salaried workers are more than farm workers. Further, with respect to the family background, higher the total number of children in the household, lower were the labor hours supplied by rural women, due to 'care' work. With respect to the socio-religious category, Dalits were found to be supplying more labor days as compared to forward caste.

Widowed and divorced rural women supply more labor hours as compared to the married rural women, as they are devoid of a stable household income to fall back upon. Further, married rural women with higher educated husbands were found to be supplying more hours of labor than rural women with illiterate husbands. With higher education, husbands may encourage their wives to work rather than attend to domestic duties. Moreover, educated men are more likely to be married to educated women, so it is profitable for both of them to work, as women fetch higher returns in labor market with higher levels of education. With respect to women`s own level of education attainment, labor supply of rural women rises consistently with rise in education standards, as job opportunities are more for the higher educated.

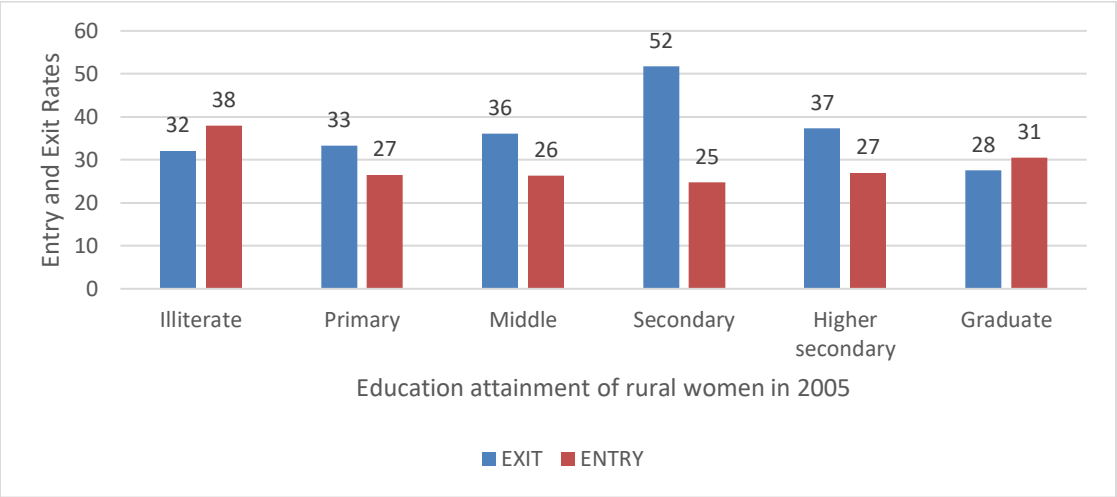
3.4.5. Entry and Exit Rates of Rural Women Workers

3.4.5.1. Entry and Exit Rates across Socio-Economic Variables

The following observations were made on the percentage distribution of rural women entering and exiting workforce using panel data of IHDS, across different socio-economic groups (Table 3.2a; Figure 3.4, 3.5, 3.6, 3.7 & 3.8). High entry rates were observed among rural women who were illiterate, Dalits; those in the 30-39 age-group; those from lowest income quintile; and married. On the other hand, high exit rates were found among rural women from age group 60-65 years; highest income quintile; higher secondary educated; Muslims; and unmarried. Further, state-wise analysis of entry and exit rates show that Punjab, Assam and Delhi had one of the highest exit rates whereas Rajasthan and Chattisgarh had one of the highest entry rates (Table 3.2b).

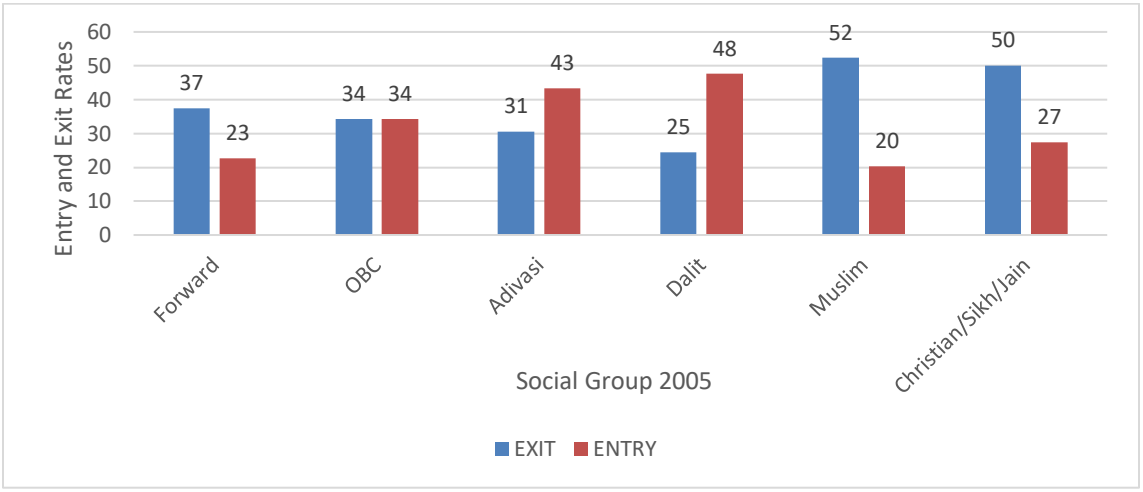
Age-group wise enrolment in educational institutes show that more women in the working-age group are enrolled in 2012 as compared to 2005 which partly explains the exit due to education effect on WPR (Table A.3.5.). Further, rural households that remain Below Poverty Line (BPL) in both rounds, were found to have a high proportion of rural women working in both rounds (Table A.3.4). Hence, clearly rural women whose participation is driven out of economic necessity mainly remain in workforce. Rural women who were out of workforce in both rounds were mostly from highest income quintile, Christian/Jain/Sikhs, primary educated and unmarried in 2005. Whereas, rural women who were found working in both the rounds were mostly from lowest income quintile, illiterate, backward caste (ibid).

Figure 3.4. Rural women`s Workforce Entry and Exit across Education level (2005)



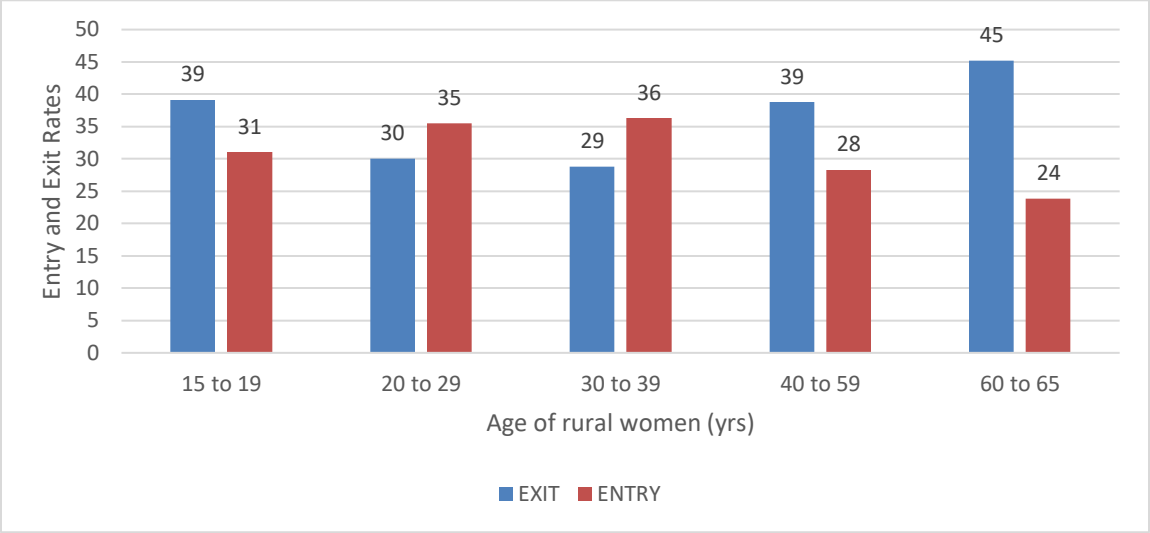
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Figure 3.5. Rural women`s Workforce Entry and Exit across Socio-religious Background (2005)



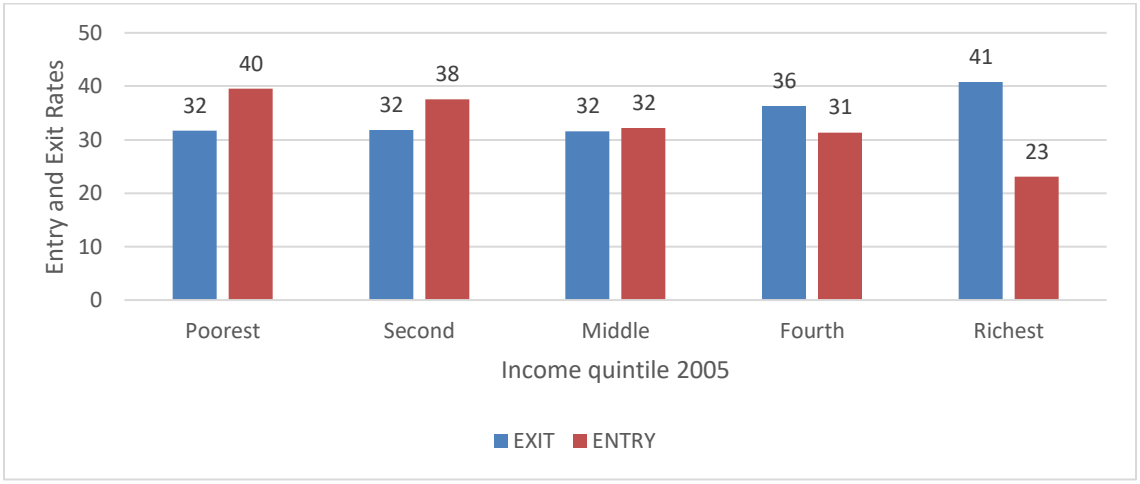
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Figure 3.6. Rural women`s Workforce Entry and Exit across Age-group (2005)



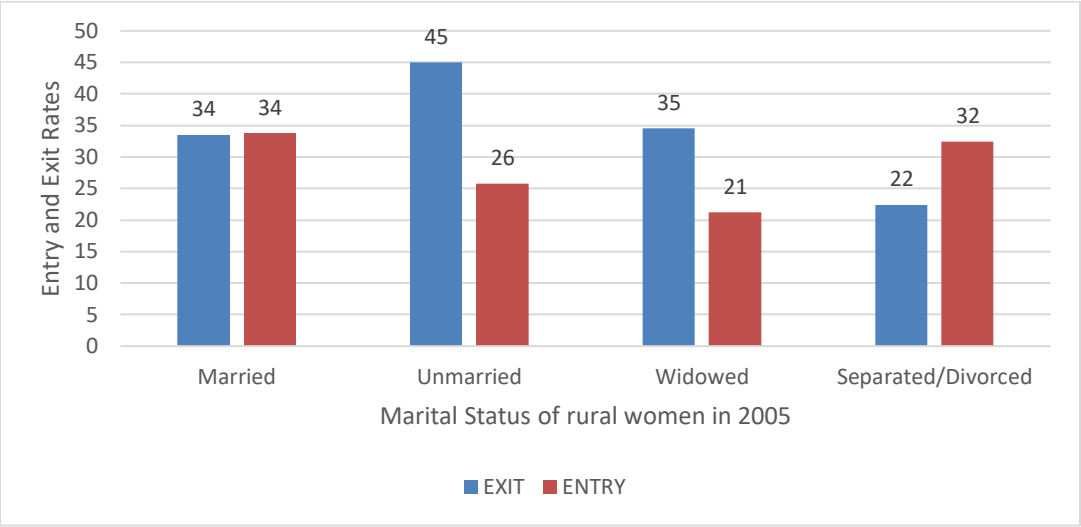
Source: Author`s own calculation from IHDS-I (2004-05) and IHDS-II (2011-12)

Figure 3.7. Rural women`s Workforce Entry and Exit across Household Income Quintile (2005)



Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Figure 3.8. Rural women`s Workforce Entry and Exit across Marital Status (2005)



Source: Author`s own calculation from IHDS-I (2004-05) and IHDS-II (2011-12)

3.4.5.2. Entry and Exit Decision of Rural Women in Workforce: Logistic Regression

At the first stage, two Probit regressions are run to derive IMR to be included as additional explanatory variables, correcting for selection bias due to attrition and bias due to the presence of women in the sample who supply zero labor hours in 2005 (Table A.3.6 & Table A.3.7). The binary logistic regression (Table 3.3), in the second stage, provides us with the average marginal probabilities of the socio-economic variables influencing the entry and exit of rural women in workforce. The following observations were made using IHDS panel data. It was observed that rural women engaged in non-farm (family) own business during 2005 were most likely to exit from workforce in 2012 as compared to farm work. This signals an income effect on WPR. They may have withdrawn either to attend to domestic duties or to pursue higher education. With regard to women`s (own) wages, in the long run, higher the wages, higher the probability of entry and lower the probability of exit. However, the marginal impact of wages on entry/exit decision of rural women is too low. Similarly, rural women who witnessed a rise in their unearned income overtime and

those who had higher number of earning members in the household in 2005 were more likely to exit, as the opportunity cost of attending to domestic duties becomes lesser.

With respect to changes in income level overtime, it was observed that rural women from households that remain in low income quintile; and from households that remain BPL in both rounds, were more likely to enter workforce. On the other hand, rural women who remain in higher income quintile in both rounds, were more likely to exit workforce. With respect to the changes in education attainment level, it was observed that rural women who remain illiterate were most likely to enter workforce. On the other hand, rural women whose education rose from middle to secondary where more likely to exit, clearly, due to the pursuit of higher education coupled with rise in income which allows them to quit workforce overtime to pursue higher education. The transition matrix with respect to income quintile and education attainment of rural women show that a mix of income effect and education effect are responsible for rural women who are found withdrawing overtime (Table A.3.8)

With respect to the family background, there was a higher likelihood to exit and lower likelihood to enter among rural women with an increase in their household size overtime. This reflects the role of family size and the influence of growing household responsibilities on female labor supply. Further, those rural women who witnessed an increase in number of children (women`s own children) in the household have shown a lower probability to enter workforce as women are traditionally assigned the 'care burden' of their respective household. It has been observed that rural women from couple-headed families were more likely to exit as compared to single women. The withdrawal among women from couple - headed might be due to child birth or child rearing. Thus, family plays a strong role in influencing women`s work participation decisions.

With regard to their socio-religious background, Muslim rural women were found to have the highest probability for exit from workforce. This could be due to an increase in household income, pursuit for higher education coupled with socio-cultural norms. Whereas, Adivasi rural women had highest probability for entry compared to those from the forward caste. Further, with respect to the change in marital status, rural women who

remain married in both rounds were more likely to enter, whereas, those who remain single in both rounds were more likely to exit from workforce. Married women may enter workforce out of financial compulsion, to supplement the household income. They may also enter if they find help to cater to the household responsibilities or when labor market returns look attractive. On the other hand, women who remain single over the two rounds, may be withdrawing due to rise in their household income or to pursue higher education.

3.4.6. Rural Women`s Inter-temporal Labor Supply

This section examines the socio-economic factors affecting the dynamic labor supply of rural women who remain in workforce over the two rounds of IHDS. Table 3.5a presents the percentage distribution of rural women based on their labor supplied across socio-economic categories. It shows that rural women who are illiterate and from lower income quintile supply the maximum proportion of labor hours but it has fallen overtime.

The results of Random effect Tobit regression (Table 3.5b) can be summarized as follows. Labor hours supplied by rural women in the current period is strongly influenced by previous year performance. Thus, the inclusion of `lagged' participation (participation by the individual in the past year) variable helps in countering the unobserved heterogeneity which is prevalent in inter-temporal labor supply decisions. Those rural women who supplied higher labor hours in 2005 were found to supply higher labor hours in 2012 too. Further, with respect to the type of work, rural women employed as salaried workers were found to increase their labor supply over time as compared to those who were engaged in family farm work. Due to the social security benefits and the return from salaried jobs, these jobs help women continue in workforce.

It has been observed that an increase in real hourly (own) wages of rural women lead to an increase in labor hours supplied. Thus, exhibiting positive elasticity of labor supply with respect to wages. Further, rural women who were illiterates, from the lowest income class, and from backward caste were found to increase their labor supply over time. With respect to family background, it was found that higher the number of infants in the family in year 2005, lower were the labor hours supplied by rural women. Divorced and widowed rural

women were found to be increasing their labor hours overtime as compared to married women.

3.5. Conclusion

This chapter investigates the determinants of inter-temporal labor supply of rural women during the 2005-2012 period. Changes in income and education level of rural women turn out to be important determinants of their entry and exit decisions in workforce. On the other hand, type of work and education level turn out to be important determinants of their continuity in workforce.

High probability of entry into workforce was observed among rural women who were Dalit, who remain illiterate, those from households that remain in low income quintile and who remain married in both the rounds. Whereas, high probability of exit from workforce was found among rural women who were Muslim, whose education rose from middle to secondary level, those engaged in non-farm own business, those from households that remain in highest income quintile; and who remain single in both rounds. Further, a lower probability of entry and a higher probability to exit from workforce was observed among rural women who witnessed a rise in their household size. Rural women with higher number of children were found to reduce their labor hours overtime and also had a lower probability to enter workforce due to their 'care' responsibilities. Further, high probability of exit was also found among rural women who witnessed a rise in unearned income and increase in number of earning members in the household. This may be due to a rise in household income which reduces their pressure to work. Thus, family background plays a strong role in influencing women`s decision to participate in work-force.

Rural women who were illiterate, from backward caste, widowed/divorced and those from lowest income quintiles were found to increase their labor hours overtime which indicate their vulnerability and the economic necessity to work. Thus, rural women's entry and exit from workforce depends majorly upon social norms, availability of job opportunities, type of work, labor market returns, socio-economic background and the opportunity cost of attending to domestic duties. Further, it was observed that an interplay of income effect, education effect and the socio-cultural norms seems to be the reason for the withdrawal

from workforce of rural women who were Muslim; who remain single over the two rounds; whose education rises from middle to secondary; and who remain in higher income quintile, overtime. Hence, with an overall rise in rural income, even if decent work is made available closer to their household realm, for some women, the socio-cultural norms restrict their paid work, once the household reaches a threshold level of income. This calls upon a social change with respect to the attitudes of family, community and women themselves. To enhance their economic participation and empowerment, they must be encouraged to get education, skill training; must be provided with the necessary institutional support to balance their family and as well as paid work.

The next chapter examines the occupational transition among rural women, in the phase of structural transformation and the determinants of their occupation choice, in the advent of public programs like MGNREGA.

Table 3.1. Rural women`s WPR* across socio-economic categories

Categories	CROSS –SECTION				PANEL	
	NSS		IHDS			
	NSS 68th round	NSS 61st Round	IHDS II	IHDS I	IHDS II	IHDS I
Overall WPR	24.84	32.70	28.52	38.39	32.63	30.15
Sample (Total Sample)**	34,206 (1,37,687)	63,679 (1,94,710)	19,378 (67,940)	27,047 (70,457)	15,916 (48,783)	14,706 (48,783)
WPR (age specific)	**WPR (15-65 years)**				**WPR(22 to 65 years)**	**WPR (15 to 65 years)**
	36.59	50.36	41.84	51.38	48.09	47.09
Sample (Total Sample)	33,972 (1,37,687)	62,477	18,594	25,904	14,338	14,042 (29,818)
	MPCE quintiles		**Income quintiles**			
Lowest	37.87	54.37	43.54	62.84	46.64	51.05
Second	34.39	52.97	43.79	60.45	48.92	52.31
Middle	36.33	49.86	44.01	59.06	49.7	48.26
Fourth	38.59	48.25	40.81	52.2	45.27	41.4
Highest	35.8	43.44	35.56	45.37	39.5	32.23
Education attainment						
Illiterate	44.99	58.57	52.73	65.96	50.57	51.92
Primary	36.93	46.14	48.6	57.05	48.56	47.28
Middle	27.71	34.93	35.05	46.6	39.92	36.32
Secondary	22.23	25.24	23.62	37.22	32.17	29.62
Higher Sec	17.58	39.38	21.66	35.08	34.25	32.03
Graduate and above	31.41	40.66	28.01	38.28	34.15	32.76

Notes: * WPR is based on usual status measure of employment which combines principal and subsidiary activities of rural women for NSS estimates.
** The figure denotes sample of working rural women and figure in the parenthesis denotes total sample of rural women in the reference year.
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table 3.1a. Probit Regression on rural women`s workforce participation decision in 2012

Independent variables	Coefficients
Age 2005	-0.04*
Age squared 2005	0.0004
Work status in 2005 (ref: not working)	1.47***
Square of daily wages 2012	0.0000002***
Daily wages 2012	-0.002***
work status of spouse 2005 (ref: not working)	0.725***
Change in number of earning members in hh	1.01***
State dummy	included
Maximum education attainment in hh 2005 (ref: illiterate)	
Below primary	0.08
primary	0.07
Secondary	0.17
Higher secondary	0.13
graduate	0.51*
Social group 2005 (Ref: forward caste)	
OBC	-0.35**
Dalit	-0.51***
Adivasi	-0.23
Muslim	-0.10
Christian, Sikh, Jain	-1.06***
Area of residence 2005 (ref: more developed village)	
Less developed village	-0.06

Independent variables	Coefficients
Change in education attainment (ref: remain poor)	
Remain upto middle	-0.11
Remain upto secondary	0.10
Remain graduate	0.37
Up to middle to secondary	0.001
Illiterate to middle	0.03
Marital status change (ref: remain single over the rounds)	
Remain married	0.16
Single to married	-0.63**
Married to single	0.14
Change in level of income quintile (ref: rural women who remain in lower income quintile)	
Remain in middle quintile	0.21
Remain in higher quintile	0.45***
Shift from Low to middle	0.08
Shift from middle to high	0.08
Number of obs	6467
Wald chi2(50)	426.03
Prob > chi2	0
Pseudo R2	0.36
Log pseudolikelihood	-708.85

Notes: Rural women in the age group 15-65 in IHDS-I & 15-65 in IHDS-II have been taken
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table 3.1b. Determinants of rural women`s labor supply (aggregate) in 2012: OLS regression

Explanatory variables↓[Dependent variable: Log of Hours of work supplied by rural women]	1 Coefficient	2 Coefficient	3 Coefficient	4 Coefficient
Age 2012	0.004	0.02***	0.02***	0.03***
Age squared 2012	-0.00002	-0.0003***	-0.0003***	-0.0004***
IMR (Probit employment equation)	-14.70***	-10.41***	-5.04**	
IMR (panel attrition at individual level)	0.01	-0.05**	-0.05**	
Log of hours supplied by rural women in 2005	0.09***			
Predicted values of being in workforce(Employment)	-15.41	-72.20***	-36.68***	
(Employment)^2	-41.73	121.88***	66.02***	
(Employment)^3	67.03	-110.22***	-63.07***	
(Employment)^4	-33.29	35.49***	21.62***	
No. of children in hh in 2012			-0.03***	
State	included			
Change in household size	-0.01*			
No. of earning members in the hh in 2012	-0.02*			
Hourly wage 2012		0.003*		
Square of hourly wage 2012		-0.000005		
Change in education level (ref: Rural women who remain illiterate over the two rounds)				
Remain up to middle	-0.01			
Remain up to secondary	0.07			
Secondary to graduate	0.07			
Remain graduate	0.24*			
Up to middle to secondary	0.05			
Illiterate to middle	0.05			
Change in level of income (Ref: Remain poor)				

Explanatory variables↓[Dependent variable: Log of Hours of work supplied by rural women]	1 Coefficient	2 Coefficient	3 Coefficient	4 Coefficient
Low to middle	0.10***			
remain middle	0.14***			
middle to high	0.17***			
remain high	0.14***			
Marital 2012(ref: married)				
Unmarried			-0.07	
Divorced/separated/widows			0.22***	
Income quintile 2012 (ref: Lowest)				
Second			0.22***	
Middle			0.34***	
Fourth			0.34***	
Richest			0.37***	
Education Attainment 2012 (Ref: Illiterate)				
Primary			0.10***	
Middle			0.06***	
Secondary			0.14***	
Higher secondary			0.37***	
Graduate			0.50***	
Husband`s education (Ref: illiterate)				
primary				-0.10***
Middle				-0.06***
Secondary				-0.05**
Higher sec				-0.05

Explanatory variables↓[Dependent variable: Log of Hours of work supplied by rural women]	1 Coefficient	2 Coefficient	3 Coefficient	4 Coefficient
Graduate				0.10***
Social group 2005 (Ref: forward caste)				
OBC				-0.05***
Dalit				0.04**
Adivasi				-0.01
Muslim				-0.14***
Christian, Sikh, Jain				0.02
Change in poverty status of the household (Remain Below Poverty Line)				
Remain in Above Poverty Line	0.05*			
Fall into poverty	0.04			
Escape out of poverty	0.0004			
Area of residence(Ref: more developed village)				
less developed village	0.03*			
Type of Work (ref : Farm Labor) 2012				
Non-farm work	-0.07**			
Salaried	0.45***			
Non-farm business	-0.21***			
Number of obs	3361	6191	6191	14220
Prob > F	0	0	0	0
R-squared	0.33	0.0379	0.1154	0.02

Note: ***p < 0.01, **p < 0.05, *p < 0.1
(i)Number of days worked by rural women has been capped at 365 days.
(ii) Hours per day worked by rural women has been capped at 8 hours.
Source: Author`s own calculation from IHDS-I(2004-05) & IHDS-II (2011-12)

Table 3.2a. Rural women`s Workforce Entry and Exit rates during 2011-12 across socio-economic variables

Socio-economic variables	EXIT	ENTRY
Change in income quintile	(Column percentages : within categories)	
Remain low income quintile	31.92	37.08
Remain in middle quintile	29.15	27.5
Remain in higher quintile	36.24	24.66
Shift from Low to middle	28.69	42.78
Shift from middle to high	30.65	34.19
Household income quintile 2005		
Poorest	31.66	39.51
Second	31.81	37.56
Middle	31.61	32.23
Fourth	36.29	31.32
Richest	40.75	23.06
Change in education attainment		
Remain illiterate	31.62	38.25
Remain up to middle	34.51	25.64
Remain up to secondary	48.18	23.52
Secondary to graduate	54.98	24.14
Remain graduate	24.55	32.1
Up to middle to secondary	44.37	26.52
Illiterate to middle	36.99	36.69
Education attainment 2005		
Illiterate	32.08	38
Primary	33.33	26.55

Socio-economic variables	**EXIT**	**ENTRY**
Middle	36.15	26.38
Secondary	51.8	24.73
Higher secondary	37.28	27.01
Graduate	27.55	30.53
Socio-Religious group		
Forward	37.36	22.62
OBC	34.28	34.19
Adivasi	30.61	43.43
Dalit	24.53	47.65
Muslim	52.37	20.24
Christian/Sikh/Jain	50.02	27.38
Age categories		
15 to 19	39.12	31.06
20 to 29	30.03	35.48
30 to 39	28.77	36.31
40 to 59	38.78	28.29
60 to 65	45.17	23.9
Marital Status		
Married	33.53	33.78
Unmarried	45.06	25.75
Widowed	34.51	21.19
Separated/Divorced	22.42	32.44
Category	Sample	Percentage
Entering workforce	5,046	16.64
Exiting workforce	4,704	15.52
Not working in both rounds	11,172	36.85
Working in both rounds	9393	30.99
Total	30,315	100

Notes: Rural women in the age group 15-65 in IHDS-I & 15-65 in IHDS-II have been taken
Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table 3.2b. State-wise Entry and Exit rates of rural women

States	EXIT	ENTRY
Jammu & Kashmir	63.36	23.91
Himachal Pradesh	30.73	47.28
Uttarakhand	20.72	48.55
Punjab	67.33	24.95
Haryana	46.28	31.88
Delhi	66.27	20.5
Uttar Pradesh	39.88	30.98
Bihar	55.18	26.07
Jharkhand	58.65	16.2
Rajasthan	21.17	55.72
Chhattisgarh	19.3	51.94
Madhya Pradesh	30.34	41.97
Northeast	51.67	29.75
Assam	67.09	13.86
West Bengal	46.8	19.34
Orissa	41	25.55
Gujarat	32.73	42.18
Maharashtra & Goa	24.2	46.91
Andhra Pradesh	22.01	44.62
Karnataka	25.91	44.55
Kerala	46.19	28.47
Tamil Nadu	28.3	45.97

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table 3.3. Logit regression on rural women`s workforce entry and exit decision during 2011-12

Independent Variables	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	3 Avg. Marginal Prob.
	ENTRY		EXIT		
Age2005	0.02***	-0.0003	-0.01	0.02***	-0.02***
Age squared2005	-0.0003***	-0.00001	0.0002**	-0.0001	0.0003***
Sum of workers in the HH 2005	-0.02***		0.01**		0.02***
Change in unearned income		-0.00000001		0.0000001**	
IMR (Employment decision of women in 2005)	0.04***	0.002	0.19***	0.42***	0.07
IMR (Panel attrition)	-0.02*	-0.010	-0.0004	-0.01	0.003
State	yes	no	yes		Yes
Change in household size	-0.005***		0.01***		0.004*
Change in number of own children(below 10) in household	-0.05**	0.002		-0.04*	
Daily wage rate 2005		-0.0001***			0.001***
Square of daily wage rate 2005		0.000000002**			-0.000001***
Area of residence (Ref: more developed village) 2005					
less developed village		-0.02**		-0.02*	
Family type (Ref: Single) 2005					
Couple	-0.03		0.15**		0.13**
Nuclear	0.05		0.06		0.07*
Joint (without siblings)	0.04		0.06		0.07*
Joint (whole family)	0.04		0.06		0.10**
Income quintile (Poorest) 2005					
2nd Quintile	-0.02		-0.002		

Independent Variables	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	3 Avg. Marginal Prob.
	ENTRY		EXIT		
Middle	-0.04***		0.02**		
4th quintile	-0.05***		0.03**		
Richest	-0.09***		0.05*		
Education attainment of rural women in 2005 (Ref: illiterate)					
Primary		-0.031		-0.01	
Middle		-0.005		0.02	
Secondary		0.041**		0.04	
Higher Secondary		0.021		-0.08**	
Graduate		0.042**		-0.13***	
Change in education level (ref: Rural women who remain illiterate over the two rounds)					
Remain up to middle	-0.08***		0.002		
Remain up to secondary	-0.12***		0.03		
Secondary to graduate	-0.10**		-0.02		
Remain graduate	0.01		-0.16***		
Up to middle to secondary	-0.11***		0.08**		
Illiterate to middle	-0.01		0.03*		
Highest Education Attainment in the household (Ref: illiterates) 2005					
Primary	-0.004		0.005		0.003
Middle	-0.071***		0.05***		0.05***
Secondary	-0.086***		0.08***		0.08***
Higher Secondary	-0.080***		0.08***		0.02
Graduate	-0.131***		0.14***		0.03

Independent Variables	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	3 Avg. Marginal Prob.
	ENTRY		EXIT		
Social group (ref: Forward caste) 2005					
OBC	0.04***	-0.02	0.01	0.0001	-0.02
Dalit[29]	0.09***	-0.03	-0.01	-0.03**	-0.02
Adivasi	0.18***	0.03*	-0.07***	-0.05**	-0.08***
Muslim	-0.09***	-0.02	0.11***	0.15***	0.07**
Christian/Jain/Sikh	-0.06**	-0.10*	0.08*	0.10**	-0.01
Type of Work (ref : Farm Labor)					
Non-farm work			0.01		
Salaried			0.03**		
Non-farm business			0.19**		
Marital status change (ref: remain single over the rounds)					
Remain married	0.10***		-0.02*		0.01
Single to married	0.01		0.11		0.11
Married to single	0.09***		-0.02		0.01
Change in level of income quintile(ref: rural women who remain in lower income quintile)					
Remain in middle quintile		0.002		0.01	
Remain in higher quintile		0.044***		0.03**	
Shift from Low to middle		0.033**		-0.02*	
Shift from middle to high		0.045**		-0.02	

[29] Robustness check shows Dalit rural women exhibit significant likelihood of entry into workforce(Author`s own estimation using IHDS panel data)

Independent Variables	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	1 Avg. Marginal Prob.	2 Avg. Marginal Prob.	3 Avg. Marginal Prob.
	ENTRY		EXIT		
Change in poverty status (Ref: BPL in both rounds)					
APL in both rounds	-0.06***			0.01	
Entry into poverty	-0.05**			0.01	
Exit from Poverty	-0.02			-0.01	
Number of obs	14573	2440	14310	10447	8044
Wald chi2(28)	1833.58	69.68	1620.44	705.4	743.12
Prob > chi2	0	0	0	0	0
Pseudo R2	0.12	0.06	0.11	0.07	0.10
Log pseudo-likelihood	-8251.99	-550.40	-7927.65	-6046.563	-4055.37

Notes: (i) Rural women in the age group 15-65 in IHDS-I (2004-05) & 15-65 in IHDS-II (2011-12) have been taken
(ii) (***)=p < 1%; (**)=p < 5%; (*)=p < 10%

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II (2011-12)

Table 3.4a. Percentage distribution (column percentages) of rural women across socio-economic variables by amount of labor supplied (in terms of annual labor hours)

Education	2012			2005		
	0 to 2000	**2000 to 4000**	**4000 to 6000**	**0 to 2000**	**2000 to 4000**	**4000 to 8000**
Illiterate	41.85	49.26	35	57.12	61.4	50
Primary	15.12	9.48	10	16.11	8.66	4.17
Middle	30.62	23.69	20	20.49	20.66	35.42
secondary	6.82	6.12	10	4.02	5.01	6.25
Higher secondary	4.11	5.68	25	1.53	2.3	2.08
Graduate	1.48	5.77	0	0.73	1.98	2.08
Total	100	100	100	100	100	100
Social Group						
Forward	19.11	19.1	30	18.51	21.37	24.49
OBC	35.77	32.63	20	36.32	38.74	42.86
Dalit	21.97	24.33	20	22.01	21.16	6.12
Adivasi	10.36	16.34	25	10.18	12.48	8.16
Muslim	10.33	5.73	5	10.28	4.47	12.24
Christian	2.45	1.88	0	2.7	1.77	6.12
Total	100	100	100	100	100	100
Income quintile						
Poorest	20.25	9.68	5	20.49	15.53	10.42
Second	20.13	18.21	0	21.32	21.04	10.42
Middle	21.26	23.03	45	20.04	24.01	20.83
Fourth	19.49	26.6	20	19.9	21.41	27.08
Richest	18.86	22.48	30	18.25	18.02	31.25
Total	100	100	100	100	100	100

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table 3.4b. Factors affecting the changes in labor hours supplied by rural women during 2005-2012: Random Effect Tobit regression

Independent Variables	1 Coefficients	2 Coefficients
lagged labor hours (2005)	-0.03***	0.07***
Age	0.05***	0.77***
Age Squared	-0.001***	-0.01***
Number of Infants 2005	-0.13***	
Number of earning members in the household	0.37***	
Real Own hourly Wage	0.02***	
Square of hourly wage	-0.0001***	
Work Type (Reference: Own Farm Work)		
Agriculture Work	0.89***	
Non-Agriculture Work	0.81***	
Salaried	1.40***	
Business	-1.04***	
Social group (Ref: Forward caste)		
OBC	-0.12***	0.48***
Dalit	-0.22***	0.39***
Adivasi	-0.07***	1.91***
Muslim	-0.38***	-1.76***
Christian/Jain/Sikh	-0.25***	-3.47***
Education Attainment (Ref: illiterates)		
Primary	0.03	-0.85***
Middle	-0.07***	-0.70***

Independent Variables	1 Coefficients	2 Coefficients
Secondary	-0.10***	-1.14***
Higher Secondary	-0.21***	-1.45***
Graduate	-0.17**	-1.44***
Marital status (ref: married)		
Unmarried	-0.89***	
Divorced/separated/widows	0.15***	
Income quintile (Poorest)		
2nd Quintile	0.05***	-0.05
Middle	0.06***	-0.18**
4th quintile	0.05**	-0.46***
Richest	0.01	-0.95***
/sigma_u	0.34***	2.92***
/sigma_e	1.09***	4.39***
rho	0.09	0.31
left-censored observations	801	55995
uncensored observations	37802	39226
Number of observation	38603	95221
Wald chi2(24)	26631.06	22958.09
Prob > chi2	0	0

Source: Author`s own calculation using IHDS – I(2004-05)& IHDS-II(2011-12)
Note: Work-type includes those working zero or greater hours
(***)=p < 1%; (**)=p < 5%; (*)=p < 10%

Chapter 4

Patterns of Occupational Shift among Rural Women in the context of Structural Transformation in India

4.1. Introduction

Having analysed the determinants of rural women`s inter-temporal labor supply in chapter 3; this chapter examines the patterns and determinants of occupational shift of rural women, in the context of structural transformation of rural economy.

Over the years, rural labor market has witnessed a rise in real wages due to the rising competitiveness and diversification (Chand & Srivastava, 2014). It is witnessing an evident structural transformation, however, "employment opportunities for women in the private labor market are limited, irregular, poorly paid and hazardous" (Khera & Nayak, 2009, p.51). Hence, women take up multiple jobs for additional income (Unni, 1996) or withdraw from workforce to attend domestic duties. Additionally, due to the traditional gender roles which assign man as the chief 'provider' of the household and woman as the 'caretaker', the 'role incompatibility' theory[30] explains the nature, location and type of work undertaken by women. Women are traditionally expected to perform the household duties (Lobel, 1991). Hence, there is often a 'role strain' among women in balancing paid work and household duties. Thereby, they may withdraw, to attend only to domestic duties or take up part-time jobs (Chaudhary & Verick, 2014). In this context, the authors argue that providing 'productive' job opportunities to women is important, besides the efforts to raise the participation rates.

This chapter analyses the socio-economic factors influencing women`s participation decision in various forms of work. It also analyzes the pattern of occupational shift among rural women, in the phase of structural transformation of rural economy. Many cross-sectional studies based on NSS data have already analysed these aspects of labor market. This chapter utilizes the IHDS panel data for the years 2005 and 2012 and fills the gap in literature. The panel data structure allows tracking the same individuals over a period of time, which enables one to identify the socio-economic background of rural women whose work patterns have changed overtime, determinants of their job choices and impact evaluation of government schemes on their work participation. This chapter tests the

[30] "Work-family conflict refers to a situation when participation in one of the roles makes participation in the other role more difficult" (as cited in Lobel, 1991).

hypothesis that there is a shift away from farm sector towards non-farm sector among rural women workers, in the context of structural transformation.

The remaining part of this chapter has been divided into the following sections. The second section reviews the existing literature on occupational shifts among women in the context of structural transformation. The third section describes the data sources and methodology. The fourth section analysis the results and the final section concludes the chapter.

4.2. Literature Review

Kumar et al. (2011, p.362) defines employment diversification as the "shifting of workforce from one sector to the other, for employment. The proportion of this workforce engaged in different sectors of the economy constitute the structure of employment". Their study shows that rising non-farm employment significantly reduces rural poverty (ibid). Further, Abraham (2009, p.102) claims that factors like "stagnant wage rates, sustained wage differential between farm and non-farm sector; and limited employment opportunities in the agricultural sector gave rise to the rural non-farm sector employment". Fisher et al. (1997) emphasizes that non-farm employment is an important safety net during agricultural distress especially for small and marginal farmers; and landless (ibid). Also, Abraham (2011) claims that shift from farm to non-farm occupations in distress-driven regions is due to 'push factors associated with distress', whereas in the normal regions the shift is mostly due to 'growth driven factors'. Jatav and Sen (2013, p.1) claim that though "rural non-farm employment is mainly distress-driven, yet there are entry barriers in the nonfarm sector in terms of age, gender and education".

In the context of type of work undertaken across gender, World Bank (2007) states that women are more likely to be self-employed; engaged in informal sector; domestic and family workers. Whereas, men are more likely to be wage and salaried workers. It is observed that women`s labor force has been 'dominated by casual wage labor' at a much faster rate than that of men. This has led to 'feminization of casual employment' in the non-farm sector (Kak, 1994; Jatav & Sen, 2013). Further, Kak (1994) argues that "women keep moving in and out of the labor-force due to the seasonal nature of agricultural employment" and are utilized as the 'reserve army of labor', who are employed during

peak season for low wages. However, Garikipati and Pfaffenzeller (2010) claim that men have been shifting towards non-farm jobs and self-employment. Whereas, women are stuck in agricultural-wage work, with low social status and less pay. Further, ample studies indicate that "agriculture work is being feminized". The "relative pace of shift from agriculture to non-agriculture has been observed to be slower for women relative to men".

The introduction of government schemes like Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) holds a special significance in terms of changes in work patterns (especially for rural women who have been participating more in the scheme than men[31]), in the context of structural transformation, declining FLFP, limited job opportunities for women, rising informality and the traditional gender roles assigned to men and women. MGNREGA is a right-based social protection legislation expected to provide 100 days (annually) of work per household, on demand (Khera & Nayak, 2009). Introduction of MGNREGA[32] has made the employment programme in rural areas 'comprehensive' and 'women specific' (ibid), although government legislations like social institutions and minimum wage are already in place to improve the socio-economic condition of the marginalized, in the labor market (Kannan, 1988; Reddy, 1998; Sharma & Kumar, 1998).

Further, MGNREGA work is provided in the village itself, where women work in groups. Since the work is provided by the government, it becomes a 'socially acceptable' work and thereby reduces discrimination against working women (Khera & Nayak, 2009). These 'women friendly' features of MGNREGA are expected to ease the 'role strain' in balancing both household responsibilities and outside work. It has helped raise FLFP in India by providing work experience for women and breaking the social norms that force women to stay at home (Ghani et al., 2013; Sorsa et al., 2015). Participation in MGNREGA

[31] MGNREGA provided employment of 135 crore person days as of Jan, 2016. Out of this, 57% were availed by women (GOI, 2016). Das et al. (2015) find that due to the 'female-friendly' provisions of the Act, women are more likely to participate in MGNREGA than men.

[32] "The Act places no restriction on the sharing of household`s quota of 100 days within the household. Wages are equal for both men and women and they have fixed labor days. Several aspects of work provided under MGNREGA are 'gender friendly'. It is available within 5km radius of home, one-third of the work is reserved for women, basic work-site facilities are to be made available including childcare facilities" (Khera & Nayak, 2009, p.50).

programme has also significantly raised the likelihood of FLFP outside the programme (ibid). Further, Harish et al. (2011) identifies gender, education and household size as important factors affecting MGNREGA participation. It has led to improvement in income and number of days worked. However, it has also led to labor scarcity for agricultural operations like weeding and sowing; and decline in area for labor-intensive crops (ibid).

Many studies like Pellissery and Jalan (2011), Khera and Nayak (2009), Sudershan (2009), Grown (2006) and Chari (2006) claim that MGNREGA work provides 'additional income opportunity' for poor households in the context of limited opportunities available for women. MGNREGA is an "income opportunity for rural women (especially in southern states) who would have otherwise remained unemployed or even underemployed" (GOI, 2012). Studies have also found that post-MGNREGA, rural women`s earning potential has improved (ibid). Multiple jobs are undertaken along with MGNREGA work to supplement income, especially by women who are employed in low skilled and low-paid casual jobs. Unni (1996) finds that people who opt for such multiple jobs are generally young, less educated, are settled away from towns and supply labor for low wages.

4.3. Data Source and Methodology

4.3.1.Data Source

(i) Cross-section and Panel data of IHDS (at individual level) for rural women in 15-65 age-group has been utilised for the analysis.

(ii) Various rounds of Employment and Unemployment Survey (EUS) of NSS (at individual level) has been utilised to analyse the trends in work-force participation and to explore informality among them.

4.3.2. Methodology and Variables in the Study

4.3.2.1. Occupation Transition Matrix

Occupational transition matrix is tabulated to depict the changes in occupational choice for rural women, during 2005-2012 period, using IHDS panel data, in the context of structural transformation in rural areas.

4.3.2.2. Multinomial Logistic Regression for rural women`s participation in different types of work in 2012

MLR was run using cross-section data of IHDS-II (2011-12) to analyze the determinants of choosing different types of work among rural women in 2012. The dependent variable is a categorical variable which includes 5 outcomes, thereby 4 equations. Dependent variable can be described as the participation in farm work (own farm or agricultural wage laborer), which is the base outcome. The other four outcomes of the dependent variable are: non-farm work (non-agricultural wage work excluding MGNREGA; own business; salaried work); combined (farm and non-farm work) work; MGNREGA (exclusive) work; and MGNREGA combined with farm work. Independent variables of 2012 include :

(i) **Age** is expected to have a positive effect on work participation of any form, in the short run.

(ii) **Age squared** is included to capture the non-linearity of age of rural women with respect to their work-participation decision..

(iii) **Socio-religious group** is taken as a categorical variable with the reference category as forward caste. The other categories are OBC, Dalits, Adivasis, Muslims and Christians/Sikhs/Jains. Rural women from backward caste are expected to have higher probability of participating in farm work.

(iv) **Income quintile** is a categorical variable with lowest income quintile as the reference group. The other categories are second, middle, fourth and highest

income quintile. It is assumed that rural women from lower income quintiles are more likely to participate in farm work.

(v) **Education attainment of rural women** is a categorical variable with 'illiterate' as the reference group. The other categories are primary, middle, secondary, higher secondary; graduate and above. It is assumed rural women with lower levels of education attainment are more likely to participate in farm work.

(vi) **Number of infants (below 2 years) in the household**: It has been assumed that higher the number of women`s own children in the household, lower is their probability to participate in any form of work.

(vii) **Number of earning members in the household:** It has been assumed that higher the number of earning members in the family, lower is the probability of participating in any form of work for rural women.

(viii) **Marital status:** is a categorical variable with 'married' rural women as the reference category. The other categories are unmarried, widowed and divorced. It has been assumed that married rural women are more likely to participate in MGNREGA than any other form of work due its female-friendly features.

4.3.2.3. Rural Women`s Participation in MGNREGA and Other Non-farm Work (excluding MGNREGA)

Two separate binomial logistic regression is run using IHDS panel data (at individual level) to estimate the likelihood of rural women`s participation in MGNREGA in 2012 as opposed to their participation in other non-farm work (excluding MGNREGA) in 2012. The dependent variables were as follows:

a) **Regression 1:** Rural women`s participation in MGNREGA work in 2012 is the binary dependent variable [takes the value 1, if rural women participate in MGNREGA work in any form (combines with farm or non-farm work or does exclusive MGNREGA work) , else takes the value 0].

b) **Regression 2**: Rural women`s participation in non-farm work in 2012 is the binary dependent variable [takes the value 1, if rural women participates in non-farm work (excluding MGNREGA), else takes the value 0].

Factors explaining each of these two regressions are same, so as to promote comparison between them. The explanatory variables of IHDS-I (2004-05) were used for the analysis which were as follows:

(i) Age(2005) is expected to have a positive effect on work participation of rural women, in the short run.

(ii) Age squared (2005): Square of their age is taken as an independent variable to capture the non-linearity of the age.

(iii) Socio-religious group (2005) is taken as a categorical variable with reference category as forward caste. The other categories are OBC, Dalits, Adivasis, Muslims and Christians/Sikhs/Jains. Rural women from backward caste are expected to have higher probability of participating in MGNREGA work.

(iv) Income quintile (2005) is a categorical variable with lowest income quintile as the reference group. The other categories are second, middle, fourth and highest income quintile. It is assumed that rural women from lower income quintiles are more likely to participate in MGNREGA.

(v) Education attainment (2005) is a categorical variable with illiterate as the reference group. The other categories are primary, middle, secondary, higher secondary; graduate and above. It is assumed that rural women with lower levels of education attainment are more likely to participate in MGNREGA work.

(vi) Type of work in 2005 is a categorical variable with own farm work [includes own (family) farm work and animal care] as the reference group. Other categories are agriculture wage work, non-farm wage work, salaried work and non-farm (family)

business. It is assumed that rural women engaged as own farm workers are more likely to participate in MGNREGA work.

**(vii) Number of women`s own children (below 5 years) in the household (2005**): It has been assumed that higher the number of women`s own children in the household, lower is the probability to participate in workforce.

(viii) Number of earning members in the household 2005: It has been assumed that higher the number of earning members in the household, lower is the probability of rural women`s participation in any form of work.

(ix) Marital status (2005) is a categorical variable with 'married' rural women as the reference category. The other categories are unmarried, widowed and divorced. It is assumed that married rural women are more likely to participate in MGNREGA work due to its 'women-friendly' features.

4.4. Results and Discussion

4.4.1. Distribution of Rural Women within Farm and Non-farm Work

The following observations were made with regard to the sample distribution of rural women workers engaged in farm and non-farm work, in both rounds, using cross-section and panel level data of IHDS. Within farm work category, majority were own farm workers (family farm) and only around 30% were agriculture laborers, in both rounds, both at cross-section and panel level of IHDS (Table 4.1). Among the non-farm workers, most of them were engaged in salaried work followed by non-farm wage laborers, followed by non-farm (own) business (ibid) at the panel level, in both rounds. However, within non-farm work category, at the cross-section level, maximum proportion were engaged as non-farm wage workers, followed by salaried workers, followed by non-farm (family) business, in both rounds.

4.4.2. Trend in Rural Women`s WPR based on the Type of Work

The following observations were made with respect to rural women`s WPR using cross-section and panel level IHDS data. WPR of rural women engaged as own farm workers has increased slightly overtime, both at cross-section as well as panel level of IHDS (Table 4.1 & 4.2). WPR of agricultural wage workers, on the other hand has fallen overtime (ibid). With respect to non-farm work, both at the panel and at the cross-section level, WPR of salaried rural women workers has fallen and WPR of non-farm wage workers has risen overtime (ibid). Whether at panel or cross-section level, WPR is highest in farm work (animal care, own farm and agriculture wage labor) among rural women in both rounds (ibid).

Using the Central Statistics office (CSO) data (GOI), it has been observed that the agriculture employment growth as measured by CAGR[33] has declined by 4%, whereas industry and service sector employment have grown during the period 2005-2012 for rural women (Table 4.3). Service sector has shown a rise of over 12% for rural women during the same period (ibid). Further, as per NSS data, since 1990s, the agricultural sector growth has declined overtime, but it is still the largest employer among rural women (Table 4.4). By detailed industrial division, only construction sector has shown some noteworthy growth with respect to rural women`s employment (ibid).

4.4.3. Exploring Informality among Rural Women

A considerable part of women`s work isn`t officially documented which gave rise to terms like 'economic invisibility' (Devi, 1990) or 'statistical purdah' (World Bank, 1991) (as cited in Mazumdar & Guruswamy, 2006). The incapacitation of institutions to provide education, skill-training and infrastructure, contribute to the growth of the informal economy (ILO, 2013). Further, Floro and Meurs (2009, p.18) claim that due to a "complex mix of factors, including household duties, educational background, discrimination, social norms and personal choice, women are more likely than men to be in part-time, informal sector, doing house-work, unpaid labor in family enterprises and concentrated in certain

[33] "Compound Annual Growth Rate (CAGR) is calculated as [(End value/Beginning value) $^{(1/\text{number of years})}$] – 1" ("CAGR", n.d.).

types of jobs, usually those at the lower end of the pay and status scale". On one hand, formal sector is associated with good pay and status but has limited opportunities for rural women. On the other hand, informal sector is more flexible but is associated with low pay, low social status, no regularity or social security benefits and bad working conditions. Lack of skills keep rural women away from certain jobs and they tend to get concentrated in few sectors. Thereby, further limiting their already limited options.

Informal Employment is defined as follows:

> *"Unorganized workers consist of those working in the unorganized enterprises or households, excluding regular workers with social security benefits, and the workers in the formal sector without any employment/ social security benefits provided by the employers" ~(NCEUS, 2009, p.3)*

The NSS report identifies the informal sector as consisting of "proprietary and partnership enterprises (excluding those run by non-corporate entities such as cooperatives, trusts and non-profit institutions), in the non-agricultural sector and in AGEGC (agriculture-related activities excluding crop production)" (as cited in Chandrasekhar, 2017). The informal employment among rural women workers was estimated to be around 99% in crop and animal production; hunting and related services; construction and retail trade; and it was around 98% in manufacture of tobacco products and textiles, using NSS data 68th round, 2011-12 (Srija & Shirke, 2014).

Comparing 61st and 68th round of NSS, the following observations have been made on the informal sector employment trends among men and women (Table 4.5). The proportion of temporary employees was higher among rural women as compared to rural men, for both years, 2005 and 2012. This proportion has remained constant for rural women during the same period. Further, the proportion of employees not eligible for any social security benefit in the AGEGC and non-agriculture sectors is higher for rural women as compared to rural men. However, this proportion has fallen slightly for rural women during 2005-2012 period. Share of informal sector in AGEGC and non-agriculture sector has slightly fallen for rural women during 2005-2012 period. However, in comparison to rural men,

women clearly fare worse in terms of formal employment with social security benefits, which are too few for women.

IHDS shows that rural women engaged in farm work were more underemployed[34] than non-farm sector. During period 2005-12, the underemployment has increased within farm sector and has slightly fallen within non-farm sector, for rural women (Table 4.6a). Further, according to NSS data, 67% of rural women state the reason for seeking additional work as 'to supplement the current income' in 2012, which has increased from 48% in 1993 (Table 4.6b). Whereas, around 67% claim that 'current employment is not remunerative enough', as the reason to seek alternative work in 2012, which has increased from 58% in 1993 (ibid).

Further, those attending to domestic duties[35], the following observations were made. Rural women engaged in domestic activities have risen from 52% in 2005 to 60% in 2012 (Table 4.7). Around 55% of rural women responded that there is 'nobody else to carry out the domestic activities' in 2005, as the reason for them to attend to domestic duties for most part of the reference year and this proportion has increased to 60% in 2012 (ibid). Further, in terms of the nature of work acceptable to rural women who were attending to domestic activities, it was found that 77% desired to have part-time job, mainly into dairy and animal husbandry in 2005 (Table 4.8) and around 80% desired to work part-time in manufacturing of wood and cane in 2012. Around 54% rural women in 2012, responded positive on having the required skill, if work was made available, which has slightly increased from 52% in 2005 (Table 4.9). Further, most women preferred either 'own-house dwelling' or the street with a 'fixed location' for their regular job (NSS, 68th Round). Around 47% rural women in 2005 were willing to accept work in the household premises, if initial finance on easy terms, is made available, which has fallen to 40% in 2012 (Table 4.10). It was observed

[34] "The underemployment rate is defined as the proportion of workers in *usual status (principal status +subsidiary status)* who were found to be not employed (i.e. either unemployed or not in labour force) during the week preceding the date of survey. It was about 3 per cent for rural males, 17 per cent for rural females, 1 per cent for urban males and 6 per cent for urban females in 2012". (NSS 68th round, EUS report)

[35] "As per the classification of activity statuses, persons with activity status codes 92 (attended domestic duties only, as per the usual principal status) and 93 (attended domestic duties and were also engaged in free collection of goods, sewing, tailoring, weaving, etc. for household use) were considered to be engaged in domestic duties" (NSS, 68th round, EUS report).

that 48% of rural women who weren't required to do domestic duties but were still pursuing, were doing them by their 'own choice' in 2005 and this number has increased to 50% in 2012 (Table 4.11). These trends reveal the need for better remunerative and flexible job options for rural women closer to their home. Women`s own attitude towards gender equality must be positive, to involve themselves in economic participation and contribute to the well-being of household as well as the society.

4.4.4. Patterns of Occupational shift among Rural Women

The occupation transition among rural women during the two waves of IHDS (2005-2012) has been analyzed in this section, in the context of structural transformation of rural economy (Table 4.12a & 4.12b).

(i) With respect to farm work

Maximum proportion of rural women engaged in combined[36] work in 2012 were observed to be farm workers in 2005, indicating that farm sector is poorly remunerated[37] and requires additional days of work to supplement income. It was observed that around 45% of farm workers in 2012 were not in workforce in 2005 implying that farm based jobs are easily available for those wanting to enter workforce in 2012. Also, given the limited amount of jobs available and high entry barrier for most of the non-farm jobs, majority of farm workers of 2005 remain farm workers in 2012 as well.

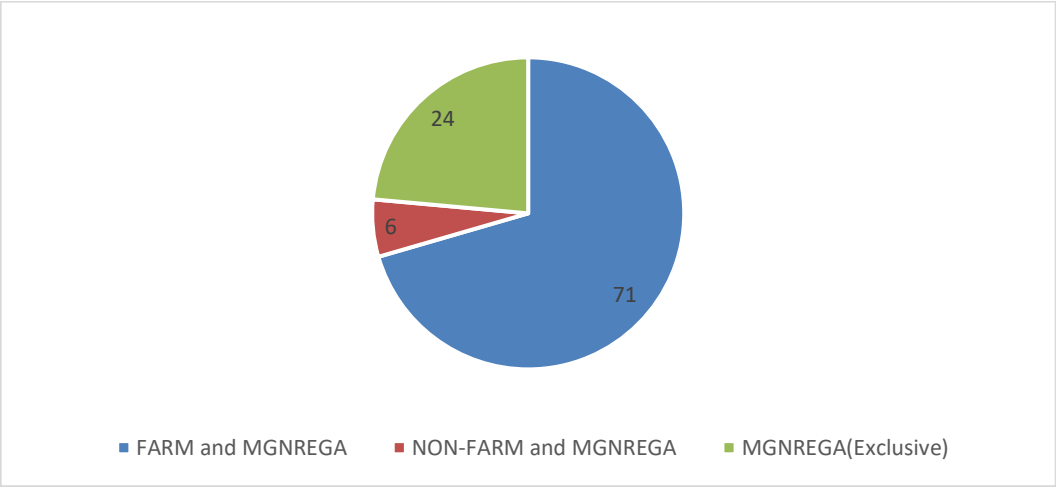
(ii) **With respect to MGNREGA**

Majority of rural women workers in MGNREGA were farm workers in 2005 (Table 4.12a & Figure 4.1). The detailed division of occupations reveal that among those engaged in exclusive MGNREGA work in 2012, around 30% were agricultural wage laborers of 2005 (Table 4.12b).

[36] Those engaged in both farm and non-farm work.

[37] Table 4.16a shows that agricultural work is low remunerated as compared to non-farm jobs, for both men and women. There is also an evident wage disparity among men and women, across both farm and non-farm jobs with women getting paid less than men.

Figure 4.1. Percentage distribution of women engaged in MGNREGA by combination of work in 2012

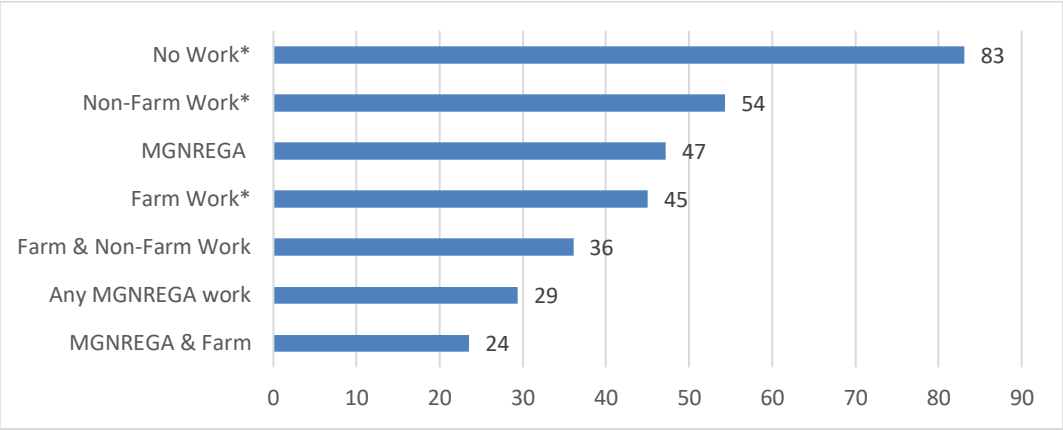


Source: Author`s own calculation from IHDS-II (2011-12)

(iii) MGNREGA as a job option for those entering into workforce in 2012

MGNREGA serves as a job option for rural women who would otherwise choose to remain out of work (Table 4.12a). Around 47% of rural women who were engaged in exclusive MGNREGA work in 2012 and around 30% of those engaging in MGNREGA work in any form in 2012, were non-worker (not in workforce) in 2005. However, the transition of occupation among the rural women during 2005-2012 shows that the non-farm job in 2012 absorbed a higher proportion of non-workers (from 2005) as compared to what MGNREGA work had absorbed (ibid). Hence, MGNREGA clearly isn't the only option for rural women entering workforce in 2012. The entry of non-workers of 2005 into different types of work in 2012 shows that majority of non-workers choose to remain non-workers even in 2012 and those who choose to work in 2012, majority were found entering non-farm wage work (excluding MGNREGA work) (Figure 4.2), mainly into salaried jobs (Table 4.12b). This reveals the preference for regular salaried jobs among rural women for entry into workforce in 2012.

Figure 4.2. Proportion of rural women out of workforce in 2005 by type of work done in 2012



Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II (2011-12)

4.4.5. Rural Women`s Participation across Different Forms of Work

MGNREGA (either combined with farm work or exclusive MGNREGA work) worker in 2012 were found mainly to be from low income quintile, illiterate and from backward caste (Table 4.13). Socio-economic characteristics of rural women engaged in farm and combined work were similar to those engaged in MGNREGA work (ibid). Hence, clearly MGNREGA is just an additional income opportunity especially for the marginalised rural women. There is clearly a need for more job opportunities in productive employment, farm work being less productive and poorly remunerated. On the other hand, non-farm work finds considerable participation from higher income quintiles, higher educated and the younger age group of 15-30 years as compared to other forms of work (Table 4.13).

The multinomial regression (Table 4.14) estimates the marginal probabilities of socio-economic factors influencing the participation of rural women in different forms of work as compared to farm work. There are five outcomes (hence four equations) where farm work is chosen as the base category and the other four categories are non-farm work; combined work (farm and non-farm); MGNREGA; MGNREGA and farm work. The following observations were made:

(i) High probability of participation in non-farm work as compared to farm work was found among rural women who were graduates, Muslim, those from higher income quintile and widowed.

(ii) High probability of participation in combined work (farm and non-farm) was observed for rural women who were Dalit, widowed, lowest income quintile and illiterate.

(iii) High probability of MGNREGA participation was found among rural women who were less educated and Dalits. However, those women with higher number of infants in household, unmarried, those from highest income quintile, those with higher number of earning members in the family; and graduates were less likely to participate in any form of MGNREGA work.

4.4.6. MGNREGA work Vs other Non-Farm Wage Work (excluding MGNREGA)

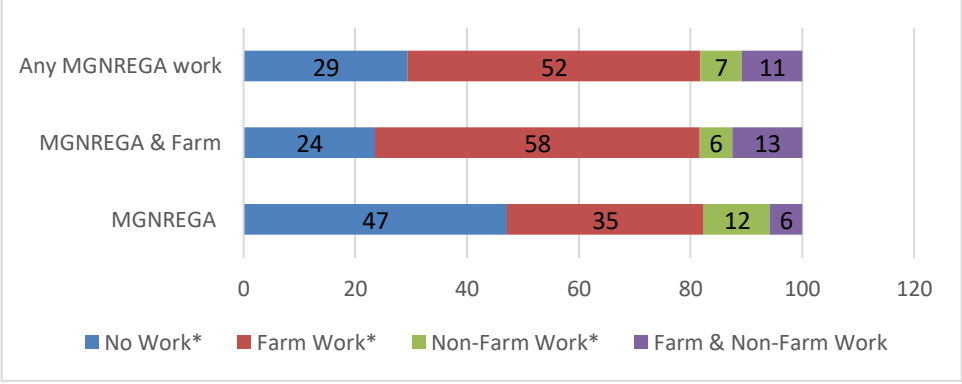
The sample distribution of rural women engaged in MGNREGA (in any form) work reveals that around 70% of MGNREGA work is combined with farm work and only 23 % is exclusive MGNREGA work in 2012 (Table 4.15a). Further, more women than men are found to be participating in MGNREGA work due to its women friendly features (Table 4.15b). Also, rural women shifting to MGNREGA in 2012 (from any form of work in 2005 or who were out of workforce in 2005) were found to be mainly from lower income quintile, backward caste, less educated and in the 20-30 age-group, irrespective of the type of work done in 2005 (Table 4.15c). These tabulation results are further reinforced by regression results.

The logistic regression results on the factors influencing rural women`s participation in MGNREGA and participation in other non-farm (excluding MGNREGA) work reveal the following (Table 4.15d). It has been observed that exclusive non-farm jobs have entry barriers in the form of higher income and higher education (which could be seen as a proxy for skill). Further, less educated rural women were more likely to participate in MGNREGA as opposed to non-farm work. This shows that non-farm work demands higher skill and education to enable participation. Rural women who were working as non-farm workers in

2005 were most likely to be engaged in non-farm jobs in 2012 as well (ibid). On the other hand, MGNREGA helps in absorbing low remunerated farm workers of 2005, compared to other non-farm work (Figure 4.3 & Table 4.12a). It was also observed that rural women who were engaged in non-farm (family) business in 2005 were most likely to participate in MGNREGA (in any form) in 2012 (Table 4.15d).

Further, the backward caste were more likely to participate in MGNREGA. On the other hand, Muslim and Christians/Sikhs/Jains were more likely to participate in other non-farm wage work (Table 4.15d). Married women were more likely to participate in either form of work as compared to unmarried/widowed/divorced rural women. Those rural women who had higher number of children below 5 years (women`s own children in the household) in 2005 were more likely to participate in MGNREGA as compared to other non-farm work in 2012 (ibid). They may be participating out of financial compulsion, as MGNREGA work is generally sought by rural women who are poor and marginalised. Further, due to the women- friendly features of MGNREGA, women find it relatively easier to manage both paid work and household responsibilities. Those rural women who had higher number of earning members in the household in 2005 had less likelihood to participate in either of the jobs, as they have lesser pressure to join workforce with the rise in household income.

Figure 4.3. Rural women`s Occupation of MGNREGA workers in 2005



Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II (2011-12)

4.4.7. Growth rate of rural wages and Impact of MGNREGA on Poverty

This section discusses the growth rate of wages across gender and jobs in rural areas. It has been observed that the growth rate of agriculture wages is more[38] than the non-agriculture wage, over the years, for both men and women in rural area. However, the absolute mean daily wage rate, for both agriculture and non-agriculture, remains higher for men than women (Table 4.16a). Clearly, there is a huge wage disparity between rural men and women. Further, absolute agriculture wage rate is lower than non-agriculture wage rate, for both men and women, in rural areas, for both the rounds. Thus, farm work remains low remunerated, especially for women. The growth rate for agriculture wages has been same for men and women but growth rate of non-farm wages has been more for women than men. However, the latest data (Economic Survey of India, 2014-15) on overall wage growth shows that it has been increasing only at 3.6% (with inflation above 5%) as against 20% in 2011. Part of the reason for this decline in growth rate could be the worsening agrarian situation and lack of demand[39] from non-agricultural sector.

Post-MGNREGA, the earnings of rural women from non-farm work has definitely seen a jump (Table 4.16b). This provides sufficient evidence that rural wages have risen considerably and more non-farm job options like MGNREGA definitely needs to be encouraged. Further, using the IHDS panel dataset, it was observed that around 67% of poor households of 2005 with rural women (age group 25-60 years) currently working in MGNREGA, were no longer poor[40] in 2012.

4.4.8. Exploring the Shift away from Agriculture among Rural Women

The share of agriculture in total workforce has come down to 49% in 2012 (NSS, 68th round) from 59% in 2005 (NSS, 61st round). Although the share of agriculture in total

[38] Similar trend is observed using Labor Bureau Statistics during period 2008 to 2014 period (Kundu, 2018).

[39]Rural areas are witnessing low demand and decline in employment generation through public programmes. This is in contrast with the last five years before 2013, which witnessed a rise in wages in real terms, at 6% per annum, induced by rising rural demand and an increase in government spending (Himanshu, 2016).

[40] Based on Tendulkar Poverty line

workforce has fallen, it still the major employer among rural women. Around 75% rural women and only 59% rural men were engaged in agriculture in 2012 (NSS, 68th Round) which has fallen from 83% for rural women and 67% for rural men in 2005 (NSS, 61st Round). Further, Table 4.17a shows that around 50% of the rural women farm workers of 2005 continue to engage as farm workers in 2012.

Based on IHDS panel data, it has been observed that the farm days haven't reduced much at 'All India' level for both men and women during 2005-2012 (Table 4.18). Whereas, rural non-farm days have increased more for men than women and non-farm labor days supplied by men is much higher than women in rural areas in both the rounds, 2005 and 2012 (ibid). Given the lack of employment opportunities and entry barriers to participate in non-farm jobs among rural women, farm work remains as the only easily accessible income earning option among them.

The increase in non-farm labor days overtime has been mainly for rural women from higher income quintiles, primary educated, married and Muslims. Whereas, farm days have reduced overtime, more for rural women who were unmarried; those in the 15–19 years age group; Christian/Sikh/Jain; and higher secondary level of educated (ibid). In both the rounds, it was observed that as income quintile of the household rises, farm days supplied by rural women are found to rise (upto middle income quintile) thereafter it falls at higher income quintiles as the pressure to work becomes lesser for women. Further, in both the rounds, it was observed that with a rise in level of education of rural women, farm days supplied falls as they prefer non-farm jobs with better market returns.

4.5. Conclusion

India is predominantly an agricultural[41] and a labor surplus economy with sharp gender division of labor. Agricultural work is mainly less productive and relatively low

[41] ILO (2016) observes that in India, a "large proportion of workforce is still dependent on the agricultural sector (48.95% employment share in 2011-12). In rural areas, the agricultural sector still accounts for 62.7% of India's employment, although this share has fallen significantly, from 77.6% in 1993-94. However, the share of agriculture in Gross Value Added (GVA) has fallen considerably, from 18.4% in 2011-12 to 15.4% in 2015-16. The Indian economy is dominated by the services sector, which accounted for 53.4% of GVA in 2015-16. In terms of employment, the share of the services sector in urban areas was 58.7% compared to just 16.1% in rural areas in 2011-12".

remunerated. Opportunities tend to be seasonal in agricultural jobs and even fewer when it comes to non-agricultural jobs among rural women. In comparison to rural men, women clearly fare worse in terms of access to formal sector jobs with social security benefits, which are already too few for women. There is engagement in multiple jobs to supplement income.

Rural women`s likelihood of participating in farm work is more among the illiterate, backward caste and from lower income quintile. Whereas, with rising level of income and education, rural women are more likely to take up non-farm jobs. Further, majority of the non-workers (those out of workforce in 2004-2005) enter into salaried jobs in 2012. However, farm work still remains the main occupation for majority of rural women, owing to high entry barrier in the non-farm sector and limited job opportunities for women. Majority of rural women farm workers of 2005 remain farm workers even in 2012. Thus, there is a need to make farm work more lucrative as it continues to be the main activity among rural women. Although, it has been observed that agriculture employment growth has fallen overtime, farm days haven't reduced much for rural women or men. Whereas, non-farm days have increased more for rural men than women. The increase in non-farm labor days has been mainly for rural women from higher income quintiles, primary educated, married and Muslims.

Even the NSS data reveals the need for more remunerative, flexible, decent, productive and female-friendly employment closer to the residence, for rural women. A large proportion of rural women who were engaged in domestic activities, report willingness to accept part time jobs near their residence which would enable them to balance their family along with outside work. Therefore, the need for institutional help becomes important, even as many report that there is 'nobody to carry out the household chores' if they decide to work. Above all, rural women also need a change in perception of 'self' and women`s own attitude towards gender equality must be positive, even as half of them are engaged in domestic activities by 'own choice'. A change in mindset among all the family members is equally imperative, especially on the traditional gender roles assigned to man and woman. This would ease out their role strain imposed by the gender roles and would help in arresting the problem of falling work participation among rural women

Table 4.1. Percentage distribution of rural women engaged in farm and non-farm work

Work type↓	Cross-section		PANEL		
	2012	2005	2012		2005
	15-65 years		15-65 years	22 to 65 years	15-65 years
Non-Farm work category	(sample)Percentage				
Non-agriculture(Including MGNREGA)	(4,783) 62.71	(1,736) 46.74	(3,170) 30.09	(2,998) 30.81	(1,374) 14.41
Salaried	(1,327) 17.4	(968) 26.06	(7,047) 66.9	(6,444) 66.23	(7,876) 82.57
Business	(1,517) 19.89	(1,011) 27.21	(317) 3.01	(289) 2.97	(288) 3.02
Total	(7,628) 100	(3,716) 100	(10,534) 100	(9,730) 100	(9,538) 100
Farm work category					
Own Farm Labor (including animal care)	(18,205) 71.36	(16,332) 68.07	(15,826) 73.03	(13,716) 71.75	(12,903) 68.07
Agriculture labor	(7,307) 28.64	(7,661) 31.93	(5,845) 26.97	(5,399) 28.25	(6,052) 31.93
Total	(25,513) 100	(23,993) 100	(21,671) 100	(19,115) 100	(18,956) 100

Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I(2004-05)

Table 4.2. WPR of rural women across different forms of work

Type of work↓	PANEL			CROSS-SECTION	
	2012		2005	2012	2005
	WPR (22 to 65 years)	WPR (15 to 65 years)	WPR (15 to 65 years)	WPR (15 to 65 years)	WPR (15 to 65 years)
Not in workforce	(12,373) 34.89	(8,686) 29.83	(9,076) 33.03	(16,873) 37.97	(19,388) 43.39
Own farm (family farm or engaging in animal care)	(7,463) 21.04	(6,003) 20.62	(4,868) 17.72	(14,666) 33	(14,487) 32.42
Agricultural wage Labor	(5,543) 15.63	(5,114) 17.56	(5,279) 19.22	(4,661) 10.49	(6,860) 15.35
Non-farm (excluding MGNREGA)	(1,282) 3.62	(1,159) 3.98	(1,165) 4.24	(3,126) 7.04	(1,844) 4.13
Salaried work	(6,493) 18.31	(5,938) 20.39	(6,102) 22.21	(1,350) 3.04	(1,028) 2.3
Non-farm (family) business	(292) 0.82	(266) 0.91	(983) 3.58	(1,441) 3.24	(1,074) 2.4
MGNREGA	(2,018) 5.69	(1,951) 6.7	NA	(2,320) 5.22	NA
Total	(35,464) 100	(29,117)100	(27,473) 100	(44,437) 100	(44,681) 100

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II (2011-12)
Notes: numbers in the parenthesis reflect the sample size of rural women in the specific category of work.

Table 4.3. Rural women`s participation by broad industrial division

Sector	2012	2005	CAGR
Agriculture	60	78	-4
Industry	8	7	2
Service	32	14	12

Source: Author`s own calculation from Central Statistics Office, Ministry of Statistics and Programme Implementation, GOI.

Table 4.4. Rural women`s participation by detailed industrial division (NIC)

Sector	1993-94	2004-05	2011-12
Agriculture	86.2	81.4	74.94
Mining & quarrying	0.4	0.4	0.29
Manufacturing	7	8.7	9.79
Electricity	0.1	0	0.07
Construction	0.9	1.7	6.59
Wholesale, retail, trade, etc.	2.1	2.8	2.95
Transport, storage, etc.	0.1	0.2	0.16
Other Services(Financial + community)	3.4	4.6	5.21

Source: Author`s own calculation from various rounds of NSSO
Notes: Usual status measure of employment is used for the calculations
Source: NSS 68th Round (2011-12) and 61st Round (2004-05)

Table 4.5. Percentage distribution of workers in Informal sector across gender in rural areas

Category	2011-12		2004-05	
	Male	Female	Male	Female
Proportion of temporary employees	49	52	47	53
The proportion of employees not eligible for any social security benefit for employees in the AGEGC and non-agriculture sectors	78	80	79	83
share of informal sector in the employment of AGEGC and non-agriculture sectors	76	73	79	86

Source: Informal sector and conditions of employment in India, NSS 68th Round (2011-12) & 61stRound (2004-05)

Table 4.6a. Underemployment Rates for rural women across type of work

Type of work	2012	2005
Farm	57.59	55.25
non-farm	42.41	44.75

Notes: (i)Farm work includes agriculture wage labor, own (family) farm, animal care.
Non-farm work includes Non-farm own (family) business, non-farm wage labor, salaried work.
(ii) Age-group 15- 65 years has been considered.

Source: IHDS –I (2004-2005) & IHDS-II (2011-2012)

Table 4.6b. Percentage distribution of rural women by reasons for seeking additional/alternative work

Reasons for seeking additional work	2011-12	1993-94
To supplement income	66.84	47.5
Not enough work	17.4	18.6
Both	13.44	20.3
Others	2.32	13.6
Alternative work reasons		
Present work not remunerative	67.05	58.2
No job satisfaction	9.31	9.3
Lack of job security	3.17	4.6
Workplace too far	1.26	0
Wants wage/salary job	6.73	4.6
Others	12.48	23.3

Source: 50th and 68th round, NSS

Table 4.7. Percentage distribution of rural women who were required to spend most of their time on domestic duties by reason for spending most of their days on domestic duties

R**eason for spending most of their days on domestic duties**	**2004**	**2012**
no other member to carry out the domestic duties	55	60.1
cannot afford hired help,	7.1	8.7
for social and / or religious constraints	20.3	15.8
Others	17.5	15.5
Sample details		
Percentage of rural women Engaged in domestic activities	51.8	59.7

Note: 15 years and above age-group has been considered
1) Usual Principal Status measure of employment
Source: NSS 68th Round (2011-12) and 61st Round (2004-05)

Table 4.8. Percentage distribution of rural women engaged in domestic activities in rural areas by regularity and duration of work acceptable

Type of work acceptable	2004			2012		
	full time	part time	occasional	full time	part time	occasional
Dairy	21.1	77.1	1.7	21.5	75.5	3
Poultry	17.9	74	7.9	18.6	78	3.4
Other animal husbandry	18.1	76.7	5.2	21.7	74.7	3.6
food processing	26.7	61.7	11.6	17.8	74.8	7.3
spinning and weaving	17.6	73.2	9.1	15.5	75	9.5
manufacturing of wood and cane	20	64.9	15.2	11.9	80.7	7.2
tailoring	23.1	71.6	5.3	18.3	76.2	5.5
leather goods manufacture	33	67	0	64.2	35.4	0.4
others	31.7	62	6.3	30.8	61.8	7.4
Total	22.8	71.9	5.1	20.5	74	5.4

Note: 15 years and above age-group has been considered
Source: NSS 68th Round (2011-12) and 61st Round (2004-05)

Table 4.9. Percentage distribution of rural women having required skill/experience to accept work if made available

Type of work	2012	2005
Dairy	73.5	69.1
Poultry	52.9	56.6
Other animal husbandry	65.5	56.9
food processing	54.3	39.9
spinning and weaving	54.6	54.2
manufacturing of wood and cane	48.3	50.3
tailoring	46.5	45.5
leather goods manufacture	40	36.4
others	35.8	35.2
Total	53.6	51.8

Note: 1) 15 years and above age-group has been considered
2) Usual Principal Status measure of employment
Source: NSS 68th Round (2011-12) and 61st Round (2004-05)

Table 4.10. Percentage distribution of rural women willing to accept work in the household premises by type of assistance required

Type of assistance required	2004	2012
no assistance	3.8	3.4
initial finance on easy terms	47.7	40.8
working finance facilities	14.5	19.1
easy availability of raw materials	3.1	2.8
assured market	6.4	5.6
training	14.9	21.2
accommodation	0.6	0.7
others	8.9	6.1

Note: 15 years and above age-group has been considered
Source: NSS 68thRound (2011-12) and 61st Round (2004-05)

Table 4.11. Percentage distribution of rural women who were not required to spend most of their days on domestic duties by reason for still pursuing domestic duties

Reason for still pursuing domestic duties	2004	2012
non-availability of work	18.8	17.1
by choice	47.9	50
Others	30.8	31.7

Note: 15 years and above age-group has been considered
Source: NSS 68thRound (2011-12) and 61st Round (2004-05)

Table 4.12a. Occupation transition matrix of rural women during 2005-2012

Variables	No Work	Farm Work	Non-Farm Work	Farm & Non-Farm Work	MGNREGA	MGNREGA & Farm	Any MGNREGA work
No Work*	83.13	45.03	54.33	36.08	47.19	23.56	29.41
Farm Work**	13.52	49.21	16.39	40.96	35.18	58.01	52.36
Non-Farm Work***	2.47	2.01	25.68	8.52	11.83	5.87	7.35
Farm & Non-Farm Work	0.88	3.75	3.6	14.44	5.8	12.56	10.88
Total	100	100	100	100	100	100	100

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II(2011-12)

*No work: Not in workforce
**Farm work includes own farm work and agricultural wage work (excluding animal care)

***Non-farm work includes non-agricultural wage labor, salary and own business in 2005 and includes non-agricultural wage labor(excluding MGNREGA), own business, salary in 2012

Table 4.12b. Occupation of workers of 2005 in 2012 (Column Percentages)[Detailed Categories]

Work Categories 2012 → 2005 ↓	No work	Agriculture lab	Own-farm	salary	Business	Non-Farm (excluding MGNREGA)	Any MGNREGA	Exclusive MGNREGA
No work	83.81	40.76	30.57	46.36	37.71	34.69	38.81	43.98
Agriculture lab	2.96	35.01	16.23	3.46	10.46	22.2	11.91	28.69
Own-farm	1.65	8.95	26.8	7.35	8.58	13.04	12.35	3.69
Nonfarm	1.3	3.8	5.5	3.09	8.02	6.6	16.15	5.74
Salary	8.42	8.42	18.19	38.11	19.46	18.51	17.43	12.75
Business	1.86	3.07	2.7	1.63	15.77	4.96	3.36	5.14
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II(2011-12)

(i) No work: Not in workforce
(ii) Any MGNREGA: Includes exclusive MGNREGA worker or those combined MGNREGA with any other work.

Table 4.13. Percentage distribution of rural women workers in 2012 across socio-economic variables of 2005

Socio-economic variables	No Work*	Farm Work*	Non-Farm Work*	Farm & Non-Farm Work	MGNREGA (exclusive)	MGNREGA & Farm
Income quintiles						
Poorest	19.57	23.05	20.71	26.57	24.46	25.62
Second	20.23	23.22	23.6	25.33	23.99	28.79
Middle	20.49	20.51	20.9	21.03	22.68	23.24
Fourth	19.57	17.99	19.22	16.53	20.41	14.98
Richest	17.65	12.31	14.14	8.24	5.75	5.45
Socio- Religious Groups						
Forward caste	19.07	16.24	14.39	13.23	4.65	6.72
OBC	36.97	42.25	33.26	38.18	37.16	39.95
Dalit	21.93	22.23	25.84	21.65	39.62	36.41
Adivasi	7.24	11.49	8	18.18	7.82	13.62
Muslim	12.56	6.92	15.99	7.67	7.27	2.86
Christian, Sikh, Jain	2.23	0.86	2.52	1.08	3.49	0.43
Education Attainment						
Illiterate	57.01	60.12	44.9	53.91	65.51	75.4
Primary	17.64	15.51	12.87	11.82	9.27	7.67
Middle	19.44	20.27	24.49	25.77	19.55	15.06
Secondary	3.92	2.82	7.24	5.38	4.66	1.59
Higher Secondary	1.38	0.99	5.71	1.59	0.86	0.27
Graduation and Above	0.61	0.29	4.79	1.52	0.15	0.01

Socio-economic variables	No Work*	Farm Work*	Non-Farm Work*	Farm & Non-Farm Work	MGNREGA (exclusive)	MGNREGA & Farm
Age Categories						
0 to 9	36.14	11.86	5.17	6.26	0.69	0.9
10 to 14	10.42	8.73	8.48	8.25	2.19	2.27
15-19	4.72	5.33	6.86	5.8	4.36	4.76
20-29	11.65	19.83	26.42	25.64	21.14	27.97
30-39	9.27	23.42	27.08	28.72	32.39	32.63
40-59	16.78	26.47	22.52	23.15	33.5	29.65
60 & above	11.02	4.35	3.48	2.18	5.74	1.82

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II(2011-12)

Table 4.14. Multinomial regression for rural women`s participation in different types of work in 2012

(Ref: farm work[42])	Non-farm[43]	Farm & non-farm (combined)	MGNREGA	MGNREGA & farm
Education attained (ref: illiterate)	Avg. Marginal Prob.	Avg. Marginal Prob.	Avg. Marginal Prob.	Avg. Marginal Prob.
Primary	0.06***	-0.02*	0.01	-0.02*
Middle	0.07***	-0.03***	0.03***	-0.01
Secondary	0.15***	-0.03	0.00	-0.03***
higher secondary	0.27***	-0.05***	0.00	-0.05***
graduate and above	0.54***	-0.01	-0.04***	-0.07***
Income quintile (Poorest)				
2nd Quintile	0.03***	0.01	-0.02***	-0.04***
Middle	0.05***	0.01	-0.01	-0.05***
4th quintile	0.07***	-0.02	0.00	-0.05***
Richest	0.05***	-0.07***	-0.02***	-0.048
Marital status (ref: married)				
Unmarried	0.03*	0.01	-0.03***	-0.038***
Widowed	0.12***	0.038***	0.01	-0.02***
Divorced	0.10***	0.01	0.03	-0.03***
Age	0.00*	0.01***	0.00	0.018***
Age square	0.00*	0.00***	0.00*	0.00***
Number of infants in household	-0.01	-0.03***	-0.0***	0.00
Number of earning members in household	0.00	0.04***	0.00	0.03***

[42]Farm work includes own farm work and agriculture wage labor but excludes animal care.

[43]Non-farm work includes own business, salaried work, non-agriculture work but excludes MGNREGA work.

(Ref: farm work[42])	Non-farm[43]	Farm & non-farm (combined)	MGNREGA	MGNREGA & farm
Education attained (ref: illiterate)	Avg. Marginal Prob.	Avg. Marginal Prob.	Avg. Marginal Prob.	Avg. Marginal Prob.
Social group (Ref: Forward caste)				
OBC	0.00	0.06***	0.01	-0.01
Dalit	0.05***	0.08***	0.03***	-0.02***
Adivasi	0.01	0.06***	0.00	-0.01
Muslim	0.22***	0.02	0.01	-0.07***
Christian/Jain/Sikh	0.10***	0.04	0.11***	00.00
Number of obs	19401			
Wald chi2(66)	1422.86			
Prob> chi^2	0			
Pseudo R^2	0.071			

Source: Author`s own calculation from IHDS-I(2004-05)& IHDS-II(2011-12)

(***) =p<1%; (**)= p<5%; (*) = p<10%.

Table 4.15a. Percentage distribution of rural workers engaged in MGNREGA(any form) by combination of work in 2012

Combination of MGNREGA work	Sample	Percentage
Exclusive MGNREGA	543	23.56
NON FARM and MGNREGA	137	5.93
FARM and MGNREGA	1,626	70.51
Total	2,306	100

Source: IHDS-II (2011-12)

Notes: Rural women in the 15 to 65 age group have been considered

Table 4.15b. Percentage distribution of rural workers engaged in MGNREGA by gender

Gender	Sample	Percentage
Male	1,913	4.52(100)
Female	2,320	5.22(100)

Source: Author`s own calculation from IHDS-II (2011-12)

Notes: Rural women in the 15 to 65 age group have been considered

Table 4.15c. Percentage distribution of rural women MGNREGA workers of 2012 across socio-economic variables based on their type of work done in 2005 (column percentages)

Variables	No work to MGNREGA	Non-Farm to MGNREGA	Farm to MGNREGA	Combined work to MGNREGA
Educational Attainment				
Illiterate	63.21	72.82	76.67	81.35
Primary	11.99	8.52	6.24	6
Middle	21.01	14.97	14.56	11.69
Secondary	3.44	3.36	2.04	0.24
Higher Secondary	0.34	0	0.46	0.71
Graduation and Above	0	0.34	0.03	0
Income Quintiles				
Poorest	26.46	16.89	26.63	21.75
Second	29	29.28	25.44	33.14
Middle	19.95	32.11	22.89	26.55
Fourth	17.04	17.21	16.16	14.62
Richest	5.97	3.59	6.24	2.14
Socio-religious				
Forward caste	6.07	2.76	7.16	4.36
OBC	35.25	44.48	40.85	38.96
Dalit	41.22	34.52	38.23	23.27
Adivasi	8.25	11.13	10.42	32.03
Muslim	7.29	5.23	2.44	1.29
Christian, Sikh, Jain	1.92	1.89	0.9	0.1
Age categories				
0 to 9	2.89	0	0	0
10 to 14	6.77	1.65	0.26	0
15 to 19	7	1.6	3.83	4.42
20 to 29	26.83	35.34	24.33	28.04
30 to 39	25.19	34.72	36.31	33.06
40 to 59	24.94	25.19	33.83	34.02
60 & above	6.39	1.48	1	0.47

Source: Author`s own calculation from IHDS-I(2004-05)& IHDS-II(2011-12)

Table 4.15d: Logistic Regression on rural women`s participation in MGRNEGA and other Non-Farm work

Socio-economic variables	MGNREGA work		Non-farm work	
	1 Average Marginal Probabilities	2 Average Marginal Probabilities	1 Average Marginal Probabilities	2 Average Marginal Probabilities
Age	0.007***	0.007***	0.001	0.002
Age squared	-0.0001***	-9.000E-^{05}***	-0.00003***	-0.00004***
Number of total own child(below 5) in HH	0.007*	0.007*	0.004***	0.004***
Number of earning members in the HH	-0.002	-0.002	-0.012***	-0.010***
Education Attainment (Ref: illiterates) 2005				
Primary	-0.02***	-0.02***	-0.001	-0.0004
Middle	-0.01	-0.01	0.001	0.002
Secondary	-0.02	-0.01	-0.015	-0.02
Higher Secondary	-0.04***	-0.04***	-0.03***	-0.03*
Graduate	-0.07***	-0.07***	-0.04***	-0.04***
Social group in 2005 (Ref: Forward caste)				
OBC	0.03***	0.03***	0.01***	0.01***
Dalit	0.04***	0.04***	0.03***	0.03***
Adivasi	0.04***	0.04***	0.03***	0.03***
Muslim	-0.01	-0.01	0.07***	0.07***
Christian/Jain/Sikh	0.06***	0.07***	0.05***	0.05***
Marital (Ref: Married)				
Unmarried	-0.035***	-0.03***	-0.02*	-0.02*
Widowed	0.007	0.00	0.01	0.007

Socio-economic variables	MGNREGA work		Non-farm work	
	1 Average Marginal Probabilities	2 Average Marginal Probabilities	1 Average Marginal Probabilities	2 Average Marginal Probabilities
Divorced	0.015	0.01	0.02	0.023
Work type in 2005 (Ref: own farm work)				
Agriculture work	0.03***	0.03***	0.04***	0.04***
Non-agriculture wage work	0.04***	0.04***	0.16***	0.15***
Salaried Work	0.01*	0.01*	0.02***	0.02***
Non-farm Own business	0.05***	0.05***	0.03***	0.02***
Income quintile (Poorest) 2005				
2nd Quintile	-0.016***		0.01***	
Middle	-0.016***		0.03***	
4th quintile	-0.004		0.02***	
Richest	-0.007		0.01	
Number of obs	20074	20508	20074	20508
Wald chi2(25)	199.37	198.37	474.69	453.73
Prob > chi2	0	0	0	0
Pseudo R2	0.0367	0.0359	0.1152	0.1102
Log pseudo likelihood	$-3.1E^{+07}$	-32006065		$-2E^{+07}$

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II(2011-12)
(***) =p<1%; (**)= p<5%; (*) = p<10%.

Table 4.16a. Mean Sectoral wages and growth rates across Gender over the period 2005-2012 in rural area

Mean Daily (real)wage	2012		2005		CAGR (during 2005-2012)	
	Agricultural*	Non-agriculture*	Agricultural	Non-agriculture	Agricultural	Non-agriculture
Male	143	172	94	135	6.2	3.5
Women	95	112	62	79	6.3	5.0

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II(2011-12)
*Agriculture includes agriculture wage labor
*Non-Agriculture includes MGNREGA, any non-farm wage work, and salaried work.

Table 4.16b. Mean Sectoral Earnings and growth rates (Gender-wise) over period 2005-2012 in rural area

Mean (real) Earnings (Rs)	2012				2005			Compound Annual Growth Rate (CAGR)		
	Agriculture Laborer	NREGA	Salary	Non-Agriculture	Agriculture Laborer	Salary	Non-Agriculture	Agriculture laborer	Non-agricultural	Salary
Male	10245	2058	46702	14752	2398	5014	2898	23	26	38
Women	5681	2208	23360	4443	1016	604	353	28	44	69

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II(2011-12)

Table 4.17a. Percentage distribution of rural women workers in 2012 based on their type of job in 2005

Work type in 2005↓ Work type in 2012→	own farm	Agricultural wage labor	Non-farm wage labor	Salaried work	Non-farm own (family) business
own farm	50.22	12.95	8.95	26.54	1.33
Agricultural wage labor	11.17	54.24	17	15.52	2.07
Non-farm wage labor	14.11	25.22	35.56	21	4.11
Salaried work	24.91	13.87	11.29	48.17	1.76
Non-farm own(family) business	26.75	25.8	18.47	16.24	12.74

Source: Author`s own calculation from IHDS-I(2004-05) & IHDS-II(2011-12)

Table 4.17b. Percentage distribution of rural women workers engaged in farm work in 2012 by type of work

Work type in 2012	Sample	Percentage
exclusive FARM work	14,936	91.13
FARM work and MGNREGA	1,454	8.87

Source: Author`s own calculation from IHDS-II(2011-12)
Note: Rural women in the age-group 15-65 years have been taken.
Farm work includes agriculture wage labor and own(family) farm work.

Table 4.18. Number of days worked by rural men and women using panel data

No of days worked (mean)	2012						2005			
	Women			Men			Women		Men	
	FARM	Non-Farm	MGNREGA	FARM	Non-Farm	MGNREGA	FARM	Non-Farm	FARM	Non-Farm
ALL India	100	22	52	99	67	44	112	14	110	44
Age										
15 to 19	65	23	NA	33	91	71	95	15	86	42
20 to 29	87	22	48	80	79	46	105	17	106	50
30 to 39	103	22	52	93	81	44	118	14	114	47
40 to 59	102	22	53	111	58	43	112	12	114	37
60 & above	93	18	50	108	35	46	109	10	120	26
Marital status										
married	102	20	46	102	67	50	113	13	114	44
Unmarried	60	21	53	70	72	44	70	22	92	40
Div/sep/widowed	103	28	49	108	56	43	114	23	97	46
Income Quintiles										
Poorest	84	17	43	99	50	37	106	10	119	32
Second	98	22	49	99	83	44	114	15	116	54
Middle	110	25	54	101	78	47	116	19	108	52
Fourth	108	27	63	97	79	50	110	15	100	49
Richest	101	18	59	92	44	55	110	7	95	28
Educational Attainment										
Illiterate	103	22	52	110	77	44	115	15	122	54
Primary	109	28	50	116	73	41	120	14	127	44
Middle	97	22	54	96	76	45	109	12	106	46

No of days worked (mean)	2012						2005			
	Women			Men			Women		Men	
	FARM	Non-Farm	MGNREGA	FARM	Non-Farm	MGNREGA	FARM	Non-Farm	FARM	Non-Farm
Secondary	82	13	50	95	50	46	86	9	101	32
Higher Secondary	56	11	57	83	37	49	70	6	89	26
Graduation and Above	21	2	44	57	21	40	29	28	67	12
Place of residence										
More developed village	104	25	57	101	64	48	121	14	113	42
Less developed **village**	96	19	48	97	69	42	104	14	107	45
Social group										
Forward caste	107	12	54	110	37	44	122	8	116	24
OBC	102	18	53	102	60	45	113	10	113	38
Dalit	100	27	55	94	90	45	111	18	108	60
Adivasi	101	20	44	97	69	45	116	17	117	45
Muslim	70	46	50	85	90	33	71	29	82	57
Christian/Sikhs/Jains	59	33	55	81	46	71	109	25	127	39

Source: Author`s calculation from IHDS-I(2004-05) & IHDS-II(2011-12)

Notes: Rural women in age-group 15-65 years. Farm work includes own farm work, agricultural laborer
Non-farm work includes non-Agricultural wage work (excluding MGNREGA)

Chapter 5

Rural Women`s Labor Supply and Household Poverty

5.1. Introduction

Having analysed the determinants of labor supply and occupational transitions among rural women in chapter 3 and 4; this chapter examines the linkages of rural women`s labor supply and household poverty.

According to the World Bank (2000), "poverty is pronounced deprivation in well-being". Sen`s (1987) conceptualises poverty in terms of the 'capability' to function in the society. Thus, lack of key capabilities like income, education, health, security, rights, etc causes poverty. Hence, poverty is a 'multi-dimensional' phenomenon. According to Sen (1985), poverty needs to be tackled by "providing opportunities, creating entitlements and building capabilities". Since the economic reforms in India in 1991, there have been many studies examining trends of economic development and poverty across the country.

Labor market is crucial for poverty reduction and pro-poor growth because the poor mainly have only labor as their main asset (World Bank, 1990). Further, women's access to education and economic participation reduces the probability of a household being poor (Kabeer, 2012) and their employment is a crucial driver of economic growth in India (Klasen & Pieters, 2012) and enhances the economic well-being of the household (Martin & Roberts, 1984). The effect is significant in poor households where women are the sole providers or when earnings of other household members are very low (Morris, 1990). However, because of their traditional 'care duties', women opt for part-time jobs. This further reduces their contribution to family income due to their lower earnings (Smith et al., 1998). The "potential contribution of women's employment to their household's economic well-being depends on three main factors: the availability of employment, women's wage rate, and the number of hours they allocate to market activity" (Stier & Lewin, 2002, p.213).

Further, Goldberg (2010) claims that creating day labor jobs is a prominent policy tool for governments seeking to simultaneously reduce poverty and promote infrastructure development. However, having employment in certain industry groups does not help the poor in reducing their poverty risks. This has been observed to be true for poor rural women who are compelled to work in hazardous jobs with low pay (Khera & Nayak, 2009). Rural

women (compared to rural men) are relatively less educated and have limited job opportunities. However, low educational levels of the workforce hinders poverty reduction (Rani & Schmid, 2006). On one hand, households undergoing financial duress may use female labor for additional earnings, who otherwise remain out of work. They may enter the labor market only to supplement the financial needs of the household. Hence, they have relatively less experience and low skill level than men. Thereby, poor women may be trapped in a low wage cycle, who keep moving in and out from one low paid job to another. Hence, poor women`s labor is less likely to have an impact on poverty reduction of the household.

In this chapter, the role of household poverty status in shaping the nature of labor supply of rural women; and the role of rural women`s labor supply in mitigating the household poverty risks overtime, has been analyzed. Firstly, the effect of household poverty on rural women`s labor supply has been examined, using IHDS panel (2005-2012) dataset. IHDS panel data gives us the unique opportunity to reinvestigate the factors influencing rural women`s labor supply in 2012, differentiated by poverty status of the household with additional variables like rural women`s labor hours supplied in 2005 (lagged labor hours supplied), change in number of earning members and number of children in the household, etc.

Secondly, the role of rural women`s labor supply towards changes in household poverty risk during 2005-2012, has been examined in this chapter. Studies have used cross-section level analysis either at the state, region or district levels, hitherto (Kim et al., 2016). The unique panel dataset of IHDS has been used, thereby adding to the existing literature on rural poverty. The panel data tracks the same rural household overtime and enables the analysis of determinants of poverty risks of rural households overtime. Few of the existing studies on poverty transition are that of Thorat et al. (2017) which investigated the poverty risks among socio-religious groups for urban and rural areas, using IHDS panel data (2005-2012); Bhide and Mehta (1998) analyzed the poverty transitions from year 1970 to 1988; Dhamija and Bhide (2010) explored poverty transition for India between years 1970 to 1998; and Balcazar et al. (2016) explored the role of structural transformation in poverty transition in India. This chapter therefore, is an addition to these transition studies with the

objective of analyzing the role of female labor supply in influencing the poverty risks of rural households in India.

This chapter tests the hypothesis that household poverty status determines the nature of rural women`s labor supply, on one hand. On the other hand, female labor supply helps in reducing household poverty risks overtime. The remaining part of this chapter has been divided broadly into the following sections. The second section reviews the existing literature about the role of household poverty in influencing women's labor supply and also on the factors affecting poverty transition of households. The third section describes the data sources and methodology. The fourth section analysis the results and the final section concludes the chapter.

5.2. Literature Review

5.2.1. Influence of Household Poverty on Female Labor Supply

This section reviews existing studies on the nature of women`s labor supply curve differentiated by household poverty status. Dasgupta and Goldar (2005) divided the rural population on the basis of poverty line and estimated the labor supply curve of rural women from households categorized on the basis of poverty, using NSS (1999-2000) data. They found that the supply curve is downward sloping for rural women from BPL (Below Poverty Line) families. 'Forced' or 'need-based' participation in workforce among rural women was evident from their results. Sharma (1989) termed such a downward sloping supply among poor as 'deprivation-induced employment'. Licona (2000), Dessing (2002), El-Hamidi (2003) and Sharif (1991) also observe existence of negative relationship between labor supply and wage rate, at very low wage level in developing countries. The literature attributes the lower labor days supplied at higher wages by poor workers as 'irrational'. Such irrationality is explained by the 'culture of poverty' (Lewis, 1966) or due to 'limited consumption opportunities'. This is in contradiction to the neo-classical labor supply theory which expects a positive relationship between labor supply and economic opportunities. Likewise, Dessing (2002) explains that once the basic needs are met, the labor supply falls and the worker opts for leisure, which results in a backward bending labor supply curve (as cited in El-Hamidi, 2003). Myrdal (1971) and Lipton (1983) find

similar negatively sloped labor supply among peasant class, once they reach a subsistence level of income. Likewise, Schultz (1964) and Miracle (1976) claimed that poor living conditions in towns forced them to head back to their home village, once they satisfied their minimum needs.

Further, Abraham (2009) shows how female labor is used to cope up financial crisis in the household. The author observes that under conditions of distress, especially agrarian distress in case of rural India, the otherwise non-working 'secondary workers' (women) are compelled to enter the labor-force to supplement the family income. Income shocks (even if they are transitory in nature) can throw households into poverty traps. Under such cases, labor is the only asset they possess (Bhalotra & Aponte, 2010). Thus, the poverty status of the household plays an important role in determining not just the participation but also the number of labor days required to be put in by the female members of the household.

Further, El-Hamidi (2003) explains that poor women end up working more than women from APL families as they are compelled to work out of economic necessity. Eberharter (2001, p.245) claims that "in poor families, both men and women have greater pressure to contribute to family income. Variables like age, education, economic and demographic characteristics, social attitudes and gender role patterns are found to influence the annual working hours of female labor supply" (ibid).

5.2.2. Impact of Female Labor Supply on Poverty Transition of a Household

Transition models provide a strong framework that enables the understanding of poverty persistence. These models help in understanding the inter-linkages of socio-economic background of individual and changes in poverty (Stevens, 2011). The author argues that understanding the causes and timing of transition of a household into and out of poverty are crucial to analyze short-term poverty or long-term persistence of poverty. Dhamija and Bhide (2010, p.91) distinguish between 'transitory' or 'chronic' concepts of poverty. They explain that "transitory poor are the people who remain poor for a short duration and then move out of poverty and the chronic poor are people who are poor for significant periods

of their lives, could be inter-generational and for whom finding exit routes from poverty is difficult".

With respect to the causes of poverty transition of a household, factors like family structure and education attainment have large impact on transition and persistence of poverty. Labor market variables are also important in transition models. Changes in the earnings of the household head may significantly influence the duration of poverty spells (Stevens, 2011). Further, Balcazar et al. (2016, p.19) in their study using IHDS data, claim that "rising income from the non-agricultural[44] sector (especially wage/salaried work) was the most important driver of poverty reduction". In one of the very few and recent studies on poverty risk, it was found that the risk of falling into or remaining in poverty was higher for Dalit and Adivasi as compared to the more privileged groups (Thorat et al., 2017).

In yet another study, Bhide and Mehta (1998) show the need to analyze persistence of poverty over time using panel data to address chronic or persistent poverty. The authors state that improvement of income potential depends on improvement of physical and human resources. The authors observe that more than the household size, household composition in terms of dependents and women's access to labor market significantly influence poverty transition. Further, village-level infrastructure and greater employment opportunities at the local level have shown to significantly reduce poverty.

McKernan and Ratcliffe (2002, p.1) claim that "shifts in household structure (i.e., transitions from a two-adult to a female-headed household and vice versa) are relatively rare events in the population, but individuals who experience these events are most likely to enter into or escape out of poverty". Further, Değirmenci and İlkkaracan (2013) examine the changes in poverty risk as households transform from 'single' to 'dual' earner household. They show that increasing female employment is an important strategy against poverty. Further, Stier and Lewin (2002) find that women's employment reduces the probability of the household being poor.

[44] Similar results are also found in a region-level panel data analysis for India by Lanjouw and Murgai (2009). They find that expansion of nonfarm sector leads to directly to poverty reduction and also indirectly by putting pressure on agriculture wage rates, on which most of the poor are dependent upon.

However, Goldin`s (1990) and Blau and Kahn`s (1995) study shows that women's level of earnings are much lower than that of men irrespective of the type of work they perform and a large proportion of them are engaged in part-time work (as cited in Stier & Lewin, 2002). Further, women's labor supply being used as an insurance mechanism for households has been analyzed in various studies like Attanasio (2005) and Bhalotra and Aponte (2010). Bhalotra and Aponte (2010) claim that female labor supply contribute to smoothening of household consumption in environments characterized by income volatility. They observe that in developing countries like Asia, women`s labor supply moves counter-cyclically, i.e., women move from being 'out of workforce' into 'paid work' or self-employment during recession period. Such a trend is observed to be strongest among households with limited means against income shocks.

5.3. Data Sources and Methodology

5.3.1. Data Sources

(i) The household level panel data of IHDS (2005-2012) has been used for the household poverty transition analysis.

(ii) For analyzing the socio-economic factors affecting rural female labor supply in 2012, differentiated by household poverty status, the individual level panel data of IHDS (2005-2012) has been used to enable the inclusion of more explanatory variables that show the changes in socio-economic variables overtime.

5.3.2 Methodology

5.3.2.1. Impact of Household Poverty on Rural Women`s Labor Supply

Vella and Verbeek`s two step panel estimation (as explained in section 2.3.1) has been used to analyze the factors influencing rural women`s labor supply in 2012, differentiated by poverty status[45] of the household, using IHDS panel data (2005-2012). In the first stage, IMR derived by two Probit regression (one on individual panel attrition and another on

[45] Poverty cut-offs distinguishing between APL and BPL rural household are based on Tendulkar poverty line.

decision of women to participate in workforce in 2012) are used as additional explanatory variables in the second stage regression. At the second stage, an OLS regression is run to estimate the factors affecting rural women`s labor supply in 2012, but separately for APL and BPL household. The independent variables remain same for both APL and BPL regressions.

Variables in the Study

The dependent and independent variables chosen are same as those used to estimate the aggregate labor supply of rural women in 2012 (in section 3.3.2.1). Dependent variable is the log of labor hours supplied by rural women in 2012. It is taken as a continuous variable.

The independent variables were as follows:

(i) Hourly market wage (rural women`s own wage) in 2012: It is assumed a-priori that as own wages of rural women rise, they supply more labor days. Thus, labor supply of rural women from APL household is upward sloping curve.

(ii) Square of hourly wage in 2012: This variable is included to capture the non-linearity of wages on labor hours supplied by rural women, in the long run.

(iii) Number of children in the household (below 15 years) 2012: It is assumed a-priori that higher the number of children in the household, lower are the labor hours supplied by rural women from APL household.

(iv) Marital status of rural women 2012 is a categorical variable with the reference category being 'married'. The other categories are unmarried, divorced and widowed rural women. It is assumed a-priori that as compared to married rural women, unmarried rural women supply more hours of labor as they don`t have additional burden of household responsibility.

(v) Monthly Per-capita Consumption Expenditure (MPCE[46]) quintile of the rural household: It is included in the model as a categorical variable. It is taken as a proxy for household income. The lowest MPCE quintile is taken the reference category. The other categories are second, middle, fourth and highest quintile. It is assumed that higher the MPCE of the APL household, lower are the labor days supplied.

(vi) Number of lagged labor hours (2005): It is taken as a continuous variable. Log of lagged labor hours are the labor hours supplied by rural women in 2005. It is assumed that higher the labor hours supplied by rural women in the previous round (2005), higher were the labor hours supplied in 2012.

(vii) Earning members in the household in 2012: It is taken as a continuous variable. It is assumed a-priori that as the earning members in the household increase, rural women from APL households supply lesser labor days.

(viii) Age of rural women in 2012: It is assumed a-priori that as the age of the rural women increases, they were likely to supply more labor hours in the short run.

(ix) Age squared 2012: It is included to capture the non-linearity of the age of rural women in the long run.

(x) Work type 2012: It is a categorical variable with farm work as the reference group. Non-farm wage work, salaried and own non-farm business as other categories. It is assumed a-priori that rural women engaged in farm work, supply more days of work as compared to other categories of work.

(xi) **Socio-Religious group 2012**: It is a categorical variable with forward caste as reference category. The other categories are OBC, Adivasi, Muslim, Christian/Jain/Sikh. It is assumed a-priori that the backward caste supply more labor hours as compared to forward caste.

[46] "The NSS concept of MPCE is defined first at the household level (household monthly consumer expenditure ÷ household size). This measure is an indicator of the household's level of living" (NSS, CES report, 68th round).

(xii) **State dummy:** State dummy have been used to control for the regional differences in labor hours supplied by rural women.

(xiii) IMR: IMRs derived from Probit regression on attrition and workforce participation decision by women in 2012 is taken as additional explanatory variables, in the second stage OLS regression on hours supplied by rural women.

(xiv) Predicted values of dependent variable from Probit regression on decision to participate in workforce: Lester and Fitzpatrick (2008) claim that there is endogeneity (due to dynamics and/or state dependency) which can be controlled by including a polynomial of predicted values of the dependent variable of the first stage Probit regression on decision to participate in workforce in 2012, as explanatory variables in the second stage OLS regression.

(xv) Area of residence in 2012: It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages. More developed village is taken as the reference category. It is assumed that rural women from less developed villages supply more labor hours.

(xvi) Changes in education attainment[47] : This variable is a categorical variable with reference group as rural women who 'remain illiterate' during 2005-2012 period. Other categories are those who remain up to middle level educated in both rounds; who remain higher[48] educated; who shift from illiterate to middle level educated; who shift from middle to higher educated. It is assumed that rural women who remain illiterate over the two rounds, supply more labor hours.

(xvii) Change in household size: The difference between the number of members in the household, over the two rounds has been taken to reflect the change in household size.

[47]Education attainment of rural women are classified as primary (1-5th standard), middle (5-9th standard), secondary (10-11thstd), higher secondary; graduation and above.

[48] Higher educated rural women includes all those rural women who have education attainment above middle school education.

Higher the increase in number of members in the household over time, lower are the labor hours supplied by rural women.

5.3.2.2. Role of Rural Female Labor Supply towards Household Poverty Transition

The methodological approach followed in Thorat et al. (2017) to analyse the determinants of poverty transition of rural households in India, has been adapted for this study too. At the first stage, a Probit regression is run on attrition to derive the IMR, which are then included as additional explanatory variables in the second stage to correct for the attrition bias. At the second stage, two binary Logistic regressions were run, separately for ENTRY into poverty and for EXIT from poverty, to assess the factors influencing the poverty risks of rural households.

Variables used in the study:

Dependent Variable:

a) Poverty **EXIT**: It is a binary variable which takes the value 1, if the rural household was BPL[49] in 2005 but APL in 2012 and it takes value zero, if the rural household remains BPL. The dependent variable can be expressed in the following notations:

$$Pr\ (Poor_{i,t} = 0 \mid Poor_{i,t-1} = 1) \quad (1)$$

b) Poverty **ENTRY:** It is a binary variable which takes the value 1, if the rural household was APL in 2005 but BPL in 2012 and it takes value zero, if the rural household remains APL. The dependent variable can be expressed in the following notations:

$$Pr\ (Poor_{i,t} = 1 \mid Poor_{i,t-1} = 0) \quad (2)$$

Where t refers to the second round (2011-12) and t-1 refers to the first round (2004-05). Equation 1 shows the dependent variable expressed in terms of probability of a poor rural

[49] Poverty line cut offs are based on Tendulkar poverty lines for both years 2005 and 2012. Poor (BPL) and non-poor (APL) have been classified based on the cut-offs.

household in 2005 of not being poor anymore in 2012. Equation 2 shows the dependent variable expressed in terms of probability of a non-poor rural household in 2005 of becoming poor in 2012.

Independent Variables are same for both (poverty entry and exit) regressions:

(i) **Socio-religious group (2005):** It is a categorical variable. The reference category is taken as forward caste. The other categories are OBC, Adivasi, Dalit, Muslim and Christian/Sikh/Jain. It is assumed that non-poor rural households of 2005 are more likely to fall into poverty in 2012 and poor rural households of 2005 less likely to escape poverty in 2012, if they belong to backward caste.

(ii) **Highest education attainment in the family (2005):** It is taken as a categorical variable. The reference category is taken as 'illiterate household', i.e., all members are illiterate. The other categories are primary, middle, secondary, higher secondary and graduate. It is assumed that higher the maximum education attainment in the household, lower is the likelihood of the household to fall into poverty.

(iii) **Asset owned (2005):** It is a categorical variable. Assets owned by the rural household signals the standard of living of a household. Higher the assets owned by the household, greater is the likelihood of a poor household to escape poverty overtime.

(iv) **Change in average number of hours worked by female members of family**: It is taken as the difference between mean labor hours supplied by female members in the household in 2012 and 2005. Higher the mean labor hours supplied by the female members of a poor household, higher is the probability to escape poverty.

(v) **Change in average years of education of female members in the rural household**: It is taken as the difference between average years of education of female members in the household in 2012 and 2005. Higher the increase in average years of education of female members of a poor household, higher is the probability to escape poverty.

(vi) **Main source of income for the rural household (2005):** It has been taken as a categorical variable with income from farm as the reference variable. The main sources of income of a rural household have been divided into the following categories according to IHDS: Farm (includes cultivation and allied agriculture), Agriculture wage labor, non-agriculture wage, self-employment (includes households engaged as artisan/self-employed and petty shop owners), business (organised), salaried (includes regular profession), pension/rent, others. It is assumed that households with main source of income from salaried jobs are less likely to fall into poverty.

(vii) **Change in dependency[50] ratio**: It is taken as a continuous variable. It has been taken as the difference between dependency ratio of household in year 2012 and 2005. Higher the increase in dependency ratio of a household overtime, lower is the probability to escape poverty.

(viii) **Change in household size[51] :** It is taken as a continuous variable. It is taken as the difference between household size of 2012 and 2005. Higher the increase in household size overtime, lower is the likelihood of escaping poverty.

(ix) **State dummy:** State dummy have been used to control for the regional differences in levels of poverty.

(x) **Member of credit/saving group or Self-Help Group (2005):** It is taken as a categorical variable which takes the value 1, if any member of the rural household belongs to a self-help group/credit/saving group, else zero. It is assumed that rural households with membership in such groups are more likely to escape poverty or prevent their fall into poverty.

(xi) **Land owned or cultivated (2005**) is a binary variable which takes the value 1, if the rural household owns or cultivates land, else takes the value 0. It is assumed

[50]Ratio of number of dependents (those less than 15 years of age and those aging more than 60 years) to number of members in the working-age group (15-59years) in a household.

[51] Number of members residing in the same household.

that the rural household that owns or cultivates land, is less likely to fall into poverty and more likely to escape from poverty.

(xii) **IMR:** IMRs derived from Probit regression on attrition is taken as additional explanatory variables in the second stage logit regression on probability of a household to enter or exit poverty.

(xiii) **Area of residence in 2005:** It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages. More developed village is taken as the reference category. It is assumed that poor households of 2005 from less developed villages are less likely to exit poverty.

(xiv) **Change in Household type:** It is taken as a categorical variable. Households with only men working in both rounds is taken as the reference category. The other categories are as follows: when households shift overtime from 'only men working' in first round to joint labor (men and women both working) in the second round; 'only women working' in both rounds; when households shift from 'only women working' in first round to joint labor in second round.

5.4. Results and Discussion

5.4.1. Trends in Poverty

Overall poverty rates in India have drastically fallen since 1990s (Table 5.1). Rural poverty rates have fallen slightly more than urban (ibid). The Planning Commission (GOI) estimates show that overall poverty rate fell from 37% in 2004–05 to 22% in 2011–12. The IHDS shows a similar fall in poverty rate from 39% in 2004–05 to 20% in 2011–12 (ibid). Further, state-wise, it was observed that Maharashtra and Uttarakhand witnessed the highest fall in poverty during 2005-2012 period based on Planning Commission estimates (Table 5.2). With respect to poverty transition among rural households, Jammu and Kashmir and Andhra Pradesh witnessed one of the highest rates of escape from poverty (Table 5.3). On the other hand, Orissa had one of the highest entry rates into poverty (ibid).

5.4.2. Role of Household Poverty on Rural Women`s Labor Supply

5.4.2.1. Distribution of rural women across socio-economic variables by poverty status of the household

The sample distribution of rural women from BPL and APL households across socio-economic categories (Table 5.4) reveals the following. The maximum proportion of rural women from BPL households were in lowest MPCE quintile, least educated, OBCs and those engaged as agricultural wage laborers. On the other hand, maximum proportion of rural women from APL households were in higher MPCE quintile, less educated, OBCs and engaged in non-farm wage work. Large proportion of rural women were found to be less educated, irrespective of the poverty status of the household, but proportion of rural women who were graduate and above were more from APL households than BPL households. It indicates that higher standard of living helps provide access to higher education standards.

There is major disparity in labor days supplied by men and women in rural areas, with rural women supplying much lesser than men (Table 5.5a). Further, the following observations were made on the average labor days (per year) supplied by rural women across socio-economic categories, differentiated by household poverty status (Table 5.5b). It was observed that mean labor days supplied by rural women from BPL household are less than that supplied by rural women from APL household in 2012. It has been observed that rural women from APL households supply more labor days as the MPCE quintile rises. It indicates that the availability of jobs are more at higher income quintiles. Rural women engaged in salaried jobs supply most labor days, irrespective of the poverty status of the household. It was also observed that the U-shaped hypothesis of labor supply holds true with respect to education attainment of rural women from BPL households. The labor days fall upto higher secondary level for BPL rural women, thereafter it rises again for graduate and above. Whereas, for rural women from APL households, labor supply consistently rises with rise in education as their labor market returns may be higher than women from BPL families. Muslim rural women from BPL households and Christian/Jains/Sikhs women from APL households were found to be supplying higher labor days.

Further, Table 5.6a provides insight into rural women`s work transitions across poverty status of the household. It was found that among rural women from household which remain in poverty (chronically poor) during 2005-2012 period, maximum proportion were observed to remain in workforce or were forced to enter workforce in year 2012 (those who were previously not in workforce). For those rural women from non-poor rural household of 2005, which have newly fallen into poverty in 2012 and those which remain non-poor during 2005-2012, maximum proportion of women remain out of workforce, as rural women from non-poor households have less pressure to work. For those rural women from poor rural household of 2005 which escaped poverty in 2012, maximum proportion remained in workforce. This indicates the how households use women`s labor as an insurance mechanism to cope with financial crisis.

5.4.2.2. Labor Supply of Rural Women across Household Poverty Status

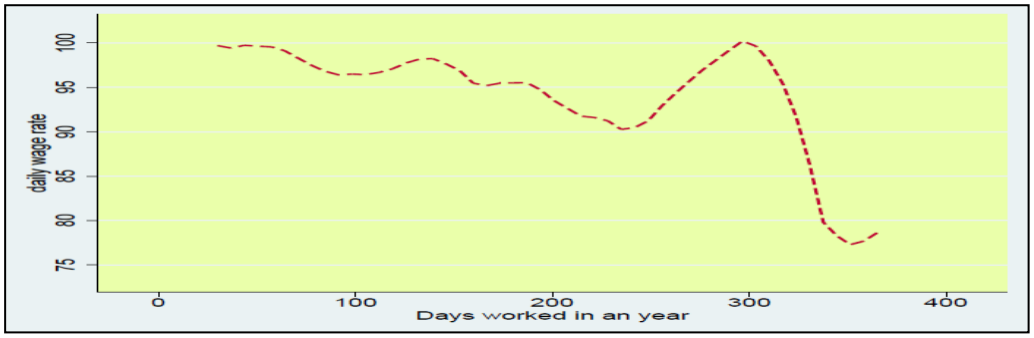
Following the Vella and Verbeek`s methodology as explained in section 2.3.1, two step panel estimation is done to estimate rural women`s labor supply differentiated by poverty status. At the first stage, two Probit regression are run. One on individual attrition (Table A.3.6) and another on work participation decision by women (Table 3.1a), using the same approach applied in section 3.3.2.1 to estimate aggregate labor supply of rural women. At the second stage, OLS regression is run on rural women`s labor hours supplied differentiated by poverty status (BPL/APL) (Table 5.7) using IHDS panel data. The following observations were made.

Rural women`s own wage rate shows a negative[52] relationship with respect to the labor hours supplied by rural women from BPL households. Lower the hourly market wage rate for rural women, higher were the labor hours supplied by them, indicating a downward sloping labor supply curve, contrary to the standard theory of labor supply. This clearly indicates the prevalence of 'forced labor' among rural women from BPL households. This also justifies the participation of rural women in low paid and hazardous jobs for long hours, given the limited labor market opportunities in rural areas. This implies that once

[52] This result is similar to the study of Dasgupta and Goldar (2005) who used NSS cross-section data to determine the factors affecting of rural women`s labor supply.

their basic (immediate) needs are met, they tend to reduce their labor hours with rise in wages. Given their lower labor market returns as compared to men, the welfare gains of women staying at home is perceived as higher than earning wages. This explains the 'irrationality' behind supplying lower labor hours at higher wages assuming all other factors are constant. As the literature points out, this behavior can be attributed to 'culture of poverty' or 'limited consumption opportunities'. Unlike the labor supply behavior of rural women from BPL households, for rural women from APL households, the relationship between wage rate and labor supply is positive. Higher their hourly market wage rate, higher are the labor hours supplied by them, thus producing an upward sloping labor supply curve and upholding the classical theory of labor supply. However, the wage coefficients have lower values with respect to having an impact on labor supply, irrespective of poverty status of the household. Figure 5.1 and Figure 5.2 clearly reflect these trends (polynomial smoothened distribution) between wage rate and labor supply of rural women according to the poverty status of the household.

Figure 5.1. Labor Supply curve of Rural Women from BPL Household in 2012

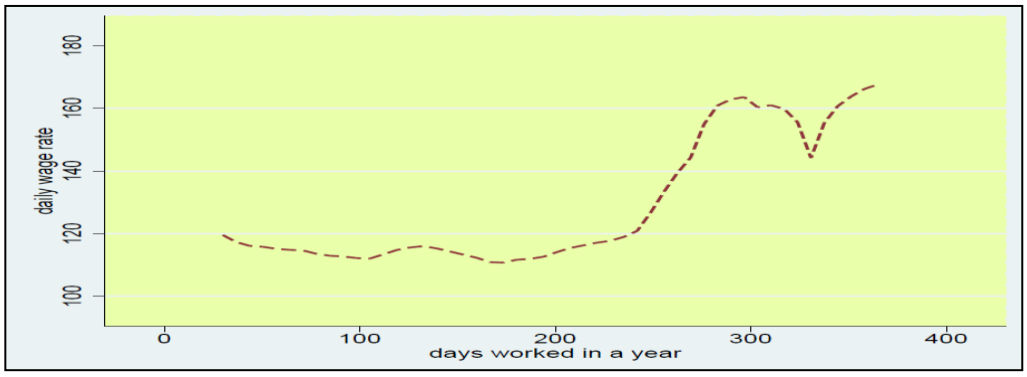


Notes: days worked in a year capped at 365 days.

:Rural women aged 15-65 years have been utilized

Source: Author`s own calculation from IHDS-II(2001-12)

Figure 5.2. Labor Supply Curve of Rural Women from APL Household in 2012



Notes: days worked in a year capped at 365 days.

:Rural women aged 15-65 years have been utilized

Source: Author`s own calculation from IHDS-II(2011-12)

Further, it was observed from Table 5.7, at higher MPCE quintile, rural women from APL households supply higher labor hours as compared to lowest MPCE quintile. At higher MPCE (proxy for income) quintile, the MPCE coefficient values are positive but have very low significance in having an impact on labor supplied, as women have lesser pressure to work at higher income levels. In contrast, the distribution of rural women from BPL households is majorly concentrated in the lower (first and second quintile) MPCE quintiles (Table 5.4). Hence, rural women from BPL households at second MPCE quintile supplied higher labor hours than lowest MPCE quintile (Table 5.7).

Further, using IHDS panel data, it has been observed that for rural women from APL or BPL households, higher their labor supplied in the previous round, higher was their labor supply in 2012. Previous period labor market activity of rural women significantly influences current year`s labor market performance due to state dependence (as explained in section 2.3.6) prevalent in panel data models. With respect to the type of work, rural women workers engaged in salaried work were observed to be supplying more labor days, irrespective of the poverty status of the household in 2012. Although the WPR is highest in farm work, the actual days of labor supplied is highest among salaried workers.

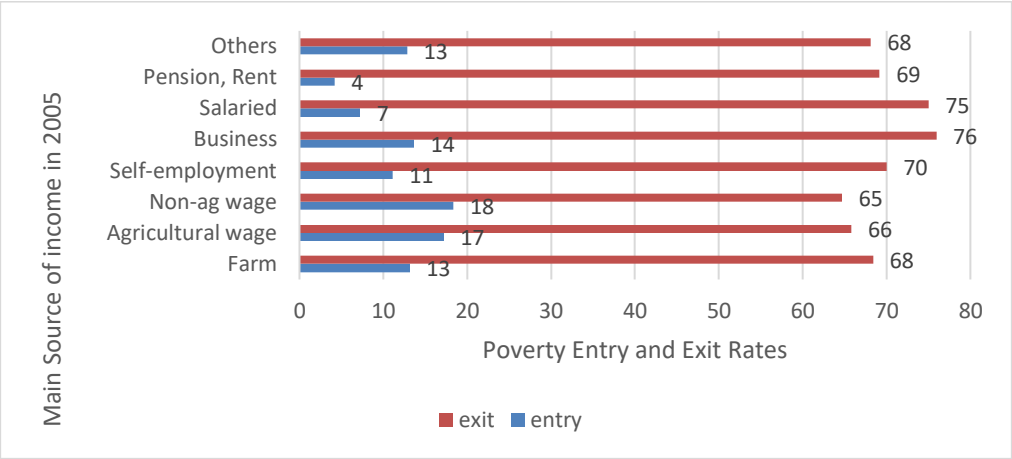
Further, irrespective of household poverty status, higher the total number of earning members in the household, lower were the labor hours supplied by rural women, as their pressure to work reduces with rise in household income. With respect to the socio-religious category, forward caste rural women supply more labor hours, irrespective of poverty status of the household. Widowed and divorced rural women from APL households supply more labor hours as compared to married rural women as they are devoid of a stable household income to fall back upon. Whereas, married rural women from BPL households supply more labor hours. Higher labor hours are supplied by rural women with higher levels of education, irrespective of poverty status of the household due to the availability of job opportunities with better market returns.

5.4.3. Role of female labor supply towards poverty transition of rural households

In contrast to the previous section, this section examines the role of labor supply and education attainment of female members (apart from the other socio-economic factors) in influencing the transition in poverty status of a rural household overtime.

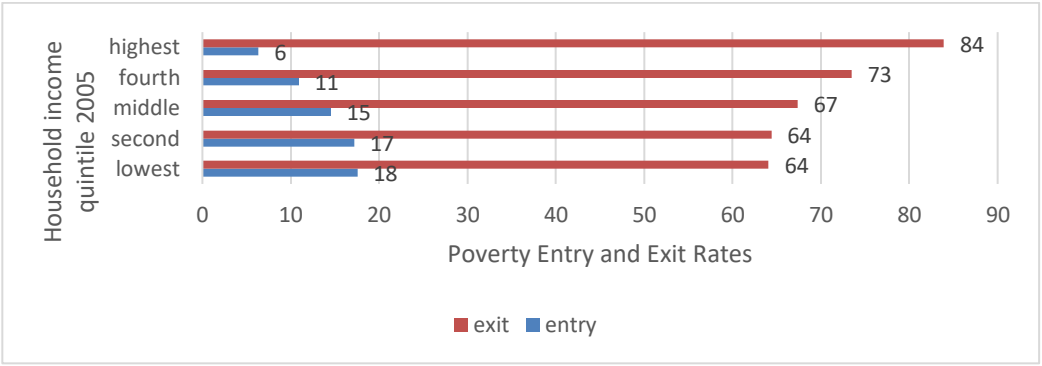
Few socio-economic variables from year 2005 have been taken to analyze the poverty entry and exit rates of rural households (Figure 5.3; Figure 5.4.; Figure 5.5, Figure 5.6; Table 5.8a) using IHDS panel data. The following observations were made on the rural household poverty transition rates. High entry rates into poverty was observed among non-poor households of 2005 which were illiterate, Adivasi and those with non-farm wage as main source of income. Whereas, high escape rates from poverty was found among poor households of 2005 with graduation as the maximum education attainment in the family, Christian/Sikh/Jain group and those engaged in organized business as main source of income.

Figure 5.3. Poverty Entry and Exit Rates of Rural Household by Main Source of Income in 2005



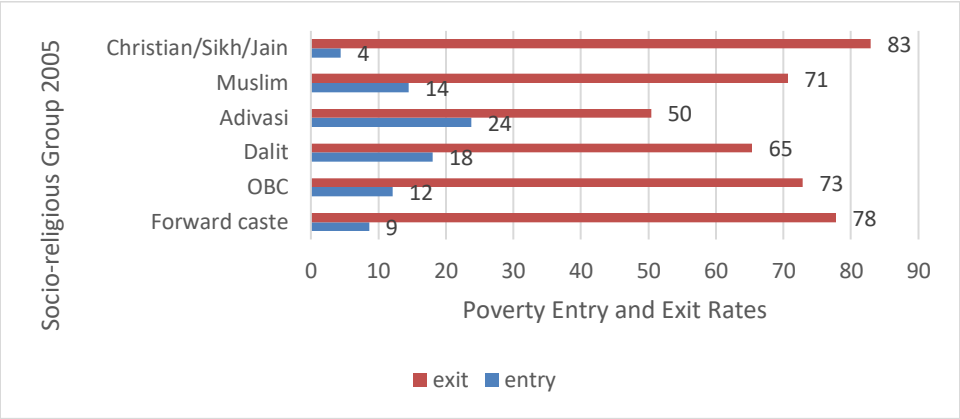
Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I(2004-05)

Figure 5.4. Poverty Entry and Exit Rates of Rural Household by Household Income Quintile in 2005



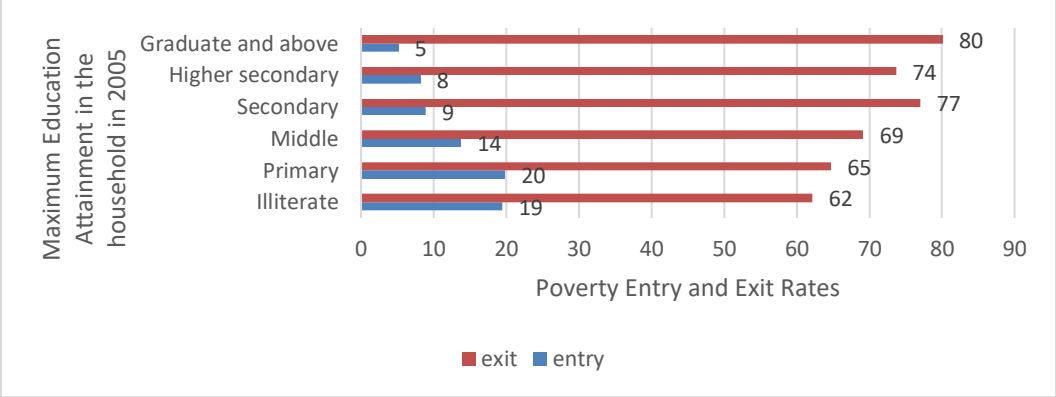
Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I(2004-05)

Figure 5.5. Poverty Entry and Exit Rates of Rural Household by Socio-Religious Group in 2005



Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I(2004-05)

Figure 5.6. Poverty Entry and Exit Rates of Rural Household by Maximum Education Attainment in Household in 2005



Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I(2004-05)

Apart from those households entering and exiting poverty, the following observations were made on the households that remain in poverty (chronic poverty) and the households that remain non-poor (APL) (Table 5.8a). Highest rate of chronic poverty was found among those households in lowest income quintile, Adivasi, illiterate household; receiving non-farm wage as their main source of income. Whereas, those that remain non-poor, were mostly those rural households which were receiving pensions and rents as their main source of income, from highest income quintile, graduates, and Christians/Jains/Sikhs.

5.4.3.1. Poor Rural Household`s Escape from Poverty and Non-poor Rural Household`s Entry into Poverty

At the first stage, Probit regression (Table A.5.1) is run on household level attrition, to derive IMR to be included in the second stage. At the second stage, the logistic regression results (Table 5.8b) show the average marginal probabilities of socio-economic factors influencing the escape of poor rural household of 2005 from poverty in 2012 and the entry of non-poor rural household of 2005 into poverty in 2012, using IHDS panel data.

It was observed that with respect to the family background, higher the increase in dependency ratio and household size over time, lower was the likelihood of a poor rural household to escape from poverty and higher was the likelihood of the non-poor rural household to enter poverty overtime. With increasing dependents in the household, the burden of poverty for a poor household increases and makes the escape from poverty difficult. Whereas, the vulnerability of non-poor households to fall into poverty increases with increase in dependents in the family, overtime Further, with respect to the socio-religious background, it was observed that non-poor rural households from backward caste were specifically prone to the risk of falling into poverty and those that are already poor were unable to escape from poverty. Dalit non-poor rural households of 2005 were more likely to enter poverty by 2012. Whereas, Adivasi poor households of 2005 were least likely to escape poverty by 2012.

With respect to women`s contribution in a rural household towards reducing the risk of poverty overtime, the following observations were made from the regression results. Higher the increase in mean (completed) years of education and mean labor hours supplied

by female members of a rural household, higher was its likelihood to escape poverty and lower was the likelihood to fall into poverty overtime. Although these likelihoods are small in comparison to other factors but they are positive and significant enough to make an impact on the poverty risk of the household overtime. Due to the low wage cycle[53] that women often face in the labor market, their contribution is much less than other economic factors influencing poverty transition of the household. In the same light, it was observed that non-poor rural households of 2005 that make a transition from single earner household in 2005 (only men supply labor) to dual earner household (both men and women supply labor) by 2012, have higher likelihood to enter poverty overtime. This may be true in case of vulnerable non-poor household going through financial turmoil, which use female labor (who are otherwise considered as secondary workers and have no financial compulsion to work in a non-poor household) as a coping[54] strategy (or as an insurance mechanism) to meet the financial duress. This reflects how female members of the household are used for 'income buffering' when household are met with 'income' shocks.

Higher the asset quintile to which the household belongs to, higher was the likelihood of escaping poverty and lower was the likelihood to enter poverty. Non-poor households of 2005 from highest asset quintile were least likely to enter poverty and poor households of 2005 from second asset quintile were more likely to escape poverty as compared to the households from lowest asset quintile. Further, higher the maximum education attainment in the household, lower is the risk of the non-poor household to fall into poverty. Further, non-poor households with main source of income from pensions and rents were less likely to fall into poverty. Whereas, poor households engaged in self-employment as artisans and petty shop owners were more likely to escape poverty. Further, non-poor households that own or cultivate land were less likely to fall into poverty overtime. It was also observed that the association of a rural household with a self-help group, reduces the probability of

[53]In such non-poor households, women may be out of workforce due to less pressure to work and low returns for women (relative to men) in the job market. But when they decide to enter workforce, they have less experience, low pay and the low-wage cycle perpetuates which keeps their earnings relatively low as compared to men.

[54] Women are often used as a reserve army of labor and may be compelled to increase their labor hours or enter workforce when the non-poor household is under financial crisis.

falling into poverty and increases the probability of escaping overtime. These results indicate the positive role of human, physical and financial capital in preventing a non-poor household from falling into poverty overtime and helping a poor household escape poverty overtime.

5.5. Conclusion

Our results provide an empirical evidence of backward sloping labor supply curve for rural women from BPL households in India. This implies the existence of 'forced' or 'need based participation' among them. This justifies why poor rural women work long hours in poorly paid hazardous jobs. They participate out of sheer economic necessity at lower wages. However, the standard upward sloping labor supply curve is witnessed for the rural women from APL households. Further, rural women engaged in salaried work were found to supply more labor days, irrespective of poverty status of the household. Despite high WPR in farm work, labor hours supplied are higher for salaried work than farm work. Those with higher levels of education were found to supply higher labor hours, irrespective of poverty status of household.

With respect to poverty transition of rural households overtime, it was observed that rural households that witnessed an increase in average completed years of education and mean labor hours of female members of the household were more likely to escape poverty and less likely to fall into poverty overtime. However, the impact of education and labor supply of female members of the household in reducing poverty risk is relatively less as compared to other factors as their returns in the labor market are lower than that of men. Further, the self-employed poor household were more likely to escape poverty whereas non-poor households with the main source of income as pensions and rents were less likely to enter into poverty. It was also observed that the association of a rural household with a self-help group, reduces the probability of falling into poverty and increases the probability of escaping overtime. However, increase in variables like dependency ratio and household size, increases the likelihood of non-poor households to enter poverty and reduces the likelihood of poor households in escaping poverty overtime. Further, higher maximum

education attainment of household and a higher level of assets ensures higher probability of escaping poverty and lower probability of falling into poverty overtime.

It is observed that household poverty and female labor supply strongly influence each other. Therefore, understanding the nature of the labor supply of rural women across poverty status of the household is important to design better policies to increase economic opportunities for women in the labor market and help reduce poverty risks. Reduction in labor hours by poor rural women (once their basic needs have been met) as their wages rise, implies the need to incentivize their labor supply, provide them skill training to demand a higher pay and ensure female-friendly flexible work conditions for them. Also, efforts need to be made to transform her role from an 'income buffering' role to an 'income generation' role.

The next chapter investigates the inter-linkages of poverty, empowerment and labor supply of rural married women.

Table 5.1. All India Poverty Ratios across Sector

Poverty Ratio→ Years↓	Rural	Urban	Total	Rural	Urban	Total
	Planning Commission(a)			IHDS(b)		
1993-94	50.1	31.8	45.3			
2004-05	41.8	25.7	37.2	42.6	29.8	39.03
2011-12	25.7	13.7	21.9	22.8	12.7	19.90

Notes: Poverty estimates are based on Tendulkar Methodology using Mixed Reference Period
Source: a)Press note on Poverty estimates, Planning Commission, 2011-2012.
b)Poverty estimates , IHDS-I(2004-05) & IHDS-II (2011-12) data using Tendulkar methodology

Table 5.2. State-wise Poverty Ratio

Poverty ratio→ states↓	2011-12	2004-05	Poverty Reduction
Andhra Pradesh	10.96	32.3	-21.34
Arunachal Pradesh	38.93	33.6	5.33
Assam	33.89	36.4	-2.51
Bihar	34.06	55.7	-21.64
Chhattisgarh	44.61	55.1	-10.49
Delhi	12.92	15.6	-2.68
Goa	6.81	28.1	-21.29
Gujarat	21.54	39.1	-17.56
Haryana	11.64	24.8	-13.16
Himachal Pradesh	8.48	25	-16.52
Jammu & Kashmir	11.54	14.1	-2.56
Jharkhand	40.84	51.6	-10.76
Karnataka	24.53	37.5	-12.97
Kerala	9.14	20.2	-11.06
Madhya Pradesh	35.74	53.6	-17.86
Maharashtra	24.22	47.9	-23.68
Manipur	38.8	39.3	-0.5
Meghalaya	12.53	14	-1.47
Mizoram	35.43	23	12.43
Nagaland	19.93	10	9.93
Odisha	35.69	60.8	-25.11
Punjab	7.66	22.1	-14.44
Rajasthan	16.05	35.8	-19.75
Sikkim	9.85	31.8	-21.95
Tamil Nadu	15.83	37.5	-21.67
Tripura	16.53	44.5	-27.97

Poverty ratio→ states↓	2011-12	2004-05	Poverty Reduction
Uttarakhand	11.62	35.1	-23.48
Uttar Pradesh	30.4	42.7	-12.3
West Bengal	22.52	38.2	-15.68
Pondicherry	17.06	22.9	-5.84

Source: Press note on Poverty estimates, Planning Commission, 2011-12 & 2004-05
Notes: Poverty ratios are based on Tendulkar Methodology using Mixed Reference Period

Table 5.3. State-wise poverty transition of rural households during 2005-2012

States	ENTRY	EXIT
Jammu & Kashmir	2.17	95.1
Himachal Pradesh	7.59	63.16
Uttarakhand	19.77	52.34
Punjab	5.38	84.43
Haryana	12.19	71.18
Uttar Pradesh	15.44	71.23
Bihar	23	65.95
Jharkhand	17.5	61.98
Rajasthan	13.22	75.04
Chhattisgarh	19.62	50.68
Madhya Pradesh	10.95	66.42
Northeast	8.82	85.44
Assam	19.93	66.57
West Bengal	19.22	63.37
Orissa	27.44	56.81
Gujarat	7.27	74.84
Maharashtra & Goa	16.43	65.21
Andhra Pradesh	3.42	93.12
Karnataka	12.95	72.55
Kerala	3.14	84.16
Tamil Nadu	7.75	71.22

Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II (2011-12)

Table 5.4. Percentage distribution of rural women across socio-economic variables by household poverty status in 2011-12

Percentage distribution of Rural women (column percentages)→ Socio-economic categories↓	BPL	APL
MPCE quintile		
lowest	86.34	2.28
second	13.57	21.72
middle	0.09	25.32
fourth	0	25.34
highest	0	25.34
Education		
illiterate	55.23	44.58
primary	16.94	12.87
middle	22.89	28.16
secondary	3.02	7.22
higher secondary	1.65	4.96
graduate and above	0.28	2.22
Socio-religious group		
forward	9.53	19.38
OBC	32.37	38.63
Dalit	28.58	21.66
Adivasi	18	7.59
Muslim	10.96	11.13
Christian/Jain/Sikh	0.56	1.61
Work type		

Percentage distribution of Rural women (column percentages)→ Socio-economic categories↓	BPL	APL
Own farm	19.44	28.61
Agricultural laborer	37.56	24.41
Non-agricultural laborer	30.65	28.07
Salaried	5.93	8.42
own business	6.42	10.48
Working rural women	45(4,160)	41(14,404)
Total sample	22(9,765)	78(34,654)

Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I(2004-05)
Note:
Rural women aged 15-65 years have been taken for analysis.
Numbers in the parenthesis denote sample of rural women in the respective as a proportion of total population

Table 5.5a. Average Labor Days (per year) across Gender[Panel data]

Mean Labor Days in a year→	2011-12		2004-05	
	Rural male	Rural female	Rural male	Rural female
	194	139	187	106

Note: Age group of the sample: 15 to 65 years in both rounds
Source: IHDS-II (2011-12) & IHDS-I (2004-05)

Table 5.5b. Rural Women`s Average Labor Days Supplied across Socio-Economic Categories by Household Poverty Status in 2011-12

Avg. Labor Days→ Socio-economic categories of 2012↓	**BPL**	**APL**
MPCE quintile		
First	122	117
Second	152	131
Middle	67	140
Fourth	0	146
Highest	0	148
Education attainment		
Illiterate	128	136
Primary	148	150
Middle	118	142
Secondary	121	152
Higher secondary	112	200
Graduate and above	164	231
socio-religious group		
Forward caste	137	147
OBC	119	137
Dalit	135	148
Adivasi	124	145
Muslim	145	135
Christian/Sikh/Jain	104	158
Work type		

Avg. Labor Days→ **Socio-economic categories of 2012↓**	**BPL**	**APL**
Own farm	74	95
agriculture wage work	140	154
Non-farm wage work	137	151
Salaried work	231	250
Own non-farm business	147	176
Total mean days worked in a year	128	142
Percentage poor/non-poor among total working rural women population	24(4,393)	76(14,192)
Total rural women	22(9,765)	78(34,654)

Notes:

- Rural women aged 15 to 65 years have been utilized.
- Only those workers who supply more than 240 hours per year are considered working.
- Number of labor days has been capped at 365 days per year.

Source: Author`s own calculation from IHDS-II(2011-12)

Table 5.6a. Rural Women`s Work Transitions across Poverty Status of the Household

Workforce transition of rural women→ Poverty transition of HH↓	**remain in workforce**	**enter workforce**	**exit workforce**	**not in workforce**	**total**
remain poor	36.65	19.22	16.15	27.98	100
enter poverty	29.51	16.01	17.15	37.33	100
exit poverty	33.51	18.87	14.53	33.09	100
remain non-poor	28.64	15.32	15.39	40.65	100

Notes: Working rural women aged 15 to 65 years have been utilized (Individual level panel data)
Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I (2004-05)

Table 5.6b. Poverty Status of the Household across rural women`s work status

Workforce transition of rural women↓ Poverty transition of HH→	remain poor	enter poverty	exit poverty	remain APL	total
remain in workforce	15.36	7.43	28.99	48.22	100
enter workforce	10.02	8.09	24.5	57.38	100
exit workforce	15.86	7.45	30.12	46.57	100
not in workforce	13.51	8.78	25.93	51.79	100

Source: Author`s own calculation from IHDS-II (2011-12) & IHDS-I (2004-05)

Table 5.7. Labor Supply(hours equation) of Rural Women from APL and BPL household in 2012: OLS Linear regression

Dependent: log of hours worked by rural women in 2012	APL			BPL	
	1 coefficients	2 coefficients	3 coefficients	1 coefficients	2 coefficients
Age 2012		0.02**	0.02***	0.005	0.01
Age squared 2012		-0.0003**	-0.0003***	-0.0001	-0.0001
Log of hours worked in 2005		0.11***		0.15***	0.09***
Number of children in household 2012	-0.02**		-0.01	0.02*	0.02
Hourly wage 2012	0.004**				-0.02***
Square of Hourly wage 2012	0.00				0.0001***
State dummy	No	Yes	NO	NO	Yes
Change in Household size			0.002	-0.02**	
Number of earning members in 2012			-0.03***	-0.05**	-0.005
Predicted values of being in workforce(Employment)	-63.60***	-41.80**	-65.70***	-153.09**	-82.50*
(Employment)^2	117.81***	88.67**	120.28***	134.60	98.18
(Employment)^3	-112.40***	-88.54**	-114.25***	-53.43	-62.25
(Employment)^4	38.22***	30.97*	38.61***	-8.12	10.89
IMR (panel attrition at individual level)	-0.04	-0.01	-0.04	0.08	0.01
IMR (Probit employment equation)	-8.16***	-4.07	-8.64***	-38.15***	-15.19*
Marital 2012(ref: married)					
Unmarried		0.07			-0.16
Divorced/separated/widows		0.07**			0.05
Type of Work (ref : Farm Labor) 2012					
Non-farm work		-0.08***		-0.10**	
Salaried		0.47***		0.46***	
Non-farm business		-0.08		-0.52***	

Change in education level (ref: Rural women who remain illiterate over the two rounds)					
Remain up to middle			0.06**	-0.01	
Remain higher educated			0.33***	-0.07	
Illiterate to middle			0.10**	0.09	
Middle to higher			0.15**	0.48***	
Social Groups (Ref: Forward caste) 2005					
OBC		-0.05	-0.09**	-0.07	0.005
Dalit		-0.04	-0.06*	0.04	0.01
Adivasi		0.002	-0.002	-0.07	0.05
Muslim		-0.07	-0.08	0.09	0.04
Christian, Sikh, Jain		-0.14	-0.22*	0.05	0.26
MPCE quintile of the household (ref: lowest)					
Second			-0.03		0.17***
Middle			0.05		-1.12***
Fourth			0.13*		NA
Highest			0.12*		NA
Area of residence 2005 (Ref: more developed village)					
less developed village			-0.05***	-0.07*	
Number of obs	4457	3108	4455	1206	1206
R-squared	0.04	0.2172	0.0786	0.17	0.2573

Note:

Number of days worked by rural women has been capped at 365 days.
Hours per day worked by rural women has been capped at 8 hours.
(***)=p<1%; (**)=p<5%; (*)=p<10%
Source: Author`s own calculation from IHDS-I(2004-05) & IHDS-II (2011-12)

Table 5.8a. Percentage Distribution of Rural Households across Socio-Economic variables by Household`s Poverty Transition Status during 2005-12 (column percentages)

2005 Variables	Poverty ENTRY	Poverty EXIT	Remain non-poor	Remain poor
Main source of income 2005				
Farm	13.15	68.4	55.13	11.51
Agricultural wage	17.23	65.81	40.46	17.47
Non-ag wage	18.37	64.7	39.12	18.37
Self-employment	11.14	70.02	59.2	9.98
Business	13.67	75.95	61.61	6.89
Salaried	7.24	75.04	74.02	5.03
Pension, Rent	4.21	69.18	76.47	6.18
Others	12.85	68.11	58.27	10.34
socio-religious group 2005				
Forward caste	8.67	77.76	69.23	5.37
OBC	12.09	72.86	56.26	9.75
Dalit	18.02	65.37	44.21	15.92
Adivasi	23.75	50.4	25.71	32.84
Muslim	14.48	70.67	51.5	11.66
Christian, Sikh, Jain	4.46	82.92	74.24	3.79
Highest education in the rural household 2005				
Illiterate	19.46	62.14	39.81	19.1
primary	19.85	64.7	43.3	16.19
middle	13.78	69.16	50.98	12.59
Secondary	8.93	77.02	63.87	6.86
Higher secondary	8.21	73.68	66.04	7.38
graduate	5.19	80.11	79.65	3.18

Source: Author`s own calculation from IHDS-I(2004-05) & IHDS-II(2011-12)

Table 5.8b. Logistic Regression: Probability of a Rural Household of 2005 to Escaping Poverty (Exit) and fall into Poverty (ENTRY) in 2012

Explanatory variables↓	**1 Avg. marginal prob.**	**2 Avg. marginal prob.**	**1 Avg. marginal prob.**	**2 Avg. marginal prob.**
	ENTRY		EXIT	
Inverse Mills Ratio (Household Panel attrition)	0.28	0.004	0.33	1.11***
Change in Dependency ratio	0.01**	0.01***	-0.01	-0.01**
Change in Household size	0.03***	Not included	-0.05***	
State dummy	included	Not included	included	Not included
Change in mean hours worked by female members in the HH	-0.00002**		0.00	0.00002***
Change in mean years of education attained by female members in hh	-0.01**		-0.01*	
Area of residence (Ref: more developed village) 2005				
less developed village	Not included	0.03***		-0.03***
Asset Quintile 2005		Not included		
2nd quintile	-0.03		0.07***	
Middle	-0.05**		0.09**	
4th quintile	-0.08***		0.04	
Richest	-0.10***		0.04	
Land owned or cultivated? (Ref: no) 2005	Not included		Not included	
Yes		-0.018***		0.01
Self -help group(ref: no) 2005	Not included			
Yes		-0.02***		0.04***

Explanatory variables↓	1 Avg. marginal prob.	2 Avg. marginal prob.	1 Avg. marginal prob.	2 Avg. marginal prob.
	ENTRY		EXIT	
Main Source of Income (Ref: Farm work) 2005		Not included		Not included
Agricultural wage	0.03		-0.02	
Non-ag wage	0.02		0.05	
Self-employment	0.02		0.07*	
Business	0.05		0.12	
Salaried	-0.04**		-0.01	
Pension, Rent	-0.07**		-0.11	
Others	-0.03		-0.03	
Social Groups (ref: forward caste) 2005				
OBC	0.03*		-0.02	-0.05***
Dalit	0.06***		-0.05	-0.11***
Adivasi	0.04		-0.18***	-0.27***
Muslim	0.05**		-0.08	-0.07***
Christian, Sikh, Jain	0.02		-0.09	-0.01
Change in household type (Ref: only men supply labor in both rounds)				
Only men to joint labor	0.04**		-0.03	
Only women supply labor in both rounds	0.005		0.03	
Only women to joint labor	0.01		0.13**	
Highest education in the rural household (Ref: illiterate) 2005				
primary	-0.02		-0.04	
middle	-0.00005		0.00	

Explanatory variables↓	**1** **Avg. marginal prob.**	**2** **Avg. marginal prob.**	**1** **Avg. marginal prob.**	**2** **Avg. marginal prob.**
	ENTRY		EXIT	
Secondary	-0.03		0.07	
Higher secondary	-0.04**		0.08	
graduate	-0.02		0.05	
Number of obs	17354	3518	1963	10295
Wald chi2(48)	312.18	353.24	209.07	505.73
Prob > chi2	0	0	0	0
Pseudo R2	0.0281	0.2002	0.12	0.04
Log pseudolikelihood	-6166.708	-1025.7805	-1094.9	-6158.8

Note: (***) = p<1%; (**) = p<5%; (*) = p<10%
Source: Author`s own calculation from IHDS-I (2004-05) & IHDS-II (2011-12)

Chapter 6

Empowerment of Rural Married Women in India: Linkages with Labor Supply and Household Poverty

6.1. Introduction

In the previous chapters, the determinants of rural women`s inter-temporal labor supply, changing work patterns overtime; and linkages of their labor supply and household poverty have been analysed. This chapter investigates the inter-linkages of rural married women`s empowerment, labor supply and household poverty. Our data sample for empowerment analysis is available only for rural 'married' women only. Hence, this chapter is solely based on rural 'married' women`s labor market decisions, empowerment and their household poverty status.

India is inherently patriarchal, chained under the age-old social norms and practices discriminating women at many fronts. Cultural contexts have significant bearing on women's position and status in society and hence influence FLFP (Clark et al., 1991). Further, studies by Kemp (1986), Kapadia (1995); Desai and Jain (1994) find that "cultural norms operate at multiple levels and often reflect the status of women in a particular region, caste, or religion" (as cited in Das & Desai, 2003, p.4). Power structures across gender like **'**hegemonic masculinity'[55] (Connell & Messerschmidt, 2005) worsen women`s work outside the household territory. Further, it has been observed that women's role in household decision-making is dependent on the family structure (Malhotra & Mather, 1997). The dependency of women on men, the unequal division of house-work and paid work, confinement of women to caring and cooking roles, the association of women with notions of 'nature' and 'nurturance' (Ortner, 1974; Stacey, 2011; Lancaster, 2011) are means by which the family system establishes the gender codes of segregation. Family and socio-cultural norms interact with economic factors to explain female labor market decisions. In Ramu`s (1989, p.25) words it could be explained as follows:

> *"There is a dynamic interplay of familial, cultural and labor market conditions which influence a married woman in unique ways in her decision to remain a full-time homemaker, or to combine homemaker to co-provider roles".*

Women's world of work is multi-dimensional, and their economic participation is often the key to their improved social status in traditional societies. However, women`s work-participation may not always guarantee their empowerment. In Boserup`s (1970: 71) words:

> "Poor women work everywhere; not by choice but by necessity in a range of tasks crucial to ensure the survival of their families..., but the world statistics deny women's activities"

On the other hand, women of wealthier classes and castes are found withdrawn from the workforce and limited to home, to keep the family honour (Kandiyoti, 1988; Sourabh, 2007). When the household reaches a threshold level of income, social norms may affect FLFP decision rather than just economic factors. The literature shows that improvement in economic status of the household gives the opportunity to men to exercise patriarchal controls and thus aggravate the existent gender divides in the household and later in the society (Sundaram & Vanneman, 2008). Such gender divides act as a deterrent for women`s work participation and exacerbate gender inequality. The ideological realm of the patriarchal subordination of women is basically derived from denial of access to resources and opportunities in economic realm (German, 1981).

Hence, the question arises, does women`s economic participation always ensure empowerment among them? If not, under what conditions does paid work empower women and vice-versa? Linkages of empowerment and work of women have been analyzed in many cross-section studies in India. However, this chapter adds to the literature by using IHDS panel data. It analyzes the interaction of poverty and employment of rural married women as a factor explaining women`s level of empowerment. Panel nature of data enables us to add new variables to the empowerment analysis like changes in poverty status of the household, changes in work status of the household and changes in income level of the household. Further, the bi-directional relation between empowerment and rural married women`s labor supply, conditioned upon the poverty status of the household has been analyzed in this chapter.

Objectives of this chapter can be summarized as follows. Firstly, to determine the factors affecting empowerment of rural married woman. Secondly, to examine the interlinkages of empowerment, household poverty and labor supply of rural women. The hypothesis to be tested is that rural married women`s empowerment and employment reinforce each other. The remaining part of this chapter has been divided broadly into the following sections. The second section reviews the existing literature about the factors affecting empowerment and its inter-linkages with employment and poverty. The third section describes the data sources and methodology. The fourth section analyses the results and the final section concludes the chapter.

6.2. Literature Review

Women's empowerment is defined as the "degree to which they can control material resources (different forms of wealth) and social resources (knowledge, power and prestige) within the family and society" (Mason, 1986, p.286). The pathway towards women`s empowerment is a 'multi-dimensional' process (Aslam, 2013). It unfolds in different ways to different women (Kabeer, 1999). Many studies like Mason and Smith (2003), Bloom et al. (2001), Jejeebhoy (2000); and Kabeer (1999) have measured empowerment using dimensions like decision-making power in the household, their degree of control over resources and their mobility outside the household sphere. The impact of paid work on empowerment of women depends on degree of regularity, visibility, social benefit, type of work undertaken and the poverty status of their household (Kabeer et al., 2011). Further, Assaad et al. (2014) show that education, employment, poverty status, number of children turn out to be significant determinants in defining the concept of empowerment among women.

Heavy care burden and reproductive responsibilities without any control over the economic resources or entitlement to land, leave women with limited bargaining capacity within the household power dynamics (Agarwal, 1994). Hence, access to economic resources is seen as a way out of the patriarchal structure by strengthening their bargaining power (Sundaram & Vanneman, 2008). It is argued that women's greater participation in the outside world and their earnings from paid work, increase their bargaining capacity within the household

(Agarwal, 1997). Apart from economic independence, women's greater participation in paid work leads to expansion of network, along with providing independent exposure to the world (ibid). Involvement of women in more productive roles rather than being confined solely to reproductive roles and household activities has shown to increase their social mobility and freedom (Boserup, 1970; Raju, 1994, 2010; Jejeebhoy & Sathar, 2001; Jose, 2007; Sundaram & Vanneman, 2008).

Education and employment have a major role in promoting empowerment. "Engels (1884, 1942/1972) claims that emancipation of woman will only be possible when woman can take part in production on a large scale, which does not merely permit the employment of female labor over a wide range but positively demands it" (as cited in Pyle, 1990, p.4). Hence, education and skill training suited to the industrial requirements is necessary for rural women. Additionally, Gupta and Yesudian (2006) find women's age, educational levels and their extent of exposure to media as important determinants of women's empowerment.

Now let's discuss how empowerment influences women`s work participation decisions. Women's decision to work is not independent of their household responsibilities, which directly influence their labor market options (Sen & Sen, 1985; Floro & Meurs, 2009). Raju (2010) claims that apart from factors like income level of the household and availability of work, socio-cultural norms lead to different participation levels among women across the country. Further, Poloma and Garland (1971), argue that it is the bondage towards family that restricts FLFP. The 'doubly burdened' married woman with work within and outside the household stand on a very unequal position with respect to her male counterpart, in an already hostile labor market. Such a social structure, traditionally imposed through a scheme of gendered roles, makes a woman accept her domestic position as her true self and biological identity (ibid). Further, the gender stratification system at the macro-level and at the household level influences women`s access to opportunities in the formal labor market and the type of work women can take up. Studies by Raju and Bagchi (1993) and Elson (1999) show that such a system "push women into non-wage (such as self-employed) and unpaid work, or out of the labor force" (as cited in Das & Desai, 2003, p.4).

Limited mobility is one of the key challenges women face when they are willing to work outside (Pande et al., 2016). The authors claim that infrastructure improvements, although are in place, but they are not improving women's mobility and access to work. They observe that farther from home the opportunity, the less likely it is for women to access it. They find that women in India are willing to participate in the labor force at higher rates, but they have constraints in terms of skill, social norms and mobility.

Further, Mason and Smith (2003) show that community strongly influences women's empowerment than the individual traits. Their study shows that "empowerment is a multi-dimensional phenomenon, with women relatively empowered in some spheres but not in others" (Mason & Smith, 2003, p.2). Community does play a role in shaping personal beliefs[56] and provides a platform to encourage women`s social and economic participation in various ways. Moreover, institutional interventions play a major role in influencing individual, social, structural and material factors preventing or sustaining change in the society (Heise & Manji, 2016). The authors claim that interventions could communicate change with respect to woman`s empowerment, education and work, spread awareness, help create material resources for ease of access to education and employment, can influence woman, their peer groups and their family members who are most likely to make decisions for them (like male members or elders of the family, etc.) and thereby help change existing norms or create new ones that promote their economic participation and empowerment

Employment, empowerment and poverty are inter-linked with each other. Studies of Kabeer (2003), Quisumbing (2003) and Dwyer and Bruce (1988) find that resources in women's hands lead to positive outcomes with regards to human capital and capabilities within the household. Their findings suggest that "empowerment will contribute to the inclusiveness of growth, because women's access to economic resources improves distributional dynamics within the household" (as cited in Kabeer, 2012, p.4). However, women's empowerment inturn may depend upon the poverty status of the household, type

[56] "Individuals may hold beliefs about reality and the physical world that may or may not be true" (Heise & Manji, 2016). Those whose opinions are important and can influence a person (even though the person may not personally believe in them, but believes for the sake of societal approval), constitute the 'reference group'.

of work and her education attainment. Further, it has been found that women`s power increases in the household as her contribution towards family income (as compared to other family members) rises. Thereby, she attains more freedom and flexibility in terms of choosing between household work or paid work outside her home (Atal, 2015). However, under some circumstances, "women`s employment may not necessarily enable them to challenge the power structures and norms that restrict their agency and economic participation" (Pearson, 2004). Moreover, work participation could also be 'need-based' or 'forced' participation, especially for rural women belonging to BPL families as observed in chapter 5.

6.3. Data Source, Methodology and variables used in the study

6.3.1. Data Sources

IHDS panel data has been utilized to define the components of empowerment among rural married women; to analyze the socio-economic factors influencing their empowerment and their labor supply decisions in workforce. The eligible[57] women data has been merged with individual level data to merge the work and empowerment variables for each of the cross-section round. Thereafter, the cross-section files are merged to construct a panel. In IHDS-I (2004-05), 15-49 age group of eligible women are chosen and in IHDS-II (2011-12), 15 to 56 age-group of eligible women are taken into consideration. The sample count of eligible rural married women comes to around 26,000 in the panel dataset. To analyze the trends in dimensions of empowerment, various rounds of NFHS data has been utilized. However, the information on all the indicators of women`s empowerment are not available since 1990s. Although, post the year 2000, the empowerment trends can be analysed.

[57] 'Eligible' women have been defined by the IHDS as ever-married women in the age-group 15-49 years present in the household. In the IHDS panel dataset, eligible women from 2005 are taken for 2012 analysis whatever their current age is. If the 2005 eligible women is no longer present in the household, one new eligible women from the household is chosen.

6.3.2. Methodology and variables used in the study

6.3.2.1. Factor analysis: Defining empowerment for rural married women

A sample of around 26,000 rural married women have been utilized who were present in both the rounds, constituting the panel dataset of IHDS. Firstly, the method of tetra-choric correlations have been used, because the variables considered for factor analysis are categorical variables and are not continuous. Thus, the usual approach of linear correlation doesn't work ("Tetra-choric correlation for binary variables", n.d.). After tetra-choric correlation is run, a matrix is built and then factor analysis is done upon that matrix to identify the factors defining empowerment of rural married women. The following dimensions were taken into consideration to identify the major factors defining empowerment.

(i) **Work:** The variable takes the value 1, when rural married women have most say in decision with respect to their work; or who are currently not working but are willing and allowed to work, if suitable job is made available to them. Else, it takes the value 0. This variable information is present only for IHDS-II round.

(ii) **Personal mobility:** The variable takes the value 1, if rural married women don`t need permission to travel to nearby health centre or go to relative`s or friend`s place or travel short distance by bus or train or visit a kirana shop. Else, the variable takes the value 0.

(iii) **Decision regarding how many children to have:** This variable takes the value 1, when rural married women have most say in the decision regarding how many children to have. Else, it takes the value 0.

(iv) **Household expenditure**: The variable takes the value 1, if rural married women have most say in the decision with respect to expenditure on buying land or property; on expensive item; on social functions. Else, the variable takes the value 0.

(v) **Member of an organisation:** It takes the value 1, if rural married women is a member of Mahila-Mandal/Self-Help Group/credit saving group/political organisation; or have attended a public meeting or Gram Sabha called by Panchayat/Nagar Palika/ward. Else, the variable takes the value 0. This variable is available only for IHDS-II round.

(vi) **Financial autonomy:** This variable takes the value 1, if rural married women have cash in hand to spend on household expenditure; or have a bank account open in their name; or have their name in the property papers. Else, the variable takes the value 0.

(viii) **Woman's own attitudes[58] towards gender equality:** This variable takes the value 1, if women don't practice customs like wearing 'Ghungat'; or if everyone at home eats meals together; or when women discuss with their husband about things in the community like politics/work/expenditure. Else, the variable takes the value 0.

Using the factor analysis methodology, the same factors that define empowerment among rural women in 2005 have been used for the year 2012 as well, to analyse the change in empowerment levels overtime. However, empowerment definition used in the binary logistic regression to analyze the socio-economic factors influencing empowerment of rural married women in 2012, is based on the two factors identified by factor analysis that define empowerment among rural married women in 2012.

[58] "An attitude is an individual construct. It is an individually held belief that has an evaluative component. It depends on their perception that something is good, bad, exciting, boring, disgusting, etc" (Heise & Manji, 2016).

6.3.2.2. Logistic Regression: Determinants of empowerment for rural married women

Binary Logistic regression was run to analyse the determinants of empowerment among rural women in 2012, using IHDS panel data. The explanatory variables include variables at a point of time as well as change in variables over time, utilizing the panel nature of the dataset.

Dependent variable is a categorical variable which takes the value 1, if rural married women is empowered in 2012, else zero. The empowerment variable is defined by the two main factors identified in 2012 through factor analysis.

The independent variables chosen are as follows:

(i) **Age of the rural married woman in 2005:** It is assumed that higher the age of rural married women, higher is their empowerment in the short run.

(ii) **Age (squared) of the rural married woman in 2005:** It is included to capture the non-linearity of age of rural women, in the long run**.**

(iii) **Area of residence in 2012:** It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages. More developed village is taken as the reference category. It is assumed that rural married women from less developed villages are less likely to be empowered.

(iv) **Education attainment of rural married woman in 2012**: It is taken as a categorical variable with illiterate rural married women as the reference category. Other categories are primary (1-5th std), middle (5-9th std), secondary (10-11th std), higher-secondary; graduation and above. It is assumed that higher the education attainment of rural married women, higher is their likelihood of being empowered.

(v) **Changes in the education attainment level of rural married woman:** It is a categorical variable with reference group as rural married women who 'remain illiterate'. Other categories of this independent variable include rural women who

remain upto middle level educated in both rounds; remain secondary level educated; remain graduate; those who make a transition from being illiterate in 2005 to middle level educated in 2012; from middle to secondary; from secondary to graduate. Those who remain at higher levels of education and those who made a transition to higher levels of education were more likely to be empowered.

(vi) Highest education attainment in the family in 2012: It is taken as a categorical variable. The reference category is taken as 'illiterate household', i.e., all members are illiterate. It is assumed that higher the maximum education attainment in the household, higher is the likelihood of rural married woman to be empowered.

(vii) Income Quintile in 2005: It is taken as a categorical variable. The lowest income quintile is taken as the reference category. Other categories are second, middle, fourth and highest income quintile. It is assumed that higher the income quintile of the household to which the rural married woman belongs to, higher is the likelihood to be empowered.

(viii) Number of children (below 15 years) in the household in 2005: It is assumed that higher the number of children in the household, lower is the likelihood that the rural married women will be empowered, as married women may be burdened by increasing household responsibilities which may affect their economic, social and political representation.

(ix) Socio-religious category of the household: It is taken as a categorical variable. The forward caste is taken as the reference category. The other categories are OBC, Adivasi, Muslims, Christians/Sikhs/Jains. It is assumed that rural married women from backward caste are least likely to be empowered.

(x) Exposure to media (2005): It has been taken as a categorical variable. It takes the value 1, if the rural married women in the household have some or regular exposure to T.V, radio or newspaper. Else, the variable takes the value zero. It is assumed that higher the exposure of women to media, higher will be their empowerment.

(xi) Education level of husband in 2012: It is taken as a categorical variable with reference variable as 'illiterate husband'. The other categories are husband with below primary, primary, middle, secondary, higher secondary, graduate and post graduate. It is assumed that higher the education level of husband, higher is the level of empowerment of rural married women.

(xii) Type of work in 2012: It is a categorical variable with own farm (family farm) work as the reference variable. The other categories are agricultural wage labor, non-farm wage work, own (family) non-farm business; salaried job. It is assumed that those rural married women engaged in family farm work are least likely to be empowered.

(xiii) Work status in 2012 of rural married women: It is a categorical variable which takes the value 1, if the rural married woman is found working in 2012 and takes the value 0, if otherwise. It is assumed that if the rural married woman is working, then she is more likely to be empowered.

(xiv) Work and poverty interaction (2012): It is taken as a categorical variable. With reference category as poor rural married women who are working. Other categories are: poor but not in workforce, non-poor who are working; non-poor but not working. It is assumed that poor rural married women who are working, are less likely to be empowered.

6.3.2.3. Determinants of Rural Married Women`s Labor Supply in 2012

Vella and Verbeek`s methodology (section 2.3.1) has been used to analyze the factors influencing rural married women`s labor supply, using panel data of IHDS.

Variables in the Study

At the first stage, two Probit regressions are run to address the selection bias. One on the decision to participate in workforce by women and another on panel attrition of individuals. The IMRs derived from respective regressions are added as explanatory variables in the second stage, following the same approach used for rural women`s aggregate labor supply (as explained in section 3.3.2.1). In the second stage, dependent variable is the log of labor hours supplied by rural married women in 2012. It is taken as a continuous variable.

The independent variables were as follows:

(i) **Real Hourly wage (Rural married women`s own real wage):** It is assumed a-priori that as own hourly wages of rural married women rise, they supply more labor hours. Thus, labor supply curve follows the classical theory and has an upward sloping curve.

(ii) **Square of hourly wage:** It is included to capture the non-linearity of wages with respect to labor supplied by rural married women.

(iii) **Infant (less than 2 years) in the household 2012:** It is assumed a-priori that higher the number of infants in 2012, lesser are the labor hours supplied by rural married women.

(iv) **Earning members in the household in 2012:** It is assumed a-priori that as the earning members in the household increase, rural married women supply lesser labor days.

(v) **Age:** It is assumed a-priori that as the age of the rural married women increases, they supply more labor days, in the short run.

(vi) **Age squared:** It is included to capture the non-linearity of age of rural women.

(vii) **Work type 2012 :** It is a categorical variable with farm work as the reference group. Non-farm wage work; salaried; and own non-farm business are other categories. It

is assumed a-priori that rural married women engaged in farm work supply more days of work as compared to other categories of work.

(viii) **Socio-Religious group**: It is a categorical variable with forward caste as the reference category. The other categories are OBC, Adivasi, and Christian/Jain/Sikh. It is assumed a-priori that the rural married women from backward caste supply more labor hours as compared to forward caste.

(ix) **Changes in education[59] attainment level:** It is a categorical variable with reference group as rural married women who remain illiterate in both rounds. Other categories of this independent variable include: rural married women who remain upto middle level educated in both rounds, remain secondary level educated, remain graduate and above level educated; those who elevate from being illiterate in 2005 to middle level educated in 2012; who shift from middle to secondary level education; and who shift from secondary to graduate level education. With rise in education attainment, labor hours supplied by rural married women conforms to the U-shaped hypothesis.

(x) **Changes in Income Quintile:** It is a categorical variable with rural households which remain in the lower income quintile (first and second income quintile) in both rounds as the reference category. Other categories are rural households which remain in higher income quintile (fourth and fifth income quintile); remain in middle income quintile in both rounds; who shift from lower to middle income quintile; those who shift from middle to higher income quintile. It is assumed that rural married women who remain in the lower income quintile in both the rounds supply more labor hours.

(xi) **Education level of husband in 2012**: It is taken as a categorical variable with reference variable as illiterate. The other categories are below primary, primary, middle, secondary, higher secondary, graduate, post graduate. It is assumed that

[59] Education attainment level of rural women are classified as primary (1-5th standard), middle (5-9th standard), secondary (10-11th std), higher secondary; graduation and above.

higher the education attainment of husband, lower were the labor hours supplied by rural married women as higher educated husbands imply higher household income.

(xii) Changes in poverty status of rural household: It is taken as a categorical variable**.** Reference category are rural households that remain BPL. Other categories are households which remain APL; those which enter poverty; and those which escape poverty. It is assumed that rural married women from households that remain in poverty, supply more labor hours as compared to those from other categories.

(xiii) Empowerment status of rural married women in 2012: It is taken as a categorical variable. It takes the value 1, if rural married women are empowered in 2012 (based on the factors identified through factors analysis method for 2012). Else, the variable takes the value 0, which is taken as the reference category. It is assumed that if women are empowered, then they supply more labor hours than those rural married women who are disempowered.

(xiv) **Area of residence in 2012:** It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages, with more developed village as the reference category. It is assumed that rural married women from less developed villages supply more labor hours.

(xv) IMR: They are included as continuous variables. IMRs derived from Probit regression (at the first stage) on attrition and workforce participation decision by women in 2012 are included as additional explanatory variables in the second stage OLS regression on labor hours supplied by rural women.

(xvi) Predicted values of dependent variable from Probit regression on decision to participate in workforce: Lester and Fitzpatrick (2008, p.19) claim that there is "endogeneity (due to dynamics and/or state dependency) which can be controlled by including a polynomial of predicted values of the dependent variable" of the first stage Probit regression (on women`s work-participation decision in 2012), in the second stage OLS regression, as additional explanatory variables

(xvii) State dummy: State dummy have been used to control for the regional differences in labor hours supplied by rural married women.

(xviii) Number of lagged labor hours (2005): Log of labor hours supplied by rural married women in 2005 is taken as a continuous variable. It is assumed that higher the labor hours supplied by rural married women in the previous round (2005), higher were the labor hours supplied in 2012.

6.3.2.4. Logistic Regression: Determinants of Entry and Exit probability for Rural Married women in workforce

Vella and Verbeek`s (1999) two step methodology (as explained in section 2.3.1) has been used to examine the determinants of entry and exit from workforce among rural married women during 2005-2012. At the first stage, two Probit regression were run to address the selection bias. First regression is run to counter bias due to panel attrition at individual level and second, to counter the bias occurring due to the presence of women in the sample who supply zero labor hours in 2005. IMR derived from these regressions are included as explanatory variables in the second stage. In the second stage, two separate binary logistic regressions are run for entry and exit decisions of rural married women in workforce, using IHDS panel data.

The dependent variable for regression 1:

a) EXIT: It is a binary variable to explain the probability of a rural married woman to withdraw from workforce overtime. It takes the value 1, if she was working in 2005, but no longer works in 2012 and it takes the value 0, if she is found working in both the rounds. The dependent variable can be expressed in the following notations:

$$Pr\ (Work_{i,t} = 0 \mid Work_{i,t-1} = 1) \quad \ldots\ldots (1)$$

The dependent variable for regression 2:

b) ENTRY: is a binary variable to explain the probability of a rural married woman to enter workforce overtime. It takes the value 1, if the rural married woman was out of

workforce in 2005 but is found working in 2012 and it takes value 0, if the rural married woman remains out of workforce in both rounds**.** The dependent variable can be expressed in the following notations:

$$\Pr (Work_{i,t} = 1 \mid Work_{i,t-1} = 0) \quad \text{.....(2)}$$

Where t refers to the current time period (2011-12) and t-1 refers to the previous round (2004-05).

Independent Variables:

The independent variables are the same for entry and exit regressions, which are as follows:

(i) **Age of the rural married women in 2005**. It is taken as a continuous variable. It is assumed that higher the age of rural married women, higher is their entry into workforce, in the short run.

(ii) Age (squared) of the rural married women in 2005: It is included to capture the non-linearity.

(iii) **Area of residence in 2012:** It is a categorical variable. Rural area is divided into 'more' developed and 'less' developed villages, where more developed village is treated as the reference category. It is assumed that rural married women from less developed villages are more likely to enter workforce.

(iv) **Household size in 2005:** It implies the number of members residing in a rural household. It is assumed that higher the household size, higher is the probability of rural married women to enter workforce to supplement the family income.

(v) **Infant (less than 2 years) in the household 2012:** It is assumed a-priori that higher the number of infants in 2012, higher is the exit and lower is the entry among rural married women workers.

(vi) **Changes in education[60] attainment level:** It is a categorical variable with reference group as rural married women who remain illiterate in both rounds. Other categories of this independent variable include: rural married women who remain upto middle level educated in both rounds, remain secondary level educated, remain graduate and above level educated; those who elevate from being illiterate in 2005 to middle level educated in 2012; from middle to secondary level education; from secondary to graduate level education. Lower educated rural married women are more likely to enter.

(vii) Income quintile in 2005: It is a categorical variable with reference category as the lowest income quintile**.** The other categories of this categorical variable are second, middle, fourth and highest (richest) income quintile. It is assumed that rural married women from lower income quintile were more likely to enter workforce.

(viii) **Changes in Income Quintile:** It is a categorical variable with rural women who remain in the lower quintile (first and second income quintile) in both rounds as the reference category. Other categories are those rural women who remain in higher income quintile (fourth and fifth income quintile) in both rounds, remain in middle income quintile in both rounds, those who shifted from lower to middle income quintile; those who shifted from middle to higher income quintile. It is assumed that those who remain in the lower income quintile in both the rounds are less likely to exit workforce.

(ix) **Real[61] hourly wage:** The hourly wage of 2012 is taken for the entry regression and the hourly wage of 2005 is taken for exit regression. It is assumed that

[60] Education attainment level of rural women are classified as primary (1-5th standard), middle (5-9th standard), secondary (10-11th std), higher secondary; graduation and above.

[61] Nominal wages of year 2005 have been inflated using deflator for converting 2012 prices (CPI based, monthly adjusted).

higher the hourly real wage for rural married women, lower will be the probability to exit and higher will be the probability to enter the workforce.

(x) **Square of real hourly wage:** to capture the non-linearity of wages with respect to entry or exit probability of rural women in workforce.

(xi) **Changes in poverty status:** It is taken as a categorical variable**.** Reference category is taken as those rural households which remain in BPL. Other categories are rural households which remain APL, those which enter poverty and those that escape poverty. It is assumed that those rural married women from households which remain in poverty are least likely to exit workforce.

(xii) **Socio-religious category of the household 2005**: It is taken as a categorical variable**.** The forward caste is taken as the reference category. The other categories are OBC, Adivasi, Muslims; Christians/Sikhs/Jains. It is assumed that rural married women from backward caste are least likely to exit workforce.

(xiii) **Education level of husband in 2012**: It is taken as a categorical variable with reference group as illiterate. The other categories are below primary, primary, middle, secondary, higher secondary, graduate and post graduate. It is assumed that higher the education attainment of the spouse, higher will be the likelihood of entry of rural married women into workforce and lower is the likelihood of withdrawing from workforce.

(xiv) **Personal mobility in 2005:** It is taken as a categorical variable. The variable takes the value 1, if the woman doesn't need permission to travel to nearby health centre/ go to relative`s or friend`s place/ travel short distance by bus or train/visit a kirana shop, else the variable takes the value 0. It is assumed that if rural married women don't need permission to venture out of house (for any of the above reasons stated above), then they are more likely to enter workforce.

(xv) **Type of work:** It is a categorical variable with own farm (family farm) work as reference variable. The other categories are agricultural wage labor, non-farm work, own non-farm business, salaried job. For entry regression, the 2012 work

type variable is taken and for exit regression, the 2005 work type variable is chosen. It is assumed that rural married women engaged in family farm work are least likely to exit workforce.

(xvi) Inverse Mills Ratio: They are continuous variable which are included as additional explanatory variables to correct for selection bias arising out of panel attrition and initial employment decision (2005) by women.

(xvii) State dummy: State dummy have been used to control for the regional differences in labor hours supplied by rural married women.

6.4. Results and Discussion

6.4.1. Empowerment among women In India

6.4.1.1. Trends in empowerment

Despite programs like 'Beti Bachao-Beti Padhao'[62], Sukanya Samridhi Yojana, Mandatory Maternity Leave and numerous other programmes and laws to prevent female foeticide and promote gender equality, the IHDS-II (2011-2012) data shows that in rural areas, 82% of the husbands desire to have atleast 1 boy child and only 50% of the husbands desire to have at least 1 girl child in 2012, when asked for preference about the sex of the child, if they wished to have children. The preference for a girl child looks bleak in the Indian society and their future also could be equally grim, if immediate actions aren't taken to promote gender equality on all fronts.

At the All India level, using NFHS data, during period 2005-20115, women`s agency has improved in few dimensions, however their agency with respect to the usage of contraceptives as a family planning measure has slightly fallen (Table 6.1 & Table 6.2). Further, overall female work participation has fallen and the sex-ratio at birth has also slightly worsened during the same period (ibid).

[62]The Beti Bachao-Beti Padhao campaign launched on Jan 15, 2015. The campaign aims at stopping female foeticide and improving the women`s status in Indian society by giving her opportunities for education (Economic Survey of India, 2015-16)

6.4.1.2. Defining empowerment among rural married woman in India: Factor Analysis

Using factor analysis methodology on IHDS-I (2004-05) cross-section data (Table 6.3a, 6.3b, 6.3c, 6.3d, 6.3e and 6.3f) to identify the main factors defining empowerment in 2005 and 2012 among rural married women, the following observations were made.

Kaiser criterion (Toress, n.d.) states that factors with Eigen 'values equal to or higher than 1' need to be retained. Hence, only the major factor (Factor 1) is retained (Table 6.3a). As can be seen from Table 6.3a, this factor explains 65% of the variation. Since only factor 1 is relevant to our calculation, it has been observed that factor one is mainly explained by having most say in decision regarding how many children to have and most say in decision regarding household expenses based on the values of factor loadings (Table 6.3d). Thus, empowerment among rural married women in 2005 is defined by these two dimensions defining factor 1. Further, using factor analysis methodology (Table 6.4a, 6.4b, 6.4c, 6.4d, 6.4e, 6.4f) on IHDS-II (2011-12) cross-section data, the following observations were made on empowerment of rural married women in 2012. Factor 1 explains 84% of the variation. Secondly, according to the Kaiser criterion, only the first factor is retained as it has value more than 1 (Table 6.4a). Factor 1 is mainly explained by rural women`s own positive attitude towards gender equality and having financial autonomy, as estimated by the factor loadings (Table 6.4d). Thus, empowerment among rural married women in 2012 is defined by these two dimensions defining factor 1.

6.4.2. Inter linkages of Empowerment, Poverty and Labor supply of rural married women

Using IHDS panel data, it has been observed that the overall empowerment for rural married women has risen in 2012 as compared to 2005 (Table 6.5). Except the mobility dimension, the percentage of empowered rural married in all other dimension of empowerment has risen during the period 2005 to 2012 (Table 6.6). Empowerment rates of rural married women have fallen during the period 2005-2012 for some states like Jammu and Kashmir, Delhi, Bihar and Jharkhand (Table 6.7). With respect to mobility

dimension of empowerment, Delhi, Punjab and Jharkhand are few of the poor performers (Table 6.8).

The work and empowerment linkage can be understood as follows. The percentage of empowered rural married women among those who were 'working' were more than among those who were 'not working', both in 2012 as well as in 2005 (Table 6.9). Hence, being in work clearly promotes empowerment among women. Also, empowerment among working rural married women has increased overtime. However, when rural married women are categorized on the basis of household poverty status, it is observed that empowerment rates for 'working women from BPL households' are lesser than for 'working women from APL households' implying that work may not necessarily mean empowerment for women (Table 6.10). On the other hand, empowerment encourages work participation among women. Among empowered rural married women, majority were working, but the proportion of those working women has declined in 2012 as compared to 2005 (Table 6.11 & Table 6.12). However, the proportion of 'working' women among empowered rural married women was more for BPL households than APL households, due to the financial compulsion of rural married women from BPL households to work.

Table 6.13 highlights the percentage distribution of empowered rural married women in 2012 and 2005. Maximum proportion of empowered rural married women were graduate. Further, the poverty and empowerment linkages can be explained as follows. Higher empowerment rates were found among rural married women belonging to households which remain APL in both rounds (ibid). Among empowered rural married women, those belonging to BPL households constituted only a small proportion (Table 6.14). Majority of the empowered rural women belong to APL households.

More specifically, Table 6.15 highlights how rural married women fare at three dimensions of empowerment. With respect to mobility, the highest proportion of empowered rural married women whose education attainment level increased from middle to secondary level and whose household income rose from low to middle level. With respect to decision regarding number of children to have, the highest proportion of empowered rural married women remain graduate in both rounds. With respect to decision regarding household

expenses, the highest proportion of empowered rural married women were those who made a transition from secondary level of education to graduate and those from households that remain in middle income quintile. Transition to higher education and higher income quintile seems to play an important role in improving their mobility and decision-making regarding household expenses.

6.4.3. Logistic Regression

6.4.3.1 Factors affecting empowerment of rural married woman in 2012

Binary Logistic regressions to analyze the socio-economic factors that impact the empowerment of rural married woman in 2012 (Table 6.16) can be interpreted as follows.

With respect to the area of residence, it was observed that rural married women from less developed areas were less likely to be empowered. Further, with respect to the family background, it was observed that higher the number of children in the household, lesser was the likelihood for rural married women to be empowered. This is mainly due to the care work allocated to women. Christians/Sikh/ Jain rural married women were likely to be more empowered than those rural married women who belong to forward caste.

With respect to education, the following observations were made. Those rural married woman with higher levels of education attainment were more likely to be empowered as compared to illiterate rural married women. With respect to the changes in level of education during the period 2005-2012, those rural woman with middle education or above in both rounds, were more likely to be empowered than those who remain illiterate in both rounds. Further, rural married women whose husband`s education attainment was upto primary level were likely to be more empowered than who had illiterate husband. Further, rural married women from families that were found to have highest education attainment upto primary level were likely to be more empowered as compared to illiterate household. Further, those rural married woman from higher income quintile were more likely to be empowered in 2012 as compared to those from the lower quintile. Higher standard of living ensures access to better education and thus better paid jobs which contribute to their empowerment.

With respect to employment, being in work increases the likelihood of a woman to be empowered. It was observed that rural married women engaged in salaried jobs; and those with media exposure were more likely to be empowered. With respect to the interaction effects of poverty and work status, it was observed that the working rural married women from APL rural households were more likely to be empowered as compared to working rural married women from BPL households. Therefore, it was observed that women`s work may not necessarily guarantee empowerment, as it is conditioned upon the poverty status of the household. Along with work, financial capital, household economic well-being and education contributes to women`s empowerment.

6.4.3.2. Rural Married Women`s Labor Supply

Vella and Verbeek`s (1999) methodology (as explained in section 2.3.1) has been utilized to analyze the factors affecting labor supply of rural married women in 2012 at panel level. In the first stage, two Probit regression are run. One on workforce participation decision (as shown in Table 3.1a) by women in 2012 and another on individual attrition (Table A.3.7). IMR correcting for the selection bias from these two regressions and the polynomial of predicted values of dependent variable of the workforce participation decision regression are used as additional explanatory variables in the second stage. At the second stage, an OLS regression is run to estimate the factors affecting rural married women`s labor supply (Table 6.17). The dependent variable of this OLS regression is taken as the log of labor hours supplied by rural married women in 2012. Income quintile of the household to which the rural married women belongs to; their work type; and their education attainment turn out to be important determinants of their labor supply. With respect to work-type, rural married women engaged in salaried work supplied more labor than those engaged in farm work.

With respect to husband`s education attainment, it was observed that higher the education attainment of the husband, higher were the labor hours supplied by rural married women. With respect to women`s own education attainment, those who made a transition from secondary to higher education levels overtime, supplied more labor hours as compared to those who remain in lower income quintile in both rounds. As their education level rises,

their labor is more in demand and labor market returns are higher. Hence, more days of work are available for the higher educated rural married women. With respect to empowerment status of rural married women in 2012 (defined by women`s own positive attitude towards gender equality and having financial autonomy), it was found that being empowered, increases the labor supplied by them.

Family background plays an important role in a married women`s life. It was observed that higher the number of infants in the household, lower were the labor hours supplied by married women due to their care duties. Further, rural married women from forward caste were found to be supplying more labor as compared to other socio-religious groups. Rural married women from non-poor households of 2005 that fell into poverty in 2012 were found to supply more labor than households that remain in poverty. Women`s labor is reserve army of labor which is used intensely in times of financial crisis of household and for consumption smoothening purpose.

With respect to income quintile, rural married women who made a transition from middle to higher income quintile overtime were found to be supplying more labor hours in 2012. However, higher the number of earning members in the household, lower were the labor hours supplied by rural married women, as they have lesser pressure to work. Also, higher the hourly wages of rural married women, more were the labor hours supplied, generating an upward sloping labor supply curve for rural married women with respect to their wages.

6.4.3.3. Rural married women`s workforce entry and exit decisions

6.4.3.3.1. Rural married women`s workforce entry and exit rates across socio-economic variables

Table 6.18a highlights entry and exit rates of rural married women across socio-economic variables. Higher workforce entry rates were found among rural married women who were illiterate, Dalits, 15-19 age group and lowest income quintile in 2005. On the other hand, higher workforce exit rates were found among rural married women who were middle educated, Muslims, and from high income quintile. Further, around 34% empowered women were exiting and around 43% empowered women were found to enter workforce.

Therefore, empowerment helps women in entering workforce. However, empowerment doesn't imply they would remain in workforce. They may withdraw from workforce with rise in household income.

6.4.3.3.2. Workforce entry and exit decision of rural married women: Logistic Regression

At the first stage, two Probit regressions are run to derive IMR to be included as additional explanatory variables correcting for selection bias due to attrition and bias due to presence of women who supply zero labor hours in 2005 (Table A.3.6 & Table A.3.7). The binary logistic regression (Table 6.18b) in the second stage, provides us with the average marginal probabilities of the socio-economic variables influencing the entry and exit of rural married women in workforce. The following observations were made using IHDS panel data. Type of work and change in education attainment of rural married women turn out to be important determinants of their entry and exit decision in workforce. Further, rural married women from less developed villages were less likely to exit workforce due to the economic compulsion to work.

With respect to income, the following observations were made. Higher the own (market) wage of rural married women, higher is their likelihood of entry and lower is the likelihood to exit from workforce overtime. Rural married women who made a transition from low to middle income quintile were more likely to enter workforce (although the significance value on having an impact on the entry probability is very low). Whereas, rural married women who remain in highest income quintile were more likely to exit workforce. This indicates the role of income effect as well as social norms in inducing their exit from workforce. Further, rural married women from households which remain BPL are more likely to enter workforce as compared to other categories. Whereas, rural married women from households that remain APL were more likely to exit workforce as compared to those from BPL households.

With respect to the family background, the following observations were made. Higher the number of infants in the household in 2012, lower was their entry and higher was the exit from workforce. Further, backward caste rural married women were more likely to enter

and forward caste women were more likely to exit. Further, those rural married women engaged in non-farm (family) business were more likely to exit as compared to family farm work. This is may be due to an income rise in the household.

Further, it was observed that married women who had no constraints on their mobility to step outside their home for work or travel to nearby places, were more likely to enter workforce as compared to those who require permission from family members. With respect to education, those rural married women who remain illiterate in both rounds were more likely to enter workforce. Further, rural married women whose own education attainment remain middle level education in both rounds, were more likely to exit. The withdrawal could be due to the rise in household income along with social norms. With respect to education attainment level of spouse, it was observed that rural married women whose husbands were illiterate were more likely to enter workforce out of economic compulsion to work, as lower education also implies lower income class who cannot afford the time and cost involved in education. On the other hand, rural married women with husbands having primary or above level of education were more likely to exit as their pressure to work reduces with higher household income.

6.5. Conclusion

Rural married women`s decision-making regarding the number of children to have and household expenditure, define empowerment among them in 2005. Whereas in 2012, their financial autonomy and their positive attitude of towards gender equality defines empowerment among them. The overall empowerment rates have slightly risen overtime for rural married women. However, at a disaggregated level, their mobility constraints also seem to have risen during the period 2005-2012, which is quite a concern. This may be on account of the growing crime rates against women apart from the socio-cultural norms which hinder their mobility.

Further, being in work empowers them but poverty dis-empowers them. Merely working doesn't ensure empowerment among women but the household poverty status also plays an important role. It was observed that the working rural married women from APL rural households were more likely to be empowered as compared to working rural married women from BPL households. Higher household income ensures better education and employment opportunities among rural women to enhance their empowerment at an aggregate level.

Education of rural women plays an important role in promoting their empowerment. Besides, their own education, education of married women`s spouse and the highest education attainment in the household also promote their empowerment. Further, more developed areas are capable of contributing towards their empowerment with access to better facilities, opportunities, infrastructure, better pay and awareness. Transition to higher levels of income and education seems to play an important role in improving their mobility and making decisions regarding household expenses. It was observed that women`s own education, type of work and socio-religious group were among the few important determinants of empowerment for rural married women. Rural married women who were graduates, from higher income quintile, salaried workers and Christian/Sikhs/Jain were found to be more empowered.

Rural married women who were found empowered, with higher levels of education, earning higher wages, with higher educated husband, who witnessed a transition from

middle to higher income quintile; those engaged in salaried work; and from forward caste, supplied higher labor hours in 2012. On the other hand, rural women with higher number of infants and higher number of earning members in the household; and those residing in less developed villages, supplied lower labor hours in 2012.

Education, type of work and income quintile turn out to be important factors in explaining both entry and exit from workforce of rural married women. The likelihood of rural married women`s exit from workforce is found to be higher for middle level educated; from higher income quintile, forward caste, and from households that remain APL households. On the other hand, rural married women who were Dalit, remain illiterate and from lower income quintile were more likely to enter workforce. However, those women who were empowered were also found withdrawing from workforce due to a probable income rise which reduces their pressure to work. Hence, immediate measures are needed to ensure women`s equal participation at all fronts of life.

Having discussed about the inter-linkages of labor supply, poverty and empowerment of rural women in India, the next chapter concludes the study, by providing a summary of main findings, their implications and the way forward with respect to rural women`s labor supply and empowerment.

Table 6.1. Women`s responses across few gender dimension (ALL INDIA)

Gender Dimension	Women Responses	2005	2015	Decadal Change
Agency	Decision about their own health	62.3	74.5	12.2
Agency	decision on household expenses	52.9	73.4	20.4
Agency	decision about visit to family and relatives	60.5	74.6	14.1
Agency	decision about their own earnings	82.1	82.1	-0.1
Agency	decision about contraception	93.3	91.6	-1.7
Attitude	Prefer more or equal number of daughters over sons	74.5	78.7	4.3
Attitude	Wife beating is not acceptable	50.4	54	3.5
Outcome	Employed	36.3	24	-12.3
Outcome	Earning more than or equal to husband	21.2	42.8	21.6
Outcome	Educated	59.4	72.5	13.1
Outcome	Not experiencing physical or emotional violence	62.6	70.5	7.8
Outcome	Not experiencing sexual violence	90.3	93.6	3.3
Outcome	Median age at first child birth	19.3	20.6	1.3
Outcome	Median age at first marriage	17.3	18.6	1.3
Outcome	Sex ratio of last birth (females per hundred births)	39.4	39	-0.4

Source: Economic Survey (2017-2018) calculations based on DHS and NFHS data.

Table 6.2. Percentage distribution of rural married women based on their responses across few indicators of empowerment

Empowerment measure	2015		2005	
	Rural	Total	Rural	Total
Currently married women who participate in household decisions (%)	83	84	33	76.5
Ever-married women who have ever experienced spousal violence (%)	31.4	28.8	40.2	37.2
Women who worked in the last 12 months who were paid in cash (%)	25.4	24.6	NA	28.6
Women having a bank account in their own name (%)	48.5	53	NA	15.1
Women owning a house and/or land (alone or jointly with others) (%)	40.1	38.4	NA	NA

Source: NFHS-4, All-India Fact Sheet (2015-16)

Table 6.3a. Un-Rotated Iterated Principal Factors for 2005

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	1.46	0.68	0.65	0.65
Factor 2	0.77	0.74	0.35	1.00
Factor 3	0.04	0.04	0.02	1.02
Factor 4	0.00	0.03	0.00	1.02
Factor 5	-0.03	.	-0.02	1.00
Number of obs	19753			
Retained factors	2			
Number of parameters	9			
Prob>chi2	0			

Source: Author`s own calculation using IHDS-I (2004-05)

Table 6.3b. Factor loadings and unique variances for 2005

Variable	Factor1	Factor2	Uniqueness
Number of children to have for a rural married couple[63]	0.99	-0.19	-0.02
Attitudes of rural married woman towards gender equality[64]	0.26	0.82	0.26
Financial Autonomy[65]	0.15	0.20	0.94
Permission for mobility of rural married woman outside house[66]	0.12	0.11	0.97
Decision making in household expenditures[67]	0.60	-0.13	0.63

Source: Author`s own calculation using IHDS-I (2004-05)

Notes:

(i) Uniqueness is the variance that is 'unique' to the variable and not shared with other variables. Greater the value of uniqueness, lesser is its relevance to the factor model (Torres-Reyna, n.d.).

(ii) Higher the load of the variable, greater is its capability of explaining the dimensionality of the factor

Table 6.3c. Rotated iterated principal factors for 2005

Factor	Variance	Difference	Proportion	Cumulative
Factor1	1.42	0.61	0.64	0.64
Factor2	0.81	.	0.36	1.00

Source: Author`s own calculation using IHDS-I (2004-05)

[63]Empowered if respondent has most say in the decision making regarding the number of children to have

[64]Empowered if respondent`s family takes meals together; discuss with husband regarding work/expenditure/politics.

[65]Empowered if respondent has bank account or has name on house property papers.

[66]Empowered if respondent doesn't need permission to go to friends place, kirana shop, health centre.

[67] Empowered if respondent has most say in decision-making regarding household expenditures/purchases.

Table 6.3d. Rotated factor loadings and unique variances for 2005

Variable	Factor1	Factor2	Uniqueness
Number of children to have for a rural married couple	1.01	0.05	-0.02
Attitudes of rural married woman towards gender equality	0.06	0.86	0.26
Financial Autonomy	0.10	0.23	0.94
Permission for mobility of rural married woman outside house	0.09	0.13	0.97
Decision making in household expenditures	0.61	0.02	0.63

Source: Author`s own calculation using IHDS-I (2004-05)

Table 6.3e. Factor Rotation Matrix for 2005

	Factor1	Factor2
Factor1	0.972	0.236
Factor2	-0.236	0.972

Source: Author`s own calculation using IHDS-I (2004-05)

Table 6.3f. Scoring coefficients (regression based on varimax rotated factors) for 2005

Variable	Factor1	Factor2
Number of children to have for a rural married couple	1.03	-0.04
Attitudes of rural married woman towards gender equality	-0.04	0.85
Financial Autonomy	-0.02	0.06
Permission for mobility of rural married woman outside house	0.01	0.03
Decision making in household expenditures	-0.02	-0.01

Source: Author`s own calculation using IHDS-I(2004-05)

Table 6.4a. Un-Rotated Iterated Principal Factors for 2012

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	3.36	2.69	0.84	0.84
Factor 2	0.66	0.49	0.16	1.00
Factor 3	0.17	0.10	0.04	1.04
Factor 4	0.08	0.05	0.02	1.06
Factor 5	0.03	0.04	0.01	1.07
Factor 6	-0.02	0.25	0.00	1.07
Factor 7	-0.27	.	-0.07	1.00
Number of obs	27843			
Retained factors	2			
Number of params	13			
Prob>chi2	0			

Source: Author`s own calculation using IHDS-II(2011-12)

Table 6.4b. Factor Loadings and Unique Variances for 2012

Variable	Factor1	Factor2	Uniqueness
Association in political and community space	0.49	-0.26	0.69
Number of children to have for a rural married couple	0.62	0.62	0.23
Attitudes of rural married woman towards gender equality	0.93	-0.23	0.09
Financial Autonomy	0.99	-0.21	-0.02
Decision regarding work outside home	0.63	-0.02	0.60
Permission for mobility of rural married woman outside house	0.43	-0.02	0.81
Decision making in household expenditures	0.55	0.34	0.58

Source: Author`s own calculation using IHDS-II (2011-12)

Table 6.4c. Rotated Iterated Principal Factors for 2012

Factor	Variance	Difference	Proportion	Cumulative
Factor1	2.82	1.62	0.70	0.70
Factor2	1.20	.	0.30	1.00

Source: Author`s own calculation using IHDS-II (2011-12)

Table 6.4d. Rotated Factor Loadings and Unique variances for 2012

Variable	Factor1	Factor2	Uniqueness
Association in political and community space	0.56	-0.02	0.69
Number of children to have for a rural married couple	0.28	0.83	0.23
Attitudes of rural married woman towards gender equality	0.93	0.21	0.09
Financial Autonomy	0.98	0.25	-0.02
Decision regarding work outside home	0.58	0.27	0.60
Permission for mobility of rural married woman outside house	0.40	0.17	0.81
Decision making in household expenditures	0.34	0.55	0.58

Source: Author`s own calculation using IHDS-II (2011-12)

Table 6.4e. Factor Rotation Matrix for 2012

	Factor1	Factor2
Factor1	0.90	0.45
Factor2	-0.45	0.90

Source: Author`s own calculation using IHDS-II (2011-12)

Table 6.4f. Scoring coefficients (Regression based on Varimax rotated factors) for 2012

Variable	Factor1	Factor2
Association in political and community space	-0.27	-0.03
Number of children to have for a rural married couple	-0.18	0.81
Attitudes of rural married woman towards gender equality	0.50	-0.16
Financial Autonomy	1.22	-0.16
Decision regarding work outside home	-0.42	0.11
Permission for mobility of rural married woman outside house	-0.16	0.05
Decision making in household expenditures	-0.14	0.21

Source: Author`s own calculation using IHDS-II(2011-2012)

Table 6.5. Sample distribution of empowered rural married women in 2005 and 2012

Empowered married women	(Sample) Percentage	Total
2012	(6081)27.17	(22,377)100
2005	(3937)19.93	(19,753)100

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.6. Percentage distribution empowered rural married women in 2012 and 2005 (row percentage) according to different dimensions of empowerment

Dimensions of empowerment for rural married women↓	2012 (Sample)Percentage	2005 (Sample)Percentage
Financial autonomy	(20,578)91.96	(16,095)81.48
Permission to visit(mobility constraints)	(5,380)24.04	(8,172) 41.37
Decision regarding how many children to have	(4,567)20.41	(3325) 16.83
Attitudes of rural women towards gender equality	(20,003)89.39	(14,631)74.07
Household expenditure decisions	(3046)13.61	(1481)7.50

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.7. State-wise empowerment rates for rural married women in 2005 and 2012 (Row percentages)

Empowerment	2012	2005
Jammu & Kashmir	26.1	34.18
Himachal Pradesh	36.07	33.89
Uttarakhand	33.74	28.05
Punjab	23.12	12.82
Haryana	29.64	8.08
Delhi	5.88	12.95
Uttar Pradesh	27.97	13.44
Bihar	15.25	33.8
Jharkhand	18.99	27.5
Rajasthan	38.02	11.7
Chhattisgarh	29.45	8.76
Madhya Pradesh	24.41	14.75
Northeast	38.01	50.67
Assam	46.55	19.6
West Bengal	31.07	21.5
Orissa	21.82	22.01
Gujarat	41.01	25.62
Maharashtra, Goa	20.82	8.7
Andhra Pradesh	17.63	6.27
Karnataka	29.59	13.71
Kerala	19.68	15.26
Tamil Nadu	34.73	61.28

Source: Author`s own calculation from IHDS -1(2004-05) & IHDS –II(2011-12)

Table 6.8. Percentage distribution of rural married women based on their mobility as a factor determining their empowerment

States	2012	2005
Jammu & Kashmir	18.84	44.86
Himachal Pradesh	17.56	20.8
Uttarakhand	18.81	37.94
Punjab	1.33	20.23
Haryana	28.86	45.94
Delhi	17.65	61.12
Uttar Pradesh	15.85	28.59
Bihar	18.39	20.29
Jharkhand	11.26	67.59
Rajasthan	25.42	33.06
Chhattisgarh	27.99	34.45
Madhya Pradesh	10.04	18.36
Northeast	32.92	55.06
Assam	40.96	71.5
West Bengal	55.09	50.8
Orissa	30.41	44.58
Gujarat	25.44	35.7
Maharashtra & Goa	21.38	48.11
Andhra Pradesh	18.21	58.69
Karnataka	26.72	23.11
Kerala	38.1	58.9
Tamil Nadu	16.8	54.68

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.9. Percentage distribution of empowered rural married women according to their work status in 2012 and 2005

Work Status of rural married women	(Sample of empowered rural married women in 2012) Percentage	Total
Among those working in 2012	(1,744)28.78	(6,062)100
Among those not working in 2012	(2319)28.21	(8,224)100
Among those working in 2005	(1,427)21.25	(6,716)100
Among those not working in 2005	(2509)19.25	(13,036)100

Source: Author`s own calculation using IHDS-II(2011-12)

Table 6.10. Percentage distribution of empowered rural married women based on work and poverty status in 2005 and 2012

Work and poverty status of empowered rural married women	Empowered in 2005	Empowered in 2012
Working but from BPL hh	15.49	24.81
Working but from APL hh	20.47	28.6

Source: Author's own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.11. Percentage distribution of working rural married women according to their empowerment status

Empowerment status ↓	(Sample of working rural married women) Percentage	Total
Among those empowered in 2005	(2509)63.74	(3,936)100
Among those empowered in 2012	(3,100)50.99	(6,080)100

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.12. Percentage distribution of rural married women from BPL and APL households in workforce across their empowerment status in 2005 & 2012

Rural married in 2005 from BPL household	**working**
not empowered	69.99(100)
Empowered	66.44(100)
Rural married in 2005 from APL household	**working**
not empowered	65.45(100)
Empowered	63.11(100)
Rural married in 2012 from BPL household	**working**
not empowered	53.99(100)
Empowered	53.37(100)
Rural married in 2012 from APL household	**working**
not empowered	48.35(100)
Empowered	50.38(100)

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.13. Percentage distribution of empowered rural married women across socio-economic variables

Socio economic variables↓	Percentage of empowered rural married women	
	2005	**2012**
Socio-religious group		
Forward caste	20.17	27.1
OBC	18.69	27.19
Dalit	22.12	26.9
Adivasi	17.84	27.89
Muslim	18.3	27.03
Christian, Sikh, Jain	17.96	27.54
Education attainment of rural married women		
Illiterate	19.32	26.72
Primary	18.08	27.27
Middle	20.5	29.05
Secondary	21.81	22.37
higher sec	26.02	25.8
Graduate	27.43	29.87
Age categories		
19	15.54	18.04
29	18.1	23.31
39	20.41	27.46
59	22.42	30.66
Income quintile		
Poorest	21.96	29.45
second	19.54	29.43

Socio economic variables↓	Percentage of empowered rural married women	
	2005	2012
middle	18.27	27.25
fourth	19.32	28.44
richest	20.19	26.87
Change in poverty status		
Remain BPL	16.1	25.98
Remain APL	21.21	28.45
Fall into Poverty	17.02	27.74
Escape Poverty	17.26	32.27

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.14. Percentage distribution of rural married women from poor and non-poor households based on their empowerment status

Percentage distribution of rural married women (row percentages)→	Non-poor	Poor
Empowered in 2012	79.77	20.23
Empowered in 2005	81.08	18.92

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.15. Percentage distribution of rural married women across socio-economic variables based on three dimensions of empowerment in 2012 (Row percentage)

Socio-economic variables↓	No Mobility constraints	Most say in number of children to have	most say in decision regarding hh expenses
Social group			
Forward caste	23.23	21.08	13.57
OBC	21.5	20.64	13.06
Dalit	25.68	19.95	14.36
Adivasi	25.23	20.03	14.3
Muslim	30.48	20.24	12.94
Christian, Sikh, Jain	16.6	17.78	15.52
change in education attainment			
Remain illiterate	25.31	19.82	15.27
Remain upto middle	27.34	22.31	16.06
Remain upto secondary	26.16	18.64	12.45
Secondary to graduate	23.35	26.46	20.71
Remain graduate	20.08	28.52	17.18
Upto middle to secondary	30.68	17.46	17.63
Illiterate to middle	26.83	25.44	14.93
Change in level household income			
Remain in low	26.14	22.72	17.07
Remain in middle	26.11	19.39	18.14
Remain in high	25.86	20.51	14.03
Low to middle	29.52	18.65	15.39
Middle to high	26.03	19.04	15.23

Source: Author`s own calculation using IHDS-I(2004-05) & IHDS-II(2011-12)

Table 6.16. Average Marginal effects of factors affecting empowerment of rural married woman in 2012

Dependent variable: If rural married woman is empowered in 2012 Independent Variables ↓	1 **Avg. Marginal prob.**	2 **Avg. Marginal prob.**	3 **Avg. Marginal prob.**	**4 Avg. Marginal prob.**
age2005	-0.002	0.003		
age(sq) 2005	$2.68E^{-05}$	$-4E^{-05}$		
Change in education level (Ref: Remain illiterate)		NA		
Remain upto middle	0.03***			0.04***
Remain upto secondary	0.04***			0.06***
Secondary to graduate	-0.01			0.04
Remain graduate	0.03			0.06***
Upto middle to secondary	0.03			0.06***
Illiterate to middle	0.02			0.02***
Work type(Ref: farm work)				
Agriculture labor			0.03***	
Nonfarm			0.03***	
Salary			0.04***	
Business			0.03***	
Work and poor interaction(Ref: Working poor)				
Poor but not in workforce				-0.02
Above poverty line & working				0.01***
Above poverty line & not working				-0.009
Education of the spouse (Ref: illiterate)				
below primary			0.01	0.01***
primary			0.003	-0.004

Dependent variable: If rural married woman is empowered in 2012 Independent Variables ↓	1 **Avg. Marginal prob.**	2 **Avg. Marginal prob.**	3 **Avg. Marginal prob.**	**4 Avg. Marginal prob.**
Middle			0.006	-0.01
Secondary			0.002	-0.01
Higher sec			-0.04	-0.04***
graduate			-0.004	-0.015
post-grad			-0.04	-0.02
Exposure to media (Ref: Rural women has NO exposure to media)				
YES			0.03***	
Income quintile (Poorest)	NA			
2nd Quintile		0.003		
Middle		0.007		
4th quintile		0.02***		
Richest		0.0004		
Highest education attainment in the household (Ref: illiterates)				
Primary	0.022***	0.02***		
Middle	-0.004	-0.01		
Secondary	0.007	$-2.5E^{-05}$		
Higher Secondary	0.005	-0.002		
Graduate	0.012	-0.012		
Education attainment of the rural married women(Ref: illiterates)				
Primary			0.02*	
Middle			-0.0002	
Secondary			0.01	
Higher Secondary			0.03***	

Dependent variable: If rural married woman is empowered in 2012 Independent Variables ↓	1 **Avg. Marginal prob.**	2 **Avg. Marginal prob.**	3 **Avg. Marginal prob.**	**4 Avg. Marginal prob.**
Graduate			0.03***	
Number of children in the household	-0.007***	-0.009***		
Socio-Religious category (Ref: Forward caste)				
OBC	0.004	-0.003	-0.004	0.004
Dalit	0.004	0.01	-0.01	0.01
Adivasi	0.002	0.01	-0.001	0.01
Muslim	0.03***	0.02***	0.01	0.01
Christian, Sikh, Jain	0.031	0.04***	0.04***	0.04***
Work status (Reference: Not working)				
Working	NA	0.01***		
Area of residence (reference: more developed village)				
Less developed village	-0.01	-0.01***	-0.012***	-0.01***
Number of obs	6252	16694	8673	8112
Wald chi2(29)	166.19	306.78	184.41	129.19
Prob > chi2	0	0	0	0
Pseudo R2	0.059	0.0412	0.0458	0.0399
Log pseudo likelihood	-1174.58	-3397.83	-1743.47	-1661.11

Source: Author`s own calculation using IHDS-II (2011-12) & IHDS-I (2004-05)
Note: (***) = p< 1%; (**) = p<5%; (*) = p<10%

Table 6.17. Factors affecting Rural Married Women`s Labor Supply in 2012: OLS

Explanatory variables↓ **[Dependent variable: Log of Labor hours supplied by rural women in 2012]**	**1** **Coefficient**	**2** **Coefficient**	**3** **Coefficient**
Age	0.04***	0.01	0.05***
Age-squared	-0.0005**	-0.00005	-0.001***
Sum of infants in hh in 2012	-0.04**		
Empowerment status of Rural married woman (Ref: not Empowered) 2012	0.26*		
Real hourly 2012	0.003		0.01**
Square of hourly wage 2012	0.000004		0.000003
Log of labor hours supplied by rural women in 2005		0.17***	
IMR (panel attrition at individual level)	0.28	-0.74***	0.44**
IMR (Probit employment equation)	-50.00***	-10.36	-1.40***
Household size 2005		0.01**	
State		Yes	
Number of earning members in hh in 2012		-0.05***	
Change in education level (ref: Rural women who remain illiterate over the two rounds)			
Remain up to middle		0.03	
Remain up to secondary		0.06	
Secondary to graduate		1.43***	
Remain graduate		0.39**	
Up to middle to secondary		0.10**	
Illiterate to middle			
Change in level of income (Ref: Remain poor)			
Low to middle		0.06*	
remain middle		0.10**	
middle to high		0.16***	

Explanatory variables↓ **[Dependent variable: Log of Labor hours supplied by rural women in 2012]**	**1** **Coefficient**	**2** **Coefficient**	**3** **Coefficient**
remain high		0.08*	
Area of residence (reference: more developed village)			
Less developed village		0.04*	
Socio-Religious category (Ref: Forward caste) 2005			
OBC			-0.16***
Dalit			-0.13***
Adivasi			-0.18***
Muslim			0.01
Christian, Sikh, Jain			0.20
Predicted values of being in workforce (Employment)	433.43	467.16	
$(\text{Employment})^2$	-1075.52*	-902.35	
$(\text{Employment})^3$	1007.21*	745.90	
$(\text{Employment})^4$	-351.77*	-230.05	
Husband`s education (Ref: illiterate)			
Below primary	0.11***		
primary	0.09**		
Middle	0.14***		
Secondary	0.01		
Higher sec	0.45***		

Explanatory variables↓ **[Dependent variable: Log of Labor hours supplied by rural women in 2012]**	**1** **Coefficient**	**2** **Coefficient**	**3** **Coefficient**
Change in status of poverty of the household (Remain Below Poverty Line)			
Remain in Above Poverty Line		0.08**	
Fall into poverty		0.10**	
Escape out of poverty		0.05	
Work type (Ref: farm)			
non-farm		0.03	
Salaried		0.51***	
Own business		0.38***	
Number of obs	3171	2551	3279
R squared	0.1204	0.3777	0.1

Source: Author`s own calculation using IHDS-II (2011-12) & IHDS-I (2004-05)

Note: (***) = p<1%; (**) = p<5%; (*) = p<10%

Table 6.18a. Rural married women`s entry and exit rates in workforce

Socio-economic variables	ENTRY	EXIT
	(Column percentages : within categories)	
Change in income quintile		
Remain low income quintile	43.59	34.48
Remain in middle quintile	36.06	28.75
Remain in higher quintile	30.88	39.25
Shift from Low to middle	52.73	29.18
Shift from middle to high	34.51	30.67
Household income quintile 2005		
Poorest	49.4	33.79
Second	43.14	30.62
Middle	32.66	32.31
Fourth	35.65	36.42
Richest	30.81	42
Change in education		
Remain illiterate	47.93	30.44
Remain up to middle	30.84	37.79
Remain up to secondary	29.15	45.68
Secondary to graduate	45.08	39.75
Remain graduate	49.06	17.54
Up to middle to secondary	27.14	43.34
Illiterate to middle	42.92	33.57
Education2005		
Illiterate	47.24	30.83

Socio-economic variables	ENTRY	EXIT
	(Column percentages : within categories)	
Primary	34.54	35.53
Middle	30.33	38.27
Secondary	28.37	48.05
Higher secondary	30.01	45.82
Graduate	39.65	22.22
Socio-Religious group		
Forward	24.68	37.42
OBC	37.98	32.26
Adivasi	50.96	30.03
Dalit	56.83	22.47
Muslim	27.91	58.83
Christian/Sikh/Jain	37.87	57.93
Age categories		
15 to 19	40.81	38.21
20 to 29	39.61	33.28
30 to 39	37.28	32.36
40 to 59	35.36	36.81
Empowerment status 2005		
empowered	43.03	33.96
Not empowered	37.11	33.80

Source: Author`s own calculation using IHDS-II(2011-2012) & IHDS-I(2004-05)

Table 6.18b. Logistic regression on factors influencing workforce entry and exit of rural married women

Independent variables↓	1 Coefficients	2 Coefficients	3 Coefficients	4 Coefficients	1 Coefficients	2 Coefficients
	ENTRY				EXIT	
Age 2005	0.02**	-0.003	0.004	0.05	-0.02***	-0.01
Age(sq) 2005	-0.0004**	-0.0001	-0.0001	-0.001**	0.0004***	0.0001
Sum of infants in the hh 2012		-0.03**			0.02**	
State dummy			yes		Yes	
Household size 2005	0.02***					0.02***
Real wage 2005 (hourly)			-0.005***		0.02***	
Square of Real wage 2005 (hourly)			0.00003***		-0.0003***	
IMR (Employment decision by women in 2005)	-0.05**	-0.09***	-0.01	-0.18**	-0.002	0.25***
IMR (Panel attrition)	-0.24*	-0.27**	-0.13	-0.57	0.38***	-0.28**
Education of the spouse 2012 (Ref: illiterate)						
primary				-0.15	-0.02	
middle				-0.29***	0.05**	
secondary				-0.57***	0.02	
Above Secondary				-0.58***	0.09***	
Socio-Religious category (Ref: Forward caste) 2005						
OBC			-0.03	0.58***	-0.01	
Dalit			-0.01	0.70***	-0.02	
Adivasi			0.02	1.01***	-0.08***	
Muslim			0.02	-0.14	0.04	
Christian, Sikh, Jain			-0.12	0.04	0.03	

Independent variables↓	1 Coefficients	2 Coefficients	3 Coefficients	4 Coefficients	1 Coefficients	2 Coefficients
	ENTRY				EXIT	
Area of residence (reference: more developed village) 2005						
Less developed village			0.01	0.06	-0.03**	
Mobility restriction in 2005(ref: permission needed)						
No restriction		0.03*				
Work type (Ref: farm work) 2005						
Agriculture labor					0.07**	
Nonfarm					0.07**	
Salary					-0.03	
Family Business(non-farm)					0.11**	
Income quintile 2005 (Poorest)						
2nd Quintile				-0.10		
Middle				-0.31***		
4th quintile				-0.21*		
Richest				-0.37***		
Change in level of income(Ref: Remain low)						
Remain middle	-0.01					-0.01
Remain high	-0.09***					0.03*
Low to middle	0.05*					-0.03*
Middle to high	0.01					-0.03

Independent variables↓	**1 Coefficients**	**2 Coefficients**	**3 Coefficients**	**4 Coefficients**	**1 Coefficients**	**2 Coefficients**
	ENTRY				EXIT	
Change in status of poverty of the household (Remain Below Poverty Line)						
Remain in Above Poverty Line	-0.07*					0.09***
Escape out of poverty	-0.02					0.06**
Fall into poverty	0.002					0.01
Change in education level (Ref: Remain illiterate)						
Remain upto middle	-0.08***					0.03**
Remain upto secondary	-0.14***					0.04
Secondary to graduate	0.03					-0.02
Remain graduate	0.03					-0.10
Upto middle to secondary	-0.06					0.06
Illiterate to middle	-0.11***					0.05*
Number of obs	2486	3993	931	4070	4060	6126
Wald chi2(59)	143.69	79.74	43.42	252.13	347.79	232.03
Prob > chi2	0	0	0.0416	0	0	0
Pseudo R2	0.0465	0.0192	0.0863	0.049	0.0989	0.0394

Note:***p < 0.01, **p < 0.05, *p < 0.1
Source: Author`s own calculation using IHDS-II(2011-2012) & IHDS-I(2004-05)

Chapter 7

Conclusion

7.1. Introduction

Having critically analyzed the inter-linkages of labor supply, household poverty and empowerment of rural women in the previous chapters, the current chapter summarizes the main findings and concludes the study.

Household is the main space where a woman`s economic and social life revolves. Their ideas, beliefs, perception, self-worth, decision-making, emancipation and discrimination originate from that space. It is also influenced by media, peer group, government, work spaces and society. But the major stakeholders in a woman's life are the household members and the 'woman' herself. The foundation to imbibe new ideas, nurture their talents and find self-worth by involving in economic participation depends strongly on perception of 'self'. The thesis has identified the socio-economic background of rural women entering, exiting or continuing in workforce overtime, those changing their occupation overtime; role of female labor supply in influencing household poverty transition and their own level of empowerment. It also finds that women`s empowerment, labor supply and household poverty are inter-related. This chapter summarizes the main findings and derives few policy implications based on the same.

The inter-linkages of rural women`s empowerment, household poverty and employment have important policy implications at the macro level. Social norms have been identified as one of the main barriers to rural women`s work participation, apart from the economic factors that influence FLFP. Further norms, practices, beliefs and attitudes vary across individuals, households, socio-religious groups and region. Hence, the outcomes with respect to women's decision making regarding work and their degree of autonomy varies, depending on the norms operating at multiple levels; income and education level of women and her family members.

Drawing lessons from Iceland`s success in retaining the top position in terms of gender equality across the world for almost a decade, it was observed that this has been made possible through sharing of power between men and women as decision-makers, collective action, political will and effective policies in the form of legislations and gender budgeting (Marinósdóttir & Erlingsdóttir, 2017). In India, various government sponsored (or NGO

initiatives) women empowerment schemes have started or are already in place. Recent few schemes are the pink autos[68] in Assam; the Swayam Shikshan Prayog[69] (SSP) and READ[70] India program.

For overall progress and inclusive economic growth of our nation, it is the onus, not just on the policy makers, but also upon our society to respect women, their needs, desires and rights; make them capable to earn a living and be allowed to live freely. The rest of this chapter is divided into the following sections. The second section summarises the major findings from previous chapters, based on the objectives in each of these chapters. The third section resolves the hypothesis framed in each chapter. The fourth section provides few policy implications based on the main findings. The fifth section explains the limitation of this study. The final section provides the scope for further research on these issues.

7.2. Major Findings

This section summarizes the main findings from the previous four chapters which are as follows:

7.2.1. Trends and determinants of rural women`s inter-temporal labor supply

(i) NSS cross-section data reveal a falling trend with respect to rural women`s WPR since 1990s. Further, IHDS also shows a similar falling trend, at the cross section level, during 2005-2012.

(ii) Family plays a strong role in influencing women`s work participation decisions. A lower probability of entry and a higher probability to exit from workforce was observed among rural women who had higher number of earning members in the

[68] Pink autos introduced in Assam employs and caters to women and children (Dey, 2018).

[69] SSP is a woman led climate resilient 'agro-ecological farming model' in Maharashtra improving the health, food security, and economic well-being of their families ("Pune NGO", 2017).

[70] READ India program has its Community Libraries and Resource Centres (CLRCs) spread over 129 villages across 12 states, empowers rural communities and help in poverty reduction (Rai, 2017).

household. Further, women with higher number of children were found to reduce their labor hours overtime and also had a lower probability to enter workforce due to the care responsibilities of women.

(iii) Marriage acts as an institution which can strongly influence women`s paid work outside the household in many ways. High probability of entry was observed among rural women who remain married, whereas, a high probability of exit was observed among those who remain single in both rounds. On the other hand, divorced and widowed rural women who remain in workforce were found to be increasing their labor hours overtime.

(iv) Higher probability of exit from workforce was found among rural women who were Muslim; whose education rose from middle to secondary level; engaged in non-farm (family) business and those who remain in higher income quintile in both rounds. On the other hand, high probability of entry was found among rural women who were Dalits; who remain illiterate; engaged in salaried jobs; and who remain in the lower income quintile in both the rounds.

(v) Rural women from backward caste; who remain illiterate and remain in lower income quintile in both rounds were found to be increasing their labor supply overtime.

7.2.2. The pattern of occupational shift among rural women

(i) Farm work still remains as the main occupation for majority of rural women with high entry barrier in the non-farm sector and limited job opportunities for women. Majority of rural women farm workers of 2005 remain farm workers even in 2012. Further, the likelihood of being engaged in farm work is more among the illiterate, backward caste and poor rural women.

(ii) Majority of the non-workers (those out of workforce in 2004-2005) enter into salaried jobs in 2012. This reveals the preference for well-paid and regular jobs among rural women with the rise in their income level and education attainment.

(iii) Farm days haven't reduced much for rural women or men. Whereas, non-farm days have increased more for men than women in rural areas. The increase in non-farm labor days has been mainly for rural women from higher income quintiles and primary educated.

(iv) MGNREGA has a poverty reducing effect among the households where female members of the family are engaged in MGNREGA work (in any form). As opposed to other non-farm wage work, MGNREGA (most of which is found to be combined with farm work) acts as an additional income opportunity especially for the marginalized section of rural women, stuck in low remunerated farm jobs.

7.2.3. Household poverty and rural women`s labor supply

(i) Overall poverty rates in India have fallen since 1990s. IHDS data also shows a falling trend in poverty rates during 2005-2012.

(ii) A backward sloping labor supply curve is evident among rural women, i.e., existence of 'forced' or 'need-based participation' among rural women from BPL households. This justifies why poor rural women work long hours in poorly paid hazardous jobs. They participate out of sheer economic necessity at lower wages. However, the standard upward sloping labor supply curve is witnessed for the rural women from APL households.

(iii) There is a higher likelihood for the poor rural household in escaping poverty and lower likelihood for non-poor households to fall into poverty overtime, with the increase in average completed years of education and mean labor hours supplied by female members in the household.

(iv) Higher maximum education attainment of household and a higher level of assets ensures higher probability of escaping poverty and lower probability of falling into poverty overtime. However, there is a higher likelihood for a non-poor household to enter poverty overtime and a lower likelihood for a poor household in escaping poverty overtime with an increase in dependency ratio and household size.

7.2.4. Empowerment of rural married women and its linkages with their labor supply and household poverty

(i) The overall empowerment rates have slightly risen overtime for rural married women. However, at a disaggregated level, their mobility constraints also seem to have risen during the period 2005-2012, which is quite a concern.

(ii) Rural married women who were graduate, from higher income quintile, salaried workers and Christian/Sikhs/Jain were found to be more empowered.

(iii) Being in work empowers them but poverty dis-empowers rural married women. Merely work-participation doesn't ensure empowerment among women but the household poverty status also plays an important role. Also, the working rural married women from APL rural households are more likely to be empowered as compared to working rural married women from BPL households. Moreover, higher empowerment rates were found among rural married women belonging to households which remain APL in both rounds.

(iv) Transition to higher levels of education and income seems to play an important role in improving their mobility and decision-making regarding household expenses. Besides, their own education, education of married women`s spouse and the highest education attainment in the household also promotes their empowerment. Further, more developed areas are capable of contributing towards their empowerment with access to better opportunities, infrastructure, better pay and awareness.

(v) Rural married women who were Dalit; who remain illiterate; from lower income quintile and those with no mobility constraints were more likely to enter workforce. Whereas, the likelihood of rural married women`s exit from workforce is found to be higher among rural married women who remain middle level educated; from higher income quintile; forward caste; and those from households that remain APL households. Their withdrawal reflects an evident income effect coupled with socio-cultural norms.

7.3. Resolving the Hypothesis

(i) ***Rural women in workforce who are illiterate, from backward caste and from lower income class increase their labor supply overtime and are less likely to exit from workforce***

This hypothesis holds true. Rural women who remain in higher income quintile, Muslims and remain graduate overtime were more likely to withdraw from workforce due to an interplay of income effect, education effect and social norms. Maximum proportion of rural women found withdrawing from workforce, were from households that remain APL households in both rounds. Whereas, rural women who were illiterate, from lower income quintile and from backward caste were less likely to exit and were found increasing their labor supply overtime, indicating their economic necessity to work and their vulnerability to fall into poverty traps, due to lack of economic opportunities.

(ii) ***There is a shift away from farm sector towards non-farm sector among rural women workers, in the context of structural transformation***

This hypothesis doesn't hold true. With limited job options for rural women, farm work still remains as the main occupation for majority. Farm days haven't reduced much for men or women. Whereas, non-farm days have increased more among rural men than women. Non-farm work has entry barriers in the form of higher education and income for rural women.

(iii) ***Household poverty shapes the nature of rural women`s labor supply. On the other hand, female labor supply helps in reducing the household poverty risks***

A backward sloping labor supply curve is witnessed among rural women from BPL household which reflects 'poverty-induced participation' at lower wages. Whereas, an upward sloping labor supply is evident among rural women from APL households. Thus, household poverty shapes the nature of labor supply of rural women. On the other hand, female education and their labor supply help poor

households escape poverty and prevent the fall into poverty for non-poor households. However, the contribution of female labor supply and education towards changes in poverty risks is low due to the low-wage cycle prevalent among women.

(iv) ***Empowerment and employment reinforce each other***

Employment helps promote empowerment and empowerment in turn help women enter workforce. However, when the population is divided on the basis of poverty, it was found that working rural married women from APL households were more empowered as compared to working rural married women from BPL households. Moreover, empowerment of women depends on type of work, socio-religious category, education attainment and household income quintile and not merely on her employment status (working or not working). Secondly, even if women are empowered, they were found withdrawing from workforce, on account of rise in their household income. Thus, rural married women`s empowerment and employment may not necessarily reinforce each other as it is conditioned upon other factors like type of work and household income status.

7.4. Policy recommendation

(i) **Job Opportunities and skill building:** There is a need for decent (social security benefits and good working conditions suited to females), productive and flexible job options for women, preferably closer to their area of residence which would enable them to strike a balance between household responsibilities as well as paid work. Further, farm work needs to be made lucrative as it continues to be the main activity among rural women. The need to skill or even reskill the workforce, as new technologies emerge, is imperative. Further, it is important to make non-farm jobs accessible for all, by providing the required training to women. More female-friendly employment guarantee schemes like MGNREGA must be promoted.

(ii) **Women`s work and empowerment as a strategy to mitigate the risk of poverty:** Efforts need to be made to transform a woman`s role from an 'income buffering'

to an 'income generation' role. Women`s economic participation and empowerment are powerful tools for poverty reduction at the household level. However**,** education of rural women and better infrastructure facilities are needed to increase their mobility; access better education and employment opportunities and translate their economic opportunities into better welfare outcomes for all.

(iii) Incentivize their labor supply: The evidence of downward sloping labor supply curve among the rural women from BPL families implies the need to incentivize their labor supply, provide them skill training to demand a higher pay for their work and ensuring female-friendly flexible work conditions for them.

(iv) Attitudinal change: Inorder to make the policies on women effective, change in attitudes, perception and mindset of women`s peer group, family and society is required. Rural women also need a change in perception of 'self' and women`s own attitude towards gender equality must be positive. Massive public awareness programmes (using T.V, radio, street plays, hoardings) and door-to-door counselling for women and their family members, could be useful measures to promote gender equality and to make them understand the benefits of women`s economic participation and emancipation to the household and economy.

7.5. Limitations of the Study

(i) IHDS doesn't collect data on informal sector. Thus, informalisation of rural women`s work cannot be investigated upon. Hence, NSS data has been used to analyze the trends in rural women`s informal sector participation.

(ii) Empowerment variables are available only for rural married women aged 15-49 years. Hence, the linkages of labor supply, poverty and empowerment can be analysed only for rural married women. Further, the information on all the indicators of empowerment are not available since 1990s. Although, post year 2000, the empowerment trends can be analysed.

(iii) Due to the derivation[71] of wage (independent variable) and hours worked (dependent variable) calculated by IHDS, there might be a correlation between wages and hours worked which may lead to a negative bias between wages and hours worked.

(iv) IHDS data is a nationally representative multi-topic survey. However, it is not representative at the state-level due to smaller sample size. Hence, NSS data have been used to analyze the state level trends of work-participation among rural women and aggregate poverty.

(v) IHDS doesn't collect information on those who attended domestic duties in the reference year or who were engaged in free collection of goods, sewing, tailoring, weaving, etc. for household use, along with domestic duties. Hence, NSS data has been used to analyze the trend in engagement of rural women in domestic duties.

7.6. Scope for further Research

A third round of IHDS panel data set would enable a longer-term transition analysis. It would enable the identification of households which are in chronic poverty; women`s workforce entry, exit and re-entry trends; inter-generational occupation mobility; impact of women`s access to economic resources on well-being of all family members and its spread effects to the next generation. This would enable a better understanding of the factors that restrict or promote their empowerment and economic participation; and the consequent benefits to the household and the economy as a whole.

[71] Explained in chapter 2, section 2.3.4.

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Appendix Tables

Table A.3.1a. WPR across gender and area of residence

NSSO rounds	RURAL MALE	URBAN MALE	MALE	RURAL FEMALE	URBAN FEMALE	FEMALE
50th(1993-94)	53.07	51.08	52.57	26.73	13.89	23.59
55th(1999-2000)	51.12	50.91	51.07	25.22	12.77	22.12
61st(2004-05)	52.41	53.68	52.74	27.47	15.25	24.41
68th (2011-12)	52.6	53.9	53	20.7	13.8	18.8

Source: Author`s own calculation using various rounds of NSS (EUS)

Table A.3.1b. Gender gap (in percentages) with respect to WPR

NSSO rounds	Total Gender Gap	Rural Gender Gap	Urban Gender Gap
50th(1993-94)	29	26	37
55th(1999-2000)	29	26	38
61st(2004-05)	28	25	38
66th(2009-10)	33	31	41
68th (2011-12)	34	32	40

Source: Author`s own calculation using various rounds of NSS (EUS)

Table A.3.1c. Sector-wise Work Participation Rates (%) across gender

Year	Total	Persons	Males	Females
1991	TOTAL	37.5	51.6	22.27
	RURAL	40.09	52.58	26.79
	URBAN	30.16	48.92	9.19
2001	TOTAL	39.1	51.68	25.63
	RURAL	42.75	52.11	30.79
	URBAN	32.25	50.6	11.88
2011	TOTAL	39.8	53.3	25.51
	RURAL	41.8	53	30.02
	URBAN	35.3	53.8	15.44

Source: Office of Registrar General India, Census

Table A.3.2. Labor Force Participation Rate across Gender and Sector

NSSO rounds	Rural Male	Urban Male	Male	Rural Female	Urban Female	Female	Total Rural	Total Urban	Total
50th(1993-94)	54.70	53.86	54.49	27.56	15.17	24.53	41.52	35.48	40.02
55th(1999-2000)	53.17	53.97	53.37	26.18	13.78	23.09	39.97	34.78	38.66
61st(2004-05)	54.48	56.65	55.04	28.67	16.75	25.68	41.83	37.53	40.73
66th(2009-10)	54.80	55.57	55.01	23.11	14.06	20.68	39.39	35.80	38.41
68th (2011-12)	54.5	56.1	54.9	21.5	14.08	19.6	38.3	36.3	37.7

Source: Author`s own calculation using various rounds of NSS (EUS)
Note: Current Weekly status (CWS[72]) measure of employment has been used to estimate LFPR

[72] "The current weekly activity status of a person is the activity status obtaining for a person during a reference period of 7 days preceding the date of survey. It is decided **on the basis of a certain priority cum major time criterion**. According to the priority criterion, the status of 'working' gets priority over the status of 'not working but seeking or available for work', which in turn gets priority over the status of 'neither working nor available for work'. A person is considered working (or employed)) if he/ she, while pursuing any economic activity, had worked for at least one hour on at least one day during the 7 days preceding the date of survey. Having decided the broad current weekly activity status of a person on the basis of 'priority' criterion, the detailed current weekly activity status is again decided **on the basis of 'major time' criterion if a person is pursuing multiple economic activities"** (EUS report, NSSO, 66th round).

Table A.3.3. State-wise growth in WPR (CWS) across gender in rural area

Percentage Growth	68th Round		61st Round		Growth (%)	
State	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
J & K	50.57	16.68	52.41	18.13	-3.51	-8.00
HP	54.84	48.32	51.87	44.4	5.73	8.83
Punjab	55.11	23.18	53.93	32.49	2.19	-28.65
Chandigarh	50.59	12	54.55	10.34	-7.26	16.05
Uttaranchal	46.42	28.87	49.31	35.61	-5.86	-18.93
Haryana	49.14	13.18	48.86	28.16	0.57	-53.20
Delhi	47.1	10.08	55.94	4.85	-15.80	107.84
Rajasthan	48.01	25.18	48.44	32.88	-0.89	-23.42
UP	46.5	11.82	47.04	18.44	-1.15	-35.90
Bihar	46.43	4.05	45.97	9.59	1.00	-57.77
Sikkim	58.74	47.36	55.94	34.5	5.01	37.28
Arunachal Pradesh	46.52	27.97	47.89	38.43	-2.86	-27.22
Nagaland	43.61	20.92	51.43	46.48	-15.21	-54.99
Manipur	49.46	22.09	49.67	30.7	-0.42	-28.05
Mizoram	56.28	33.72	58.28	39.94	-3.43	-15.57
Tripura	55.97	12.05	54.66	7.06	2.40	70.68
Meghalaya	50.52	33.52	55.63	44.26	-9.19	-24.27
Assam	53.77	9.91	52.82	15.01	1.80	-33.98
WB	57.08	14.08	55.6	13.45	2.66	4.68
Jharkhand	51.61	13.46	50.31	21.73	2.58	-38.06
Orissa	57.46	15.77	54.42	18.91	5.59	-16.60
Chattisgarh	54.17	29.7	52.04	31.13	4.09	-4.59
MP	54.57	16.32	52.67	24.41	3.61	-33.14

Gujarat	58.23	23.1	58.64	36.08	-0.70	-35.98
Daman & Diu	58.16	7.69	57.14	16.34	1.79	-52.94
Dadra & N Haveli	55.6	15.97	52.85	42.17	5.20	-62.13
Maharashtra	56.89	29.35	54.68	36.78	4.04	-20.20
AP	58.73	35.17	58.53	40.06	0.34	-12.21
KTK	60.06	23.05	60.55	35.63	-0.81	-35.31
Goa	55.02	19.21	51.98	18.68	5.85	2.84
Lakshadweep	52.26	9.41	50.78	3.8	2.91	147.63
Kerala	51.54	17.97	50.66	19.98	1.74	-10.06
TN	58.13	28.44	58.58	39.99	-0.77	-28.88
Pondicherry	51.69	20.88	54.19	28.27	-4.61	-26.14
A & N Islands	60.2	18.41	58.08	18.62	3.65	-1.13

Source: Author`s own calculation using 61st and 68th round, NSS(EUS)

Table A.3.4. Socio-economic characteristics of rural women based on the changes in work behaviour during 2005-2012 (row percentages)

social group 2005	Not working in both rounds	working in both rounds
forward	62.78	16.16
OBC	54.72	20.38
Adivasi	52.14	21.41
Dalit	43.92	30.9
Muslim	71.59	7.83
Christian/Sikh/Jain	74.32	6.04
Education 2005		
Illiterate	52.72	22.81
Primary	71.71	10.27
Middle	55.84	17.63
secondary	53.82	14.66
Higher secondary	54.43	19.27
Graduate	47.55	22.44
Marital status 2005		
Married	36.41	30.85
Unmarried	87.67	1.33
Widowed	55.68	20.55
Separated/Divorced	32.12	43.56
Income quintile 2005		
poorest	51.4	21.69
second	53.56	22.2
middle	55.76	20.63
fourth	59.02	17.13

richest	66.71	12.48
Change in poverty status		
BPL in both rounds	56.06	19.69
APL in both rounds	56.67	19.54
Entry into poverty	57.31	18.06
Exit from Poverty	56.06	19.46

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table A.3.5. Percentage distribution of rural women who are currently enrolled in school/college by age-group (row percentages)

Age-categories	2005	2012
Upto 9	51.02	25.23
10 to 14	40.49	44.21
15 to 19	7.51	25.19
20 to 29	0.96	5.31
30 to 39	0.02	0.06
40 to 59	0	0
60& above	0	0

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table A.3.6. Probit Regression on women`s decision to participate in workforce in 2005

Variables	Coefficients
Age 2005	0.16***
Age Squared 2005	0.00***
Area of residence 2005 (Ref: more developed village)	
less developed village	-0.97***
Education Attainment of women (Ref: illiterates) 2005	
Primary	-0.24***
Middle	-0.29***
Secondary	-0.44***
Higher Secondary	-0.43***
Graduate	-0.28***
State dummy 2005	included
Number of Children 2005	0.05***
Household size 2005	-0.05***
Relation with head of the household 2005	
Wife/husband	-0.39***
Son/daughter	-0.18***
Child-in-law	-0.33***
Grandchild	-0.54***
Father/mother	-0.88***
Brother/sister	-0.37***

Parent in-law	-0.99***
Nephew/niece	-0.64***
Sibling in-law	-0.55***
Other relative	-0.57***
Servant/other	-0.50**
Total Household income 2005	0.00***
Family type 2005 (Ref: Single)	
Couple	0.00
Nuclear	0.06
Joint(without siblings)	0.11
Joint(whole family)	0.15**
Social Groups (2005)	
OBC	0.20***
Dalit	0.14***
Adivasi	0.41***
Muslim	-0.01
Christian, Sikh, Jain	0.15***
Marital Status 2005	
Married	0.25
Single	0.16
Widowed	0.19
divorced	0.42
Married, No gauna	0.68

Number of obs	111986
LR chi2(57)	46682.59
Prob > chi2	0
Pseudo R2	0.3317
Log likelihood	-47023.011

Source: Total women`s sample at individual level using IHDS-I (2004-05) & IHDS-II (2011-12)
Note: ***p < 0.01, **p < 0.05, *p < 0.1

Table A.3.7. Probit Regression on Panel attrition (Individual Level)

Variables	coefficients
Age 2005	0.01***
Age-squared 2005	0.00***
Gender 2005 (Ref: Male)	
Female	-0.01
State dummy	Included
Marital Status 2005	
Married	0.12***
Single	-0.16***
Widowed	-0.06
divorced	-0.23***
Married, No gauna	-0.13*
Area of residence 2005 (Ref: more developed village)	
less developed village	-0.10***
Relation with head of the household 2005	
Wife/husband	-0.05***
Son/daughter	-0.34***
Child-in-law	-0.52***
Grandchild	-0.63***
Father/mother	-1.10***
Brother/sister	-0.76***

Parent in-law	-1.12***
Nephew/niece	-1.22***
Sibling in-law	-1.14***
Other relative	-1.06***
Servant/other	-1.30***
Land owned or cultivated (Ref: No)	
Yes	0.11***
Social Groups (2005)	
OBC	0.13***
Dalit	0.14***
Adivasi	0.09***
Muslim	0.16***
Christian, Sikh, Jain	0.06***
Number of obs	234212
Wald chi2(47)	20626.96
Prob > chi2	0
Pseudo R2	0.084
Log pseudolikelihood	-114811.94

Source: Total sample at individual level using IHDS-I (2004-05) & IHDS-II (2011-12)
Note: ***p < 0.01, **p < 0.05, *p < 0.1

Table A.3.8. Income and education transition matrix for rural women withdrawing from workforce

2005 Variables	change income level					change in education level				
Household income quintile	**Remain lower income quintile**	**Remain in middle income quintile**	**Remain in higher income quintile**	**Shift from lower to middle income quintile**	**Shift from middle to higher income quintile**	**remain illiterate**	**remain upto middle level**	**remain higher educated**	**Shift from illiterate to middle level**	**Shift from middle level to higher**
lowest	77.34	0	0	22.66	0	70.31	21.2	1.8	5.67	1.02
second	72.58	0	0	27.42	0	70.07	17.55	5.43	5.78	1.18
middle	0	47.36	0	0	52.64	68.05	20.47	3.55	7.35	0.58
fourth	0	0	100	0	0	60.45	25.98	5.17	5.95	2.46
highest	0	0	100	0	0	41.4	31.69	16.49	7.22	3.2
Education attainment of rural women										
Illiterate	47.17	9.85	19.59	14.48	8.9	91.09	0	0	8.91	0
Primary	36.07	9.18	29.36	16.45	8.94	0	99.37	0	0	0.63
Middle	31.56	5.44	37.93	14.72	10.35	0	92.01	0	0	7.99
secondary	20.69	4.46	55.17	6.75	12.94	0	0	100	0	0
Higher secondary	55.29	1.73	33.19	2.89	6.9	0	0	100	0	0
Graduate	0	0	94.42	0	5.58	0	0	100	0	0

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Note: (i) Higher level education includes secondary and above level of education
(ii) Upto middle level includes primary to middle level education

Table A.5.1. Probit Regression on attrition of households

Variables	Coefficients
Total Household income 2005	0.00*
Highest education attainment in the household in 2005	
Primary	-0.22**
Middle	-0.11**
Secondary	-0.17**
Higher secondary	-0.17**
Graduate	-0.24**
Area of Residence(Ref: Rural)	
urban	-1.30**
State dummy	yes
Socio-religious Group (Ref: Forward caste)	
OBC	0.22**
Dalit	0.37**
Adivasi	-0.03
Muslim	0.07
Christian, Sikh, Jain	-0.04
Household Size	0.03**
Month of interview(Ref: January)	
February	0.09

March	0.20*
April	0.54***
May	0.41**
June	0.23**
July	0.03
August	-0.70***
September	-1.07***
October	-0.72***
November	0.07
December	-0.21**
Number of obs	41467
Wald chi2(44)	5285.91
Prob > chi2	0
Pseudo R2	0.3712

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)
Note: Total household sample was considered

(***)=p<1%; (**)=p<5%; (*)=p<10%

Table A.5.2. Percentage distribution of rural households (based on transition to dual earning status) across poverty transition status of household

	Remain Below Poverty Line	Remain in Above Poverty Line	Fall into poverty	Escape out of poverty
Remain only male	10.02	56.78	8.62	24.59
male to joint	15.45	46.16	7.34	31.05
only female	15.39	51.33	7.53	25.75
female to joint	11.8	51.79	6.89	29.51

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table A.5.3. Percentage distribution of rural households based on transition to dual earning status

Remain only male	**52.34**
male to joint	32.17
only female	12.58
female to joint	2.9

Source: Author`s own calculation from IHDS-I(2004-05) and IHDS-II (2011-12)

Table A.6.1. Women`s responses across few gender dimension since 1990s (All India)

Dimension	1992	1998	2005	2015
Decision about women`s own health care	NA	50	62.3	74.5
Currently married women who usually participate in household decisions (%)	NA	NA	76.5	84
Ever-married women who have ever experienced spousal violence (%)	NA	NA	37.2	28.8
Usage of contraceptives	40.7	48.2	56.3	53.5
women aged between 20-24 years married by age 18	54.2	50	47.4	26.8

Source: Various rounds of NFHS