The Unpaid Activities and Well Being: The Measurement Issues, Challenges and Limitations

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Paper Prepared for the IARIW-OECD Special Conference: "W(h)ither the SNA?"

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I. Introduction: The distribution of paid and unpaid work is highly gendered both in terms of time spent on paid and unpaid work by women and men and in terms of the types of unpaid work carried out by them. Women's total workload is somewhat higher than men's, with women working on an average longer period per day than men including paid and unpaid labour (Frances and Russel, 2005). Women worldwide perform most of the domestic tasks, including both household maintenance and childcare, even when they are employed part or full time, the mean time spent on unpaid care work by women is more than twice of that for men (Kulshreshtha, and Singh, 2005). A general assessment of law and practice on domestic work across the world is that it is "undervalued, underpaid, unprotected and poorly regulated" in spite of the contributions that domestic workers make to the care and welfare of millions of households (ILO, 2010) and if this is done by women family members, it is also unrecognised. Since within the households, the domestic work mainly falls in female domain, we can easily infer that much of the women's work is undervalued and underpaid. Moreover, the labour force participation rate of the women or say, their participation in paid activities, mainly depends upon the time spent in the domestic responsibilities. Various surveys by National Sample Survey Organisation (NSSO) of India on 'Employment and Unemployment Situation in India' reveal that 90 per cent of women who did not participate in the workforce attributed a ''pressing need for domestic work'' as the primary cause for their non-participation (Hirway and Jose, 2011). Thus, we can easily find a clear connection between the household responsibilities of the women and their labour force participation as well as the type of work in which they are employed in the job market. But the traditional labour force surveys fail to reveal this fact. From these surveys we can find lower participation of the women in the labour market but not the work burden of men and women. However, the time use surveys would reveal that even though the labour force participation rate of the women are lower than that of the men, the women spend more time on work and less on leisure as compared to men. This may be due to the involvement of women in family owned farms and enterprises, their family responsibilities, reproductive roles etc. (UNDP, 1995). But the big question is if these activities of the women are really unproductive in true sense of the words? If we focus on the welfare aspects of productive efforts of the society, there is no doubt that it would include not only market production but also household non-market production. But the latter largely goes unreported in the accounting framework of System of National Accounts (SNA) even though the households derive significant amount of utility from these activities. There are many arguments against the measurement of non-SNA activities in monetary terms and their inclusion in national accounts. The critics are sceptical about the clear definition of such activities and the methods of their valuation. Still, there is no doubt that these activities have a great importance in an individual's life. Their contribution to the well being of the individuals/ households and therefore, the society, is immense. This calls for the need of a time use survey and the valuation of these activities in to monetary terms. In this perspective, this paper is an attempt to chart out the labour force participation of women, their time use pattern and the type of domestic activities in which they are mainly involved and to find out the monetary value of these activities. The study area is the Punjab State of India.

II. The Statement of the Problem: Punjab state, located in northern region of India, is predominantly an agrarian economy. In mid sixties, this state experienced a revolutionary change in productivity of agriculture due to use of new agricultural technology. This period in the state is popularly termed as 'Green Revolution'. The advent of green revolution not only brought prosperity in the state but it also ensured food self-sufficiency for the country as

a whole. Known as 'Food Basket of India', the Punjab state has 1.54 per cent of total geographical areas of the country where 2.29 per cent of total population lives. During 2011-12, 38.7 per cent wheat and 22.1 per cent rice to the central pool of the country came from Punjab. In 2011-12, about 37 per cent of its population was engaged in agriculture and this share in rural areas is 52.47 per cent. Outside agriculture, the rural Punjab is dominated by very small sized home based manufacturing enterprises. Due to the dependence of the country for food-grains on this state, the structural transformation of the economy has not taken place as rapidly as it should be, particularly after the increase in agricultural productivity in mid sixties. Moreover, being a border state (with the international border with Pakistan, with whom the political relations had never been peaceful), the industrialists are reluctant to invest in long term capital-intensive industrial projects. Due to these reasons, the population in this state continues to earn its living from agriculture and small scale manufacturing units, both of which belong to the informal sector and mainly use the family labour. In such a society women's work participation is mainly unpaid in nature. In this state, in rural areas, the women are engaged in agriculture, cooking for family members as well as the farm labour, housekeeping, childcare, care of livestock, storing grains and other related activities along with extending a helping hand in artisanship and handicrafts in family enterprises. The conditions of the women in urban areas differ only from the fact that they spend relatively fewer hours in agricultural activities but their contribution in other activities such as tutoring children, shopping for the household consumption, dropping and picking children from school etc. is relatively higher than their rural counterparts. Much of this work is not recognised as 'work' in employment surveys as well as national income statistics. Therefore, the present paper will address this question by showing the gaps in the secondary data and then supplementing it with the primary survey of time use by men and women in Punjab. This study is primarily aimed at understanding the contribution of women's work in Punjab in terms of labour force participation, domestic duties and the household work which come under both the SNA and extended SNA activities. An attempt has also been made to incorporate the time-use dimension in the well being index. In this perspective, this paper is divided in to seven sections. Apart from the introductory section and this section showing the statement of the problem, Section III gives data and methodology used in this paper. Based upon the secondary data, Section IV discusses about the labour force participation rate and work participation rate by using the narrow and broader definitions of work. Section V gives the details of the primary survey of Time-Use by men and women in Punjab. Section VI focuses on the well being index after incorporating the time use data from Punjab. Finally, in Section VII, the challenges of incorporating the time use in unpaid activities in the production boundary have been discussed along with a few suggestions.

III. Database and Methodology: This study is based upon both the primary as well as the secondary data. For measuring the labour force participation rate, the work participation rate, women's involvement in unpaid activities and domestic duties, the information has been extracted from the household level data of NSSO on 'Employment and Unemployment Situation in India', the 68th Round (2011-12). For the time use survey, three Districts of Punjab state have been selected on basis of their agro-climatic characteristics. The selection of these districts on basis of agro-climatic conditions is based upon the argument that the household engaged in agricultural activities have greater amount of unrecorded domestic work. The females in such households are performing a number of activities in SNA production boundary but are not even included under the category of 'unpaid family workers'. They are reported to perform domestic duties only as their principal activity. A sample of 300 households has been taken from these districts. The selection of the households is based upon the multi-stage random sampling method by selecting one village

and one city in each of the districts. Further, at least two members from each household have been interviewed through a detailed socio-economic structured questionnaire method. The focus of the study is basically to understand the household work, workforce participation, division of labour in paid and unpaid activities and estimating the women's contribution in the state economy. Finally, following the method used by Floro and Pichetpongsa (2010), Well Being Index (WBI) index has been constructed for males and females in rural as well as urban areas for different social groups.

IV. Participation of Men and Women in Labour Market in Punjab: The participation of a person in the labour market is considered to be an indicator of the economic contribution of a person or the group of the persons as well as their own economic well being. It also shows the degree of their integration to the economy. Normally, we assume that the empowerment of a particular group, community or an individual is based upon their respective economic status in the society. Since, the participation in the labour market is an indicator of the economic status, it also defines the level of empowerment of a group or community in question. Thus, the participation of the men and women in labour market shows their economic position in the society and also gives a reflection of the gender relations in the economy as well as the households. Of course, in a sex-segregated society, we cannot imagine equal distribution of work. Before analysing the labour force participation rate and the work participation rate given by the traditional methods, employed by the NSSO survey on 'Employment-Unemployment Situation in India', let us first define 'what is work?' According to the 19th International conference of labour Statisticians (ICLS) in November 2013 (ratified by ILO in March, 2014), 'Work' comprises any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use (ILO, 2014). Keeping this definition in view, we can easily say that work is any formal or informal activity which may or may not be performed in the market. Employment thus becomes a sub-set of work. This change in data will altogether change the labour force participation as well as work participation rate of women in India. Currently, the National Sample Survey (NSS) on 'Employment and Unemployment Situation in India', apart from showing the employed and unemployed labour force, also has a broad category of population which is termed as 'neither working nor available for work (or not in labour force), which includes, the population attending the education institutions (code 91); attending domestic duties only (code 92); attending domestic duties and are also engaged in free collection of goods such as water, firewood, cattle feed, vegetables etc. along with sewing, tailoring, weaving, tutoring own children etc. (code 93); rentiers, pensioners, remittance receivers etc. (code 94); persons not able to work due to disability (code 95); beggars, sex workers etc. (code 97); did not work due to sickness (code 98) and children of age 0-4 years (code 99). It is very evident that Codes 92 and 93 involve the production of goods and services that are potentially marketable and are therefore economic in nature, and would be classified as work in the new ICLS definition. Code 97 also falls in same category. The matter is further complicated by the fact that the NSSO also includes some unpaid work in its definition of work, by including "unpaid helpers in household enterprises" among those defined as working while some of the households do not report their members, especially women as workers, even though they are engaged in same type of work as performed by those who are being reported as 'unpaid family workers' or 'unpaid helpers in household enterprise'. Including the codes 92, 93 and 97 in the definition of work dramatically changes the work participation rate, especially of women. Interestingly, using this broader category of workers, the participation of women becomes higher than that of the men, while by the traditional methods, reverse is the case. By the narrow definition of work, that has been used by NSS, the work participation rate by the women in age group 15 years and above was 30.5 per cent

during 2011-12 as compared to 78.1 per cent for the men in the same age group in India (GoI, 2013). However, including above codes 92, 93 and 97 in the definition of workers increases the work participation rate to 86.2 for women and 79.8 per cent for men. This is a very different picture from the conventional one that sees most women in India as "not working". Let us look at Table 1 which provides information regarding work participation rate among men and women in the study area i.e. Punjab state of India. We have used both the narrow and broader definition of work to identify the labour force participation rate and work participation rate.

Table 1: Labour Force Participation Rate and Work Participation Rate (age group 15 years and above) in Punjab (2011-12)

	Rural			Urban			Rural+Urban		
	Female	Male	All	Female	Male	All	Female	Male	All
LFPR (narrow definition)	23.86	76.95	51.08	16.63	75.64	48.10	21.25	76.45	49.97
LFPR+93	55.51	76.96	66.51	44.91	75.65	61.30	51.69	76.46	64.58
LFPR+92+93	81.34	77.18	79.21	81.68	75.85	78.57	81.46	76.68	78.97
LFPR+92+93+97	82.83	79.12	80.93	83.14	77.21	79.97	82.94	78.39	80.57
WPR (narrow definition)	23.27	73.84	49.19	15.91	73.07	46.40	20.61	73.55	48.16
WPR+93	54.91	73.85	64.62	44.19	73.08	59.60	51.05	73.56	62.76
WPR+92+93	80.74	74.07	77.32	80.96	73.29	76.87	80.82	73.77	77.15
WPR+92+93+97	82.23	76.01	79.04	82.42	74.64	78.27	82.30	75.49	78.76

Source: Calculated from Unit Level Records of NSSO 68th Round (2011-12).
LFPR: Labour force participation rate; WPR: Worker Population Ratio.

The Table shows that by narrow definition of labour force and work force participation rate among women are far lower than that of the men. According to the narrow definition, the female labour force participation and work participation rates are hardly 21.25 per cent and 20.61 per cent, respectively as compared to 76.45 per cent and 73.55 per cent for males. But as we broaden the definition of work as suggested by ICLS in its 19th international conference, a very different picture comes forth. Firstly, let us simply include code 93 which shows the persons providing free goods and services for consumption of the members of own households, the LFPR of females increases from 21.25 per cent to 51.69 per cent, an increase of about 30 percentage points while that of men increases merely by 0.01 percentage points (from 76.45 per cent to 76.46 per cent). Same is the case with WPR. Both the LFPR and WPR increases by another 30 percentage points if we also include the domestic work in the category of 'Work' while on the other hand, the increase in males' LFPR and WPR is merely of 0.20 percentage points. This indicates that as compared to men, more of the women are involved in domestic duties and other unpaid/unrecognised activities for household consumption. Finally, if we include the code 97, the LFPR and WPR increase for men and women almost by the same amount. These increase by about 1.4 percentage points for females and 1.7 percentage points for males. Thus, we can observe that codes 92 and 93 together make a huge difference in employment outcomes and hence their (i.e. of the persons categorised in these codes) contribution to total output. Hence, it is important to analyse the share of these groups in total employment and the net domestic product of the state economy.

V. Time-Use Survey of Men and Women in Punjab: In this section we examine the workday pattern of the respondents, using information from their time diaries. Table 2 simply gives an overview of the distribution of the respondents on basis of total time spent in all types of activities.

Table 2: Average Time Allocation in All Activities by Men and Women in Punjab (in minutes per day)

	Females		Males	
Primary Activities	Mean	Percentage	Mean	Percentage
Primary Work Activities				
Labour Market Work	152.67* (429.19)**	10.60	424.14* (530.17)**	29.45
Household Work	457.22	31.75	33.57	2.33
Domestic	398	27.64	3.43	0.24
Childcare	51.78	3.60	5.14	0.36
Shopping	8.67	0.60	25.00	1.74
Total Work Activities	609.89	42.35	457.71	31.79
Primary Non-Work Activities				
Leisure Activities	109.11	7.58	223.00	15.49
Personal Care/Self-maintenance	721.00	50.07	759.29	52.73
Personal Care	169.56	11.77	162.43	11.28
Sleeping	552.33	38.36	596.86	41.45
Total Primary Activities	1440	100	1440	100
Overlapped Activities				
Overlapped Work Activities				
Labour Market Work	1.33	0.52	0.00	0.00
Household Work	168.04	65.57	15.43	8.80
Domestic	112.82	44.03	0.57	0.33
Childcare	48.56	18.95	5.14	2.93
Shopping	6.67	2.60	9.71	5.54
Total Work Activities	169.38	66.09	15.43	8.80
Overlapped Non-work Activities	86.89	33.91	159.86	91.20
Leisure Activities	64.89	25.32	118.14	67.40
Personal Care/Self-maintenance	22.00	8.58	41.71	23.80
Personal Care	22.00	8.58	41.29	23.55
Sleeping	0.00	0.00	0.43	0.24
Total Overlapped Activities	256.27	100.00	175.29	100.00

* Average for whole of the population of men and women aged between 15-59 years.
** Average for employed population only.
Source: Primary Survey.

Table 2 shows the time-use patterns of men and women by type of activity. We consider the primary activity reported during the time slot as well as the overlapped activities that are performed parallel to or simultaneously with the main activity. For categorising each of the activity, we have used a modified System of National Accounts (SNA)–based activity classification (UN, 2009). First, we classify SNA production activities that include wage employment and production of services and goods for income as ‘‘labour market work.’’ Second, we classify activities associated with domestic work, care for children and sick members along with shopping/purchasing things for the household members as ‘‘household work.’’ Next, we classify social and cultural activities, mass media use, and sports as ‘‘leisure.’’ Finally, we include all other activities associated with personal care and sleeping

as ‘‘personal care and self-maintenance.’’ We can observe from this Table that women spend fewer hours in the labour market than men and merely 10.60 per cent of their total time in a day is spent on labour market related activities while on the other hand, men spend 29.45 per cent of their day’s time on the same. However, as we include household work in total work activities, the time spent by women is almost 610 minutes per day as compared to 458 minutes per day for men. This shows that women spend about 42 per cent of total time of a day on work related activities while this share is about 32 per cent for men. On the other hand, in case of non-work primary activities men spend 223 minutes per day as compared to merely 109.11 minutes by the women. This difference is due to lesser time spent in sleeping among women vis-à-vis men. Further, if we look at the simultaneous activities performed by men and women, we can easily observe the gender differences in intensity of time spent on work and non-work activities. Every day for about 256 minutes, women are involved in doing two or three activities simultaneously as compared to 175 minutes in case of men. A further segregation of overlapped activities in to work and non-work activities, we can notice that for women the proportion of the time spent on overlapped activities fall in the category of work related activities while for men this falls in the category of non-work activities. For women the ratio of percentage of time spent on work and non-work overlapped activities is 66:34 while for men the same ratio stands at 9:91. This points towards the glaring gender differences in the quality of time spent each day by men and women. For a deeper probe, we can further analyse the distribution of time and its intensity by status of work, type of work as well as by location of residence and the social group.

Table 3: Average Time Allocation in All Activities by Men and Women in Punjab by Location of Residence (in minutes per day)

	Females				**Males**			
	Rural		**Urban**		**Rural**		**Urban**	
Primary Activities	Mean	In %	Mean	In %	Mean	In %	Mean	In %
Primary Work Activities								
Labour Market Work	93.21	6.47	250.59	17.40	343.46	23.85	471.82	32.77
Household Work	500.54	34.76	385.88	26.80	31.15	2.16	35.00	2.43
Domestic	451.79	31.37	309.41	21.49	9.23	0.64	0.00	0.00
Childcare	40.00	2.78	71.18	4.94	0.00	0.00	8.18	0.57
Shopping	8.75	0.61	8.53	0.59	21.92	1.52	26.82	1.86
Total Work Activities	593.75	41.23	636.47	44.20	374.62	26.01	506.82	35.20
Primary Non-Work Activities								
Leisure Activities	110.00	7.64	107.65	7.48	248.46	17.25	207.95	14.44
Personal Care/Self-maintenance	736.25	51.13	695.88	48.33	816.92	56.73	725.23	50.36
Personal Care	175.89	12.21	159.12	11.05	178.46	12.39	152.95	10.62
Sleeping	561.79	39.01	536.76	37.28	638.46	44.34	572.27	39.74
Total Primary Activities	1440	100.00	1440	100.00	1440	100.00	1440	100.00

Overlapped Activities								
Overlapped Work Activities	173.64	66.04	162.35	66.19	26.15	12.19	9.09	5.98
Overlapped Non-work Activities	89.29	33.96	82.94	33.81	188.46	87.81	142.95	94.02
Total Overlapped Activities	262.93	100.00	245.29	100.00	214.62	100.00	152.05	100.00

Source: Primary Survey.

Table 3 shows the rural urban differences in allocation of time by men and women. We can notice that in urban areas, the participation of men and women in the labour market is higher than their rural counterparts, but the time spent by women is still lower than that of the men. Another important fact that comes out of this Table is that the urban men do spend some time in child care while no time use is reported in this category by rural men. As a result, as compared to the rural areas, in urban areas, the gender differences are somewhat lower in case of time spent in household activities. The urban life style also indicates lesser amount of time spent by men and women in activities related to leisure, self maintenance and sleeping as compared to their rural counterparts. Yet, the time spent in multiple activities is higher in case of rural areas vis-à-vis urban ones. However, in percentage terms, we can not find any rural urban differences in allocation of overlapped activities in work and non-work related activities in case of women while in case of men, more of the time is spent on non-work activities in urban areas as compared to the rural ones. Further, we can also examine if any differences in time allocation are present across various social groups. In India, the world of work and economic status is largely divided on caste lines. As a result, the socially marginalized sections of the society have lower living standards and therefore, lower levels of well being. Since our concern is to link the well being with time use patterns, therefore it is important to look at the allocation of time across social groups. In table 4, we have taken two broad social categories – the general category that includes upper castes in the caste hierarchy prevailing in the country and the marginalized social sections (Scheduled Castes, Scheduled Tribes and Other Backward Classes).

Table 4: Average Time Allocation in All Activities by Men and Women in Punjab by Social Groups (in minutes per day)

	Females				**Males**			
	General Category		**Marginalised Social Sections**		**General Category**		**Marginalised Social Sections**	
Primary Activities	Mean	In %	Mean	In %	Mean	In %	Mean	In %
Primary Work Activities								
Labour Market Work	193.33	13.43	91.67	6.37	414.00	28.8	431.75	29.98
Household Work	377.96	26.25	576.11	40.01	26.67	1.9	38.75	2.69
Domestic	319.81	22.21	515.28	35.78	0.00	0.00	6.00	0.42
Childcare	51.30	3.56	52.50	3.65	0.00	0.00	9.00	0.63
Shopping	6.85	0.48	11.39	0.79	26.67	1.9	23.75	1.65
Total Work	571.30	39.67	667.78	46.37	440.67	30.6	470.50	32.67

Activities								
Primary Non-Work Activities								
Leisure Activities	110.19	7.65	107.50	7.47	247.33	17.2	204.75	14.22
Personal Care/Self-maintenance	758.52	52.67	664.72	46.16	752.00	52.2	764.75	53.11
Personal Care	204.63	14.21	116.94	8.12	171.00	11.9	156.00	10.83
Sleeping	555.00	38.54	548.33	38.08	581.00	40.3	608.75	42.27
Total Primary Activities	1440	100.00	1440	100.00	1440	100.00	1440	100.00
Overlapped Activities								
Overlapped Work Activities	162.59	63.62	179.56	69.78	13.0	6.60	17.25	10.85
Overlapped Non-work Activities	92.96	36.38	77.78	30.22	184.0	93.40	141.75	89.15
Total Overlapped Activities	255.56	100.00	257.33	100.00	197.0	100.00	159.00	100.00

Source: Primary Survey.

Table 4 shows that among the females, there is a huge difference in time spent in labour market activities as well as the domestic work. It has also been found that the women from marginalised social sections spend lesser time on personal care and self maintenance. In case of overlapped activities, though the time spent by women is almost the same for those belonging to the upper castes and the marginalised social sections, yet the share of time spent in overlapped non-work activities is higher for the upper caste women as compared to the women belonging to the marginalised social sections. On the other hand in case of males, the time spent by marginalised social sections is higher in case of work related activities and lower in case of leisure and personal care. Hence, we can observe some caste based differences in the time use patterns and the women belonging to the marginalised social groups seem to be doubly vulnerable as their life is more tiresome not only as compared to the males from the same social group but also as compared to the women belonging to the upper castes.

Thus, we have observed that the main difference of time use among the men and women can be found in case of work related activities, especially the activities which are related with household responsibilities and which are not accounted in national income accounts and the employment surveys. Moreover, we have noticed that the women across all social groups and those living in rural as well as urban areas are experiencing the same discrimination in time allocation within the households, only the degree of discrimination varies across different categories. Ironically, much of work in which these women folks spend their life time is not recognised. Although, evaluating women's work is a tedious task but while discussing about evaluating the well being of the masses, we may be committing a bigger mistake if we do not take in to account the monetary contribution of these activities on the pretext of absence of an accurate and more scientific method. In literature on valuation of women's extended SNA activities, we can find two main methods – one is the replacement

cost method and another is the opportunity cost method. The opportunity cost method tries to calculate the wages foregone as a result of opting not to offer services in the market. The valuation will change depending upon the type of work a woman may chose, the skill level as well as the availability of jobs for the women. This method is less used due to the difficulty in determining the type of job and the wages offered had the woman been in employment rather than in domestic duties. Therefore, the replacement method is considered more accurate method to price the contribution of the women in the households. The replacement cost can again be estimated by using the minimum wages as a lower bound and the prevailing median wages as the upper bound. This estimation would depend upon the total hours spent on these activities in a week, the number of persons engaged in those activities and the wage rate. Then these figures are adjusted in annual figures to find the percentage of the same in state domestic product. The formula for this estimation procedure is given below:

Value of unpaid work = (average time spent for activity) X (wage rate) X (no. of persons)

= (total time spent for activity) X (wage rate per unit of time)

For estimating the value of unpaid activities by women in the age group 15-59 years in Punjab, we have identified a few activities and the time spent on each of them during a week along with the prevailing wages if these services are purchased from the market. This is shown in table 5. The table shows that the average wages per week range between Rs 75 and Rs 500 for different activities and total 92.16 hours of an average woman are spent on these activities in a week. If these activities would have been performed through a hired help, about Rs 4050 would have been spent by the household which means about Rs 44 per hour and Rs 352 per day (assuming an 8 hour working day). Further, these values are converted in to annual figures by using these average wages as well as the minimum wages and are displayed in Table 6.

Table 5: Distribution of Time in Different Domestic Activities by Women per week and Median Wages (per day)

Time and Wages	**Cooking**	**Cleaning**	**Utensils**	**Washing clothes**	**Pet care**
Weekly time	17.36	7	4.54	7	1.45
Median Wages	250	150	75	125	100
Time devoted	**House maintenance**	**Tending animals**	**Milking**	**Collection of dung**	**Making Dung cakes**
Weekly time	4.40	3.30	3.30	3.30	2.10
Median Wages	75	500	150	150	75
Time devoted	**Sale and purchase activities**	**Collection of grass**	**Fetching of water**	**Collection of vegetables**	**Collection of Forest miner**
Weekly time	1.45	1.45	1.10	1.52	1.24
Median Wages	75	300	125	75	100
Time	**Collection of**	**Collection of**	**Physical care**	**Teaching to**	**Accompanying**

devoted	fuel	fodder	of children	own children	children to places
Weekly time	1.10	1.45	7	3.51	1.45
Median Wages	100	250	500	125	100
Time devoted	**Physical care of sick, elders**	**Supervising children**	**Taking care of guest/visitors**	**Total**	
Weekly time	3.30	4.54	9.30	92.16	
Median Wages	250	100	300	4050	

Source: Primary Survey.

Table 6: Value of Extended SNA Activities by Women (aged 15-59 years) in Punjab and their Share in SDP

Lower and Upper Bounds	Hourly Wages (in Rs)	Total Annual Value in Extended SNA activities (in Rs Million)	Percentage of State Domestic Product at current prices (2013-14)
Upper Bound			
Median Wages	43.94	1050556	35.49
Lower Bound (Minimum Wages)			
Unskilled Workers	30.08	719179	24.29
Semi-Skilled	33.83	808838	27.32
Skilled	38.14	911945	30.81

Source: Primary Survey.

In Table 6, the upper bound estimates have been calculated on basis of prevailing market wages in the survey area while the lower bounds are estimated on basis of the officially announced average minimum wages in these activities (for the stipulated minimum wages see http://m.paycheck.in/main/salary/minimumwages). The estimates show that the contribution of women in the age group 15-59 years is as high as 35.49 per cent of the state domestic product (SDP) in the year 2013-14. Even if these women get the wages at the rate of minimum wages for the unskilled workers, this contribution is nearly 24 per cent. Since we have seen that many of the activities, mentioned in table 5 also need special skills (e.g. care activities, teaching children etc.), therefore we have also tried to estimate the contribution of women in extended SNA activities on basis of the minimum wages for the skilled as well as semi-skilled workers. These estimates show that the contribution of women in SDP would have been respectively, about 27 per cent and 31 per cent of the SDP. Thus we have seen that the contribution of women in extended activities varies from about a quarter of the state domestic product to more than one-third of the same. This contribution must be imputed and it does not lose its importance just because it has no market value. It adds significantly to the well being of the individuals as well as of the households.

VI. Time Use and the Well-being: For calculating the well being Index for men and women in Punjab, we mainly take three indicators which are personal income index, educational attainment index and the inverse of work intensity index. We assume that higher level of income, higher level of education and higher value of inverse of work intensity index (i.e.

lower work intensity or less stressful day) results in higher value of the well being. For constructing the well being index by incorporating the time use, we have mainly relied upon the works by Floro (1995) and Floro and Pichetpongsa (2010). The calculation formulae of these indices are given below:
The individual Well Being Index (WBI) is constructed as follows:

$$WBI_j = \frac{\sum_i [I_{ij}]}{m}$$

Where, $0 \leq WBI_j \leq 1$ and $I_i = edu;\ y;\ k$

The educational attainment index is calculated as

$$edu_j = \frac{\left(X_{edu,j} - min_j\{X_{edu,j}\}\right)}{\left(max_j\{X_{edu,j}\} - min_j\{X_{edu,j}\}\right)}$$

Where, edu_j= the level of educational attainment component index for individual *'j'*; $min_j\{X_{edu,j}\}$ and $max_j\{X_{edu,j}\}$ are respectively, minimum and maximum values of educational attainments within the entire sample. The value of this index ranges from 0 to 1, with the higher index value indicating a higher level of educational attainment. An individual's well-being also increases as the value of educational attainment increases.
The personal income component index of individual '*j*' is calculated as:

$$y_j = \frac{\left(log\{X_{y,j}\} - log\left\{min_j\{X_{y,j}\}\right\}\right)}{\left(log\left\{max_j\{X_{y,j}\}\right\} - log\left\{min_j\{X_{y,j}\}\right\}\right)}$$

In this equation, $log\{X_{y,j}\}$ is the discounted current personal income of individual '*j*'; $log\left\{min_j\{X_{y,j}\}\right\}$ and $log\left\{max_j\{X_{y,j}\}\right\}$ are the minimum and maximum values of personal income in the given sample. The value of this index also ranges between 0 to 1, '0' for the lowest and '1' for the maximum value. A higher value of this index means higher well being of the individuals.
Finally, the inverse work intensity includes the inverse of the average of the index of time spent in all unpaid activities and overlapped work (paid and unpaid) activities. Since, higher work intensity means more stressful life, hence its inverse will be lower leading to lower contribution to overall Well Being Index (WBI). The calculation of this index is given below:

$$k_j = 1 - \frac{1}{2}\left[\frac{\left(log\{X_{wd,j}\} - log\left\{min_j\{X_{wd,j}\}\right\}\right)}{\left(log\left\{max_j\{X_{wd,j}\}\right\} - log\left\{min_j\{X_{wd,j}\}\right\}\right)} + \frac{\left(log\{X_{ov,j}\} - log\left\{min_j\{X_{ov,j}\}\right\}\right)}{\left(log\left\{max_j\{X_{ov,j}\}\right\} - log\left\{min_j\{X_{ov,j}\}\right\}\right)}\right]$$

Where, $X_{wd,j}$ is the length of working day (in minutes) of individual '*j*' and $X_{ov,j}$ is the length of the overlapped (paid or unpaid) work activity (in minutes) of individual '*j*'.
Using above indexes, we can construct the WBI. The value of WBI ranges from 0 to 1. The higher the WBI value, the better an individual is in terms of the 'm' attributes of well being. Table 7 shows the WBI for men and women which have been further decomposed in to the index values of different attributes, giving an equal weight to all the attributes. This decomposition is also shown by the location of residence and social group.

Table 7: Well Being Index of the Men and Women in Punjab (by Location of Residence and Social Group)

	Females						Males					
	Rural			Urban			Rural			Urban		
	General Category	Marginalised Social Sections	All	General Category	Marginalised Social Sections	All	General Category	Marginalised Social Sections	All	General Category	Marginalised Social Sections	All
WBI	0.463	0.269	0.359	0.460	0.177	0.410	0.505	0.347	0.407	0.508	0.468	0.486
Decomposition of WBI												
1. Educational Attainment Index	0.717	0.385	0.539	0.662	0.088	0.560	0.600	0.430	0.495	0.594	0.471	0.527
2. Personal Income Index	0.360	0.146	0.245	0.547	0.322	0.507	0.409	0.239	0.304	0.569	0.402	0.477
3. Inverse Work Intensity Index	0.313	0.276	0.293	0.170	0.120	0.161	0.505	0.373	0.424	0.361	0.531	0.453
3.1 Inverse Primary Work Intensity Index	0.305	0.260	0.280	0.225	0.162	0.214	0.372	0.278	0.314	0.114	0.302	0.216
3.2 Inverse Overlapping Work Intensity Index	0.322	0.292	0.306	0.115	0.078	0.108	0.637	0.468	0.533	0.608	0.759	0.691

Source: Primary Survey.

Table 7 shows that the WBI of the females is lower than the males in the rural as well as the urban areas. The WBI is 0.359 for rural females as compared to 0.407 for rural males. Similarly in urban areas, the WBI for the females is 0.410 as compared to 0.486 for the males. Actually, the low WBI for the females is due to low personal income index and inverse work intensity index. Interestingly, the educational attainment index is higher for the females as compared to the males, except in case of women belonging to the marginalized social sections. Thus, the women in rural areas not only have a lower WBI than the males but also lower than their own urban counterparts, even though the educational attainment index has been the highest in case of rural women. Another point to be noted is that in the urban areas, the inverse work intensity index is much lower where the females from the marginalized social sections have the lowest index value. Further, we can also observe that the women in general have a very low index value for the overlapping work activities (inverse of working time in overlapped activities) and this is the lower one for urban women. Again, the lowest value for this index has been recorded for women belonging to socially marginalized sections. This indicates that this category of urban women lives the most stressful life than all other categories mentioned in the table. Comparing the rural and urban areas, we can notice that the educational attainment index as well as the personal income index is higher in urban areas vis-à-vis the rural ones for both the males and the females. However, the inverse work intensity index in urban areas is much lower than that of the rural areas. Similar trends can be registered for primary work activities as well as for overlapping work activities for all categories, except in case of overlapped activities for urban males. For females in rural as well as the urban areas, it is the inverse work intensity that dilutes all the gains from higher education and income outcomes and resulting in lower well being. Before, we discuss the issues related with measuring the time use, let us first examine a few determinants of inverse work intensity index. For this purpose, we can assume that the household assets, income, family size and type (joint or nuclear), education status, work status, age, marital status, social group, location of residence etc. may affect the inverse work intensity index. Here, we have included some dummies for work status (working =1, 0=otherwise), gender (male=1, female =0), location of residence (Urban=1, rural=0), social group (general category=1, 0=otherwise), family type (joint=1, nuclear=0), dependent children and/or elderly members (yes=1, No=0) and marital status (married=1, 0=otherwise). The OLS results of the determinants of inverse work intensity are shown in Table 8.

Table 8: Determinants of Inverse Work Intensity (using OLS)

Independent Variables	Coefficient	Standard Error
Constant	0.341	0.245
Work Status (working =1, 0=otherwise)	-0.113***	0.025
Household Assets	-0.043	0.028
Gender (male=1, female =0)	0.125***	0.025
Location of Residence (Urban=1, rural=0)	0.025	0.032
Education Status (years of formal education)	0.001	0.003
Per Capita Income	0.029	0.024
Social Group (general category=1, 0=otherwise)	0.083***	0.030
Family Type (joint=1, nuclear=0)	-0.025	0.028
Presence of Dependent Members (yes=1, No=0)	-0.040	0.025
Household Size	0.024***	0.007
Age	-0.001	0.001
Marital Status (married=1, 0=otherwise)	-0.066**	0.029
R-Square	0.469	0.0907

Source: Calculations from the Primary Survey.

Table 8 shows that the work intensity is significantly higher (or lower inverse of work intensity) for the working people, females, persons belonging to marginalised social sections and the married persons. Interestingly, we can see a significant positive association of inverse of work intensity index with size of the family as if bigger family size divides the work load. Other factors such as per capita income, household assets, education status, age, location of residence, presence of dependent members seem to have a very weak relationship with the inverse of work intensity index. These results almost confirm the results of Table 7 which has shown lower inverse work intensity index for females and marginalised social sections. Thus, we can say that for appropriate measure of well being, we must incorporate the time element in any measure of well being for different social groups. For this purpose extensive time use surveys are required.

VII. The Challenges: The discussion so far shows that there is a dire need of incorporating the time-use in any measure of well being, particularly if a major proportion of the time of individuals, especially women is spent in unpaid and unaccounted activities. While preparing the diaries, we need to clearly define the unpaid market work and domestic work e.g. tending animals is considered as an unpaid market activity for the males while for the females, the same is included in the domestic activity. We further, have to clearly define the stressful and non-stressful activities. Taking care of the child while watching a T.V. for one hour or so in the evening can be a joyful activity for the males but not necessarily for the females who are always busy in multiple activities. It is further difficult to say which one is a primary activity if the persons are performing multiple tasks at the same time. Another issue is related with the weights to be assigned to different tasks being performed simultaneously. This issue can not be resolved until we are not able to clearly identify all the primary activities and hence the non-primary activities. Similarly, many problems arise while giving a monetary value to the unpaid Extended SNA activities. The questions are raised on the choice of methods i.e. whether one should use the opportunity cost method or the replacement cost method. In the developing economies, where, the informal sector dominates, the quality of goods and services vary widely, it is always tough to find the appropriate price of the output or the input. It is even more difficult to find to find the opportunity cost as there are wide variations in the payment structure of the formal and informal sector. In India, at the first place there is still no nationwide time-use survey, though now this is under process, the real issues will erupt thereafter only. Yet, wide discussions are taking place regarding the methodological and conceptual issues related with such surveys. Selection of time period for maintaining the diaries is a big issue as a large proportion of the population in India still earns its living from agriculture and the busy seasons or lay seasons vary across the regions. For this purpose, the surveys have to be conducted at various points of time over a year and one can not chose the same representative time for all groups and for all the regions. This makes this exercise even more tedious. Efforts are needed to develop consistent methodologies and classifications so that not only the inter-regional but also the international comparisons can be made. These surveys should capture the quantity as well as the quality of time spent in various activities so that the level of well-being can be measured adequately. It is very important to measure how the allocation of time changes between the leisure time and the working time when the economy is growing at a faster pace. It is also important to see how these changes differ across gender, social groups and regions. Though, the sceptics raise the question on the need of such surveys and make excuses for lack of funds for such a gigantic exercise when many other important issues are unresolved but there are equally strong voices on the need and importance of such surveys. Moreover, keeping in mind the importance of such surveys in developing economies, where many of the activities of a large segment of population are not accounted, the real cost of not conducting such surveys is much higher than doing it, especially if the governments want to adequately measure the well being of its masses.

References

Frances, Mc Ginnity and Russell, Helen (2005), "The Distribution of Caring, Housework and Employment among Women and Men in Ireland", *Gender Inequalities in Time Use*, The Equality Authority and The Economic and Social Research Institute, Dublin, Brunswick Press.

Floro, Maria, S. (1995). Women's Well-Being, Poverty, and Work Intensity. *Feminist Economics* 1(3): 1–25.

Floro, Maria S. and Pichetpongsa, Anant (2010). Gender, Work Intensity and Well-Being of Thai Home-Based Workers, *Feminist Economics*, 16:3, 5-44.

GoI (2013). *Key Indicators of Employment and Unemployment in India*, NSS 68th Round, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.

Hirway, Indira and Jose, Sunny (2011). Understanding Women's Work Using Time-Use Statistics: The Case of India. *Feminist Economics*, Vol. 17, No. 4, pp. 67-92.

ILO (2010). *Decent Work for Domestic Workers*, Report IV (1), International Labour Conference, 99th Session, 2010.

ILO (2014). Resolution Concerning Statistics of Work, Employment and Labour Underutilisation, International Labour Organisation, Geneva.

Kulshreshtha, A.C. and Singh, Gulab (2005). *Valuation of Non-Market Household Production*, Central Statistical Organisation, New Delhi.

UN (2009). *System of National Accounts 2008.*United Nations. New York.

UNDP (1995), *Human Development Report, 1995*: *Gender and Human Development*, United Nations Development Programme Oxford University Press, Delhi.