Public Infrastructure Investment and Non-Market Work in India: Selective Evidence from Time Use Data

Lekha S. Chakraborty

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Abstract

Theory of allocation of time revealed that historically market-time has never consistently been greater than the non-market time and therefore the allocation and efficiency of latter may be equally important, if not more, to economic growth than that of former. The time budget data challenged the existing theories on allocation of time where nonmarket time aggregates leisure and work at home. The time budget findings revealed that unpaid work at home and leisure are not affected in the same way by changes in socio-economic variables. Tricotomising the allocation of time into work in market, unpaid work at home and leisure has important policy implications; in integrating the care economy into economic modeling and in turn in macropolicy making. This is

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particularly important in the context of developing countries, where public infrastructure deficit induces locking of time in unpaid work spurting a trade off with the time otherwise spent in the market economy activities or eroding leisure. Against this backdrop, this paper examined the link between public infrastructure investment and time allocation across gender in the context of selected states in India. The direction of regression coefficients suggests that public infrastructure investment affects market work, non-market work and leisure time in different ways with evident gender differentials. The time allocation in SNA activity of women is found significant and inversely related to the public infrastructure related to water supply. But there is no evidence that the release of time locked up in unpaid SNA work through better infrastructure can have substitution effect towards market work. This gets reinforced by the significant positive link between infrastructure and time allocation in Non-SNA activity, which manifests forced leisure. This in turn implies that though infrastructure investment lessens the time stress in unpaid SNA activity; complementary employment policies are required along with infrastructure investment to ensure substitution effect of unpaid work with market work, which in turn can have impact on household poverty. In particular, the analysis of time budget statistics enables the identification of the complementary fiscal services required for better gender sensitive human development. The overall conclusion of the paper is that fiscal policies designed to redress income poverty can be partial if it does not take in to account aspects of time poverty.

Public Infrastructure Investment and Non-Market Work in India: Selective Evidence from Time Use Data

There is a growing recognition on lifting the veil of statistical invisibility of non-market work. Theory of allocation of time revealed that throughout history the amount of time spent on work in the market economy has never consistently been greater than that spent at non-market work and other activities (Becker, 1965). He therefore argued that allocation and efficiency of non-market working time may be more important to economic welfare than that of market working time, yet the attention paid by the economists to the market economy skews any paid to latter. Time-budget data, in this context, are increasingly getting important as they capture the burden of unpaid work in addition to the market economy, which in turn has significant macro policy implications, in particular public investment.

The time budget data challenged the existing theories on allocation of time where time was dichotomized into market-time and non-market time and moreover, nonmarket time aggregates leisure and work at home. The justification for aggregating leisure and unpaid work at home rest on two assumptions: (a) the two elements react similarly to changes in socioeconomic environment and therefore nothing is gained by studying them separately; and (b) the two elements satisfy the conditions of a composite input, that is, the relative price is constant and there is no interest in investigating the composition of the aggregate since it has no bearing on production and the price of the output (Gronou, 1977). The time budget findings did reveal that these two assumptions are wrong as unpaid work at home and leisure are not affected in the same way by changes in socio-economic variables and the composition of the aggregate affects many facets of the intrahousehold behaviour, such as labour supply, specialisation in the household and demand for children.[1] These findings from time budget data tricotomising the allocation of time into work in market, work at

home and leisure has serious policy implications; in integrating the unpaid work into economic modeling and in turn in macropolicy making. This is particularly relevant in the context of developing countries where infrastructure deficit induces locking of time in unpaid work eroding leisure or spurting in trade-off with the time otherwise spent in the market economy activities.

The public infrastructure deficit in rural areas may enhance rural poverty due to the time allocation across gender skewed towards unpaid work, which is otherwise available for income-earning market economy activities. Public investment in infrastructure like water and fuel can have positive social externalities in terms of educating the girl child and improving the health and nutritional aspects of the household. Studies noted that easy accessibility to drinking water facilities might lead to an increase in school enrolment particularly girls; in Madagascar, 83 percent of the girls who did not go to school spent their time collecting water, while only 58 percent of the girls who attended school spent time collecting water (Bredie and Beehary, 1998). In the light of above issues, it is important to analyse the time use statistics and value the unpaid work as it can help in providing valuable insights in fiscal policy making especially in terms of public investment in infrastructure.

The paper looks into the extent of statistical invisibility of unpaid work and its valuation aspects and highlights the policy alternatives especially in reducing the infrastructure deficit through the analysis of time use statistics in India. The paper is divided into following sections. Section I discuss the statistical invisibility of unpaid work while section II interprets the time use data of selected states in India and the valuation issues related to unpaid work, while section III discusses the fiscal policy issues emanating from the analysis of time use statistics, in particular related to public investment. Section IV summarises the findings and draws conclusions.

II. Statistical Invisibility of Unpaid Work

Unpaid work remains significantly invisible in national accounts. The global estimates suggest that US $ 16 trillion of global output is invisible and US $ 11 trillion was the non-monetised, invisible contribution

of women (UNDP, 1995). Although a certain degree of statistical invisibility of unpaid work in the economy is a global phenomenon, it is particularly predominant in India and other South Asian nations due to the orthodox socio-cultural milieu. The attempt of United Nations Statistical Division in extending the production boundary of the Systems of National Accounts (SNA), 1993 has led to the inclusion of the activities of unpaid work into the national accounting system as satellite accounts. This extended production boundary of SNA 1993 provides a better understanding of women's contribution to the economy.[2]

Time use survey (TUS) has been an effective tool in unfolding the statistical invisibility of unpaid work across countries. The most reliable way of obtaining time use data has been by the use of time diary method, confined to a probability sample of all types of days (weekdays and weekends) and of different seasons of the year. Time diary is a retrospective method, in which the respondents are asked to keep an account of recent twenty four hour chronology of the use of time and the researchers code the responses to a standard list of activities. Time use diaries are preferred over the other methods for they tend to be more comprehensive, they enable respondents to report activities in their own terms, and they have some form of built-in check that increases the reliability of the data (Juster, 1985). However, time diary method has certain deficiencies. The significant one is the presence of multitasking or omission of overlapping of activities. This results from the imposition of a rigid constraint of time use, namely, no person has either more or less time available than 24 hours per day (time constraint) and the set of activities capable of being measured, described, and analysed must add up to a fixed number of hours or days (Floro, 1995). Theoretically, it can be solved by defining the new activity as joint activity, but the codes for possible diary activities would explode in number. But the practical way of solving this problem is to indicate one activity as primary and the other as 'secondary'. Yet another way to conceptualise secondary activities is to argue that there is really only one activity at any given time, but there are frequent switches between activities and if the time grid were fine enough, the issue of secondary activities would then effectively disappear. Finally it seems plausible that the issue of multiple or joint activities is the key source of the major failure of alternative recall methods. Recall accuracy falls when the respondents make primitive attempts to respond to questions about hours of an activity in the last week or month by engaging in a kind of temporal double counting –

adding in periods when the activity was secondary to periods when it was central (Juster, 1985).

Time use data helps in public policy making at two realms: at macro level and at microlevel. At macrolevel, time use data have been used in the construction of augmented economic and social accounting systems (conventional economic accounting systems provide only the productive activity in market economy and ignores the productive use of nonmarket time and leisure). At microlevel, intrahousehold behavioral models are built using the time use data, which has implications in terms of fiscal policy. For instance, studies have focused on the use of nonmarket time in childcare and in the care of elderly, intrahousehold division of labour, analyses of leisure activities and time stress, set of production activities etc (Becker, 1965).

Table 1 provides data on time allocation across selected developed and developing countries. The data are not fully comparable, due to the differences in concept and methodological issues in time use survey conducted across countries, which is reflected in the microdata files of time use allocation. In the Time use survey, time is subdivided into work time, which is further subdivided into market work and care (household) work; personal care (dominantly sleep and rest) and a number of leisure activities. The work in market economy is termed as SNA and the rest as non-SNA. Non-SNA activity (predominantly the extended SNA activities performed in the care economy) is as large as recorded SNA activity, both in industrial and developing countries.

In industrial countries, a little less than half of the total work time is spent in paid SNA activities and little more than half in unpaid non-SNA activities. It is interesting to note that men spend about two-thirds of the total work time in SNA activity and earn income and recognition, with only one-third devoted to unpaid non-SNA activities. The shares are reversed for women. Among industrial countries, women's share in non-SNA activities ranges from 61 percent of total work time in Canada to 81 percent in the Netherlands; while male's share in non-SNA activity ranges from 21 percent in Denmark to 48 percent in the Netherlands (table 1).

Table 1: Time Allocation by women and men: Selected Industrial Countries

(as percentage of total working time)

		Total work time		Female		Male	
Countries	**year**	**SNA**	**Non-SNA**	**SNA**	**Non-SNA**	**SNA**	**Non-SNA**
Industrial		49	51	34	66	66	34
Australia	1992	44	56	28	72	61	39
Canada	1987	52	48	39	61	65	35
Norway	1990/91	50	50	38	62	64	36
Denmark	1987	68	32	58	42	79	21
Netherlands	1987	35	65	19	81	52	48
USA	1985	50	50	37	63	63	37
United Kingdom	1985	51	49	37	63	68	32

Source: Compiled from Human Development Report, 1995 and 2000

Time use data of developing countries suggests that women work significantly more hours in the non-SNA than men. The proportion of total time spent on the non-SNA by women in the developing countries ranges from 76 percent in urban Columbia to 52 percent in the mountainous region of Nepal. The proportion of time spent by men in non-SNA activities is as little as 13 percent in urban Venezuela and 14 percent in urban Indonesia (table 2).

The Indian data is not strictly comparable with that of other countries because of different categorisation of activities and time band. Furthermore, Indian figures are based on only six states of India (table 3). In India, on an average, a male spends about 42 hours per week in SNA activities as compared to 19 hours by a female. However, in non-SNA activities (extended SNA activities), an average male spends only about 3.6 hours as compared to 34.6 hours by an average female.

Table 2: Time Allocation by Women and Men: Selected Developing Countries

(as percentage of total working time)

		Total work time		Female		Male	
Countries	**Year**	**SNA**	**Non-SNA**	**SNA**	**Non-SNA**	**SNA**	**Non-SNA**
Developing		54	46	34	66	76	24
National	1990	45	55	34	66	56	44
Rep.of Korea							
Rural		59.2	40.8	37.8	62.2	76.2	23.8
Bangladesh	1990	52	48	35	65	70	30
Guatemala	1977	59	41	37	63	84	16
Kenya	1988	56	44	42	58	76	24
Nepal	1978	56	44	46	54	67	33
Highlands	1978	59	41	52	48	66	34
Mountains	1978	56	44	48	52	65	35
Rural Hills	1978	52	48	37	63	70	30
Philippines	1975-77	73	27	29	71	84	16
Urban		54.4	45.6	31	69	79.2	20.8
Columbia	1983	49	51	24	76	77	23
Indonesia	1992	60	40	35	65	86	14
Kenya	1986	46	54	41	59	79	21
Nepal	1978	58	42	25	75	67	33
Venezuela	1983	59	41	30	70	87	13
India	1998-99	-	-	19	34.6	42	3.6

Source: Compiled from Human Development Report, 1995 and 2000 and Time Use Survey, India, 2000

III. Interpreting Time Use Data in India

Time use surveys are increasingly accepted for getting better statistics on the size of the labour force of a country, as well as the contribution of women to the economy.[3] The recent major macrolevel TUS conducted in six major states, *viz*., Gujarat, Haryana, Madhya Pradesh, Meghalaya, Orissa, and Tamil Nadu, during July 1998 to June 1999 by the Central Statistical Organisation of India is a pioneering attempt not only in South Asia, but also among developing countries. This large scale survey of 18,591 households in India gives a better understanding of how time is allocated across gender in the economy and provides some insight into the extent of statistical invisibility of women's work in India. The TUS covered all members of the household aged 6 years and above.

The TUS in India categorised activities into three classes: SNA activities (that get included in GDP calculations), extended SNA activities (that do not get included in GDP but should be included in the satellite accounts) and residual non-SNA activities.[4] The non-SNA category of activities in table 3 can be compared to the category of extended SNA activities of TUS conducted in India.

Table 3: Time Allocation by Women and Men, Selected States of India

(weekly average time in hours)

States	Female			Male			Total		
	SNA	Ext-SNA	Non-SNA	SNA	Ext-SNA	Non-SNA	SNA	Ext-SNA	Non-SNA
Haryana	21.26	31.06	115.67	37.72	1.99	128.23	30.19	15.24	122.52
Madhya Pradesh	19.85	35.79	112.38	42.07	4.43	121.47	31.54	19.22	117.19
Gujarat	17.60	39.08	111.36	43.63	3.19	121.12	31.24	20.27	116.44
Orissa	17.07	35.70	115.20	40.12	4.47	123.45	28.69	19.91	119.36
Tamil Nadu	18.97	30.46	118.61	42.54	3.19	122.27	30.68	16.87	120.45
Meghalaya	26.34	34.52	107.15	45.94	7.16	114.78	35.88	21.28	110.84
Combined States	18.72	34.63	114.58	41.96	3.65	122.42	30.75	18.69	118.62

Source: CSO, Time Use Survey, 2000

The survey found that in the production of own-account services that qualify for inclusion in the satellite accounts as per SNA 1993, on average, a female spent 34.6 hours per week compared to 3.6 hours by a male (Table 3). In these activities, females in Gujarat scored the highest time spent (39.08 hours per week) on such activities, followed by Madhya Pradesh (35.79 hours) and Orissa (35.70 hours).

In rural India, men spent 42.31 hours per week in SNA activity while women spent 22.53 hours. However, it is revealed that rural men spent only 3.74 hours in a week in extended SNA activity as compared to 33.95 hours by women (table 4). In urban India, time spent on SNA and extended SNA activities across gender was comparatively lesser than that of rural India. While urban men spent 41.06 hours per week in SNA activity, women spent only 9.16 hours. At the same time, time spent in extended SNA activity by women was 36.44 hours per week as compared to men at 3.44 hours (table 5).

Table 4: Time Allocation by Women and Men, Rural

(weekly average time in hours)

States	Female			Male			Total		
	SNA	Ext-SNA	Non-SNA	SNA	Ext-SNA	Non-SNA	SNA	Ext-SNA	Non-SNA
Haryana	23.49	30.67	113.81	37.98	1.74	128.22	31.36	14.91	121.69
Madhya Pradesh	22.62	35.47	109.85	43.55	4.42	119.98	33.64	19.12	115.20
Gujarat	23.90	37.55	106.52	44.83	3.25	119.93	34.74	19.73	113.49
Orissa	19.03	35.28	113.67	39.54	4.34	124.10	29.26	19.83	118.92
Tamil Nadu	23.46	29.52	114.99	42.02	3.51	122.43	32.77	16.53	118.71
Meghalaya	29.12	34.55	104.31	42.02	3.51	122.43	32.77	16.53	118.71
Combined states	22.53	33.95	111.50	42.31	3.74	121.98	32.72	18.40	116.89

Source: CSO, Time Use Survey, 2000

Table 5: Time Allocation by Women and Men, Urban

(weekly average time in hours)

States	Female			Male			Total		
	SNA	Ext-SNA	Non-SNA	SNA	Ext-SNA	Non-SNA	SNA	Ext-SNA	Non-SNA
Haryana	11.21	32.74	124.08	36.54	3.11	128.31	24.97	16.68	126.36
Madhya Pradesh	8.50	36.99	122.53	36.35	4.43	127.19	23.37	19.60	125.03
Gujarat	7.02	41.57	119.47	41.81	3.09	123.09	25.45	21.18	121.99
Orissa	8.37	37.61	122.06	42.19	5.00	120.81	26.46	20.18	121.41
Tamil Nadu	11.02	32.08	124.89	43.28	2.70	121.94	27.09	17.44	123.47
Meghalaya	14.42	34.39	119.24	35.42	7.96	124.60	24.23	21.99	121.77
Combined states	9.16	36.44	122.44	41.06	3.44	123.47	9.16	36.44	122.44

Source: CSO, Time Use Survey, 2000

Time use data of combined states suggest that women spent 51 percent of the SNA time on unpaid work while men spent only 33 percent (table 4). The interstate differences revealed that percentage of time spent by females in unpaid activities was highest in Haryana (85.99%) followed by Meghalaya (76.39%), and Orissa (69%), and was lowest in Tamil Nadu (32.45%).

Table 6: Distribution (%) of Time Use in Paid and Unpaid SNA Activity in India

	Male			Female			Total		
States	**Paid**	**Un-paid**	**% of time use on unpaid activities**	**Paid**	**Un-paid**	**% of time use on unpaid activities**	**Paid**	**Un-paid**	**% of time use on unpaid activities**
Haryana	33.09	18.12	35.38	4.13	25.34	85.99	20.6	21.37	51.58
Madhya Pradesh	29.41	23.34	44.25	14.31	15.75	52.4	22.99	20.12	46.67
Gujarat	44.37	14.17	24.21	17.18	13.87	44.67	33.26	14.05	29.7
Orissa	31.25	22.42	41.77	8	18.18	69.44	20.55	20.47	49.9
Tamil Nadu	41.42	13.36	24.39	21.8	10.32	32.45	32.74	12.04	26.89
Meghalaya	17.34	35.39	67.12	7.83	25.34	76.39	12.65	30.44	70.64
Combined states	36.54	18.12	33.15	14.87	15.18	50.52	27.16	16.85	38.29

Source :CSO, Time Use Survey, 2000

Time use data also provided the participation of children (6-14 years) in SNA activity. The time use data of school going children suggest that 22.21 percent of the age group 6-9 years and 39.95 percent of the age group 10-14 years participate in SNA activity (table 7). On an average, they spent 7.05 percent and 14.14 hours per week respectively on SNA activity. The major activities undertaken by children are unpaid SNA activities like collection of water, fuel and fodder, cropping and animal grazing; however these children cannot be treated as child labour as they are not 'workers' as per the established definition of a worker and they do not necessarily miss their school education (Hirway, 2000).

Table 7: Participation of School-going Children in Unpaid SNA Activity in India

Age Group	**Total**	**Participation in SNA Activities**		**Hours Spent on SNA work**	**Participation in School Education**	
6-9 years	**Number**		**%**	**Number**		**%**
Male	2362	492	20.83	6.7	1706	72.23
Female	1978	472	23.86	7.41	1379	69.72
Total	4340	964	22.21	7.05	3085	71.08
10-14 years						
Male	3687	1606	43.56	12.74	2521	68.38
Female	3234	1159	35.84	15.62	1952	60.36
Total	6921	2765	39.95	14.14	4473	64.63

Source: Hirway,2000

The SNA activity is disaggregated across primary, secondary and tertiary sectors in table 5. In primary sector, 38.5 percent of men and 25 percent of women work in crop farming; almost 25 percent of men and women work in animal husbandry and around 3 percent of both men and women work in fishing, forestry, and horticulture (table 8).

The gender differentials in SNA activity are much pronounced in fetching of water, fuel, and fruits etc. While 28.40 percent of women workers engage in collection of water, fuel etc, only 7.82 percent of men workers are engaged in it. In terms of time allocation also, women spent proportionately more time in fetching of water, fuel, fodder etc. Women spent 14.80 hours in a week on this activity while men spent only 2.17 hours.

In rural India, women spent 15.62 hours on this activity as compared to 2.79 hours among men (table 9). Within activity, collection of fuel and water remain an important activity.

There is a clear link between access to water and time allocation of women, who have primary responsibility to ensure drinking water to their households, which suggest that changes in the availability of water infrastructure can lessen their burden in fetching the water as well as release their time locked up in care economy for the income-earning market economy activities. Table 10 shows the gender disaggregated statistics of time use in fetching water across selected six states in India, which clearly revealed that women spent more time in fetching water than men, except in Gujarat. Therefore infrastructure investment in water can help women in reallocating their labour time and reduce the stress related to walking long distances to fetch water.

Table 8: Distribution (%) of Persons Engaged in SNA Activity in India

% of persons engaged in SNA		Rural			Urban			Total		
	Activity mode	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary Activities	**11-16**	**76.96**	**87**	**81.73**	**17.45**	**52.99**	**30.57**	**76.96**	**87**	**81.73**
Crop farming, kitchen gardening etc.	11	38.54	25.05	32.14	5.83	6.82	6.19	38.54	25.05	32.14
Animal husbandry	12	24.56	25.83	25.16	2.93	6.45	4.23	24.56	25.83	25.16
Fishing, forestry, horticulture, gardening	13	3.76	3.12	3.46	2.15	2.43	2.26	3.76	3.12	3.46
Fetching of water, fuel, fruits,plants etc.	14	7.82	28.4	17.59	4.37	32.91	14.9	7.82	28.4	17.59
Processing and storage	15	0.98	4.12	2.47	0.84	3.82	1.94	0.98	4.12	2.47
Mining, quarrying, digging etc.,	16	1.3	0.48	0.91	1.33	0.56	1.05	1.3	0.48	0.91
Secondary Activities -Total	**21-22**	**8.73**	**5.47**	**7.18**	**18.96**	**17.68**	**18.49**	**8.73**	**5.47**	**7.18**
Construction activities	21	3.86	0.96	2.48	5.07	2.22	4.02	3.86	0.96	2.48
Manufacturing activities	22	4.87	4.51	4.7	13.89	15.46	14.47	4.87	4.51	4.7
Secondary activities –Total	21-22	8.73	5.47	7.18	18.96	17.68	18.49	8.73	5.47	7.18
Tertiary Activities	**31,32,611**	**14.31**	**7.51**	**11.08**	**63.58**	**29.34**	**50.94**	**14.31**	**7.51**	**11.08**
Trade, business,services	31	4.41	1.44	3	22.26	4.95	15.87	4.41	1.44	3
Services	32	9.84	5.98	8.01	41.25	24.21	34.96	9.84	5.98	8.01
Construction of infrastructure	611	0.06	0.09	0.07	0.07	0.18	0.11	0.06	0.09	0.07
Total SNA		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: CSO, Time Use Survey, 2000

Table 9: Distribution (%) of Time Allocation in SNA Activity in India

% of time spent		Rural			Urban			Total		
	Activity mode	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary Activities	**11-16**	**73.31**	**86.74**	**77.75**	**8.86**	**27.07**	**11.97**	**55.19**	**78.47**	**62.16**
Crop farming, kitchen gardening etc.	11	53.79	47.94	51.83	4.6	8.73	5.36	40.01	42.57	40.72
Animal husbandry	12	11.84	18.6	14.12	0.73	4.91	1.44	8.63	16.72	11.09
Fishing, forestry, horticulture, gardening	13	2.46	2	2.29	0.63	0.98	0.7	1.95	1.82	1.92
Fetching of water, fuel, fruits,plants etc.	14	2.79	15.62	7.03	0.54	9.5	2.1	2.17	14.8	5.92
Processing and storage	15	0.52	1.78	0.95	0.51	1.53	0.62	0.5	1.71	0.88
Mining, quarrying, digging etc	16	1.91	0.8	1.53	1.85	1.42	1.75	1.93	0.85	1.63
Secondary Activities	**21-22**	**11.37**	**7.68**	**10.15**	**24.67**	**23.26**	**24.49**	**15.11**	**9.83**	**13.53**
Construction activities	21	4.82	1.6	3.73	6.92	4.59	6.48	5.41	1.98	4.36
Manufacturing activities	22	6.55	6.08	6.42	17.75	18.67	18.01	9.7	7.85	9.17
Tertiary Activities	**31,32,611**	**15.33**	**5.63**	**12.14**	**66.46**	**49.67**	**63.56**	**29.64**	**11.75**	**24.36**
Trade, business, services	31	5.6	1.24	4.13	25.47	7.31	22.35	11.15	2.08	8.49
Services	32	9.71	4.35	7.98	40.99	42.36	41.21	18.49	9.62	15.84
Construction of infrastructure	611	0.02	0.04	0.03	0	0	0	0	0.05	0.03
Total SNA		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: CSO, Time Use Survey, 2000

Table 10: Time Use Statistics of Water

(weekly average time in hours)

States	Rural			Urban			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Haryana	3.20	5.54	5.38	3.08	4.79	4.71	3.19	5.48	5.33
Madhya Pradesh	3.21	5.40	5.03	1.21	2.96	2.76	3.11	5.22	4.88
Gujarat	14.00	0.00	14.00	0.00	0.00	0.00	14.00	0.00	14.00
Orissa	5.96	8.02	7.83	0.00	5.21	5.21	5.96	7.94	7.76
Tamil Nadu	3.85	4.79	4.69	2.56	4.62	4.26	3.33	4.74	4.57
Meghalaya	4.69	5.21	5.04	9.54	7.08	8.31	5.34	5.34	5.34
Combined states	3.83	5.11	4.97	3.02	4.63	4.35	3.61	5.02	4.85

Source: CSO, Time Use Survey, 2000

Apart from the time allocation in the activity, it is to be noted that the travel time for fetching water, fuel etc. is also equally time consuming. Table 11 provides the travel time data across states of India related to fetching water, fodder, fuel etc, which is as high as 7-8 hours per week in Madhya Pradesh and Meghalaya as compared to around 4 hours in Tamil Nadu. The data revealed the gender differentials in travel time too.

Table 11: Time Use Statistics of Travel Time for Fetching

(weekly average time in hours)

States	Rural			Urban			Total		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Meghalaya	5.95	6.67	6.28	0	4	4	8.3	6.6	6.3
Orissa	6.93	6.63	6.78	0.5	7.68	6.98	6.7	6.9	6.8
Haryana	6.2	4	5.67	7	5.72	6.72	6.2	4	5.7
Madhya Pradesh	7.73	6.79	7.28	2.6	5.42	4.45	7.5	6.7	7.1
Tamil Nadu	3.83	5.44	4.3	1.2	1.7	1.44	3.3	4.2	3.6
Gujarat	5.45	5.78	5.57	7.6	42	39.15	5.5	11	7.8

Source: CSO, Time Use Survey, 2000

Before discussing the public investment issues, the valuation of unpaid work and its proportion to State Domestic Product (SDP) is given in table 12.[5] In theoretical literature, there are two main approaches to the valuation of the unpaid work: (i) input-related method, based on imputing value to labour time spent on unpaid work; and (ii) output-

related method, based on imputing market prices to goods and services produced (for eg., imputing market price to the fuel wood collected, home made utensils, etc.).[6] From the perspective of accounting for unpaid work, input-related accounting is superior to output-related accounting. For example, if women have to walk longer to fetch water, input-related accounting will show an increase in the time input, though there is no increase in output. Thus intensified effort of women is valued in input-related accounting. The results from the input-related global substitute method (improvised) for valuing the unpaid work in India are given in table 12.

Table 12: Value of Unpaid Work as compared to State Domestic Product

States	Value of Unpaid Work (Rs. Crores)			SDP (Rs. cr.)	'Unpaid Work' as % of State Domestic Product		
	Male	Female	Total	1997-98	Male	Female	Total
Haryana	928.74	10209.3	11138.04	37427	2.48	27.28	29.76
Madhya Pradesh	4466.03	29034.09	33500.12	70832	6.31	40.99	47.30
Gujarat	2209.55	22577.63	24787.18	86609	2.55	26.07	28.62
Orissa	1463.78	11343.88	12807.65	32669	4.48	34.72	39.20
Tamil Nadu	3073.37	19922.04	22995.4	87394	3.52	22.80	26.31
Meghalaya	260.45	862.97	1123.42	2250	11.58	38.35	49.93

Source: NIPFP (2000).

District-wise data on wage rates for agricultural labour and wage rate for urban unskilled manual labour have been used for valuing unpaid work in rural and urban areas respectively. With this methodology, projecting the TUS results by age-wise district-wise population, valuation of time spent on unpaid activities by females in Gujarat and Haryana indicates that the value of unpaid activities could be as much as 26-28 percent of the relevant SDP.[7] For example, the total value of such activities by females was Rs. 22,578 crore and Rs. 10,209 crore in Gujarat and Haryana, respectively relative to SDP of Rs. 86,609 crore and Rs. 37,427 crore in these two states (table 12). Compared to females, the valuation of unpaid activities by males was limited to only about 2-3 percent of SDP in these two states. The unpaid work, as a proportion of SDP, is as high as 49.93 percent in Meghalaya and 47 percent in Madhya Pradesh.

III. Implications of Time Use Statistics for Public Investment

Fiscal policy, in particular the capital expenditure in infrastructure, can redress the time burden of women in unpaid work and release their time for market economy activities which can earn them livelihood or otherwise increase their leisure and wellbeing. Fiscal policy interventions in terms of infrastructure can lead to substitution effects in time allocation of women from care economy to market economy, which has implications for reducing the poverty in the household and also in enhancing the education and health status of the household. Therefore the analysis of time use statistics can help in formulating better fiscal policies in terms of infrastructure requirements. It differs across regions, again in which time use statistics can be revealing. There is need to ensure *complementary fiscal services* for better gender sensitive human development as gender-related issues cut across sectors and for instance, investing in water supply infrastructure may be a prerequisite for improving the enrolment of girl children in school, which time use statistics can reveal.

The time use statistics can be useful in formulating macropolicies in terms of public investment in three realms: at ex-ante expenditure interventions, ex-post expenditure incidence analysis, and in public service delivery.

3.1. Ex-ante Interventions in terms of Public Investment

In case of ex-ante expenditure interventions, Sen's Capability Approach provides an advanced analytical framework over mainstream economic welfare criteria and its overemphasis on the GDP.[8] It has brought attention to a much wider range of issues on people's well being than in earlier economic planning and budgeting.[9] However, the scope of time budget statistics in identifying the capability deprivation and related functioning across gender has been an area underresearched. In terms of Sen's capability approach, there are three crucial layers, which need interpretation in the context of time budgets, unpaid work, and macropolices in terms of public investment. These crucial layers are capabilities, functioning, and commodities. The first step is to propose a list of basic capabilities. Basic capabilities can be a set of capabilities that

should have only a few elements and this set is common for all individuals. These capabilities can be termed as capability to stay alive and live long, capability to lead a healthy life, capability to have knowledge, capability to have social interaction.

The second step would be to gather relevant information on the functioning, that are observable data (gender disaggregated to the possible extent). In this step of listing the functionings, the data from time use budgets needs to be incorporated along with life expectancy, age-specific mortality rates, literacy rate, nutritional disadvantage, enrolment ratio, partici pation in governance process etc. (table 13). Time use statistic provides a gamut of functions, which are more revealing in terms of capability deprivation.

The third step is to estimate the optimal commodity space, especially the fiscal policy stance in terms of public investment, which is necessary to be at individual's command to match commodity characteristics and capability requirements and then analyse the actual commodity space to identify the gaps. For instance, in terms of public investment in water supply, time use statistics revealed the extent of requirement of infrastructure across regions and in turn its impact on the capabilities across gender.

Table 13: Relating Sen's Capability Framework to Time Use Budgets, Non-Market Work and Investment

Capabilities	Functioning[1]	Commodity Space (in terms of Fiscal Stance)
Capability to stay alive and live long.	1. Life expectancy 2. Time use and % access to water and sanitation 3. Time use and % access to health infrastructure Including travel time. 4. PEM malnutrition 5. IMR/ CMR/ Sex ratio 6. Time Stress data (non-SNA activity)	1. Food security 2. Infrastructure policies in terms of water, fuel and sanitation 3. Environmental policies 4. Immunisation/nutrition programmes
Capability to have knowledge	1. Gross enrolment ratio 2. Time use of child on care economy and schooling. 3. Time use budgets of unpaid work of school-going children. 4. Literacy rate/drop out rate/completion rate	1. Education policy with complementary fiscal services, *viz*., water infrastructure projects
Capability for Social / Economic Activity	1. Mobility: Travel time in time use statistics for economic activities, paid and unpaid. 2. Security and Safety 3. Time use budgets in community activities (including participatory process of building local infrastructure)	1. Public transport system 2. Better road infrastructure 3. Public safety and security (law and order)
Capability to earn livelihood	1. Work participation rate estimated from Time use statistics 2. Time use in care economy activities (dual burden) 3. Time poverty data	1. Employment Policies 2. Micro finance programmes
Capability to communicate /decision making/ governance	1. Time use in participation in decision making 2. Time use statistics in governance of publicly provided services	1. Policies for decentralised provisioning of public services with client participatory approach

Note: The list of capabilities, functionings and commodity space is open-ended.

3.2. Ex-post Incidence Analysis of Public Investment

In case of ex-post expenditure benefit incidence, time use statistics can provide the information on unit utilised. Benefit Incidence Analysis (BIA) is a method of analysing the distributional impacts of public expenditure across different demographic and socio-economic groups. BIA involves allocating unit cost (for example, expenditure per student for the education sector) according to individual utilisation rates of public services.[10]

Mathematically, benefit incidence is estimated by the following formula:

$$X_j \equiv \sum_i U_{ij} (S_i/U_i) \equiv \sum_i (U_{ij}/U_i)\, S_i \equiv \sum_i e_{ij}\, S_i$$

where, X_j = sector specific benefit enjoyed by group j.
U_{ij} = utilisation of service i by group j.
U_i = utilisation of service i by all groups combined
S_i = government net expenditure on service i.
e_{ij} = group j's share of utilisation of service i.

BIA can identify how well public services are targeted to certain groups in the population, across gender, income quintiles, and geographical units. The studies on BIA revealed that a disproportionate share of the health budget benefiting elite in urban areas, or that the major part of education budget benefits schooling of boys than girls, which has important policy implications. However, BIA studies have been largely confined to education and health sectors due to the comparative richness of unit utilised data from the secondary sources. However, to analyse the distributional impact of public expenditure on water supply and energy is difficult to undertake at macrolevel due to paucity of data on units utilised. The point to be noted here is that time use statistics may provide these data on unit utilised of other social sector expenditure. An illustrative calculation of gender dissaggregated benefit incidence for water supply is attempted from unit utilised data using Time use survey, applying the time budget ratio of persons involved in fetching of water across gender to the rural and urban population separately.

The derived unit utilised data revealed that more women engage in collection of water than men do across states. Gujarat is exempted from the analysis of benefit incidence due to restrictions related to the

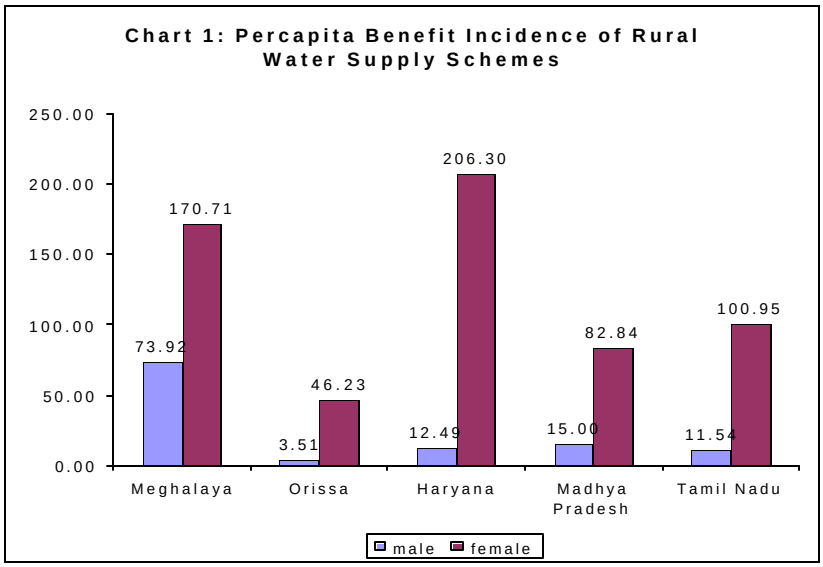
sample engaged in the fetching of water as per time use data under code 140 of economic activity. These ratios obtained from the TUS is applied to the mid-year estimates of decennial census figures of rural and urban population of these states, adjusted for the age group to above five years.

Table 14: Deriving Unit Utilised Data on Water Supply from Time Use Budgets (in percent)

	Rural		Urban		Total	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
Meghalaya	31.08	68.92	40.00	60.00	33.08	66.92
Orissa	7.14	92.86	-	100.00	6.67	93.33
Haryana	6.58	93.42	7.69	92.31	6.71	93.29
Madhya Pradesh	16.17	83.83	14.63	85.37	15.99	84.01
Tamil Nadu	10.41	89.59	13.32	86.68	11.23	88.77
Gujarat	100.00	0.00	-	-	100.00	0.00
Combined	13.42	86.58	17.07	82.93	14.23	85.77

Source: (basic data), Time Use Survey, India, 2000

The unit cost for rural and urban provisioning of water supply is obtained from the public expenditure on rural water supply schemes separately normalised to the derived global unit utilised.[11] The estimates of BIA for rural areas across states is given in chart 1. The gender disaggregated benefit incidence results needs to be interpreted with caution; as the higher per capita incidence of water on women *per se* does not tran slate that women have higher ditributional incidence on water than men. It requires a judicious interpretation that as women been involved in fetching of water more than men, the incidence figures became higher for men than women. These results can give policy signaling in the sense that higher provisioning of water can benefit women as ensuring clean water is the primary responsibility of women in the household across states in rural India.



The spatial differences in the distributional incidence of water ranges from Haryana and Meghalaya being the highest to Orissa being the lowest. These benefit incidence in per capita terms is closely correlated to the time use budgets. As discussed in section II, the time budgets of women in Haryana and Meghalaya is much higher than that of other states, while Orissa is the lowest. In terms of public investment, thus there is an increasing recognition of direct policy interventions in reducing gender gaps to alleviate poverty, especially in terms of reducing their unpaid work burden related to deficit in public infrastructure. This can release their time for more market-oriented activities which help them in earning income for the household. Fiscal policy redress inequalities in the intrahousehold division of labour by providing infrastructure that can reduce the time allocation of women spent in unpaid care economy work. Such policy interventions can be in terms of improved water supply and sanitation services along with better transport infrastructure, rural electrification, and better access to fuel. The significance of infrastructure in redressing gender equities and promoting development needs to be incorporated in framing water policies and energy policies.

Table 15: Share of Public Expenditure on Water Supply and Sanitation in Selected States in India

(In Percent)

	1999-00			2000-01			2001-02			2002-03		
	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total
Gujarat	10.23	0.49	3.12	14.15	0.83	4.06	7.75	0.40	1.76	8.49	0.44	2.27
Haryana	6.90	3.43	4.24	6.78	2.88	3.77	9.02	3.04	4.25	6.74	2.91	3.73
Madhya Pradesh	6.93	1.59	2.78	6.60	1.64	2.83	5.54	1.27	2.59	4.76	1.49	2.66
Meghalaya	10.76	3.93	6.15	10.21	4.02	6.41	11.80	3.87	7.00	12.57	4.21	7.58
Orissa	5.28	1.37	2.41	4.99	0.94	2.00	4.51	0.92	1.75	4.53	0.78	1.77
Tamil Nadu	1.41	0.04	0.29	9.97	0.07	2.08	10.50	0.04	2.04	7.42	0.03	1.81

Source: Finance Accounts (various issues)

This is particularly significant in the context of the fact that public investment in water supply and sanitation across selected states is only around 2-4 percent of the total expenditure, except for Meghalaya at around 6 percent, as is shown in table 15.

3.3. Provisioning of Public Infrastructure

Provisioning of public goods is equally important as investment in public goods. High budgetary allocation *per se* does not necessarily ensure quality in delivery of public goods. Provisioning of public goods can be better through client participatory approach. The time use data disaggregated for the community level voluntary activities across gender can capture the time allocation in participatory process of provisioning of public goods. For instance, the time use statistics of participation in infrastructure building and maintenance can be collated from code 611 of TUS, which is mainly the unpaid work related to public infrastructure. The link between the involvement of clients in the public provisioning of services and the quality of provisioning may *prima facie* appears to be positively related. The time use statistics may provide some valuable information regarding the hypothesis including spatial and gender differentials. This analysis is particularly important when the quality of infrastructure investment, apart from the quantity, also affects the time allocation of women. The positive externalities of infrastructure investment transcend from the efficiency in production boundary to the improvement in the standard of living and therefore the well being of the household. Higher the public investment in infrastructure in water and

sanitation, higher would be the health and education status of children in the household. Increased access to public delivery of water can improve the health status of children, as the quality of water will be better than the other available sources of water in the rural areas. There are evidences in which girl children help their mothers in fetching water, the public investment in water supply infrastructure can release the time of girls to attend school or participate in income-generating activities.

3.4. Link between Public Infrastructure and Time Allocation: Empirical Evidence

It is often argued that mainstream expenditure such as public infrastructure is non-rival in nature and applying gender lens to these is not feasible. This argument is refuted by the time budget statistics. The time budget data revealed that this argument is often flawed, as there is intrinsic gender dimension to the non-rival expenditure. The time allocation in the economy activities like fetching of water and fuel involves more girls and women and infrastructure investment with gender sensitive water polices and energy policies can really benefit women.

Prima facie, increase in public investment in infrastructure is negatively related to the time burden of women spending in fetching of water and fuel. There can be possibilities of substitutability between unpaid work and market work by women through increased investment in infrastructure by government. There can be a link between deterioration in infrastructure and rural poverty. In terms of fiscal policies to redress poverty, the aspects of time poverty is often surpassed. Time poverty affects income poverty. Fiscal policies designed to redress income poverty can be partial if it does not take into account the aspects of time poverty. This policy discussion has gender dimension as women are time poor and fiscal policies designed for poverty alleviation needs to incorporate the time allocation aspects across gender.[12] In this section, we undertake empirical investigation of these issues in the context of India using the data of TUS and Finance Accounts. However, the time use data across income quintiles is not available in India, so the poverty related aspects of time allocation across gender and its implications for public investment cannot be analysed.

The empirical investigation of the link between public infrastructure and time allocation related to water supply requires comprehensive time use data either in terms of longitudinal surveys or

across considerable cross-section units. An illustrative analysis is undertaken to examine the link between infrastructure and time allocation within the data constraints of 12 cross-section units of time use data conducted for rural and urban regions of six states of India.[13] The direction of regression coefficients suggests that fiscal policy interventions in terms of public infrastructure investment affects market work, non-market work and leisure time in different ways. The gender differentiated effects of public infrastructure are also evident in the results summarised in table 16. The results though tentative due to data constraints, give certain broad inferences in terms of policy suggestions. The results revealed that investment in public infrastructure has effects in terms of travel time related to collection of water rather than the time allocation in the activity *per se* and the number of persons involved in the activity and moreover, the effects are significant in case of only women.

Table 16: Public Infrastructure and Time Allocation Link: Sign of Regression Coefficients

	Female	**Male**	**Total**
Time Allocation	-	--	-
Number of Persons involved in Activity	+	-	-
Travel Time	- (*)	-	-
SNA	- (*)	-	+
Extended SNA	-	+	-
Non-SNA	+ (*)	-	-

Note: The significant regression coefficients are denoted by asterisks.
Source: (Basic Data), Finance Accounts and Time Use Survey, 2000

The time allocation in SNA activity of women is found inversely related to the public infrastructure. This result indicates that better infrastructure can lessen the unpaid SNA work of women. But there is no evidence that the release of time locked up in unpaid SNA work of collecting water through better infrastructure have a substitution effect towards market work. This gets further reinforced by the positive link between infrastructure and time allocation in non-SNA activity. It is to be noted that rise in the time allocation in non-SNA for women is *forced leisure* due to lack of opportunities in terms of employment. The policy suggestion arising from this analysis is that infrastructure investment lessens the time stress of women in unpaid SNA activity; but complementary employment guarantee policies are required along with infrastructure investment to ensure substitution effect of unpaid work with

market work, which in turn can have impact on household poverty. Time poverty affects income poverty, but infrastructure in tandem with employment policies are required for redressing the capability deprivation of the household. The point to be noted here is that employment guarantee policies without sufficient public investment in infrastructure can be equally flawed as women are time poor, and better infrastructural facilities are required to release the time locked up in the unpaid activities to have their smooth transition towards market economy.

V. Summary and Policy Conclusions

The paper examined the link between public infrastructure investment and time allocation across gender in the context of selected states in India. The direction of regression coefficients suggests that public infrastructure investment affects market work, non-market work and leisure time in different ways with evident gender differentials. Time allocation in the SNA activity of women is found significant and inversely related to the public infrastructure related to water supply. But there is no evidence that the release of time locked up in unpaid SNA work through better infrastructure can have substitution effect towards market work. This gets further reinforced by the significant positive link between infrastructure and time allocation in non-SNA activity, which manifests forced leisure in the context of India. The policy suggestion arising from the analysis is that though infrastructure investment lessens the time stress in unpaid SNA activity; complementary employment policies are required along with infrastructure investment to ensure substitution effect of unpaid work with market work, which in turn can impact household poverty.

In particular, the time use statistics of water revealed that it is significantly higher for girls in both rural and urban areas, which in turn points to the deficiency in adequate infrastructure in water and sanitation. It has significant fiscal policy implications as easy accessibility to drinking water facilities might lead to an increase in school enrolment, particularly for girls, by reducing the time utilised for fetching water. In other words, time budget statistics enables the identification of the complementary fiscal services required for better gender sensitive human development.

The paper also suggests that there is a need to integrate time budgets in ex-ante expenditure interventions (where the paper presents a matrix in terms of Sen's capability approach interpreting the three crucial layers are capabilities, functioning and commodity space in terms of time budgets, unpaid work and fiscal stance) and also for ex-post benefit incidence analysis using *unit utilised* data from time budgets.

The overall conclusion of the paper is that fiscal policies designed to redress income poverty can be partial they do not take into account aspects of time poverty. This paper is confined only to the SNA sector in terms of paid and unpaid work and its implications for fiscal policy. The analysis of extended SNA activities in care economy and its implications for public investment is an area for future research.[14]

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Endnotes

[1] Gronou (1976) in the context of Israel empirically analysed the determinants of time allocation of market work, non-market work and leisure.

[2] The 1993 System of National Accounts (SNA) however limits economic production of households for their own consumption to the production of *goods* alone, and excludes the own-account production of personal and domestic services (except for the services produced by employing paid domestic staff and the own account production of housing services produced by employing paid domestic staff and the own account production of housing services by owner occupants). This allows the SNA to avoid valuing activities such as eating, drinking, and sleeping, which are difficult for a person to obtain from another person. But, in the process, activities such as fetching water from the river or the well, collecting fuel wood, washing clothes, house cleaning, preparation and serving of meals, care, training and instruction of children, care of sick, infirm or old people also get excluded from the definition of economic activity. These services are mostly performed by women, but can also be procured from other units. While these activities are excluded partly because of the inadequate price systems for valuing these services, this exclusion principle leads to the economic invisibility and a statistical underestimation of women's work (discussions from Lahiri, Chakraborty and Bhattacharya, 2002).

[3] A major finding of TUS across the globe is that women carry a disproportionately greater burden of work than men. Since women are responsible for a greater share of non-SNA work in the care economy, they enter the labour market already overburdened with work. This dual work burden or unequal sharing of work borne by women is neither recognised in the data nor considered adequately in socio-economic policy making.

[4] In table 1, extended SNA and non-SNA has been aggregated as non-SNA; while for Indian data in tables 2 and 3, we have the categorisation in three.

[5] SNA 1993 suggests development of estimates for the value of household production of services for own use in satellite accounts of an alternative concept of gross domestic product (GDP). Estimation of the 'unpaid' work of women can suggest a quantification of the contribution of women to the economy. The quantification can also be useful for two more reasons. First, it would provide a fuller understanding of how resources and time are allocated in the economy. Second, it would indicate the extent to which economic development, and the associated feminisation of labour, by leading to the substitution of own-account production of services by purchases from the market (for example, households using self-service laundry services instead of washing at home) would give a fillip to the growth rate of GDP as it is measured. Monitoring such estimates over time can also help in understanding the effect of policies on these own-account production of services, critical for welfare.

[6] The major problem related to input-related approach is to decide which value to impute to labour time. Three methods have been used for this purpose. *Global Substitute Method:* uses the cost of a hired worker, paid to carry out the different

tasks in the care economy. *Specialised Substitute Method:* uses the costs of a specialised worker that would perform each specific task according to his/her specialisation. *Opportunity Cost Method*: is based on the wage, which the person carrying out the domestic work would receive if she/he worked in the market. Each method suffers from its own merits and demerits. The global substitute method tends to underestimate the unpaid work as it uses the wages at the lower end of the wage category. On the contrary, specialised substitute method tends to overestimate the unpaid work though they are more indicative of its market value. The opportunity cost method on the other hand tends to generate the widest range of estimates, depending on the skills and the opportunity wage of the individuals performing it (Beneria, 1992).

[7] NIPFP (2000)

[8] Capability Approach has been central to the Human Development Reports series (HDRs) launched by UNDP since 1990s by Sen's close associate, the late Mahbub ul Haq, and has subsequently influenced policy at World Bank during the Wolfensohn era (Gasper, D 2002). It provided a channel for an alternative economic development thinking, which goes beyond the undue emphasis on economic growth as in the economic planning of 1970s and its trickling down effects. It revealed that GDP (economic growth) was never suited to be a measure of well-being as it conceals extreme deprivation for large parts of the population.

[9] In assessing gender sensitive human development, the orthodox measures of well-being, such as growth of GDP per head or by some distribution-corrected value of GNP per head, used in empirical literature, have inherent limitations in capturing wider aspects of well-being and the contingent process of development. There can be little doubt about the value of higher real income in opening up possibilities of living worthwhile lives that are not available at lower levels of income (Dreze and Sen, 1995). Empirical evidence in a semi-logarithmic framework of regressing proportionate shortfalls of life expectancy against per capita GDP, revealed that nearly half of the variations in the life expectancy could be attributed to differences in GNP per head (Anand and Ravallion, 1993). In this context, it is important to note that the substantial impact of higher GDP per head on life expectancy and other social outcomes of better literacy level, low mortality rates among children and better schooling among children seems to work *via* factors in which public policy stance play a significant part. It is relevant to note the debate on 'growth-led' gender sensitive human development' versus 'support-led' gender sensitive human development in this context. The debate revolves around the hypothesis that economic growth *per se* is necessary but not sufficient for gender sensitive human development; government intervention, in particular, fiscal policies at various tiers, has significant role in redressing capability deprivation. One cannot assume that economic growth always trickles down or enhances per capita by reducing the denominator (if the reduction is increasing mortality rates rather than judiciously apply checks on uncontrolled population

growth) (Desai, 1980). The role of government policies at all tiers is to enhance basic capabilities across gender.

[10] There are three basic steps for calculating benefit incidence: Firstly, calculate the average unit cost of providing each type of publicly provided service (net of cost recovery fees). Secondly, analyse the pattern of utilisation of the services. Thirdly, multiply the utilisation figures by the government's unit cost of provision (net of fees). The estimates give the amount of public spending on the good or service going to each group. As such, the only data necessary are (1) a variable that defines the groups, and (2) an estimate of the benefits that each group receives.

[11] The Finance Accounts data across states provide the expenditure disaggregated by urban and accelerated rural water supply schemes under revenue and capital accounts. However, some negligible schemes on water supply under 'others' category is not used in the analysis due to the problem in segregating into rural and urban. The per capita benefit incidence of urban water supply schemes has been calculated for Meghalaya, Haryana, Madhya Pradesh and Tamil Nadu, though not reported. The estimates showed similar patterns across gender to that of rural areas .

[12] For instance, if public policies on microfinance designed to alleviate poverty doesnot take into consideration the time allocation aspects across gender and confine only to the indicators in terms of income poverty, the impact of policy can be partial due to flawed design of income generation activity, whether individual or cohesive peer group.

[13] The paper has depended on several assumptions while analysing the links between the time spent on water collection and public investment in infrastructure, largely due to the paucity of data. However, such assumptions are inevitable given the availability of the data. The need for updated Time Use Survey for not only six states, but for all states of India is emphasised. From macroeconomic policy perspective, it is important to integrate Time Use Surveys into statistical system of India.

[14] The time use statistics have added relevance in *care economy* (extended SNA) in terms of gender budgeting. Gender budgeting broadly categorises the public expenditure into specifically targeted programmes and mainstream expenditure. Studies across developed and developing countries showed that specifically targeted programmes constitute less than one percent of the total budget. The real challenge of gender budgeting is to integrate gender in mainstream expenditure. Gender budgeting thus exerts thrust on integrating care economy into fiscal policy. The existing fiscal policies on care economy are very myopic. For instance, though the emphasis on day care centers for working women is an important policy initiative, it has only relevance with regard to working women in the organised sector, which forms a miniscule percent of working population, especially in developing countries. It is often cited that rise in public investment in day care centres to one percent of GDP increased the female economy activity rate of Scandinavian countries by around four

percentage points. However the care economy policies confirmed to working women is a myopic approach and time budget data helps in identifying the care economy policies for women in informal sector. In terms of public investment in social security, disaggregated time budget data in terms of care economy can be revealing. Fiscal policies often focus on health issues only from users' perspective, not from provider's perspective. For instance, public policies for the care providers are often negligible or almost non-existent across countries. Health Canada's *compassionate care leave* policy for the person looking after the dying relative is one among the few instances across the globe. The designing of more policies related to care providers in the care economy, especially in HIV-AIDS, is significant and time use data disaggregated can provide useful insights into policy making.