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**Work and Reproductive health:
A Hobson's choice for Indian
women?**

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ABSTRACT

The recent reproductive and child health (RCH) combined programme of the World Bank and Government of India approaches the problem of reproductive health more from the supply side with accent on quality of care, access to service, coverage of the relevant population etc. We do not discount the need for either strengthening the existing services, making it more accessible and/or broad-based. The burden of our argument is however different: even assuming the programme (RCH) is able to provide the best of services with the widest possible coverage, our contention is that we would still be tackling only 50 per cent of the problem of reproductive health. What the programme does not address is the existing structural nature of women's work (domestic as well as non-domestic) which has severe built in hazards for women's health (reproductive and otherwise) which no amount of first rate quality of care and/or access to health services alone can deal with. Focussing on Tamil Nadu, we argue in addition that a demographic model state need not necessarily be a reproductively safe place.

Work and Reproductive Health: A Hobson's Choice for Indian Women?

Padmini Swaminathan

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Introduction :

We begin with the question raised by Dixon-Mueller in her work on population policy and women's rights, namely, to what extent might the exercise of women's rights in employment contribute to greater sexual and reproductive choice? To those who are convinced that high fertility stems largely from women's subordination and oppression consequent to their exclusion from economically productive labour outside the home, the implications for (development) policy would be clear and straightforward; enlarging women's role outside the family and ensuring equal pay, would, besides conferring positive benefits like raising household incomes, also achieve the prime demographic goal of reducing birth rates. The observed statistical correlation between increase in women's outside employment and decrease in birth rates has catapulted the demand for increasing women's wage employment as a primary goal, not necessarily on its own merits, but as a part of the demographic drive to reduce fertility.

Our interest in the nature of women's work is not merely to record (à la demographers) which kinds of employment are likely to have the greatest impact on fertility. On the contrary, the purpose of our research is to examine at what costs to women's well being (particularly in terms of their physical health) such demographic outcomes occur. We prefer to use the term work rather than just employment since the latter carries the connotation of wage earnings thereby excluding the backbreaking, endless drudgery of domestic and survival tasks (like fetching water and fuel). The relentless application of sheer physical labour to such tasks (that could have been made so much easier with access to simple equipment and basic facilities) takes a heavy toll of the health of the poor, particularly women and children.

The recent reproductive and child health (RCH) programme approaches the problem more from the supply side with accent on quality of care, access to service, coverage of the relevant population etc. We do not discount the need for either strengthening the existing services, making it more accessible and/or broad-based. The burden of our argument is however different: even assuming the programme (RCH) is able to provide the best of services with the widest possible coverage, our contention is that we would still be tackling only 50 per cent of the problem of reproductive health. What the programme does not address is the existing structural nature of women's work (domestic as well as non-domestic) which has severe built in hazards for women's health (reproductive and otherwise) which no amount of first rate quality of care and/or access to health services alone can deal with. Such supply side responses can only mitigate the adverse consequences of work; they cannot address the fundamental causes of these health problems.

We still have a long way to go in developing analytical frameworks that can contextualize simultaneously the social, economic and cultural conditions that force women to 'choose' a particular option over other possibilities that could have been pursued. Such conditions prevail in a range of situations curtailing reproductive and other choices. For example, since employment options and/or opportunities for skill acquisition and job mobility available to women shrink as we go down the caste and class ladder (and relative to males at each stage of the ladder), women are forced to knowingly expose themselves to reproductively hazardous tasks in the workplace in their desperation to earn a wage income; similarly the cultural stubbornness of patriarchal households whatever be the economic contribution of women, forces women to 'choose' abortion (rather than contraceptives) as a means to end unwanted pregnancies and/or as a method of sex selection. The hypothesis that contends that income generating employment outside the home could contribute to greater sexual and reproductive autonomy is hardly applicable to the work that most girls and women do in the third world, particularly in the agrarian settings where they are concentrated. In the Indian context of both economic stratification and social hierarchy, the question

whether work is the prime mover of women's status (and therefore their ability to exercise reproductive choices, for example) is pregnant with multiple qualifications and diverse outcomes not only between regions but also between different communities and sections of the population within a region. To quote Kalpana Bardhan:²

The rate of workforce participation may have a role in determining women's status, but that role is qualified by questions of work quality, the class variation in the double burden, and whether productive labour is a sufficient condition for autonomy and voice, whether it is even a necessary condition in a class-and-hierarchy ridden society. Aside from these components of women's status, on which differential work participation may have some intermediate effect, there is the bottom-line component of the value and care accorded to female life.

The absence of ethnographic studies of communities/households and/or epidemiological studies linking household structure, nature of domestic and outside employment to health, makes it almost impossible to establish any causality between work (as we have defined it) to observed mortality and morbidity indicators. Nonetheless, putting together available information does give a picture, however crude, of the long road still required to be traversed to attain the goal of making women's lives reproductively safe.

In an earlier study dealing with the phenomenon of fertility decline in Tamil Nadu during the decade of the eighties, we had critiqued and questioned the basis for the reasons offered as explanations for the decline in fertility rates.³ In this paper, apart from a general discussion on women's outside work, we also delve deeper into a disaggregated analysis of the structure of employment of women in Tamil Nadu; employment here refers to the Indian Census categories of main plus marginal workers. This discussion on Tamil Nadu is primarily to emphasize the fact that a demographically developed state need not necessarily be a reproductively safe place for women. We have supplemented employment data with information relating to the availability/non-availability of basic amenities, like fuel, drinking water and sanitation. The latter is to give an idea of the circumstances under which domestic tasks are carried out.

The first part of this paper focusses on employment, the attempt being to bring together available data, at a disaggregated level, on the structure of women's work outside the home. This data is supplemented with available information on child mortality indicators, the latter being used as a proxy indicator for reproductive health. The second part of the study focusses on the domestic nature of work in general, documenting in the process the adverse health consequences of inadequate and/or almost negligible investment in basic infrastructure (like fuel, drinking water) particularly in the rural areas. The third part concludes with a discussion of the emerging trends in employment as evidenced by recent NSS data, and, the not-so-encouraging scenario as far as alleviation of domestic drudgery is concerned.

Section I

Much detailed and painstaking work has gone into unravelling the 'statistical purdah' imposed by existing concepts and methods for measuring labour force participation to make visible the vital and productive work done by women particularly in the rural areas. The official 1981 Census shows only 16 per cent of the rural working-age female population as economically active, compared to 53 per cent for males. But more careful data collection procedures and more inclusive definitions of *economic activity* result in much higher female participation rates. For example, when women who work part time or those whose main activity is collecting fuel and fodder, or working in dairy, poultry or kitchen garden production for the family are added to those in the conventionally defined labour force, the female labour force participation rate rises to 51 per cent — only 13 percentage points below the male participation rate (Table 1).

We do not wish to enter the debate on the visibility/invisibility of women's work. Our main purpose, on the contrary, is to assess the *quality* of even this small portion of the female population designated as workers by official data sources. This exercise is not only to highlight the fact that the country invests far less in its women workers than in its working men, but more important, to bring out the complete dissociation between the assumptions and expectations of the new economic policies (namely rapid economic growth, particularly industrial growth and consequent beneficial impact on the population), and the actual ground realities (given the existing level of literacy, level of skill and employment composition of the population).

The sectoral break-up of occupation reveals that women make up a substantial portion of the agricultural workforce in India.⁴ Agriculture accounts for 37 per cent of India's GNP and employs about 70 per cent of the working population of the country and almost 84 per cent of all economically active women. Although, almost all rural women are involved to some extent in agriculture, the nature and extent of their involvement varies widely and is strongly influenced by economic status and the caste and class background of their households.

Table 1
Rural Male and Female Labour Force Participation Rates
(By different data sources and definitions)

Data Source (Definition)	Male (%)	Female (%)
Census, 1981 (Main Workers)	53	16
NSS, 1983 (Main Workers)	61	2
NSS 1983 (Main and Marginal workers*)	63	39
NSS, 1983 (Main, Marginal and Code 93** Workers)	64	51

Note: * Marginal Workers are those who engaged in economically productive activities less than 183 days in the year

** Code 93 activities include fuel, fodder and water collection and work in dairy, poultry or kitchen garden production for the family.

Source: Bennett, Lynn "Women, Poverty and Productivity in India", draft circulated to participants in joint World Bank - Planning Commission Workshop on *Gender and Poverty in India*, December 5-7, 1991. New Delhi (mimeo)

A feature particularly notable for the decade 1971-1981 is the *increase* in the ranks of *female child labour*, especially when at the same time, the incidence of male child labour had gone down in rural areas. Analysing the trends in women's employment for the decade 1971-81, Banerjee has shown, among other things, that the number of girl workers in both rural and urban areas had increased *faster* in states where the workforce participation rates of women had gone up *faster*, further a small part of the increase in female agricultural workforce was accounted for by rural child workers for whom most of the increase in absolute numbers as well as in the proportion was concentrated in agriculture.⁵ Composition of the workforce by sex and activity according to the 1991 census is now available and shows an increase in workforce participation rate for women between 1981 and 1991. However, unless and until an age-wise classification of the composition of workforce is made available it would be premature to gloat over the increased work participation rates for women.

An aspect that we do not explore in this paper is the social and economic implications of the noticeably higher work participation rates among scheduled caste and scheduled tribe population relative to the total population. Scheduled caste and scheduled tribe women account for nearly half of all the female agricultural labourers, although they make up only about a quarter of India's rural female population.⁶

As a general rule, the southern states have a more visible presence as far as female employment (outside the home) is concerned. In Tamil Nadu, in addition, the general all-India phenomenon of the feminisation of agriculture stands out even more starkly. We begin with a set of data laid out in Appendix (I-IV) which give a picture of the nature of female employment in Tamil Nadu. The tables bring out quite clearly the following:-

- (a) four decades of 'development' notwithstanding, even now almost 80 per cent of female workers in Tamil Nadu as a whole are still confined to the primary sector of the economy; within the primary sector, agricultural labour constitutes the biggest category employing 56 per cent of women workers (Appendix I);

- (b) the distribution of workers by industrial categories and broad age-groups reveals that, proportionately, the percentage of female workers in the age-group 0-14 years, outnumber the males in the same age-groups in each of the industrial categories (Appendix II);
- (c) a district-wise analysis of the data reveal that in almost all districts of the state, except two or three, more than 70 per cent of the women and girl children, respectively, work either as agricultural labourers and/or cultivators (Appendix III - IV). This phenomenon has a lot to do with the nature of the cropping pattern in Tamil Nadu. For the state as a whole, the area under paddy is more than 40 per cent of total area under different crops, while production of paddy exceeds 50 per cent of total crop production;
- (d) the NSS gives some idea of the break-down of agricultural work by major operations. These data show marked differences in the relative importance of female labour between different operations. Women labour figure prominently in transplantation, weeding and harvesting; in fact they outnumber the males in the casual labour category in the latter two operations, but are relatively less important or play a minor role in others, notably ploughing and non-manual work.⁷

The significance of documenting the heavy concentration of women workers in agriculture, particularly in operations like weeding, transplanting and harvesting, lies in the severe implications it has for women's reproductive health. One indicator of the adverse consequences of such work is the relatively high child mortality indicators for an otherwise 'developed'⁸ state like Tamil Nadu. In addition, Tamil Nadu has the distinction, according to population studies' experts, of having 'demographically arrived'.⁹ In Table 2 and 3 we reproduce the data compiled by the National Family Health Survey on infant and child mortality estimates for Tamil Nadu, along with the comments made by the Survey on the data. Table 4 gives the estimated child mortality indicators for India, Kerala and Tamil Nadu. Appendix V gives the child mortality estimates, districtwise, from the 1981 census, while Appendix VI gives the child mortality estimates by the occupation of main workers. These data culled from different sources bring out fairly clearly;

- (a) the relatively high infant mortality in Tamil Nadu, which is closer to all-India estimates but way behind Kerala, thereby calling into question Tamil Nadu's status as a socially developed state;
- (b) the infant mortality indicators are uniformly high in the rural areas and more so in the districts where paddy cultivation dominates;
- (c) infant mortality indicators are particularly high among agricultural labourers and among manual workers;
- (d) the mortality indicators are considerably higher for births to scheduled caste women than for births to non-SC/ST women. It may be recalled that a far higher proportion of SC women work as agricultural labourers.

Table 2
Infant and Child Mortality

Neonatal, postneonatal, infant, child and under-five mortality for five year periods preceding the survey, by residence, Tamil Nadu, 1992.

Years prior to survey	Neonatal mortality (NM)	Postneonatal mortality* (PNM)	Infant mortality (1q0)	Child mortality (4q1)	Under-five mortality (5q0)
Urban					
0 - 4 years	41.4	19.8	61.2	3.7	64.7
5 - 9 years	30.4	28.2	58.6	26.7	83.8
10 - 14 years	29.2	30.6	59.8	39.6	97.0
Rural					
0 - 4 years	48.9	22.4	71.4	28.7	98.0
5 - 9 years	54.2	26.5	80.7	34.5	112.5
10 - 14 years	59.9	28.6	88.5	56.6	140.1
Total					
0 - 4 years	46.2	21.5	67.7	20.1	86.5
5 - 9 years	46.5	27.1	73.5	32.0	103.2
10 - 14 years	50.2	29.2	79.4	51.0	126.4

Note : * Computed as the difference between the infant and neonatal mortality rates

Neonatal mortality : the probability of dying in the first month of life;

Postneonatal mortality : the difference between infant and neonatal mortality;

Infant mortality (1q0) : the probability of dying before the first birthday

Child mortality (4q1) : the probability of dying between the first and fifth birthday;

Under-five mortality (5q0) : the probability of dying before the fifth birthday

Source : National Family Health Survey, Tamil Nadu, 1992. International Institute for Population Sciences, Bombay, December, 1994, p128.

Table 3

Infant and Child Mortality by background characteristics

Neonatal, postneonatal, infant, child and under-five mortality by selected background characteristics for the 10-year period preceding the survey, TamilNadu, 1992

Background characteristic	Neonatal mortality (NN)	Postneonatal mortality* (PNN)	Infant Mortality (1q0)	Child Mortality (4q1)	Under-five mortality (5q0)
Residence					
Urban	36.1	23.9	60.0	15.1	74.2
Rural	51.7	24.5	76.2	31.7	105.5
Caste/Tribe					
Scheduled Caste	59.1	30.9	90.0	41.0	127.3
Other (Non-SC/ST)	42.3	22.4	64.8	21.3	84.7

* Computed as the difference between the infant and neonatal mortality rates

Note 1: Total includes the mortality experience of scheduled tribes, which is based on fewer than 250 children surviving to the beginning of the age interval and is not shown separately.

Note 2: Comments from NFH Survey, Tamil Nadu.

Despite the overall decline in infant and child mortality, 1 in every 15 children born during the five years before the NFHS died within the first year of life, and 1 in every 11 children died before reaching age five. Overall, 68 per cent of infant deaths recorded in the NFHS in Tamil Nadu occurred during the first four weeks of life. The corresponding proportion for the period 5-9 years before the survey is 63 per cent, which is the same for the period 10-14 years before the survey. The decline in neonatal mortality during the last 15 years was slower than the decline in postneonatal mortality. Under-five mortality for the state declined considerably during the past 15 years, to 87 per 1,000 live births during the period 0-4 years before the survey. The fairly high infant and child mortality rates in Tamil Nadu suggest that child survival programmes need to be strengthened. As expected, rural areas experience higher infant and child mortality than urban areas... The mortality indicators are considerably higher for births to scheduled caste women than for births to non-SC/ST women

Source: Definitions of mortality indicators and Source: Same as in Table 2.

Table 4
Estimated Mortality Indicators, 1989: India, Kerala and Tamil Nadu

Mortality Indicators	India			Kerala			Tamil Nadu		
	Rural	Urban	Combined	Rural	Urban	Combined	Rural	Urban	Combined
Child Death Rate	11.1	7.2	10.3	6.0	6.1	6.1	9.7	6.8	8.7
Infant Mortality Rate	98.0	58.0	91.0	23.0	15.0	21.0	80.0	43.0	68.0
Neonatal Mortality Rate	62.1	31.4	56.4	15.2	9.7	14.2	60.4	29.9	50.1
Post-neonatal Mortality									
Rate	36.4	26.3	34.5	7.6	5.1	7.2	19.6	13.5	17.6
Perinatal Mortality Rate	50.9	31.0	47.2	23.4	21.9	23.1	58.7	43.8	53.8

Note:

Crude Death Rate (CDR)	=	$\frac{\text{Number of deaths during the year}}{\text{Mid-Year Population}} \times 1000$
Infant Mortality Rate (IMR)	=	$\frac{\text{Number of infant deaths during the year}}{\text{Number of live births during the year}} \times 1000$
Perinatal Mortality Rate (PMR)	=	$\frac{\text{Number of still-births+infant deaths of less than 7 days during the year}}{\text{Number of live births + still births during the year}} \times 1000$
Neonatal Mortality Rate (NMR)	=	$\frac{\text{Number of infant deaths of less than 28 days during the year}}{\text{Number of live births during the year}} \times 1000$
Post-neonatal Mortality Rate (PNMR)	=	$\frac{\text{Number of infant deaths of over 28 days during the year}}{\text{Number of live births during the year}} \times 1000$

Source: Office of the Registrar General, India, Vital Statistics Division, *Sample registration system, 1989*. 1992.73 and 95-159 pp. New Delhi, India.

As already indicated, in the absence of epidemiological studies, we have no basis to establish causality between the nature of women's employment and the resultant impact on reproduction. We are, however, positing this hypothesis for Tamil Nadu based on the results of a field study conducted in a paddy intensive area of rural Maharashtra by Srilatha Battiwala for the Foundation for Research in Community Health, (FRCH), Bombay.¹⁰ To summarize the Report at some length:

The FRCH rural health research project was launched in 1973 in north Alibag taluk in Raigad district of coastal Maharashtra. It covered 30 villages and hamlets with a population of approximately 30,000. Between 1973 and 1980 the project made a dramatic impact on the health of the local population, particularly women and young children. The infant mortality rate was halved from 150 per 1000 livebirths to around 75, and immunisation rates for expectant mothers and preschool children shot up to over 75 per cent of the target group. The overall death rate came down to just nine per 1000 population and the birth rate to 13 per 1000 - despite the fact that the project studiously avoided pushing family planning in any form.

But despite these early successes the FRCH was disturbed by the fact that a plateau of sorts was reached and from 1980 onwards, no significant changes in the health profile of the people could be achieved. Their concern was greatest over the stubborn refusal of the infant mortality rate to move below 70 to 75 per 1000 livebirths. Infant mortality is internationally accepted as the most sensitive index of the health status of a nation or society. Therefore the FRCH team felt that, if the infant mortality rate remained static in the project area for so many years, it was a clear indication that the impact of their initial health service package had been fully absorbed. Any further decline in the infant mortality rate could only be achieved by a new set of interventions. So it was that the Death Information Study was launched in January 1982 - a study which yielded some startling findings whose relevance remains undiminished.

The Death Information Study project monitored all deaths that occurred in the project area in one calendar year and tabulated the data by age, sex, sub region and cause. A disaggregated study of the age structure of (0-6) deaths showed that almost 80 per cent of the deaths occurred below the age of one year; of this over three-fourths occurred in the neonatal period, that is upto 30 days after birth. The most startling finding of the study was the fact that 40 per cent of all infant deaths occurred in the four monsoon months of July to October, that is, at the height of the agricultural season with rice cultivation operations in full swing.

The report offers the following explanation for the bunching of infant deaths during the particular season:

It is well known that women alone perform the important, skilled but backbreaking job of transplanting saplings in rice cultivation. This means that every woman - heavily pregnant or otherwise - is squatting on her haunches for hours together. Obstetricians confirm that such physical strain and pressure on the uterus could well trigger off premature labour in the last trimester of pregnancy, not to mention increasing the chances of a stillbirth.¹¹

If the above findings are valid, then we do have a fairly strong hypothesis for Tamil Nadu, linking the inflexibility of the mortality indicators beyond a point, to the nature of women's tasks, especially in the rural areas of Tamil Nadu.

New technology in agriculture and particularly that relating to paddy cultivation has not touched those operations which are performed by women, namely, transplanting and weeding. If anything, green revolution has not only led to intensive cultivation but has also increased the number of times that paddy crop is raised within an agricultural season. We have therefore, a scenario, wherein even if there is a decline in numbers employed in agriculture, this does not necessarily apply to women labour in paddy intensive areas. Further, and worse the technological modernization of agriculture has not touched the reproductively hazardous operations performed by women labourers.

Outside of farming, the other (census) industrial categories where women are employed, in significant numbers, are the 'household' and the 'other than household category' - the two together constituting the manufacturing sector. To put it differently and more starkly, a fact that is by now well-known and well-documented, the majority of women employed in the non-farm sector are actually in the growing informal sectors of the economy, working either as labourers and servants or as petty producers and traders. Apart from their work being extremely time consuming and heavy, it is also the most deprived in technology and capital inputs. Technological marginalisation of female work is endemic in both agriculture and the non-agricultural informal sectors and accounts partly for the gender gap in wage rates.

The Shramshakti¹² (Report of the National Commission on Self-employed Women and Women in the Informal Sector), has documented some of the known health hazards in various occupations in which women in the informal sector are involved (for some details see Appendix VII). It is presently not possible to identify an adequate data base to establish whether women are more or less vulnerable than men to hazards at the workplace. It seems unlikely that there would be biological equality but from a practical point of view it may be that the concept of differential vulnerability is specious for optimal formulation of social policy. This point needs to be underscored since, all over, the concern for the foetus is primarily voiced in those higher paying industries where women have only recently gotten their 'feet at the door'¹³. When we look beyond these 'non-traditional' jobs, however, concern for real reproductive hazards affecting women workers is markedly absent.

This discrepancy in terms of where women work has a long history. The device of 'protecting' women workers from occupational hazards by excluding them is applied selectively: women in higher paying, 'heavy' industrial jobs get protected out of those jobs, while women in lower paying traditionally 'female sectors' get no protection from serious and pervasive risks.

Quite a few employers have excluded women workers from hazardous jobs based upon the possibility of reproductive injury, while at the same time, they have continued to employ men in jobs which expose them to hazardous substances in excess of accepted legal standards. Thus, on the one hand, they are singling out women, based upon protective health measures while, on the other hand, they are subjecting men to health risks in violation of legal standards. This double-edged position raises serious questions of discrimination against both sexes. From one point of view, women are denied employment; from another point of view, men are denied protection.

Our own Report of the Working Group On Personnel Policies to bring greater involvement of women in Science and Technology,¹⁴ carried forward the theory of selective sex protection when it recommended thus:

Promoting the employment of women in science based industries is important. Care is however necessary to see that they are not employed in occupations and activities which have special hazards for them. Women have been found to be more prone to some adverse effects, for instance, as in atomic energy and in mining operations. The Group, therefore, recommends that women should not be put in hazardous occupations or professions where they are biologically not suited. Nevertheless science should offer variety of occupations and professions which are safe and compatible with family responsibilities. Such occupations could, for instance, be in the fields of Electronics, Food Processing, agricultural operations, Computer Science, architecture, draughtmanship, etc.¹⁵

While acknowledging the existing gender bias in declaring certain occupations as reproductively hazardous while leaving out a whole host of others, what needs to be, however, emphasized is the fact that:

- (a) hazards to reproduction in the workplace are real and need to be addressed. What is being contested is the almost exclusive focus on female reproductive function and the implications for reproductive freedom;
- (b) protecting only women achieves only part of the goal of 'safeguarding the species'. Male reproductive function is vulnerable too - and vulnerable to the same agents. Yet, there is a remarkable paucity of research on the effects of workplace hazards on male reproductive function, "although there are positive findings virtually everytime the question is posed".¹⁶

Section II

Universally, two jobs that are carried out almost exclusively by women are housekeeping and child rearing. The possible adverse consequences of these tasks relate principally to the fatigue resulting from long hours of domestic labour and the constant demands of children. There is hardly any documentation, that we know of, of the reproductive impact of long hours of domestic labour including child rearing in the Indian context; but research carried out in industrialized countries estimates that a housewife with a young child works between 70 and 80 hours a week not counting the extra work and sleepless nights when the child is ill.¹⁷ The internalization of domestic work fatigue is so complete even in developed countries that neither the individuals concerned nor the system can accommodate a demand (if ever it is made) for the right to rest. But the crucial point here is that excessive fatigue is one important risk factor for prematurity.

Theoretically, at least, in the West, pregnant women who have a paid job have the legal right to have their work burden lightened and eventually interrupted without losing their rights as workers. But, even in such societies there is no legal protection for housewives, nor any regulation or risk prevention for the domestic work which all women do - often full time - with a workload that no union in the industrialized world would accept.

Domestic work represents a danger for the pregnant women and her baby. All the requisite knowledge is to hand. The fact that it is largely ignored demonstrates that the definition of risk factors is not the objective and mental exercise that technicians would have us believe, but that it has ideological

and political implications. It is the inability to see domestic work and the rearing of children as real jobs and not as instinctive female functions, that allows the risks, the fatigue and the inherent injustice of the situation to be ignored.¹⁹

Coming to the Indian scenario, if we expand the definition of work to include the time and energy expended in basic survival tasks we get a formidable picture of the reproductively hazardous lives being lived by most of our rural women, including in demographic model states such as Tamil Nadu. We dwell below at some length on the domestic chore of fuel collection as an illustration of,

- (a) the physically depreciating labour that needs to be continuously expended in such tasks in addition to wage earning employment, for sheer survival;
- (b) the technological exclusion and/or inappropriateness that is the hallmark of the planning process in this sector, and
- (c) the consequences for health because of the criminal negligence of this sector.

The gendered politics of fuel in India :

An offshoot of the adoption of (western) development paradigm has been an extraordinary high growth of population in urban areas. The urban/industrial growth patterns combined with the economic and political clout exercised by the urban elite in demanding priority access to all forms of infrastructure, including supply of energy, has resulted in huge investments in concentrated energy forms serving a relatively minor part of the nation's population. International and even national aid agencies have been influenced by western patterns of energy supply and consequently have tended to confine their energy capital loans to centralized electricity production and distribution systems.

The above confluence of factors have had an obvious deleterious impact in that the rural areas have not received a share of investment in energy supply (neither electric nor non-electric) proportionate to the population living there. This scenario, after four and a half decades of planning, is, in fact a documentation of how this pattern of development has excluded vast sections of the population from its purview, which exclusion is economic in nature for some sections of the urban population, but, for majority of those in the rural areas the exclusion is both at the social and economic level.

The burden of our argument is that, the review of policies, and, attempts at intervention to increase energy supply to the rural areas, cannot be measured simply by citing numbers or quantum of installation of particular facilities (which is what the Plan documents of the States and the Centre do). Despite the increase in the quantum of energy supplied by various components to the rural sector, a vast section of the population, for various reasons, has not benefited, particularly as far as energy for cooking is concerned. A vast majority of these sections of the population which depend almost exclusively on woodfuel systems largely continue to remain both outside the control of government and outside the market economy.

The entire approach towards provision of even basic facilities to this sector has a charity-oriented, social service attitude and not one of the legitimate rights of this sector to a larger share in investment and facilities, given the larger share of population residing in rural as compared to the urban areas. Much of the debate on household energy requirements has become so engendered that, intentionally, or otherwise, the issue of cooking energy and firewood availability has been relegated to the realm of women's issues and therefore of peripheral importance. Much of the discussion on woodfuel crises takes place as part of the larger concern for environmental protection; the fundamental question of how these sections of the population are to survive in the absence of alternative sources of energy gets shortshrifed in the process.

The most direct and regressive impact of cooking energy non-availability/ shortage is on women who are mainly responsible for meeting both basic needs and household energy needs. Time allocation studies document the impact on women's time of fuelwood and fodder shortage. These studies show a wide range (from 45 minutes to 5 hours) in the time women spend each day in fuel collection depending on factors such as proximity to forests

or to other sources of fuel, type of farming systems, hill, desert and/or plain regions, etc.¹⁹ The problem of measurement of fuel collection notwithstanding, the important fallout of any increase in fuel collection time is that it has severe implications for other household activities.²⁰

More direct linkages exist between fuel shortages and nutrition. Studies have noted that gathering firewood, fetching water, cooking and other domestic tasks account for a substantial share of women's and children's energy output, around 700 and 300 calories per day respectively.²¹

Domestic drudgery resulting from a lack of public investment in infrastructure and from a lack of public attention to preserving current sources of water and fuel is frequently seen as a hallmark of poverty rather than a direct form of discrimination against women. When such government inattention is viewed in the light of the disproportionate physical burden it imposes on women, it is difficult not to see women's domestic burden as another manifestation of gender inequality in the political process.²²

Worse, there is growing evidence of adverse health effects because of high biomass smoke levels. Much of domestic cooking and space heating in rural areas take place in poorly ventilated houses through the use of traditional chulhas, which have low thermal efficiency and high emission factors, all of which combine to produce very high concentration of air pollutants. Four major categories of ill-health have been identified as health risks associated with pollutants from using unprocessed biofuels. These include: (a) respiratory infections in young children; (b) adverse pregnancy outcomes for women exposed during pregnancy; (c) chronic lung disease and associated heart disease in adults; and (d) cancer.²³ With regard to adverse pregnancy outcomes, carbon monoxide emitted in the course of biomass combustion is perceived to be one of the major culprits. Considerable amounts of this undesirable gas has been detected in the bloodstreams of women cooking with biomass in India. Besides, studies conducted in Western India associate a 50 per cent increase in stillbirths to exposures suffered by the region's pregnant women.²⁴ While a lot more studies are required to allow quantified conclusions with some measure of confidence, much more effort is required to make even a small dent in the direction of Indian energy planning. The latter is still driven (politically and otherwise) by the traditional supply-oriented mentality emphasising the development of power, coal and hydrocarbons without adequate regard to specific end-uses that determine the demand for these energy sources as well as the social and environment costs of providing these services. In fact, most research in the area of fuel upgradation has preferred to keep the concerns of commercial utility and profitability in mind, rather than keeping those of indoor air pollution. As has been pointed out, "In many ways, the problem of indoor pollution as it exists today is an outward sign of the low value placed on the time and labour of women".²⁵

Objectively, also, the options available (technological and otherwise) for providing energy services to rural areas are still very limited. As a report by TERI points out, "while aggressive promotion exercises had created a general impression that renewables were the panacea for India's energy problems, the reality is that ambiguities persist in the identification of strengths and limitations of each RET (renewable energy technology). Substantial efforts need to be devoted to a serious assessment of what current RETs are able to achieve and to arrive at a realistic estimate of the potential of these technologies in the overall Indian energy system."²⁶

Section III

We began by positing the possibility of a causal relationship between the structural nature of work (both domestic and non-domestic) particularly for women, and reproductive health as indicated by child mortality estimates. We also emphasized the fact that beyond a point, if we have to make a positive impact on reproductive health, we require, not just improved and accessible health services, but focussed interventions of such a high order as to change the parameters of development. One such parameter is the structural nature of women's work which has hardly seen any dramatic changes in all these years.

Taking first the case of women's employment outside the home, we had thus far used the 1981 census data to substantiate some of our arguments. In this concluding section we discuss the (limited) data made available relating to the 1991 census as well as the 50th round of the NSS on employment patterns, for a picture of the emerging scenario in the decade of the 90s.

According to 1991 census, all-India, the total rural workforce in the primary sector over the period 1981 to 1991 has come down from 83.35 per cent to 82.26 per cent. At the same time, the rural female population depending on this sector has increased. The percentage increase in rural employment in the primary sector is 18.73 per cent for males and 42.09 per cent for females. Though the total growth in the primary sector is equal to the growth rate of population, the female workers in the agricultural sector increased substantially, while male workforce witnessed a decline compared to the rate of growth of rural population.²⁷ The NSS gives an even more disconcerting picture of employment growth in the post-reform period. At first sight the results of the 'large sample' 1993-94 NSS survey seem to support the official claim that the employment content of growth has increased in the process of economic reform. However, beyond the official claim, unravelling the quality and content of the data reveals the following:²⁸

- (a) The measured employment growth is highly sensitive to the inclusion/exclusion of subsidiary workers. During 1990-94 the number of principal workers increased by 18 million, but the number of subsidiary workers increased by 22 million. The latter are persons (overwhelmingly women) who report themselves 'usually not in the work force' but who did some work during the year. It is only if this category is included in the definition of workers that the post reform employment growth can be said to have been higher than the pre-reform trends.
- (b) The second point to note is that, even including these subsidiary workers, the recent growth rate of non-agricultural employment decelerated very markedly after the reform. An interesting aspect of this is that the deceleration in the growth of non-agricultural employment was concentrated entirely in rural areas, with there being no sign at all of any significant deceleration of urban employment growth, total or non-agricultural. This reversal, with initiation of reforms, of what had hitherto been a very rapid growth of rural non-agricultural employment is perhaps the most significant result emerging from the survey.
- (c) Clearly the post reform deceleration in non-agricultural employment growth was accompanied by a large relative shift towards agricultural work, and there was also a large increase of subsidiary workers doing such work. This raises the natural question of whether this increase in agricultural employment was a positive development or a distress outcome related to lower rural non-agricultural opportunities and higher poverty.
- (d) In fact, the rate of growth of agricultural output has slowed down after the reforms, and so the growth of labour demand in agriculture is likely to have decelerated as well. Consequently, what is being observed is almost certainly a rise in labour *supply* into the agricultural sector from certain segments of the rural population, particularly casual labourers and subsidiary workers. This in itself suggests that the higher growth of agricultural employment was driven more by distress factors: for example, research on female participation rates in the past have concluded that female participation in the casual agricultural labour market and as unpaid helpers in family farm tends to increase in bad years. And more generally, using agricultural output data and the NSS figures on agricultural employment shows that per worker agricultural output fell significantly in the post reform period. This development too confirms that the post-reform increases in agricultural employment took place not in the context of greater rural prosperity but reflected greater adversity.

If the scene on the non-domestic employment front is not very encouraging, the situation in the domestic front, as far as household work is concerned, is not very bright either. To come back to our discussion on the availability of basic infrastructural facilities like fuel, water,²⁹ etc., we find that, according to the 1991 census,³⁰ for the country as a whole,

- (a) only 56 per cent of rural households had access to safe drinking water, that is, water drawn from tap, hand pump/tube well;
- (b) 35 per cent of rural households only, had access to electricity;
- (c) 9 per cent of rural households only, had access to toilet facilities;
- (d) while 55 per cent of urban households, other than those of SC/ST, had access to all the three facilities (of drinking water, electricity and toilets), only 5 per cent of rural households had access to all the three facilities;
- (e) wood is still the most important fuel for cooking used by 72 per cent of households in the rural areas, followed by cowdung (20 per cent).

To complete this dismal scenario we need only to point out the less-than-one-percent of total central plan expenditure put aside for the non-conventional energy sector.³¹ This, despite the fact that, non-conventional energy sources continue to contribute significantly in meeting the energy needs of the rural areas. Such abject low investment in rural infrastructure has a direct bearing on the health (reproductive and otherwise) of rural women because of the enormous strain they have to undergo for the most basic tasks. In such a context it becomes increasingly problematic to support policies aimed solely at improving women's participation in market activities. Our emphasis, therefore, on modifying and/or doing away with institutionalized inequalities between men and women at the household and societal level is not just to achieve gender justice but also, more important for gender-safe life and reproduction.

Appendix I

Distribution (per cent) of total workers by Industrial Categories, Sex, and Sectors of Economy, 1981

Tamil Nadu

	Industrial Categories	Persons	Males	Females
	(1)	(2)	(3)	(4)
I	Cultivators	28.78	31.60	22.63
II	Agricultural Labourers	33.51	23.56	55.24
III	Livestock, forestry, fishing etc.	2.48	2.68	2.06
IV	Mining and Quarrying	0.21	0.24	0.14
(a)	Primary Sector:Sub-total	64.98	58.08	80.07
V	Manufacturing, processing, servicing and repairs :			
	(i) Household Industry	4.82	4.11	6.35
	(ii) Other than household Industry	10.09	12.45	4.94
VI	Construction	1.58	2.03	0.61
(b)	Secondary Sector:sub-total	16.49	18.59	11.90
VII	Trade & Commerce	8.17	10.78	2.46
VIII	Transport, storage and communications	2.98	4.20	0.32
IX	Other services	7.38	8.35	5.25
(c)	Tertiary Sector:Sub-total	18.53	23.33	8.03

Source: Report and Tables Based on 5 per cent sample data

Census of India, 1981, Series-20, Tamil Nadu,

Part II-Special, Statement 48.

Appendix II

Distribution (per cent) of workers (Main plus Marginal) by industrial categories and broad age groups, 1981 (Tamil Nadu)

Industrial Categories	Males			Females		
	0-14	15-59	60+	0-14	15-59	60+
I - IX	3.71	89.12	7.17	7.22	88.14	4.64
I	2.71	86.00	11.29	5.36	88.73	5.91
II	6.74	86.98	6.30	7.51	87.91	4.58
III	8.25	86.53	5.22	12.53	85.33	2.14
IV	3.11	94.94	1.95	12.39	86.89	0.72
V (a)	4.23	88.11	7.66	10.00	86.52	3.48
V (b)	4.32	92.26	3.42	14.59	83.37	2.04
VI	1.92	92.65	5.43	6.12	90.84	3.04
VII	1.92	92.02	6.06	2.08	88.37	9.55
VIII	0.47	97.18	2.34	1.12	96.99	1.89
IX	0.76	94.76	4.47	2.65	94.54	2.79

I Cultivators

II Agricultural Labourers

III Livestock, forestry, fishing etc.

IV Mining and Quarrying

V Manufacturing, Processing, servicing and repairs

(a) Household Industry

(b) Other than Household Industry

VI Construction

VII Trade & Commerce

VIII Transport, Storage and Communication

IX Other Services

Note : The total of the three broad groups may not add up to 100 as "age not stated" figures are not included in the statement

Source: Computed from the Report and Tables Based on 5 per cent sample data Census of India, 1981, Series 20, Tamil Nadu, Part II-Special, Statement 49.

Appendix III

Per cent of Agricultural Workers to total female workers in Tamil Nadu (Districtwise)

(Rural+ Urban)		(Rural)	
District	Agri.Lab + Cultivators	District	Agri.Lab + Cultivators
Dharmapuri	91.92	Dharmapuri	94.07
South Arcot	91.10	Pudukottai	93.56
Pudukottai	90.98	South Arcot	93.55
Tanjore	87.59	Tanjore	93.30
Trichirapalli	87.47	Trichirapalli	92.88
North Arcot	85.33	North Arcot	91.34
Madurai	82.87	Madurai	90.55
Periyar	79.99	Chengal	88.78
Chengal	78.94	Salem	87.29
Salem	77.76	Coimbatore	86.58
Ramnad	75.62	Ramnad	86.09
Coimbatore	68.31	Periyar	85.69
Tirunelveli	61.16	Tirunelveli	70.54
Kanyakumari	33.69	Kanyakumari	40.82
Nilgiris	9.19	Nilgiris	9.97

Note : Agricultural workers = Agricultural Labourers plus Cultivators

Source: Computed from General Economic Tables, Tamil Nadu, Series - 20, Census of India, 1981.

Appendix IV

Female Agricultural Child Workers (0-14 years), Tamil Nadu (districtwise)

District	(Rural + Urban)					(Rural)				
	Total female child workers (0-14)	of which female agri cultural labourers (0-14)		Total female agri-cultural labourers + cultivators (0-14)	per centage of col.(4) to col.(1)	Total female child workers (0-14)	of which female agri cultural labourers (0-14)		Total female agri cultural labourers plus cultivators (0-14)	per centage of col.(9) to col.(6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Madurai	52608	36649	8551	45200	85.92	47218	34438	8334	42772	90.58
South Arcot	34801	24442	6257	30699	88.21	34124	24187	6217	30404	89.10
North Arcot	45041	29111	7531	36642	81.35	41911	28556	7507	36063	86.05
Tanjore	17207	13071	1384	14455	84.01	14954	12624	1339	13963	93.37
Trichirapalli	32660	20689	7633	28322	86.72	30765	20133	7586	27719	90.10
Salem	47079	24307	8763	33070	70.24	39256	23398	8617	32015	81.55
Tirunelveli	45178	14392	3861	18253	40.40	34618	13068	3744	16812	48.56
Ramnad	45271	16153	8907	25060	55.36	36460	15464	8837	24301	66.65
Chengleput	22777	14666	2552	17218	75.59	20193	13777	2460	16237	80.41
Coimbatore	32113	21492	2578	24070	74.95	26237	20200	2503	22703	86.53
Periyar	30102	20566	3288	23854	79.24	27149	19697	3239	22936	84.48
Dharmapuri	30681	18648	10276	28924	94.27	30090	18514	10260	28774	95.63
Pudukottai	10500	5044	4296	9340	88.95	10200	5013	4291	9304	91.22
Kanyakumari	3062	677	47	724	23.64	2527	663	47	710	28.10
Nilgiris	2499	256	50	306	12.24	1764	165	50	215	12.19

Note : Agricultural Workers = Agricultural Labourers plus Cultivators

Source: Computed from General Economic Tables, Tamil Nadu, Series-20, Census of India, 1981.

Appendix V
Child Mortality Estimates, Tamil Nadu

State/District		q (1)	q (2)	q (3)	q (5)
TAMIL NADU	Total	86	103	114	132
	Rural	94	116	127	146
	Urban	68	78	88	104
Madras	Urban	53	58	66	79
Chengalpattu	Total	85	102	112	132
	Rural	93	116	125	146
	Urban	71	80	93	108
North Arcot	Total	100	124	137	158
	Rural	105	131	143	166
	Urban	85	100	116	129
South Arcot	Total	104	127	143	167
	Rural	109	134	152	177
	Urban	72	85	93	110
Dharmapuri	Total	81	98	106	122
	Rural	83	101	111	125
	Urban	66	77	86	96
Salem	Total	74	88	95	112
	Rural	77	94	101	116
	Urban	65	74	80	101
Periyar	Total	76	94	102	110
	Rural	79	99	106	113
	Urban	70	92	82	102
Coimbatore	Total	76	90	95	113
	Rural	90	111	122	134
	Urban	64	74	81	94
Nilgiri	Total	86	105	113	133
	Rural	94	108	126	153
	Urban	76	93	101	111
Madurai	Total	88	107	118	137
	Rural	100	124	138	156
	Urban	67	78	87	100
Trichirapalli	Total	87	104	118	134
	Rural	92	112	126	140
	Urban	74	84	95	116
Thanjavur	Total	79	95	100	122
	Rural	81	98	104	125
	Urban	73	84	97	112
Pudukottai	Total	73	83	98	111
	Rural	75	86	100	114
	Urban	59	68	76	85
Ramnad	Total	96	118	129	149
	Rural	103	131	142	159
	Urban	78	89	105	123
Tirunelveli	Total	105	128	148	166
	Rural	114	140	163	181
	Urban	89	105	122	139
Kanyakumari	Total	58	68	72	87
	Rural	59	67	73	88
	Urban	58	70	75	80

Note : The four estimates of child mortality, namely, q(1), q(2), q(3), and q(5) denote the number of deaths per 1000 live births by age 1, age 2, age 3 and age 5 respectively.

Source: Child Mortality Estimates of India, Census of India 1981, Occasional Papers, No.5 of 1988, (Pages :186-188) Office of the Registrar General, New Delhi

Appendix VI

Child mortality estimates by the occupation of main workers Tamil Nadu

Occupation		q (1)	q (2)	q (3)	q (5)
Main Workers	Total	104	135	144	159
	Rural	106	135	146	163
	Urban	92	115	130	135
Cultivators	Rural	92	112	126	142
Agricultural Labourers	Rural	138	143	155	174
Manual Workers	Rural	134	151	157	180
	Urban	138	143	148	167
Non-Manual Workers	Rural	70	85	92	99
	Urban	50	63	64	64
Non-workers	Total	73	85	94	111
	Rural	81	97	106	123
	Urban	63	71	80	96

Note : The four estimates of child mortality, namely, q(1), q(2), q(3), and q(5) denote the number of deaths per 1000 live births by age 1, age 2, age 3 and age 5 respectively.

Source: Child Mortality Estimates of India, Census of India 1981, Occasional Papers, No.5 of 1988, (Page 192) Office of the Registrar General, New Delhi

Appendix VII

Known Health Hazards of Some Occupations

Occupation and some Causal Factors	Health problems
Manual	
Agricultural Workers	
(Postural problems exposure to dusts and chemicals; unguarded implements; working barefoot).	<p data-bbox="905 744 1037 783">General</p> <p data-bbox="905 810 1885 1107">Generalised body ache; aches in calves, hips, back, legs and shoulders; irritation of the respiratory system; respiratory allergies, respiratory tract infections; tightness of chest; chest capacities; pneumoconiosis; cutaneous allergies; skin irritation; rashes and pruritus; mycosis; eye irritation; paddy keratitis; helminthiasis — schisto-somiasis, ankylostomiasis; paronocia; fungal infections in feet; eczema; osteomyelitis of fingers.</p> <p data-bbox="905 1142 1024 1181">Injuries</p> <p data-bbox="905 1207 1885 1418">High rate of thresher accidents, especially while crushing sugarcane and ginning cotton; also serious physical injuries occur from the cutting edges of implements, such as sickles and machetes; for lack of first aid facilities, small injuries become serious and often lead to tetanus.</p> <p data-bbox="905 1454 1056 1492">Toxicities</p> <p data-bbox="905 1519 1885 1777">Pesticide poisoning; intestinal respiratory and neurological disorders; nausea; vomiting; abdominal cramps; diarrhoea; cough; headaches, vertigo; blurred vision; muscular twitching, convulsions; loss of reflexes; loss of sphincter control; disturbance of equilibrium; jaundice; coma, and ultimately, death may result by respiratory arrest.</p> <p data-bbox="905 1813 1024 1852">Gynaec</p> <p data-bbox="905 1878 1885 1958">Abortions; premature deaths and stillbirths; high rate of neo-natal, infant and maternal mortality.</p>
Plantation Workers	
(Inhalation of dust; exhaustion due to heavy work loads, further increased by piece rated wages and by high environmental temperatures and humidity; lack of health and medical services, working barefoot)	<p data-bbox="888 2080 1885 2249">Lung infections and bronchial problems; physical stress; malnutrition; helminthie infestations; dysentries, contact dermatitis and other contact disease; heat stroke, high incidence of maternal and child mortality.</p>
Construction Workers	
(heavy work load, unsafe noise levels; exposure to dusts and chemicals; accident-prone working conditions contract labour)	<p data-bbox="888 2442 1885 2733">Physical stress and strain; skeletal defects; numbness of hands and fingers; loss of hearing; stress; high blood pressure; muscular pain; intestinal problems; gastroenteritis; respiratory problems; asthma; silicosis; asbestosis; skin diseases; heat cramps and sun burns; serious accident injuries, deaths, spontaneous miscarriages; high rate of infant mortality; a feeling of isolation and rootlessness.</p>

Carrying Water

(heavy physical strain, even during pregnancy)

Physical strain; intense pain in different parts of the body, especially the legs, waist, pin bones and shoulders; prolapse of the uterus; miscarriages.

All Workers Involved in Manual Labour

(lifting heavy weights; postural problems; heavy workload; continuous heavy work from childhood through illness, pregnancy and in the post-partum period to old age; nutritional deficiency).

Disturbances of blood circulation in the pelvic organs and lower limbs' menstrual disorders; prolapse of the uterus; miscarriage or still birth; flat and narrow pelvis, if carrying weights from early age; risk of injury to spinal column and adjacent muscles, especially in the lumbar region; circulatory organs may be affected; deformities; callouses; neuritic pains; paralysis.

All women workers working in home-based occupations

(Exposure to dusts, such as tobacco, cement, house-dust, exposure to hazardous, chemicals, carbon monoxide, lead, abrasive cleaners, fungi; drudgery; repeated movements of a few parts of body; heavy workload; postural problems without respite; constant strain on eyes due to poor lighting; low nutritional status and work valued less in money terms as well as in terms of status.

Respiratory problems, hastening of tumours; digestive problems; adverse effect on reproductive systems; fatigue; skin problems; back, particularly low back pain; pain in limbs, body aches; stiffness of joints; weakening of eye sight; heart diseases; acidity; ulcers, exhaustion and dizziness.

Workers Involved in Processing and other Industries

(body exposed to ice-cold water; corrosive fluids; wet grounds; constant exposure to dusts, such as, silica, fibres, allergens; infections due to work; drudgery; eye strain; injuries due to sharp-edged, rough surfaces; postural problems; contact with extremely hazardous and explosive chemicals; lack of facilities like toilets, drinking water, rest rooms; low wages and insecurity of employment; low nutritional status.

Extreme fatigue; pain in body; corrosion of hands and feet; peeling of the skin; silicosis and other incurable and fatal respiratory problems such as fibrosis; elubbing of fingers; serious injuries; skin diseases like dermatitis; elephantiasis; backaches; allergies; weakening of eyesight.

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2. Baradhan, Kalpana. 1985. "Women's Work, Welfare and Status: Forces of Tradition and Change in India", *Economic and Political Weekly*, Vol.XX, Nos.51 and 52, December 21-28, p2262.
3. Swaminathan, Padmini. 1996. "The Failures of Success? An Analysis of Tamilnadu's Recent Demographic Experience", Working Paper No.141, Madras Institute of Development Studies, Chennai, July.
4. For a fairly detailed discussion of the (statistical) aspects relating to women's participation in the labour force, see *Gender and Poverty in India: A World Bank Country Study*, Washington, 1991.*
5. Banerjee, Nirmala. 1989. "Trends in Women's Employment 1971-81: Some Macro-level Observations", *Economic and Political Weekly*, Vol.XXIV, No.17, April 29, ppws10-ws22.
6. *Gender and Poverty in India*, op.cit.
7. For more details see A. Vaidyanathan. 1986. "Labour Use in Rural India: A Study of Spatial and Temporal Variations", *Economic and Political Weekly*, Vol.XXI, No.52, December 27, ppA130-A146.
8. There is no disputing the fact that Tamil Nadu is one among the leading industrialized states of the country. Several indicators bear this out. Data in terms of share in number of factories, number of employees, value of output and net value added (for the registered manufacturing factory sector) show that Tamil Nadu has remained within the top four states. For more details, see Padmini Swaminathan, "Where are the Entrepreneurs? What the Data Reveal for Tamil Nadu", *Economic and Political Weekly*, Vol.XXIX, No.22, May 28, 1994, M64-74.
9. See in this context the following:
 - (a) Bose, Ashish. 1994 "TN's successful demographic transition", *Financial Express*, Madras, January 4.
 - (b) Antony, T.V. 1992. "The Family Planning Programme: Lessons from Tamil Nadu's Experience", *The Indian Journal of Social Science*, Vol.5, No.3.
 - (c) Sen. A. 1995. "Population Policy: Authoritarianism Versus Cooperation". The John and Catherine T. MacArthur Foundation Lecture Series on Population Issues, August 17, New Delhi (mimeo).
10. Battiwala, Srilatha. 1988. "Fields of Rice: Health Hazards for Women and Unborn Children", *Manushi*, No.46, pp31-35.
11. Ibid, p34.
12. Shramshakti. Report of the National Commission on Self Employed Women and Women in the Informal Sector, (Chairperson: Ela R. Bhatt), June 1988, New Delhi.
13. For an excellent overview on Occupational Health and Women's Work see the following:
 - (a) Chavkin, Wendy, 1979. "Occupational Hazards to Reproduction: A Review Essay and Annotated Bibliography", *Feminist Studies*, Vol.5, No.2, Summer, pp310-325.
 - (b) Hunt, Vilma, R. 1979. *Work and the Health of Women*, C.R.C. Press, Florida.
 - (c) Romito, Patrizia. and Hovelaque, Françoise. 1987. "Changing Approaches in Women's Health: New Insights and New Pitfalls in Prenatal Preventive Care", *International Journal of Health Services*, Vol.17, No.2, pp241-258.
14. India, Government of. 1981, *Report of the Working Group on Personnel Policies for Bringing Greater Involvement of Women in Science and Technology*, Ministry of Social Welfare, New Delhi.

15. *Ibid.*, p8.
16. Chavkin, Wendy. 1979. "Occupational Hazards to Reproduction..." *op.cit.*, p313.
17. Romito, Patrizia. and Hovelaque, Françoise, 1987. "Changing Approaches in Women's Health...", *op.cit.*, p244.
18. *Ibid.*, p247.
19. See Tables 45 and 46 in the study on *Gender and Poverty in India, A World Bank Country Study*, Washington, 1991. pp323-324.
20. "There is often a trade-off between the time spent in collecting fuels and the time must be devoted to preparing them and tending the cooking fuel. Major activities related to fuel provision include:
 - travel time to the fuel gathering area;
 - time spent in fuel collection;
 - transporting fuels;
 - fuel preparation (woodcutting, breaking and bundling of crop residues, making dung cakes);
 - procuring kerosene (extremely time-consuming where kerosene is rationed as in many countries);
 - food preparation and cooking; and
 - fire tending

Clearly, it is the totality of this labour use versus cost and convenience considerations that is the basis for the household's choice among alternative fuels."

Cecelski, Elizabeth. 1985. *The Rural Energy Crises, Women's Work and Basic Needs: Perspectives and Approaches to Action*, International Labour Office, Geneva, p24.

21. Batliwala, Srilatha, 1982, "Rural Energy Scarcity and Nutrition: A New Perspective", *Economic and Political Weekly*, Vol.XVIII, No.9, February 27, p332.

Cecelski (1985) adds:

Time spent on [these] survival activities can be compressed little without seriously affecting family welfare. Most often when opportunities for women to earn extra income or the need for agricultural work present themselves to a poor family the solutions are limited; the woman works even longer hours; other family members (most often children) take over some of these tasks, reducing other activities such as school attendance, or the less "essential" survival activities — such as hygiene, child feeding and care - and preparation of special infant foods are skipped or abandoned.

Cecelski, Elizabeth. 1985. *The Rural Energy Crisis...* *Op.cit.*, p30.

22. In an interesting article from where this quote is taken, Sonalde Desai and Devaki Jain argue that in many developing countries women's domestic burdens may pose a greater impediment than child care responsibilities to participation in those economic activities that may yield higher income.

Desai, Sonalde. and Jain, Devaki. 1994. "Maternal Employment and Changes in Family Dynamics: The Social Context of Women's Work in Rural South India", *Population and Development Review*, Vol.20., No.1, March, p132.

23. These and more details are contained in the following:

- (a) Tata Energy Research Institute. 1994. *Changes in the Indian Energy Scene Over the 70s and 80s, Second India Study Revisited*, New Delhi, February, especially Chapter 11.

- (b) Tata Energy Research Institute. 1995. *Environmental Considerations and Options in Managing India's Long-term Energy Strategy*, New Delhi, November (A Report prepared for the United Nations Environment Programme).
24. A telling analysis of the adverse consequences faced by the Indian poor because of prolonged and intense exposure to pollution within the four walls of homes is contained in, Souparno, Banerjee. 1996. "The Enemy Within" *Down to Earth*, Vol.5, No.5, July 15, pp27-32.
- See also in this context, Batliwala, Srilatha. 1995. "Women and Energy: Bearing the brunt of labour", *The Hindu Survey of Environment*, Chennai, pp15-20.
25. Jamuna Ramakrishna quoted in, Souparno, Banerjee. 1996. "The Enemy Within", op.cit., p32.
26. Tata Energy Research Institute. 1994. *Changes in the Indian Energy Scene Over the 70s and 80s*, op.cit., p163.
27. For more details, see, Arun Kumar, A.V., Vani, B.P., and Vyasulu, Vinod. 1994. "Structure of Employment as seen from 1981 and 1991 Censuses: A Preliminary Look", *Economic and Political Weekly*, Vol.XXX, No.38, September 23, pp2375-2388.
28. Points (a) to (d) which follow, draw heavily from an analysis of the NSS data made by C.P.Chandrasekhar and Abhijit Sen. 1996. "Has employment really improved post-reforms?", *Business Line*, Tuesday, September 24, Chennai.
29. A study of time, energy and consequences for health of drinking water collection, would without doubt bring out the adverse (reproductive) health impact of non-availability and/or not-so-easy availability of water similar to the problems related to collection of fuel. As an illustration we reproduce a finding published in the Indian Express, July 16, 1994, Chennai.
- The need to carry water either over long distances and/or up a flight a stairs (as in the case of urban Housing Board tenements), apart from causing heavy physical strain, is also responsible for prolapse of the uterus and miscarriages. A random survey by Indian Express has revealed that women residing in the City's Slum Clearance Board tenements and multi-storeyed Housing Board apartments in certain water-deficit localities in Madras city are prone to a host of physical debilities and gynaecological complications. Brought about primarily by carrying water up several flights of steep steps many times a day, these women end up with complaints ranging from acute pain in the abdomen and pelvis, disorders in the menstrual cycle and painful swelling of the knee joints. These, in turn, lead to major complications, at times resulting in displacement of the uterus. Doctors attending on women residing in these localities confirm that such ailments are very common among the women dwelling in the upper floors of tenements.
30. Details contained in, Census of India, 1991, Paper 2 of 1993, *Housing and Amenities: A Brief Analysis of the Housing Tables of 1991 Census*, Office of the Registrar General and Census Commissioner, India, New Delhi.
31. Refer, for example, to *Sectoral Energy Demand in India Report of the Government of India in cooperation with ESCAP, UNDP and the Government of France*, August 1991, p32.

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