Energy for women and women for energy (engendering energy and empowering women)[1]

Srilatha Batliwala
Hauser Center for Nonprofit Organizations, Harvard University, 79 JFK Street, Cambridge MA 02138, USA

Amulya K.N. Reddy
International Energy Initiative, 25/5 Borebank Road, Benson Town, Bangalore-560 046, India
Fax/Tel: +91-80-353 8426; e-mail: amulya1@vsnl.com

The women-energy nexus involves the challenge of engendering energy and the challenge of empowering women through energy. The first challenge arises from the gender disaggregation of energy consumption patterns. A quantitative account of the share of women in these patterns is presented through a description of the rural energy consumption pattern of the village of Pura in South India. The results indicate that women work more hours than men. Women also perform the back-breaking tasks and are displaced by agricultural mechanisation. The energy output-input imbalance is aggravated by the fact that, in developing countries, women traditionally eat last and least in a family – women therefore take in less food energy than men. The gender distribution of labour results in negative health impacts. The scarcity of energy services in rural areas has serious social and gender impacts. Tackling them requires energy interventions to improve the quality of life for women. Examples of such energy interventions are the community biogas plant at the village of Pura and the multi-purpose platforms of the Mali project.

Since technological opportunities exist for such energy interventions, attention is turned to the second challenge of empowering women through energy entrepreneurship. This requires a change of mind-set on the part of energy planners and activists – they must promote the notion of women as managers and entrepreneurs, and not just beneficiaries, of improved energy services. The idea is to push the following sequence: women as deprived in energy consumption patterns → women as beneficiaries of energy interventions → women as managers of enterprises → women as energy entrepreneurs. This is nothing short of a paradigm shift – but once achieved and implemented, the results will speak for themselves. Such an approach will engender energy by converting it into a force for improving the quality of life as well as enhancing productive capacities – a virtuous circle of energy for women and women for energy.

1. Women in energy consumption patterns

Energy analysis was traditionally restricted to the supply side of the energy fuel cycle[2]. Fortunately, the demand side has also received attention over the past three to four decades. However, even this shift has by and large focused on sectoral demands and end-uses, with little attention being paid to the gender distribution of energy consumption.

Perhaps one of the first exceptions to this gender blindness was the work on rural energy consumption patterns carried out in the 1980s by the ASTRA[3] programme of the Indian Institute of Science in Bangalore, India. Even the first papers on rural energy consumption patterns from this programme brought out clearly the gender aspects of energy [Ravindranath et al., 1979; Reddy, 1978; Reddy and Subramanian, 1979]. Subsequently, there were excellent reports on the gender aspects of the ASTRA energy consumption studies by Shailaja [Shailaja and Ravindranath, 1990; Shailaja, 2000]. These gender aspects were also highlighted in the book *Energy for a Sustainable World* [Goldemberg, Johansson, Reddy and Williams, 1988]. More recently, the *World Energy Assessment* (Chapter 2) [WEA, undated], available on the Web, summarized the research linking gender and energy.

Energy consumption patterns have to be the baseline for analysis of the gender aspects of energy. This baseline must include the pattern of expenditure of energy (including human energy), the type of tasks performed by women, the impact of mechanisation and commercial energy inputs, the intake of food energy, and the health impacts of women's labour.

1.1. Rural energy consumption patterns

The vast majority of the women in developing countries live in rural areas, mostly in villages. Hence, it is necessary at the outset to examine the nature of energy consumption patterns at the village level.

There have been several studies of the patterns of energy consumption in villages. Among the earliest of the studies was that of six villages in the Ungra region of Tumkur district, Karnataka state, southern India, carried

Table 1. Energy sources and activities in Pura (1977)

	Agriculture	Domestic	Lighting	Industry	Total
Human hours	34848	255506	-	20730	311084
(Man hours)	(19914)	(82376)	-	(16485)	(118775)
(Woman hours)	(14934)	(113928)	-	(4245)	(133107)
(Child hours)	-	(59202)	-	-	(59202)
Bullock hours	5393	-	-	-	5392
Firewood (kg)	-	207807	-	8930	216737
Kerosene (l)	-	-	1938	156	2094
Electricity (kWh)	7264	-	3078	820	11162

Table 2. Pura energy source-activity matrix (GJ/year)

	Agriculture	Domestic	Lighting	Industry	Total
Human	31.72	212.77	-	20.82	266.99
(Man)	(20.87)	(86.27)	-	(17.26)	(124.40)
(Woman)	(12.53)	(95.49)	-	(3.56)	(111.58)
(Child)	-	(31.01)	-	-	(31.01)
Bullock	51.96	-	-	-	51.96
Fuelwood	-	3,308.68	-	142.17	3,450.84
Kerosene	-	-	72.91	5.87	78.77
Electricity	26.19	-	11.10	2.97	40.27
Total	111.54	3,521.44	84.01	171.83	3,888.82

Total energy = 3,888.32 GJ/year = 1.079 GWh_t/year = 2.955 MWh_t/day = 8.28 kWh_t/day/capita (Wh_t = watt-hours thermal)

out in the late 1970s [ASTRA, 1982]. Despite the vintage of these studies, they are sufficiently generic and illuminating to warrant brief recapitulation here to establish the context.

Pura (latitude 12º 49′ 00″ N, longitude 76º 57′ 49″ E, height above sea level 670.6 m, average annual rainfall 127 cm, population (in September 1977) 357, households 56) was one of the six villages surveyed in the Ungra region in Kunigal *taluk*, Tumkur district, Karnataka state, southern India.

The energy-utilising activities in Pura consisted[4] of: (1) agricultural operations (with *ragi (Eleusine coracana)* and rice as the main crops); (2) domestic activities – grazing livestock, cooking, gathering fuelwood and fetching water for domestic use, particularly drinking; (3) lighting; and (4) industry (pottery, flour-mill and coffee shop)[5].

These activities were achieved with human beings, bullocks, fuelwood, kerosene and electricity as *direct*[6] sources of energy.

An aggregated matrix showing how the various energy sources were distributed over the various energy-utilising activities is presented in Table 1 in the units appropriate to the sources.

Using appropriate conversion factors, a source-activity matrix for Pura village was obtained (Table 2). The matrix yields the following ranking of *sources* (in order of percentage of annual requirement): (1) fuelwood 89 %, (2) human energy 7 %, (3) kerosene 2 %, (4) bullock energy 1 %, and (5) electricity 1 %. The ranking of *activities* is as follows: (1) domestic activities 91 %, (2) industry 4 %, (3) agriculture 3 %, and (4) lighting 2 %.

Human energy is distributed thus: domestic activities 80 % (grazing livestock 37 %, cooking 19 %, gathering fuelwood 14 %, fetching water 10 %), agriculture 12 %, and industry 8 %. Bullock energy is used wholly for agriculture, including transport. Fuelwood is used to the extent of 96 % (cooking 82 % and heating bath water 14 %) in the domestic sector, and 4 % in industry. Kerosene is used predominantly for lighting (93 %), and to a small extent in industry (7 %). Electricity flows to agriculture (65 %), lighting (28 %), and industry (7 %).

There are several features of the patterns of energy consumption in Pura that must be highlighted. Even though not all of them are directly relevant to gender aspects, the overall context needs to be appreciated.

1. What is conventionally referred to as *commercial* energy, i.e., kerosene and electricity in the case of Pura, accounts for a mere 3 % of the inanimate energy used in the village, the remaining 97 % coming from fuelwood[7]. Fuelwood must be viewed as a *non-commercial*