

Method Précis: Functional Time Use Analysis

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With functional time use (FTU), we follow the same systemic logic as with material and energy metabolism while largely complying with the generally established classifications used by survey-based time use studies (e.g., Robinson and Godbey 1997). We treat human time as a key resource of social systems. Although each individual has 24 h per day at his or her disposal, the *stock* of available time in a social system (e.g., a village) is ‘created’ by population size, reproduction (the birth of new individuals) and the average number of years its members stay in the community. Concerning the *flows* of human time, one fraction of daily time use is expended on certain metabolic functions (such as sleeping or eating) necessary for an individual’s basic reproduction, whereas the remainder is used according to sociocultural norms, economic necessities or simply individual preferences. We distinguish among flows serving four functional subsystems, each of which requires time for reproduction: the *person system*, the *household system*, the *economic system* and the *community system* (for a discussion on methodology, see Singh et al. 2010).

Such a systemic analysis offers a perspective on how much human time is available and what it is used for in the *whole* social system, thereby helping us to understand the specific *opportunities* and *constraints* a society faces in its interaction with the natural environment. At the same time, because the lifetime/labor time ratio is calculated for all the age/sex groups in this system, FTU sheds light on the ‘labor burden’ or ‘time poverty’ some of these groups bear with regard to important aspects of social inequality.

Classifications and Methods

The *person system* functionally serves personal reproduction and includes all those activities that cannot be delegated or ‘outsourced’ to others. It holds all the physiologically necessary functions for a person’s self-reproduction, such as sleeping and eating, and it encompasses functions for extended reproduction, such as studying, leisure activities and idling. Breaking it down into single activities, the *person system* comprises sleeping, eating, hygiene, rest and idleness, leisure activities and study and education.

The *household system* involves those personal reproduction functions of its members that need or allow for collaboration and a division of labor. The household system is typically organized as an exchange of unpaid labor according to the social norms regulating age and gender roles in the local system. Time use for the household system contains the following sub-activities: care for dependents, food preparation, house building, repair/maintenance work and domestic chores.

The time invested in reproducing the *economic system* is what we usually refer to as ‘labor time’. The economic system implies and relies upon a social division of labor and, at least in market-based societies, usually involves monetary transactions. In subsistence societies, economic activities may simply be an additional

function of households or communities. The economic system entails the following activities: agriculture, hunting, fishing, gathering, trading, wage work, kitchen work, gardening, manufacture of handicraft and animal husbandry.

The *community system* is the reference system for activities contributing to the reproduction of services on the community level, reciprocal relationships, social cohesion, politics and religion. It subsumes public sports and games, visiting friends and relatives, ceremonies and festivals, communal work and political participation.

FTU data collection in the field may use various methods. In some case studies, ‘time-frame’ analysis was applied, focusing only on certain activities (such as building a house or repairing a boat) of functional importance. The duration of these activities and their participants (in terms of gender and age) were recorded and subsequently weighted according to their annual frequency. This method is practical for understanding the importance of specific focal activities, but it hardly allows for constructing a comprehensive time budget on the system’s level. In more recent empirical studies, time use data were collected more systematically, with samples of people and households observed for days during waking hours. In addition to these samples, spot checks by direct observation (who does what at a certain time) allow the creation of independent statistical estimates that can—in combination with household interviews—be used for cross-checking. Optimally, people have to be ‘shadowed’ at different times of the year, thus covering seasonal differences. The reliability of these measurements as well as the annual estimates that need to take into account the variability of the number of people present in the system (because of some leaving for seasonal work, for example) and the variability of seasonal tasks (such as sowing or harvesting) still requires some improvement. However, repeated application and refinement of these methods across various case studies seems to produce increasingly robust results, which we illustrate for one of our latest case studies below.

Empirical findings from Campo Bello (see Ringhofer 2010, 2013), an indigenous subsistence community in the Bolivian Amazon, provide insights into the share of labor of each age/sex group from a system-level perspective (Table 26.3). The economic system predominantly draws on male labor; however, 38 % of all working hours are supplied by women. For household work, the share of female labor amounts to three-quarters of overall time investment in this system. Taken together, the female share in labor hours exceeds the share of the female population (55 % of labor hours relative to a 46 % share in population).

Children of both sexes (6–15 years) contribute quite significantly to labor activities within the economic system, accounting for nearly one-third. The same is true for the ‘household economy’. One-third of all the labor invested in the upkeep of the household system is provided by children. Clearly, children perform lighter work and may perform it less efficiently than adults, but these results lend support to the argument that in agricultural communities, children have high use value in terms of labor contribution.

Table 26.3 Daily labor time invested by age/sex groups in Campo Bello (Bolivia) as observed in 2004 and 2006

	Boys 6–15	Male adults 16–60	Male adults > 60	Girls 6–15	Female adults 16–60	Female adults > 60	Total hours per day	Share of children	Share of females
Population Numbers (n)	37	41	6	27	38	6	3720	41.3 %	45.8 %
<i>Household System (hours/day) %</i>	66.6 13.5 %	45.1 9.2 %	13.2 2.7 %	78.3 15.9 %	258.4 52.6 %	30 6.1 %	491.6 13.2 %	29.5 %	74.6 %
<i>Economic System (hours/day) %</i>	96.2 17.0 %	237.8 42.0 %	15 2.7 %	70.2 12.4 %	133 23.5 %	13.8 2.4 %	566 15.2 %	29.4 %	38.3 %
Total Daily Working Time %	162.8 15.4 %	282.9 26.7 %	28.2 2.7 %	148.5 14.0 %	391.4 37.0 %	43.8 4.1 %	1057.6 28.4 %	29.4 %	55.2 %

In effect, the labor demand on women of all age groups competes with the time to spend on personal reproduction activities, such as sleeping, eating, studying, leisure and idleness (Fig. 26.5).

Thus, FTU also serves as a tool for assessing the gender impact of development innovations. In the case of Campo Bello, the use of labor-efficient rice seeders, a technology initially introduced as part of a larger development program (and that has since turned into a highly solicited agricultural tool), does not particularly benefit women. Rice seeders only increase the efficiency of rice planting, an activity that is largely undertaken by men. Other labor-intensive crop management tasks such as weeding and harvesting largely remain in the hands of women—with no particular labor-saving devices introduced. A similar conclusion applies to the innovation of nylon fishing nets. These labor-saving devices are only used by men; women still use traditional fishing armory, such as hooks and lines and machetes. However, the mending of the fishing nets is assigned to women, thereby adding to their labor burden rather than reducing it.

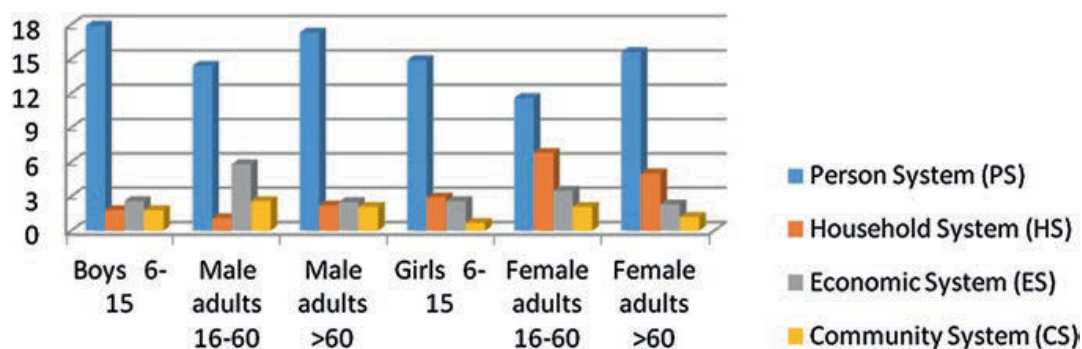


Fig. 26.5 Age/sex group segregation in time use, Campo Bello 2004 and 2006

Other uses of this methodology allow for structural comparisons between different social systems and sociometabolic regimes. Examples that continue in the tradition of Ester Boserup's work include the analysis of the energy intensity of working hours, labor investment per unit area or per unit harvest and the impact of increasing fossil fuel use in changing these relationships (see, for example, Fischer-Kowalski et al. 2010), thus enhancing our understanding of the impact of development trajectories in both social and natural systems.

References

- Fischer-Kowalski, M., Singh, S. J., Ringhofer, L., Grünbühel, C. M., Lauk, C., Remesch, A. (2010) *Sociometabolic regimes in indigenous communities and the crucial role of working time: A comparison of case studies*. Social Ecology Working Paper 121
- Ringhofer, L. (2010). *Fishing, foraging and farming in the Bolivian Amazon: On a local society in transition*. Dordrecht, Heidelberg, London, New York: Springer Science + Business Media B.V.
- Ringhofer, L. (2013) *Introducing functional time use (FTU) analysis: A gender-sensitive approach to labor time in Gendered Perspectives on International Development*, GPID Working Paper 302. (http://gencen.isp.msu.edu/documents/Working_Papers/WP302.pdf)
- Robinson, J. P., & Godbey, G. (1997). *Time for life: The surprising ways Americans use their time*. Pennsylvania: Pennsylvania State University Press.
- Singh, S. J., Ringhofer, L., Haas, W., Krausmann, F., Fischer-Kowalski, M. (2010). *Local studies manual: a researcher's guide for investigating the social metabolism of local rural systems*. Social Ecology Working Paper 120 (http://www.uni-klu.ac.at/socec/downloads/WP120_Web.pdf)