Time allocation in Catalonia: Policy implications for unpaid work

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Abstract

The present work tries to bring visibility to the part of social work that is referred to as "unpaid work" in the jargon. The part of social work that remains outside the market necessary to structure and maintain households, human relationships and communities and providing sustenance and care. It represents a flow of hidden subsides to the economy mostly shaped, structured and experienced by women. The work sheds light on the undesirable implications of reducing the unpaid work in monetary terms, quantifying it as any similar works provided by the market. In this way, we highlight the importance of household contribution to society's wellbeing and the dangerous of the continuous shift of labour and skills from households-based production to the commodity-based economy. If future, in fact, the adaptability could ask for a reallocation of sustainable policy toward unpaid and community, less energy intensive.

Palabras clave: time allocation, paid and unpaid work, gender, societal metabolism.

Área temática: tiempos, trabajos y género en tiempo de crisis.

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1. Introduction

The present work tries to bring visibility to the part of social work that is referred to as "unpaid work" in the jargon, along with the implications of its maketization. The unpaid work is necessary to build and maintain homes, establish human relationships and communities provisioning, for sustenance and caring activity (Ellie Perkins 1997) but the commodification of its service and production has important consequences in social and environmental terms. In particular, within the scope of this article, we pay special attention to the interactions between paid and unpaid work, an approach that refers in literature to Sahlins's (1974) Domestic Mode of Production, to Polanyi's (1944) notion of embedded economy, to the economic role of the gift (Mauss, 1924; Godbut 1998, 2002), and to Kropotkin's (1915) analysis of mutual aid as a factor of evolution in social life. As well, the boundary between market production and household production can be interpreted in Becker's (1965) theory of allocation of time. Finally, this approach also fits with the eco-feminist criticism to economic thoughts: mainstream economics forget about dependency and interdependency of life; the link with social and natural world that lies outside the market (McMahon, 1997, Jochimsen & Knoblock, 1997, O'Hara, 1997, Mellor, 1997). Goods and services produced by the household and nature remain external and unaccounted (O'Hara, 1997), generating a representation of the society in which the embeddeness and embodiedness of humanity is hidden (Mellor, 1997).

Under these frameworks, the present paper highlights that part of social work that remains outside the market (unpaid work) necessary to structure and maintain households, human relationships and communities and providing sustenance and care (Perkins, 1997). It represents a flow of hidden subsides to the economy mostly shaped, structured and experienced by women (Jochimsen & Knoblock, 1997). Also, we shed light on the undesirable implications of reducing the unpaid work in monetary terms, quantifying it as any similar works provided by the market. In this way, we highlight the importance of household contribution to society's wellbeing and the dangerous of the continuous shift of labour and skills from households-based production to the commodity-based economy.

Our analysis first structures the use of time in Catalonia across gender and age categories, then we present the main differences in time allocation between males and

females. It allows to show the importance of household activities necessary to maintain, in terms of time allocation, the quality of life of a developed society. If the household sector produces economic benefit through unpaid work, time rather than money becomes the meter of reference. Considering an evolutionary perspective we provide some insights for future scenarios. In a few decades the structure of the population will change, and many more old people will require care and assistance. Who will do these tasks in the future is an issue. Finally, we explore possible implications, in energy terms, of making the unpaid work part of the market. To analyze the time allocation in Catalonia we will use the methodology multi-scale integrated analysis of societal and ecosystem metabolism MuSIASEM – original proposed as MSIASM. This meta-model of accounting makes possible to perform a check on the feasibility and desirability of patterns of metabolism of socio-economic systems by providing a characterization at different levels and scales (Giampietro et al 2008).

With an aging population, considering the importance of care giving and of carrying out household chores, the MuSIASEM approach wishes to highlight the overall amount of work (paid and non-paid) done by women. Furthermore, the case is to discuss how this non conventional part of the economic sphere will be performed in the future and by whom. To such extent, combinations between the use of the market (externalisation) or domestic production for household services have to be considered, as well as their impact in terms of energy use. This will be discussed in this paper for the specific case of Catalonia.

The paper is organized as follow, section 2 tells about the background analysis; section 3 explains the methodology; section 4 presents the results; section 5 discusses the principal outcome; section 6 concludes.

2. Background

Becker (1965 and 1981) developed the theory of household production. He considered that household production is a place where not only consumption (as in the traditional microeconomic approach) but also production is carried on. This resembles what Sahlins (1977) defined in Economic Anthropology as the Domestic Mode of Production: households and families do not tend to rationalize their behaviour through

organization in scale, time management or other techniques as firms do. Nonetheless, they provide a sort of economic production invisible to macro-economic figures. This embedded economy (Polanyi, 1944) is not based on the laws of scarcity, rationality, utility maximization, is not visible and does not produce any exogenous market value, with the consequence of keeping anonymity on its main actors, predominantly women and nature (Jochimsen and Knobloch, 1997). The very essence of the market system defends a pre-analytical position such as the natural law of the markets, the natural instinct of people towards individualism, the natural law of Darwinian evolution. By studying the rising of the market Polanyi made special reference to the early economic history and to economic anthropology. His aim was to question the philosophical and moral fundaments of the market; the answer he gave is very different from what the market economy is trying to sell. Using evidence from Thurnwald, Malinowsky, Firth, Herskovits, Weber, Pirenne, Loeb and others, Polanyi showed that:

- The aim of profit is not "natural" for the human being;
- To expect payment from a job is not "natural" for the human being;
- To limit work to the minimum is not "natural" for the human being;
- Normal incentives to work are not based on profit but on reciprocity, competition, happiness to work and social approval;
- Economic systems are normally embedded in social relationship; the distribution of material goods is ensured by non economic reasons;
- Reciprocity and redistribution are principles of economic behaviour that refer not only to little primitive communities, but also to large and rich civilizations;
- The presence or absence of markets is not an essential characteristic; local markets do not tend to develop;
- Labour division does not originate from trade or from exchange but in geographical, biological and other non economic factors;

- Money is not a decisive invention; its presence or absence does not necessarily create a substantial difference in the economy.

Mauss, another anthropologist, in his "*Essai sur le don*" (1923-1924) explained how the gift economy is central in traditional societies in a time when Malinowsky (1922) showed the complex trade system of the Trobriand Islands where, when different islanders used to meet, the gifts interchanged – as a representation of their the socio-cultural values – were more important than the trade itself.

Kropotkin (1915) argues that the Darwinian idea of competition for life and of the survival of the fittest – then reproduced as the natural characteristic of economic systems – is only one factor of the evolutionary law. He shows how, among members of the same specie or society, most living time is instead spent in mutual aid. He produces an extensive evidence of it: Darwin himself recognised that in the natural world the *survival of the fittest* is not the only mode and that many times there is also co-operation among animals. Kropotkin begins with the description of co-operative behaviour among social animals and stresses that co-operation co-exists in nature with fierce competition. His aim is to make justice of the misinterpretation of Darwinian findings and goes on showing how mutual aid is also a characteristic of less evolved tribal and hunter-gatherer societies. Higher degrees of social evolution show that still, non-competitive social behaviour is the rule amongst rural communities, barbarians from the post-Roman time and Middle Age guilds. Feudalism co-existed with rural villages and tolerated their most basic institutions: common property of the land and self-jurisdiction of the villages. When the system of the commons fell, communes and handcraft corporations continued the history of co-operation within urban areas.

Becker's *A Treatise on the Family* (1981) describes the evolution of the family towards the market. The role of technical change over the value of accumulated knowledge of elders is stressed and the quality of information is highlighted (Hannan, 1982). "*The traditional family is depicted in the context of a risky but stationary world where mutual help and insurance across generations in extended families can play an important role in the lives of individuals […] the modern family is briefly sketched as nuclear with […] fewer functions to perform in a world of rapid change and*

more efficient markets. The contemporary period is described as one of very rapid family change […] and an increase in labour force participation" (Ben-Porath, 1982, pages 56-57).

Time is a crucial element that marks the distinction between market production and non market domestic production. In fact, under a competitive and disembedded perception of the monetary-driven economic system, time is a scarce resource and its use has to be efficiently allocated. On the other hand, in household economies, and in the economics of reproduction, maintenance and care, time is less relevant and subject to the pace of Nature.

From (eco-)feminist literature we can derive some criticisms in terms of time perception. Mellor (1997) distinguishes between clock time of production, typical of time based competitive paid work, and biological time of reproduction, more typical of households where caring, nursing and feeding are important household chores. Without entering the distinction between entropic historical "Time" and Newtonian mechanicistic "time" (Georgescu-Roegen, 1971), we consider that the latter is more typical of capitalistic profit-making production, which has to produce faster and which does not respect the time of natural reproduction (Brennan, 1997). Newtonian time neither applies to household's reproduction of value, which, for its maintenance and caring functions, is more dependent from physiological and biological processes such as child-bearing, aging, sleeping, eating, etc.

Eco-feminist literature stresses on the role of women in care and reproduction and maintaining the connection to the rhythms of nature with their unpaid work also serving as invisible subsidies to economic man (McMahon, 1997).

In the context of Becker's theory of allocation of time and his rational economic analysis extended to non-market sphere of social life, (Becker, 1965 and 1981) Anxo and Carlin (2004) show that "*Consistent with both bargaining and specialization models of the family, we find that the greater the husband's share of labour income, the lower his share of house work time; the greater the wife's market hours, the lower his housework time, but the larger his share of housework time*" (page 14).

Bittman et al. (2005) consider the time cost of care and show that "*summing the average caregiving time provided by all household members reveals that over a quarter of Australian households caring for an adult or child provide the equivalent of a full-time employee's labour, and another quarter work between 20 and 39 total weekly hours to provide informal care*" (page 54).

Most contributions from time use research focus on gender and age distinction, as is the case of our research (see next section). The most relevant household chores are looking after people –children, sick or elderly – and routine household works. In particular, Joesch and Spiess (2006) show that European mothers among 9 countries spend between 40 and 67 hours per week looking after children, as reported in ***Figure 1*** below.

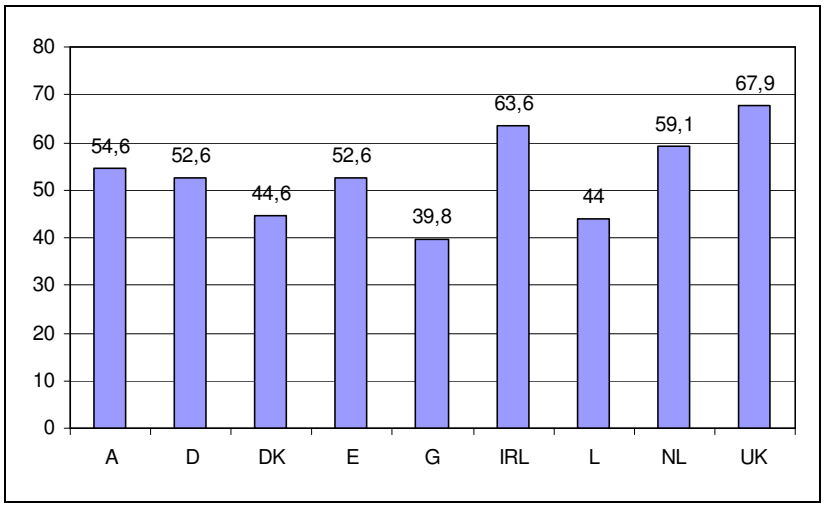

Figure 1. Hours/week reported looking after children in 1996: means from 9 European countries. Adapted from Joesch and Spiess (2006)

With the exception of Spain and Greece the authors explain part of the great time variation in looking after children as an outcome of different government policies where, for a country with more policies for combining parenthood and employment, mothers reported spending less time looking after children because is easier to reconcile motherhood and paid work.

As well, the Norwegian Time Use Survey (conducted through questionnaires and through diary information) shows that women and older people spend more time on housework than men and younger generations, with figures ranging between 7 and 20

hours per week for females and between 3 and 9 for males. (Kitterød and Lyngstad, 2005)

3. Methodology

The "metabolism of human society" is a notion used to characterize the processes of energy and material transformation in a society that are necessary for its continued existence. The MuSIASEM approach (Giampietro et al. 2008) is based on the idea that human societies have two distinct forms of metabolism (Georgescu-Roegen 1971): (1) an endosomatic metabolism – e.g. food energy converted inside the human body for preserving and sustaining the physiological activity of humans; and (2) an exosomatic metabolism – e.g. energy converted outside the human body with the goal of boosting the output of useful work associated with human activity (e.g. when using tractors, melting metals, moving heavy loads). To study the biophysical roots of economic processes, Georgescu-Roegen (1971) proposed the adoption of a fund–flow model for representing, in biophysical terms, the socio-economic process of production and consumption of goods and services. This framework in the chosen proposes a distinction between the different categories used for quantitative representation:

1) **Fund** variables (capital, people, and Ricardian land) characterizing the size of what has to be maintained. Fund categories refer to agents remaining "the same" over the duration of the representation. In this case, we define the size of the whole Catalan society in terms of Total Human Activity; a variable directly related to population size and affected by demographic changes.

2) **Flow** variables (energy, raw material, new products) characterizing the amount of energy and materials going across the system analyzed. Flow categories refer to elements appearing and/or disappearing over the duration of the representation. That is, elements that enter but do not exit and /or elements that exit without having entered the process. In this case, we consider final energy consumption, which we call the Energy Throughput (ET) of the Catalan economy. In the same way we can use the ET of the Service and Government (SG) sector, as well as the Transport (TR) and Household sectors (data from Ramos-Martin et al., in press).

The MuSIASEM approach produces different intensive and extensive variables. Some of the extensive variables are the following:

THA Total human time for the whole society in a given year (fund element).

HA_i Human activity allocated in sector ***i*** for a given year (fund element).

TET Total Energy Throughput (exosomatic energy consumption) in the whole society for a given year (flow element).

ET_i Total exosomatic energy consumption in a sector ***i*** for a given year (flow element).

The intensive variable used here is flow-fund ratio across different levels of hierarchy. This variable provides information on the structure of the sector under study by means of indicating the amount of exosomatic energy invested per hour of human activity in a given sector. In this case, we use the following flow-fund ratios:

$EMR_{SG} = \frac{ET_{SG}}{HA_{SG}}$: Exosomatic metabolic Rate of the Service and Governance sector,

$EMR_{TR} = \frac{ET_{TR}}{HA_{TR}}$: Exosomatic metabolic Rate of the Transport sector,

$EMR_{HH} = \frac{ET_{HH}}{HA_{HH}}$: Exosomatic metabolic Rate of the household sector

These ratios denote how much exosomatic energy is invested for each hour allocated in each one of these sector/activities. The extensive variables are related to the size of the analyzed system, and the intensive ones refer to how the system is performing its different activities.

3.1 Time use categories

As mentioned above, we start defining a set of typologies of "end uses" of human activity. The typologies are the following:

- *Physiological Overhead* (HA_{PO}) the amount of hours allocated to sleeping, eating and personal care,

- *Unpaid Work* (HA_{UW}) the amount of hours allocated in household chores (i.e. cleaning, shopping, cooking, caring)

- *Paid Work* (HA_{PW}) the amount of hours allocated to work in the market,

- *Study* (HA_S) the amount of hours allocated to school and university,

- *Transport* (HA_{TR}) the amount of hours allocated to mobility, and

- *Leisure and Entertainment* (HA_{LE}) the amount of hours allocated in leisure.

The requirement of congruence implies that:

$$THA = HA_{PO} + HA_{UW} + HA_{PW} + HA_S + HA_{TR} + HA_{LE.} \quad (1)$$

Equation 1 should hold for the whole society and for the individuals.

3.2 Age categories

To characterize the population we define the following age categories: $x_1 \leq 10$; $10 \leq x_2 \leq 24$; $25 \leq x_4 \leq 44$; $45 \leq x_5 \leq 64$; $X_6 \geq 65$. Then, the information of the use of time in Catalonia is based upon the information presented in IDESCAT (2003), which indicates the allocation of time across sex and age categories.

In this study, we use the correspondences of data across categories as Table 1 shows.

Table 1. Age categories and time use categories used in the MuSIASEM analysis and by IDESCAT (2003)

Categories	*Our categories*	*IDESCAT categories (interviewees are older than 10)*
Age	< 10 10 to 24 25 to 44 45 to 64 >65	n.a. <25 25 to 44 45 to 64 >65
Use of Time	• Physiological overhead (PO)	• Personal caring • Work

	• Paid work (PW) • Study • Unpaid Work (UW) • Transport (TR) • Leisure and Entertainment (LE)	• Education • Home and family + Voluntary work & meetings • Movements and not specified uses of time • Social life & entertainment + Sports & open air activities + Hobbies and games + Media.

3.3 Calculation of the time use in Catalonia

The first step is the calculation of the Total Human Activity across age and sex. This is done by multiplying the Catalonian population by 8.760 hours (365 days/year * 24 hours/day). Then, based in the statistics on the use of time, we proceed to calculate the time allocated to different activities, across age categories and sex.

For the age categories older than 10 years old we use the information provided by IDESCAT (2003). On the other side, we either make some assumptions on the use of time of people below 10 years old or we look for information in other data sources. In order to obtain their time use, we made the following assumptions.

- We assume that people below 10 years old children allocate use half of their time to Physiological Overhead (PO_{0to9} = Human Disposable Activity (HDA_{0to9}) = THA_{0to9} * 0.5).

- We obtain the number of students under 10 years old from Departament Educació (2007). We assume that school students allocate 6 hours/day, 5 days/week and 36 weeks/year to study.

- We consider that people younger than 10 years old don't work

- We assume that people younger than 10 years old don't allocate time to Unpaid Work (i.e. they don't carry out household chores).

- We consider that people younger than 10 years old are transported by their parents (i.e. they don't allocate time to mobility).

- We consider that they allocate the rest of their time to Leisure and Entertainment. That is, for age category 0 to 9, $HA_{LE} = THA - HA_{PO} - HA_{ST}$.

4. Results

Aggregating the data at the Catalonian level according to the different time categories, it is possible to note that the half of Total Human Activity is Physiological Overhead (48.1%); the amount of time allocated to Studying (Study at school and at university) is the 2.3%; the time spent to move from a place to another is 5.1%, the Catalan dedicate 22.8% of their time to Leisure and Entertainment; they work 10.8% (Paid Work) in the market and 10.9% (Unpaid Work) of their time goes for the Household.

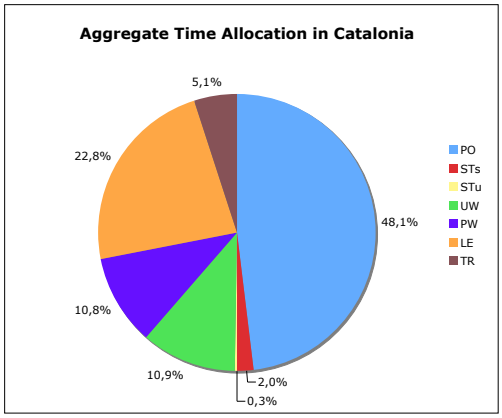

Figure 2. Percentage of hours/year allocated into seven time categories for Catalonia as a whole.

Looking at the data across gender categories, it is possible to observe some relevant distinctions among different time categories: men (48.3%) allocate little more time to the Physiological Overhead then women (47.8%); both spend the same amount of time in Studying (Men 2.4%; Women 2.1%); men (5.4%) spend a bit more time in moving then women (4.9%), men also (23.9%) spend more time in Leisure and Entertainment then women (21.8%). Women (7.7%) work less in the market (Paid Work) then men (13.9%) but the latter (6%) work for the household much less then the former (15.7%).

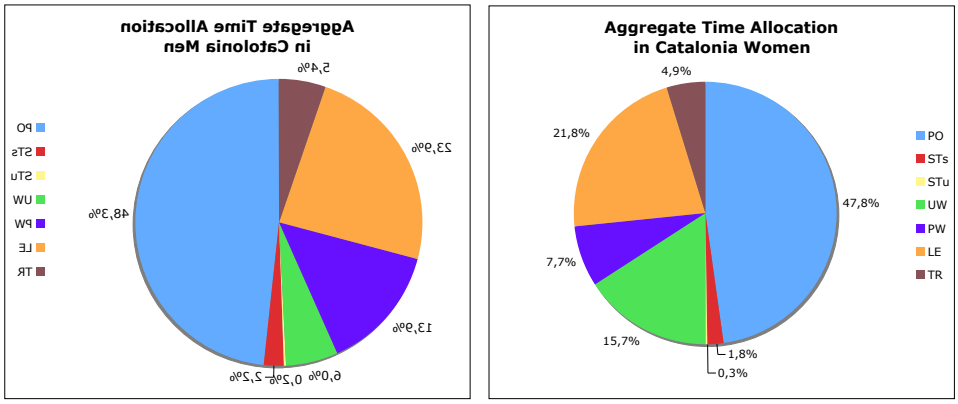

Figure 3. Percentage of Hours/year allocated into time categories across gender.

When the data are analyzed across gender for both the seven time categories and the five age categories (as characterized in the section 3.2) other relevant results become evident.

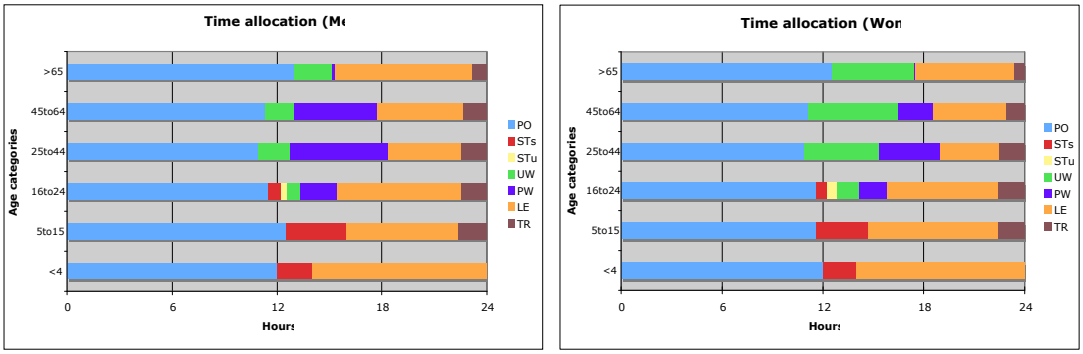

Figure 4. Hours/day (annual average) allocated across gender for time and age categories.

If we focus on the population belonging to the 25-44, and 45-64, the categories where the results are more robust, some evidence can be highlight. The men belonging to the 25-44 age categories allocate to the Physiological Overhead 10.9 h/d, they work for a salary of 5.6 h/d and for the Household 1.8 h/d, they dedicate to the displacement 1.5 h/d and they invest 4.1 in Leisure and Entertainment. Meanwhile, the women of the same categories allocate to the Physiological Overhead the same amount of hours of the men (10.9 h/d), they work for a salary of 3.6 h/d and for Household 4.4%. They

dedicate to the same amount of the men of the same age category (1.5 h/d), the amount of the time they can invest in Leisure and Entertainment is 3.5 h/d. The women (8 h/d) work 1,6 h/d more then the men (6.4 h/d), if we consider both Paid and Unpaid Work, they dedicate less time (-0.6 h/d) to the Leisure and Entertainment them the men do. Looking at the population between 45-64 years old, it is possible to note some relevant differences across gender. The men (11.3 h/d) allocate to the Physiological Overhead little more h/d then the women (11.1 h/d); the man (4.7 h/d) work much more in the market then women (2 h/d) but the latter (5.4 h/d) work considerably more for the Household then the former (1.7 h/d) do. The men displace 1.3 h/d and women 1.1 h/d. the men invest 4.9 h/d in Leisure and Entertainment the women just 4.4. Even for this age category, considering Unpaid and Paid work, the women (7.4 h/d) work more then the men (6.4 h/d) do.

4. Discussion

With this work we try to highlight the amount and the importance of time allocation for the reproduction of the fund element Total Human Activity. This additional set of tasks must include sleeping, personal care, eating, (at the individual/physiological level) plus a certain number of hours allocated in working out effective personal relations, giving birth to children and taking care of their education (at the household/societal level). This entails the existence of a "Societal Overhead" on the fund Human Activity (SOHA). That is a certain fraction of the total hours of human activity dedicated to the maintenance and reproduction of Total Human Activity (Giampietro et al., 2008).

Two major results come out from our analysis on time allocation for Catalonia:

1. Even if our system tends to ever expand the market as a way to perform some tasks previously considered as domestic work, the amount of Unpaid Work (10.9) and Paid Work (10.8) in hours in Catalonian is the same. Mainstream economists and policy-makers stress the necessity of increasing the rate of growth of GDP to sustain well-being, while in the real world, in order to maintain the actual standard of life in Catalonia, we need the same amount of Paid Work (allowing us a certain amount of money) and Unpaid Work (allowing the maintenance of human fund, i,e, the reproduction of humankind and so of

workers). As the table nº1 shows the amount of hours of UW (10,9%) is the same that of PW (10,8%). The SOHA = PO+UW/THA is 0,6. It confirms the need of a big investment of the fund Human Activity for those tasks associated with the maintenance and reproduction of itself.

2. Women work much more than men. The sum of Unpaid and Paid work for the women is 23.4% for the men is 19.9%. The differences between the two contributions increase with age, from 31.18% for men and 33.57% for women between 25-44; to 26.6% and 30,83% between 45-64; and 9.7% and 20.54 for age category >65, showing a clear generational effect, where differences are smaller in younger generations. The women tend to have some problems to get into the labour market; Paid Work is 7.7 for the former and 13.9 for the latter. They continue to bear the major load for Household, Unpaid Work is 15.7%, whereas for the men it is less then the half of the time 6 %. These results translated into real life, looking at the people between 25-44 and 45-64, means that women have half an hour a day less for Leisure and Entertainment (women 3.5 h/d men 4.1 h/d) for the categories 25-44, meaning that the women can go out less with any friend once a week than men; or both less in Leisure and Entertainment (women 4.4% and men 4.9%) and Physiological Overheard, i.e the care of the self, (women 11.1, men 11.3%), meaning that the women prepare the breakfast in the morning and the men go on sleeping for twenty more minutes.

To a certain extent, these results are not new. But, from a multi-scale perspective, new important issues can be arisen. The stability of a socio-economic system requires certain investment of the fund Human Activity for those tasks associated with maintenance and reproduction of it (as the energy sector does when it supplies the energy consumed by the rest of the socio-economic system). To maintain the quality of life enjoyed by Catalan people (a developed society), Catalonia, as a whole, invest the same amount of hour in market activity and Household activity. Reducing the amount of human activity allocated to household tasks would mean either shifting these tasks to the service sector or increasing the use of appliances at home (thus, increasing the EMR_{HH}). The last has being happening in the last years in Catalonia (together with an increase in personal

transportation). Overall, it reduces, in some case the amount of hours dedicate to the Household tasks but the only way to reduce this consistently it is to use the market services for household chores and for caring for people and this trend is very likely to grow. In fact, as female market activity rate grows, women dedicate less time to household chores but earn more money with which households can pay for housekeepers and nurses. This result, along with an ageing population implies the market for personal services is likely to increase in the near future. In terms of energy use there are important implications of these changes. When a household externalizes some of these services energy consumption increases because of two factors. First the home assistant will use energy to get to work and to conduct the activities. Second, the person of the household that has been freed from household chores (be it the man or the woman) is very likely to start working for money, therefore consuming more energy both for commuting and at work.

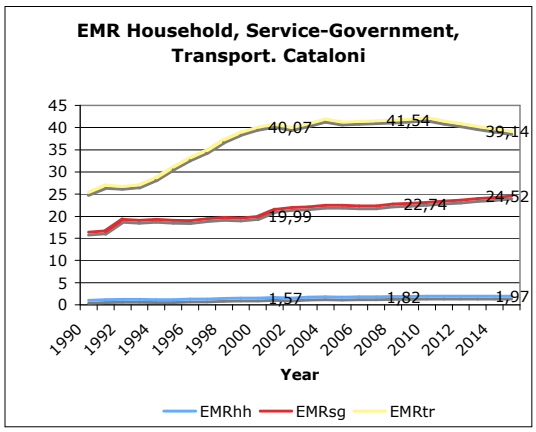

Figure 5. Energy Metabolic Rate for Household, Service and Government, Transport. In Catalonia. Data from Ramos-Martin (in press), our adaptation.

Comparing the metabolic rate of the household sector (Figure 5), transportation and services and government it is evident the increase in energy consumption if Unpaid Work for Household chore is substituted by professional Paid Work. Looking at Figure 5, a part from a faster increase in the EMR_{hh} –due to the growth of household appliances- it is evident that time spent at home –including Unpaid Work household chores- was more than 13 times less energy consuming than time spent in the service sector. The age pyramid of Catalonia (Figure 6) shows that the largest fraction of population is in working age, so they can provide the economic system with the

necessary Paid Work and also provide care and assistance to children and elderly. But, in twenty years from now, these people will not be able to work and will instead be requiring assistance. Additionally, half of the energy consumed in personal transport, to which Catalans dedicate nearly 5% of their time, is for commuting: connecting the household with the working place. Our calculations show that the EMR in the transport sector is about 40MJ/h, around 2,5 times more intense than time spent at home. Shifting some household tasks to the service and government sector would mean to increase both the use of transportation, and therefore the energy consumption per hour of human activity.

If some policy action gives not the right dignity to the household chores, the society should face an huge increase in the energy demand.

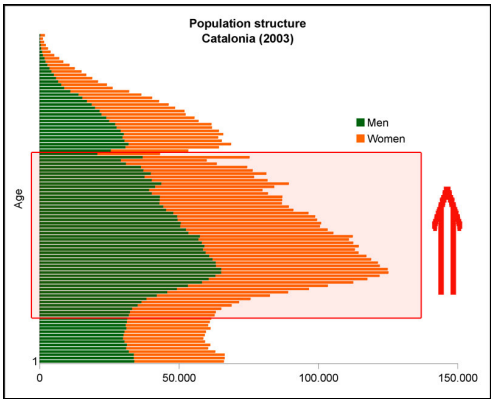

Figure 6. Catalonian population pyramid for the year 2003.

Although the total value in monetary terms of UW and production in the HH is impressive, as some works are shown (H. Pietilä 1997 pag.116-117.), when we claim for policy intervention, we do not refer to a monetary recognition of Unpaid Work for two order of reason:

1. The logic in the hh work, as so in other non-market contexts, is not based on self-interest, or better often it's the context of anti-utilitarian logic (Godbut, 1999).

It is not simple and always a free economy (H. Pietilä 1997, pag 117-119) but in a more complex sense it is a gift relationship. It also produces things not available on the

market and cannot be purchased by money, such as the feeling of being somebody, closeness, encouragement, recognition and meaning life. All this is realized in connection with living and doing things together so called relational goods (H. Pietilä 1997). Moreover, the majority of UW is linked to biological time, a time-scale that takes account of the rhythms and needs of human existence, being time oriented is very different from economic time that is task oriented, (M. Mellor 1997, pag. 136- 137).

2. If we reduce everything in monetary terms we perpetuate the power of money.

Neither at household level the power will have a big influence thus at this level the power is not simply linked to the monetary terms but more to individual, cultural and societal value. Moreover, stressing, that the value of Unpaid W is equal to some percentage of GDP on can risk forgetting all the limits of that index to measure the welfare or better the well being of the society as a whole. Building solution for the energy limit on neoclassical theory, waiting for the optimal allocation of energy price, on will promote the welfare of rich households at the expense of poorer households (M. McMahon 1997, pag. 171), liberating some men a few women at the expense of the rest of humanity and the planet (M. Mellor 1997, pag.138).

5. Conclusion

Our results show that the progress meant as a continual shift of labour and skills from households to economy (H. Pietilä 1997) has some limits:

1) an energetic limit, because the expansion of the market asks for a big amount of energy balanced to the households-based production

2) a social limit, the majority of tasks in households are based on a different logic, tending to the relationship more then to self-interest, not reducible to monetary value. The compression of time allocation in household's task below some level can have some deleterious consequences in terms of well being and happiness perceptions.

What we remark is the recognition of the importance of the Unpaid Work for the society in social terms, because of its important for the well-being, for direct production of welfare and thus an essential component in human livelihood (M. McMahon 1997),

and in energy terms, because it is very low energy intensive in comparison with its market substitute.

The recognition starts taking in consideration the limits to compress the time for household chores, the different gender load of this task, when decision-makers draft economic policy at different scales. The blind faith in the market is an abdication of responsibility of the latter (Giampietro 2003).

A more sustainable society should ask for a mix of rational and passionate choices, guaranteeing a cultural diversity, giving the right importance to different interdependence across the scale and being aware of the existence of incommensurable value, different logic, linked to the presence of non-equivalent observers and observed (Giampietro 2003).

A fairer policy should be to sustain households giving to the UW the right dignity. According to the fact that production time of domestic labour, ensuring human subsistence, above certain level can never be reduced but it can only be shared or redistributed (M. Mellor 1997, pag. 136), it should be encouraged the sharing tasks between groups of household, thus easing the burden of the individual Household (H. Pietilä 1997); avoiding an unreasonable huge work load for women obliged to find individual solution to collective problems (H. Pietilä 1997 pag. 121) what Bauman defining the impossible aim of liquid society (Bauaman 2002), supporting also the collective voluntary work for the common good in the neighbourhood or in tending the environment participation in the activities of voluntary organizations, mutual help, cooperation with neighbourhood, reinforcing the forgotten community management (H. Pietilä 1997 pag. 117).

Thinking HH as the core of human economy, we have the new angle from which to look at the economic process as a whole (M. McMahon 1997, pag. 172) to bring up the thought for a need for a new theory of the totality of human actions of sustainable livelihood (H. Pietilä 1997, pag. 125). This new angle can help us to face with changing in the availability of energy or with is different mixes in the future, when the adaptability could ask for a reallocation of sustainable policy toward unpaid and community work being less energy intensive.

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