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Imputing Monetary Value to Egyptian Females' Unpaid Domestic and Care Work

Doaa Mahmoud *
May Gadallah *

Abstract

In several cultures, it is believed that women's primary functions are reproductive, domestic and care work (such as housework, cooking, and caring for children, the elderly, and the sick), while men are the main breadwinners. This leads to an incomplete picture of women's real contribution to economic life, where women's unpaid work (especially domestic and care work) is most often being devalued and ignored in various indicators such as GDP. This underestimates women's role in the work field. Proper valuation of unpaid work would show that women should also be considered as main breadwinners if the number of hours worked rather than the money earned is considered. The main objective of this paper is to present a more realistic picture of the Egyptian women's contribution in the economic and domestic spheres of society by determining the level of different types of work done by Egyptian women (15- 64 years) and time spent doing it, and imputing a monetary value of the time spent by women in domestic and care work activities.

تقدير القيمة المادية للأعمال المنزلية وأعمال العناية التي تقوم بها النساء

دعاء محمود
مي جاد الله

ملخص

يعتقد في ثقافات مختلفة أن عمل المرأة هو الأعمال المنزلية والرعاية للأطفال والمسنين والمرضى، بينما يقوم الرجال بالعمل خارج المنزل من أجل الحصول على لقمة العيش. ويقود ذلك إلى صورة عن المرأة ومساهماتها في الحياة الاقتصادية، حيث يتم تجاهل العمل غير المدفوع للمرأة (وخصوصاً عمل المرأة المنزلي) حيث يتم تجاهله أو التقليل من قيمته. تقوم هذه الورقة بتقدير القيمة المناسبة لعمل المرأة، حيث يجب اعتبار هذا العمل كجزء من العمل من أجل لقمة العيش. وبذلك تكون الورقة قد أعطت تقييماً أكثر واقعية لعمل المرأة المصرية ومساهمتها في الاقتصاد وفي المجال المحلي للمجتمع، وذلك عن طريق تحديد مستوى الأنواع المختلفة للعمل الذي تقوم به المرأة المصرية (15–64 عاماً) والوقت الذي يستغرقه القيام بذلك العمل، ووضع قيمة نقدية للوقت الذي تقضيه المرأة في أنشطة العمل المنزلي والرعاية الأسرية.

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* D. Mahmoud is a Statistical Researcher in the National Council for Childhood and Motherhood, the state ministry of family and population, Cairo, Egypt; email: doaa_am@yahoo.com. M. Gadallah is an Assistant Professor at the Department of Statistics, Faculty of Economics and Political Science,- Cairo University, Cairo, Egypt; email: mayabaza@hotmail.com. N.B. This paper is part of Mahmoud's thesis towards a master degree from the Faculty of Economics and Political Science,- Cairo University, Cairo, Egypt The authors gratefully acknowledge Professor Hussein Abd-Alaziz for his useful comments and the Population Council for providing the data set used in the analyses. The authors are also grateful to Dr. Heba El-laithy for her insightful comments on the paper.

1. Introduction

Unpaid work may be understood to include all productive activities outside the official labor market done by individuals for their own households or for others; such as: housework, care for children and for sick and old people, voluntary community work, subsistence agriculture, helping in family businesses, building the family house, maintenance work, transport services etc. All of these activities have one thing in common — they could, at least in theory, be replaced by market goods and paid services (Swiebel, 1999).

Despite the importance of unpaid work, it is largely not considered in labor force and national accounts. This is mainly due to the difficulty of measuring it, since the outputs of this kind of work are intangible unpaid services. As a result, it remains statistically invisible and is generally ignored in economic policies. This has serious consequences on unpaid workers who are still marginalized by decision makers (Gibb, 1999).

Production Boundaries

Considering any economic activity as being work or not is limited to the production boundaries which, in turn, is determined by the System of National Accounts (SNA), The SNA[1] consists of a coherent, consistent and integrated set of macroeconomic accounts; balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules. It provides a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision-taking and policy-making.

Ironmonger (2001)[2] describes the total economy as "a two-legged animal, with a market leg and a household leg — both are necessary for the economy to stand up, to walk and to run". It is therefore inappropriate to describe work as only within the limited scope of the SNA production boundary as economic work. It is also misleading to consider people who do only unpaid household work (most of it is traditionally undertaken by women) outside the SNA production boundary as economically inactive. The value of unpaid work has no difference from the value of that work included within the production boundary of the SNA especially for women (ESCAP and UNDP, 2003).

The latest revision of the United Nation SNA in 1993 has modified the production boundaries of goods and services. As a result, some economic activities previously excluded from the narrow SNA boundary have been included as SNA economic activities. These include "water carrying", "wood collection", and the processing of primary products for own final consumption (milling of grain, basket weaving, home tailoring etc). All of these activities are traditionally undertaken by women (op cit.).

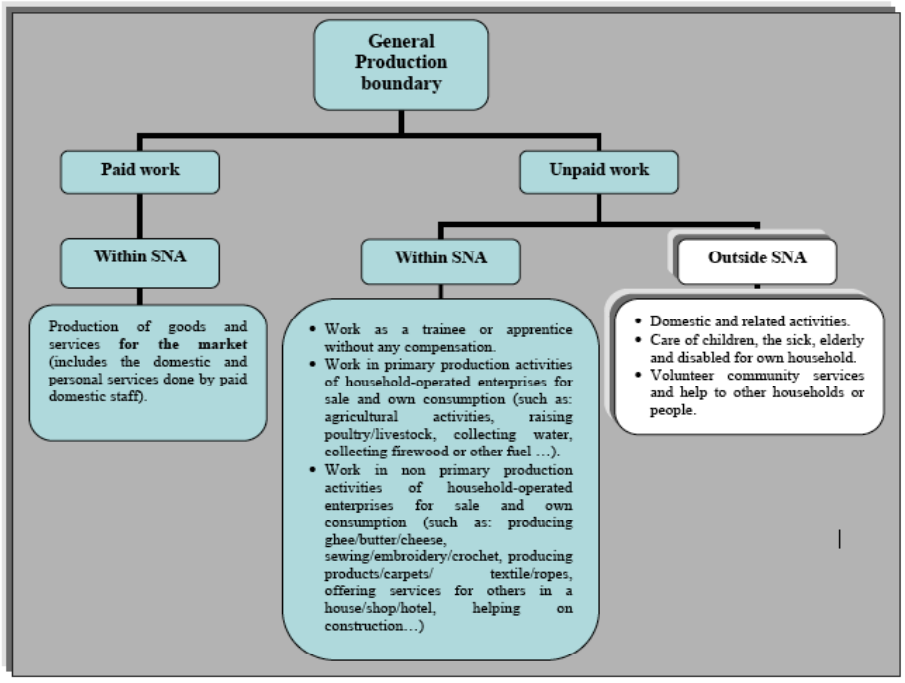
The 1993 SNA is better than earlier SNAs in gender terms because it includes subsistent production, where women often predominate. However, it still does not include all types of work. In particular, it excludes own-account production of domestic and personal services by members of the households for their own final consumption (Budlender, 2002).

Measuring Unpaid Work

There are different approaches for measuring unpaid work but the primary ones are:

The Output Method which takes all outputs into account based on the value of all goods and services produced by the household (quantity x price) at market equivalent prices (ESCAP and UNDP, 2003).

Figure1. A flow chart of the economic activities according to the general definition of production



Source: Based on SNA 1993 and ESCAP and UNDP, 2003 — modified by the authors.

The Input Methods which are based on the value of labor that is determined by the wage that would be given to a worker to replace the unpaid worker doing the same work. It includes the opportunity cost approach and the market replacement cost approaches; (a) the specialist market replacement; and (b) The generalist market replacement (op cit.)

Many countries — India, United States, the Republic of Korea, Mongolia, Australia, Canada, Japan, South Africa, Zimbabwe, China, Ireland to name a few — have used these methods to give a monetary value to unpaid work. However, none, as of yet, is perfect. More work needs to be done in order to give a real picture to allow policy-makers and governments to fully understand the importance of unremunerated work Valuating unpaid work in economic terms is part of a process; including its value in SNA being just a step. The UN Statistical Commission in the 1993 revision of the SNA, recommended the compilation of a satellite account (called the Household Satellite Account) as an extension of the SNA central framework to show the role of the unpaid household production (op cit.)

The Household Satellite Account

The United Nation Statistical Commission 1993 and the Fourth World Conference on Women in Beijing 1995 have both recommended that national statistical offices should prepare a "Household Satellite" account that is separated from, but consistent with, the main SNA accounts of the market economy. It would assess the values of unremunerated work outside the national accounts, such as caring for dependents and preparing food, to recognize the economic contribution of women and show the unequal distribution of remunerated and unremunerated work between men and women (Ironmonger, 2001). The satellite account for the household economy should include, in addition to labor costs, measurements of capital expenditure, intermediate costs of production purchased from the market and the value of outputs (Hirway, 1999b).

The household production can be measured and analyzed in different ways and consequently, different satellite accounts may be developed. Several approaches have been presented by scholars in this context (op cit.) There are four major approaches described below:

- The Household Input Output Tables: Ironmonger (1999) pioneered work in this field suggesting two major parts of the economic system: (a) The market part and (b) The non-market part. To include all paid and unpaid work, Ironmonger proposed Household Input-Output Tables and published the first one in 1975-76 for the Australian household economy. The proposed Household Input-Output Tables are exactly the satellite accounts that have been recommended in the 1993 revision of the SNA and in the 1995 Beijing Women's Conference (op cit.). They include time, materials, energy and capital in the household economy.

Based on this approach, Household National Accounts need three types of nationwide surveys: (a) Household Time-Use Survey; (b) Household Expenditure Survey; and (c) Household Output Surveys. No country has yet conducted a nation-wide survey of the last type. However, time-use surveys can collect output data if properly designed (op. cit).

- The Total Work Account System (TWAS) of Canada: TWAS is from the Canadian Statistics that attempts to integrate paid and unpaid work. It gives an analytical view of the laws of paid and unpaid work between different agents in the economy. The basic concept of the TWAS is "the total productive work" and it has two components: (a) "Work of economic value" whose output can be purchased in the paid labor market; and (b) "Personal investment work" which is meant to improve human capital, education and training. The TWAS combines both by developing innovative concepts, indicators and micro data in an integrated way. The main feature of the TWAS is that each work activity paid or unpaid is classified according to the main purpose of the work output (Hirway, 1999b).
- The Household and Resource Satellite Accounts: The value of human resources is not expressed in monetary unit although their labor input to production is. Arboleda and Ericta (!999) have presented a framework for a household and human resources satellite account that is based on the central framework of the 1993 SNA and includes the activities which are outside the 1993 SNA production boundary. It requires data on the stock of consumer durables and on the time use of household members in all activities. There is also a need for an appropriate estimation methodology for valuation of outputs of the different production activities included in the household satellite accounts (Arboleda and Ericta, 1999 in Hirway, 1999b).
- Satellite Accounts of Household Production under Eurostat[3]: In 1999, Eurostat has also proposed a framework for a household production satellite account to provide an overall picture of the productive activities undertaken by households and to give an estimate of the value of non-market household production. The satellite proposes that the household production should be divided into four principal functions namely: (a) The provision of housing services, (b) nutrition, (c) clothing and care and education, and finally (d?) activities like shopping, transportation and cleaning (Hirway, 1999b).

The input method is used for valuation rather than the output method, and time-use survey data are used for measuring labor costs. The generalist method has been recommended for valuation. Capital costs are estimated on the basis of the data on household assets (Eurostat, 1999) All the proposed models for integrating paid and unpaid work in the national accounts system are considered "work in progress", as they are in the experimental phase (Hirway, 1999b).

Data Used in Measuring Unpaid Work

Conventional data collection tools such as census of population or labor force surveys are not capable of providing information on the unpaid non-market activities. Time-use surveys are considered very useful tools in this context since they provide detailed information on how individuals spend their time on a daily or weekly basis with a combination of specificity and comprehensiveness

not achieved in any other type of surveys (Hirway, 1999a) Well designed standardized time use surveys can provide a basis for international comparisons of time use.

Situation in Egypt

Women aged 15-64 years constitute 49% of total persons in the age range of 15-64 years in Egypt (2006 census). However, only 22% of the entire labor-force in this age range is women (Assaad, 2007). This implies that the contribution of females in the work force does not match their size in the society. However, this picture can be changed according to the concept of work adopted.

The International Labor force Organization (ILO) gives two definitions of the labor force: (a) The market labor force which includes all those who are either engaged in economic activity for purposes of market exchange or seeking of work; and (b) The extended labor force which includes those engaged in "the production and processing of primary products, whether for the market, for barter, or for their own consumption" (ILO, 1982).

Under the market definition of economic activity, only market work counts as work. In this context therefore, subsistence workers are considered unemployed. Under the extended definition, any subsistence work counts as work and subsistence workers are not considered unemployed even if searching for market work (ESCAP and UNDP, 2003).

In Egypt, the results of the last Egyptian labor market surveys (ELMPS, 2006)[4] conducted by the Economic Research Forum (ERF) in cooperation with the Central Agency of Public Mobilization and Statistics (CAPMAS) show that using different definitions of the labor force and unemployment is particularly significant for women in Egypt, as seen in the following table:

Table 1. The Labor Force in Egypt, 2006

	Market Definition	Extended Definition
Labor Force (millions)	22.3	26.8
Labor Force Participation Rates for Working Age Population (15-64)[5]:		
Male	78.5	78.9
Female	26.9	45.9

Source: Assaad (2007).

From Table 1, it may be noted that using the extended definition of the labor force almost doubles the female participation rate (45.9 versus 26.9 with market definition). By using the extended definition, any subsistent work counts as work and many Egyptian women are involved in that kind of work (such as: animal husbandry and dairy products for household consumption), while using the market labor force definition excludes all of these women (Assaad, 2007). For males, there is almost no significant difference in participation rate in either the extended or the market labor force definition.

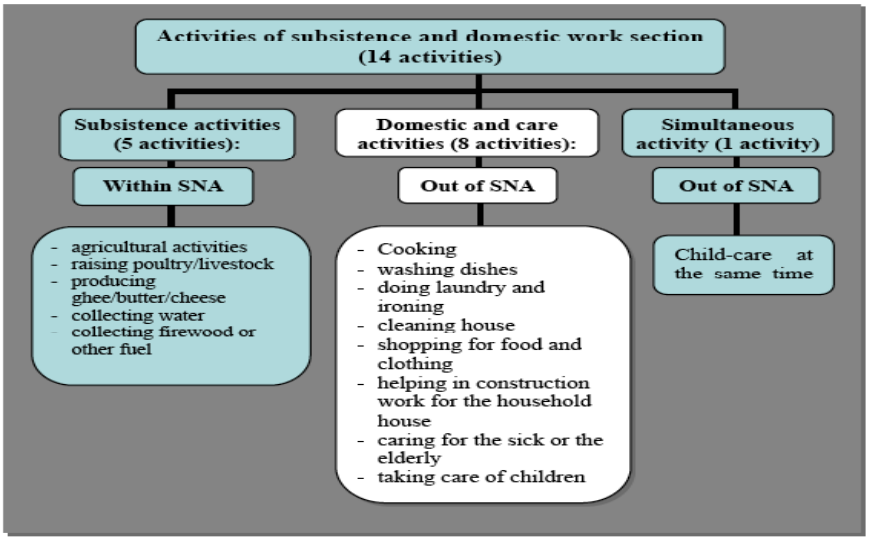
It is clear that using different definitions of work and labor force dramatically changes the number of economically active women. Looking at the part of unpaid work that is excluded from the SNA for women, may change the real contribution of women in society. Imputing a monetary value of this type of work may help in presenting realistic women participation.

2. Data

The data used are from the nationally representative Egypt Labor Market Panel Survey 2006 (ELMPS, 2006) It covers the civilian non-institutionalized population 6 years of age and above, conducted on a sample of 37140 individuals. Excluded from the survey>s coverage are the residents of the five frontier governorates of North Sinai, Matrouh, Red Sea, New Valley, and South Sinai. These represent an exclusion of less than 2%. ELMPS 2006 is not a time-use survey but the questions on domestic work in Section 4.3 Subsistence and Domestic Work in the individual questionnaire, investigate time spent on various domestic chores during the past 7 days. The questions in this section are applied to all females (6 years and older) and males aged 617-. Only the last question of the section allows for the activity (child care) to be done simultaneously with other activities (Barsoum, 2007).

Section 4.3 of the ELMPS contains 14 activities which are done for the purpose of the household own consumption in the seven days before the survey. These activities may be grouped as follows:

Figure 2. The activities of subsistence and domestic work section in ELMPS 2006.

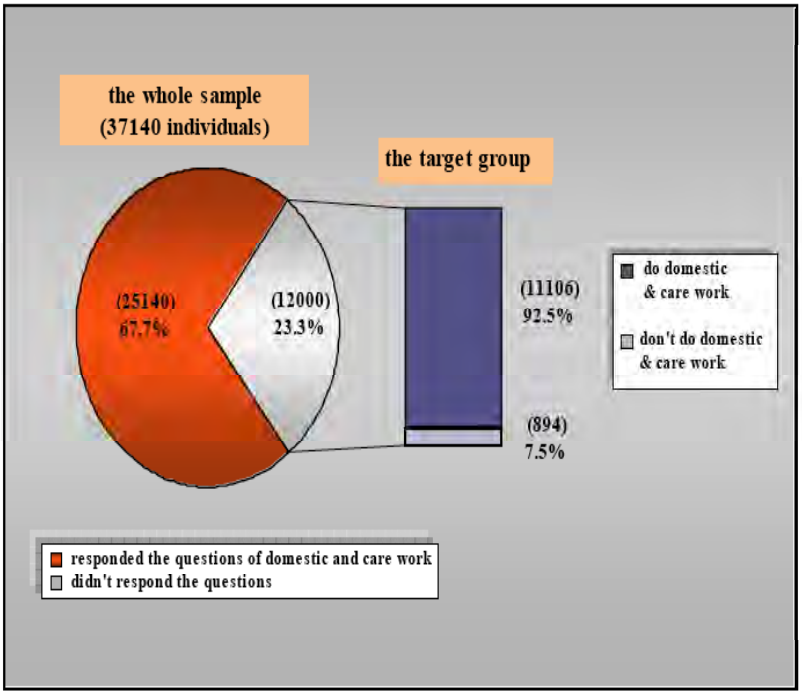


Source: Based on Barsoum (2007) and ERF, ELMPS (2006).

The activity in the last group (Figure 2) is a simultaneous activity, and this type of activities is dealt with in different ways. The United Nations has made a guide about time-use statistics and measuring unpaid work in 2005 which states that "there are no practical satisfactory approaches of measuring time spent in simultaneous activities and further research is needed on this issue". The guide describes some methods that may be considered (Dept of Economic and Social Affairs, Statistics Division, United Nations, 2003). However, these methods are based on the assumption that simultaneous activities are specified in the data, which is not provided in data set used in this paper. Therefore the last activity is excluded in the analyses. The paper is focused on the analysis of the domestic and care work activities which represents the unpaid work out of SNA[5].

The target group in this paper is comprised of females aged 1564- years who responded to the questions on domestic and care activities (12000 females). The rationale for focusing on this group is to be comparable to the definition of labor force age that can be involved in paid work. The following figure shows how the target group is derived from the whole sample survey:

Figure 3. The target group.



Source: Based on Barsoum (2007) and ERF, ELMPS (2006).

3. Methodology

Generally, imputing a monetary value for unpaid work activities depends on the valuation of the unit of work and the wage rates for this unit. The general formula for computing that value of an individual is:

Value of unpaid work = volume of work done x wage rate (Equation 1)

At the aggregated level, the formula is:

Value of unpaid work = average volume of work done x average wage rate x number of persons involved

(Equation 2)

The volume of unpaid work could be in terms of the output units or time units spent in producing the output. Similarly, the wage rate (price for a unit of work) could be in terms of the wage paid by output units or by time spent. The measurement would depend upon the prevailing practices in the economy of a country. The common approaches used in the valuation are the output approach and the input approach (ESCAP and UNDP, 2003).

Output Approach

This approach would be applicable in economies where household and domestic productions are paid based on the units of output. The valuation of unpaid work in this approach needs data on the output of the unpaid work such as the number of meals prepared, items of clothing washed and ironed, area of house cleaned, children taught, number of elderly given care etc. This approach also needs data on the wage rate per unit of output, such as the labor charge for each meal prepared, charge per item of clothing washed and ironed number of children tutored, payment for each elderly person given care (ESCAP and UNDP, 2003).

The output method is theoretically superior, but unfortunately, it is difficult to be applied if the goods and services produced are not sold on the market (Swiebel, 1999).

Input Approach

This approach is applicable for household and personal services for which individuals are paid by the time spent, depending upon the country practice of payment for those activities such as: taking care of children and the elderly, transporting household members, teaching children, cleaning and other similar activities. This approach is also applicable to volunteer work in non-profit institutions (op cit.)

The input approaches value household production as the sum of all values of its inputs which include labor inputs (time-use) and the use of physical capital (the land, dwellings and equipment owned by households). However, time-use surveys only provide information on time-use; so that, the valuation methods in practice do not take into account the value of the physical capital used by households in non-market production (Budlender, 2002).

The output method measures the values of the goods produced while the input method measures the burden (which is the major concern in unpaid work). Thus, input measures are commonly used in the valuation of unpaid work for household production of domestic and personal services for own consumption (Swiebel, 1999).

Consequently, the current paper concentrates on the input methods to impute a value to the unpaid domestic and care work done by women.

There are two broad approaches in applying the input methods to evaluate the wages: the opportunity cost and the market replacement cost:

The Opportunity Cost Approach (OCA). The opportunity cost approach is based on the potential wage that the person would earn in the market. The most common wage used in this method is the potential wage of the person based on sex, educational level and age, i.e. the valuation will change depending upon who is engaged in the unpaid work (ESCAP and UNDP, 2003). Under this approach, several variations are used:

- OCA1 — Time spent and wage rates are disaggregated according to age only;
- OCA2 — Time spent and wage rates are disaggregated according to age and education level;
- OCA3 — Female wage rate is based on the male wage rate, i.e. applying men's wage to women's unpaid work.

In the last method (OCA3), men's wage is used because applying women's wage to women's unpaid work would reflect the gender difference in wage in the labor market in the economic evaluation of unpaid work, resulting in under-evaluation of the value of unpaid work (Hong, 2001).

The Opportunity Cost Approach assumes that the worker has a job opportunity in the paid labor market and that compensation is based on the worker's qualification or possible paid employment instead of the type of work done. This means that it uses different wages for the same activity when the work is performed by different people. For example, the time spent cooking a meal by a university graduate has more value than the same time spent by someone without formal schooling doing the same activity, even if that person is a better cook (ESCAP and UNDP, 2003).

The Market Replacement Cost Approach (MR). Two types of wage rates — Specialist and Generalist — have been commonly used in the valuation of unpaid work of domestic and personal services, using the market replacement cost approach [(op cit.)

- Market Replacement - Specialist (MR-S). The value of unpaid work for a specific activity is equal to the compensation or wage rate of a specialist engaged in this activity multiplied by the time spent on the activity. MR-S is based on the activity associated with the job by occupational classification and the corresponding wage rate of the particular job classification. For example, time spent on cooking activities could be valued at the wage of a paid chef or cook, and time spent on cleaning activities could be valued at the wage of a paid cleaner. This approach assumes that: (a) The quality of work or productivity of the person engaged in the unpaid work is the same as that of the specialist; (b) The particular specialist is available in the market; and (c) The household production of domestic and personal services for own consumption has the same capital intensity as that in the market.
- Market Replacement - Generalist (MR-G). This approach is based on the wage of the domestic paid worker under the country classification (for example, the wage rate of a housekeeper, or housework or food service worker). This approach assumes that there are available workers in the market and their work is similar to that of a domestic worker.

A general formula that may be used to estimate the aggregate value of the unpaid work using the input approach is:

$$\text{Value of unpaid work} = \Sigma\ T*W*P \qquad \text{(Equation 3)}$$

where T = average time spent for the type of work, activity or job
W = average wage rate per unit of time for work, activity or job
P = estimated population engaged in the work, activity or job

In most countries that have done the calculations such as the Republic of Korea, India, Canada, Japan and the United States of America, the OCA gives the highest values; the MR-G Approach gives the lowest values and the MR-S Approach gives a medium value between them (ESCAP and UNDP, 2003). This is because wages of occupations of housework employees used under the RC Approaches are lower than those of other types of jobs that are used under the OCA. Consequently, assessed value under the RC Approaches tends to be lower than that obtained under the OCA (Fukami, 1998).

The differences between the values from the different approaches become particularly big where there are large inequalities in wages and salaries in the economy. This is the situation in many countries (ESCAP and UNDP, 2003).

4. Results

Different Types of Work by Egyptian Women and Time Spent

This section concentrates on the distribution of the target group of women aged 1564- years according to the different types of work they do and how much time they spend in each type. Results exclude women with time more than 98 hours per week (outliers> cases)[6].

The following are considered in the paper:

1. A woman is considered a paid worker if her employment status is waged employee, employer or self-employed[7] in the reference week.
2. A woman is an unpaid worker within SNA if she does at least one of the activities of unpaid work that fall within SNA either for sale or for consumption[8] in the reference week.
3. A woman is an unpaid worker out of SNA if she does at least one of the activities of unpaid work that fall out of SNA [9] in the reference week.
4. A woman is considered to be doing unpaid work if she does only unpaid work within SNA or out of SNA or both in the reference week.

Table 2. Distribution of Women According to Type of Work and Average Time Spent

Type of work	%	Ave time (hr/wk)
Women do only paid work	0.8	53.4
Women do only unpaid work:	78.9	
・ Do only unpaid work within SNA	0.6	11.1
・ Do only unpaid work out of SNA*	53.6	32.7
・ Do both (within & out) SNA	24.7	43.2
Women do both paid and unpaid work	13.8	69.7
Don>t do any type of work	6.5	0
Total	100.0	38.8

* N.B. Work out of SNA is the domestic and care work
Source: Based on authors' calculations using ERF, ELMPS (2006)

About 92% of women are engaged in domestic and care work, either exclusively or combined with unpaid work within SNA, or combined with paid work. A group of women (about 14%) is engaged in both types of work; paid and unpaid. Hence, they spend large amounts of hours working (about 70 hours per week). This group of women is doubled burdened, and this may affect their opportunities of better life, their health and even their well-being. Finally, there is a group of women (6.5%) who don>t do any type of work; they are mainly young girls at school (Table 5).

It is also clear that the time the women spend in unpaid work out of SNA (about 33 hours) is approximately three times of the time they spend in unpaid work within SNA (11 hours). This means that unpaid work out SNA (which is not included in the National Accounts) takes more time in women's life than the other type of unpaid work (which is included in the National Accounts).

Table 3. Women Involved in Domestic and Care Work and the Average Time Spent in each Activity per Week

Activity	%*	Average time (hr/wk)
Cooking	84.8	8.7
Dish washing	86.8	6.1
Doing laundry	84.1	6.3
Cleaning house	85.5	6.5
Shopping	57.6	5.2
Help in construction	0.5	6.9
Elderly/sick care	8.8	9.4
Child care	34.0	17.9

*N.B. Each female can do more than one activity
Source: Based on authors' calculations using ERF, ELMPS (2006)

Table 4 presents the different domestic work Egyptian women engage in. While most women are washing dishes, cleaning house, cooking or doing laundry, child care takes the longest hours.

Table 4. Distribution According to Type of Work (%)*

Variable	Type of work					
	Only paid work	Only domestic and care work	Domestic and unpaid work within SNA	Domestic and paid work	All work	Don>t do any work
Residence						
Urban	1.0	65.6	9.6	15.7	1.5	6.6
Rural	0.6	39.8	43.2	5.2	4.5	6.7
Total	0.8	53.6	24.7	10.9	2.8	6.5
Age Groups						
15-24	1.0	59.3	20.7	5.0	0.8	13.1
25-34	1.0	56.9	25.6	12.8	2.8	0.9
35-44	0.2	44.3	30.0	19.1	5.8	0.5
45-54	0.6	44.8	29.5	16.8	5.5	2.7
55-64	0.6	55.9	23.5	7.4	1.8	10.9
Total	0.8	53.6	24.7	10.9	2.8	6.5

Table 4 continued ...

Variable	Type of work					
	Only paid work	Only domestic and care work	Domestic and unpaid work within SNA	Domestic and paid work	All work	Don>t do any work
Wealth Index [1]						
Poor	0.9	39.3	45.2	4.6	4.5	5.5
Middle	0.8	56.5	23.4	10.0	2.6	6.6
Rich	0.5	60.0	4.7	24.9	1.7	8.2
Total	0.8	53.6	24.7	10.9	2.8	6.5
Educ Status						
Illiterate	0.5	44.8	39.2	2.6	3.5	9.4
Read or write	0.4	43.0	45.0	3.1	5.0	3.5
Primary	0.4	58.9	31.3	4.1	2.0	3.2
Preparatory	0.7	62.3	23.0	3.9	0.8	9.3
General Secondary	0.2	59.2	9.7	2.0	0.2	28.7
Tech Secondary 3&5 years	1.2	57.6	18.3	15.2	3.0	4.6
Above intermediate	0.7	61.8	6.7	22.1	3.3	5.5
University	1.4	54.1	5.4	29.4	1.7	8.0
Post graduate	8.3	66.7		16.7		8.3
Total	0.8	53.6	24.7	10.9	2.8	6.5
Marital Status						
Not married [2]	2.1	54.0	16.2	9.6	0.9	17.3
Currently married	0.1	54.6	29.5	11.2	3.5	1.1
Married before[3]	1.3	49.5	22.1	13.6	4.7	8.9
Total	0.8	53.6	24.7	10.9	2.8	6.5
Children						
Have children	0.2	51.2	29.5	13.6	5.2	0.2
Have no children	1.7	55.1	17.3	10.2	1.2	14.1
Total	0.8	53.6	24.7	10.9	2.8	6.5

[1] It is a proxy variable for wealth (asset ownership) of the household where the females live. It is constructed using "the factor analysis". The wealth variable is a combination of three types of indicators: durable goods, housing assets, and financial assets. Durables include indicators such as: fridge, freezer, TV, etc. Housing assets include: flooring types, number of rooms, and access to electricity, etc. Financial assets refer to dividends on assets or interest on bank account (El-Hamidi, 2003). The indicator range is then divided by 3 (3 classes), and the class of minimum values represents the lower case "poor" and so on.

[2] Not married includes women who never married and are contractually married

[3] Married before includes widowed and divorced women.

Source: Based on authors' calculations using ELMPS (2006)

Table 5 presents the following:

Place of Residence. About two thirds of the urban females are involved in domestic work only, compared to only around 40% of the rural females, who are more involved in both domestic and unpaid work (within SNA) for the family.

Age group. While the participation in paid work increases for the middle aged females, this does imply a decrease in participation in domestic work. This means double burden, as both works are done combined. Older women have higher chances of relaxing from any work effort.

Wealth index. Females of high standard of living are more likely to be engaged only in domestic work. Although there is an increase in doing paid work among those females (around 27% of them), still it has to be combined with domestic work (around 25%). Females with low standard of living are more involved in unpaid work within SNA in addition to the domestic work with about 45%, while around 4.5% of those females have to do all kinds of work.

Educational status. Low educated females are more likely to be involved in domestic and unpaid work within SNA. As education gets higher, the percentage of doing only domestic work increases to 59%, 62% (primary and preparatory, respectively). About one third of girls who are in general secondary (thanaweya), are kept out of all work, in order to study. Finally, as the education gets higher, females start to be more engaged in paid work, but again, combined with the domestic (around one fourth of them).

Marital status. Interestingly, the percentages of females, who are not engaged in any work, increases for those who are not married (17%) and probably are in schools, and the married before (9%) probably are old women.. But the rest of women are either engaged in paid or unpaid work within SNA beside the domestic work, or only in domestic work by around half of them.

Having children. As having children decreases the possibility of getting engaged in paid work only or not doing any type of work (0.2%), it increases the possibility of staying home and doing domestic work even if combined with other types of work; females who have children and do domestic work combined with other types of work are 48.3%, compared with 28.7% of females who don>t have children.

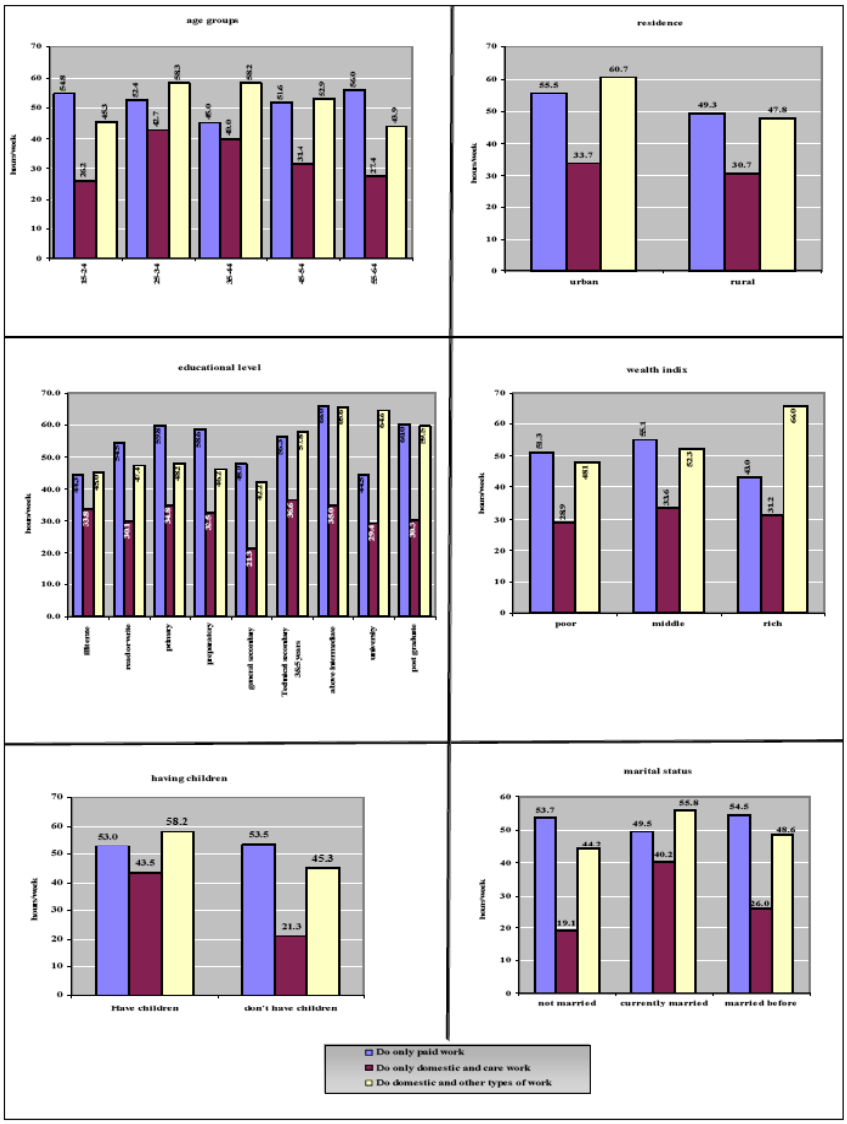
The following figure represents the distribution of time the females spend in different types of work according to the previous characteristics.

Based on Figure 4, women who do any type of work may be divided into three groups:

Group 1 — Females do only domestic and care work. Females who spend more time in this type of work are urban residents with middle standard of living, (2534- years old) with technical secondary educational level, currently married and have children.

Group 2 — Females do domestic and care work and other types of work. Females who spend more time in this type of work are rich urban residents, (2534- years old) with above intermediate educational level, currently married and have children.

Figure 4. Average hours per week spent by females for each type of work.



Source: Based on authors' calculations using ERF, ELMPS (2006)

Group 3 — Females do only paid work. Females who spend more time in this type of work are urban residents with middle standard of living, 1524- years old and 5564- years old, with above intermediate educational level, married before or not married and don>t have children.

The characteristics of females in Groups 1 and 2 are similar. This is mainly due to the fact that domestic and care work is related to some familiar characteristics of women: the age range corresponds to the reproductive period (1549-) years, getting married and having children. Thus, females with these characteristics are expected to spend more time in doing this type of work, whether doing it only or with other types of work. For example; females who have children spend time in doing domestic work only (43.5 hours per week). This is twice the time spent by females who do not have children (21.3 hrs). The main difference between the two groups lies on the educational level. This is mainly because Group 2 includes paid work which is occupied by higher educational levels. It is interesting to note that rich females have the most number of hours doing domestic and other types of work.

For Group 3, it is expected of females with such characteristics that allow them to do only paid work to spend more time doing it only. Since females with fewer responsibilities in their families — not currently married females; do not have children; or 5564- years old where their load of housework is reduced since their children are grown up and married; or females who have to do this type of work such as poor or middle females — they are expected to spend more time doing paid work only.

5. Imputing Monetary Value on the Time Spent in Domestic and Care Work Activities

It is imperative to clarify the economic value of housework (based on Equation 3) and its burden on women in a form that allows comparison with other economic indicators, because women play a major role in such activities.

As already pointed out, the target group is comprised of females aged 1564- years that do domestic and care work and spend time not greater than 98 hours per week doing. The 1993 SNA production boundary excludes the household production of domestic and personal services for own use (domestic and care work) for many reasons. One of them is that inclusion of these types of activities would imply that all these persons would be considered workers. Consequently, this makes the definition of unemployment definition impossible (ESCAP and UNDP, 2003). Hence, a minimum level of time spent in these activities should be considered.

The ILO report on decent work for domestic workers (2010) includes a section on laws and regulations of this employment. Some countries restrict the coverage of domestic workers in terms of the duration of employment. An example is Argentina which excludes any domestic worker from employment legislation who works less than four hours per day for the same employer with one rest day per week. Finland excludes domestic workers whose regular hours for the same employer do not exceed three hours per day with one rest day per week. Therefore, a minimum level of 18 or 24 hours per week should be considered.

Components Needed to Compute the Monetary Value

- Time Spent for an Activity per Week. This may be directly taken from ELMPS (2006) as follows: «Section 4.3 Subsistence and Domestic Work» of the individual questionnaire — the eight respective activities of domestic and care work: cooking; washing dishes; doing laundry and ironing; cleaning house; shopping for food and clothing; helping in construction work for the household house; caring for the sick or the elderly; and taking care of children.
- Number of Females Engaged in the Activity may be estimated for the whole population based on the same ELMPS survey (2006) by weighting, where the survey is nationally representative.
- Wage per Hour can be obtained using two procedures:
  - Procedure 1: Using Published Data of Wages at the National Level. The Annual Bulletin of Wages and Hours Work published by the CAPMAS (2005) is used. The monetary value of domestic and care work may be computed using three different types of wages based on the three approaches: (a) OCA3[10] since the average wage used in OCA3 is the male average wage of £E2.86[11] per hour; (b) MR-G since the average wage used in MR-G is the average wage rate for female housework servant shaghalla (£E1.62 per hour); and (c) MR-S since the average wages used in MR-S are the female average wages of the corresponding occupations to the eight respective activities of the domestic and care work.

Table 6 shows these corresponding occupations and its average wage rates per hour for females.

Table 5. Average Wage of Some Occupations (£E?)

Type of activity	Corresponding occupation*	Average wage rate (£E/ hour)
Cooking	Cook in house	2.23
Dish washing	Dish washing worker	1.77
Laundry/ironing	Laundryman/iron man	1.21
House cleaning	Building cleaning	5.98
Shopping	Janitor	0.00
Construction	Construction worker	3.06
Elderly/sick care	Companies	12.71
Child care	Baby sitter	1.15

*N.B. Many countries such as Japan and Canada use these corresponding occupations (Dept of Economic and Social Affairs, Statistics Division of the United Nations, 2005)
Source: The Arabic Union Classification for Jobs 1996, CAPMAS (1996) and CAPMAS, 2005

The results of using these wages are presented in Table 7 in three cases: (a) when minimum number of hours of domestic work is not considered; (b) when 18 hours per week as a minimum level is used; and finally (c) when 24 hours per week is used as the minimum hours.

Table 6. Monetary Value of Domestic and Care Work per Year (£E)
in Comparison with GDP (Procedure 1)

	GDP-2005/2006*	OCA3	MR-G	MR-S
Time less than 98 hrs/wk				
Value of the domestic and care work whether done by itself only or combined with other types of work				
Annual value billions**	581.1	97.890 (97.874 - 97.906)	55.448 (55.439 — 55.457)	85.8 (85.827 — 85.862)
As % of GDP		17	10	15
Value of the domestic and care work that is done by itself only				
Annual value billions	581.1	52.614 (52.602 — 52.626)	29.802 (29.796 — 29.809)	46.402 (46.389 — 46.415)
As % of GDP		9	5	8
Time 18-98 hrs/wk				
Value of the domestic and care work whether done by itself only or combined with other types of work				
Annual value billions	581.1	89.686 (89.666 — 89.706)	50.801 (50.790 — 50.812)	78.378 (78.354 — 78.403)
As % of GDP		15	9	13
Value of the domestic and care work that is done by itself only				
Annual value billions	581.1	47.967 (47.952 — 47.982)	27.170 (27.162 — 27.179)	42.025 (42.006 — 42.043)
As % of GDP		8	5	7
Time 24-98 hrs/wk				
Value of the domestic and care work whether done by itself only or combined with other types of work				
Annual value billions	581.1	81.961 (81.944 - 81.978)	46.426 (46.416 — 46.436)	71.513 (71.490 — 71.535)
As % of GDP		14	8	12
Value of the domestic and care work that is done by itself only				
Annual value billions	581.1	43.960 (43.947 — 43.972)	24.900 (24.893 — 24.907)	38.386 (38.369 — 38.403)
As % of GDP		8	4	7

* GDP is the Gross Domestic Product at Factor Production Cost in current prices (£E1.0 = US$0.16)
** The estimated annual value is followed by an interval that represents the 95% confidence interval considering the sampling standard errors of the estimated variables using this sample.
Source: CAPMAS, The Annual Statistical Book 20062007/ .

Procedure 2: Using the Current Data. This procedure may be used to get the wage rates of the Opportunity Cost Approaches[12] — OCA1, OCA2 and OCA3. The wage rate used in OCA3 is the male wage rate and this can be directly calculated from the data (£E3.3 /hr). Data used in this paper from ELMPS (2006) have wealth information on job characteristics, mobility, earnings, wages, household's socio-economic characteristics, demographic characteristics, family enterprises and women's status and work. This information can provide many estimates. For example, wages of females> waged workers may be used to get estimated wages for females with no wages depending

on some specific characteristics. This is the main concept used to compute the wage rates of OCA1 and OCA2 methods.

Two regression models on the natural logarithm of wage can be done in the form of:

$$\text{Ln } w_i = \alpha + \beta_i x_i + \varepsilon_i,^{(13)} \qquad \text{(Equation 4)}$$

where ln (w_i) is the natural logarithm of the observed wage rate for individual i, ε_i is the error term and x_i>s are the independent variables representing the characteristics of individual i (these two methods being based on the two main variables of age and educational level).

The First Model is performed for females (1564- years) who do paid work and have wage, and it estimates the parameters β_i' s using OLS.

The Second Model is done for females (1564- years) who do domestic and care work to predict the values of wage rate based on the parameters resulting from the first model.

These two models are done for both methods OCA1 and OCA2, where:

- OCA1: The wage rate used is based on age only; so that, the two regression models contain one independent variable, i.e. age.
- OCA2: The wage rate used is based on age and educational level, so that, the two regression models contain two independent variables — age and educational level.

The results of using the wages predicted from this procedure are shown in Table 7.

Table 7. Monetary Value of Domestic and Care Work/Yr (£E) and Comparison with GDP (Procedure 2)

	GDP-2005/2006*	OCA1	OCA2	OCA3
Time less than 98 hrs/wk				
Value of the domestic and care work whether done by itself only or combined with other types of work				
Annual value billions	581.1	72.840 (72.823 — 72.857)	54.361 (54.347 — 54.374)	112.950 (112.932 — 112.969)
As % of GDP		13	9	19
Value of the domestic and care work that is done by itself only				
Annual value billions	581.1	37.303 (37.291 — 37.316)	28.222 (28.212 — 28.232)	60.708 (60.695 — 60.722)
As % of GDP		6	5	10
Time 18-98 hrs/wk				
Value of the domestic and care work whether done by itself only or combined with other types of work				
Annual value billions	581.1	66.411 (66.386 — 66.435)	49.718 (49.698 — 49.737)	103.484 (103.461 — 103.507)
As % of GDP		11	9	18
Value of the domestic and care work that is done by itself only				

Table 7 continued ...

Annual value billions	581.1	34.090 (34.071 — 34.108)	25.813 (25.799 — 25.828)	55.347 (55.330 — 55.364)
As % of GDP		6	4	10
Time 24-98 hrs/wk				
Value of the domestic and care work whether done by itself only or combined with other types of work				
Annual value billions	581.1	59.798 (59.775 — 59.822)	45.094 (45.075 — 45.113)	94.571 (94.552 — 94.591)
As % of GDP		10	8	16
Value of the domestic and care work that is done by itself only				
Annual value billions	581.1	30.318 (30.795 — 30.831)	23.641 (23.448 — 23.475)	50.723 (50.708 — 50.737)
As % of GDP		5	4	9

* GDP is the Gross Domestic Product at Factor Production Cost in current prices (£E1.00 = US$0.16)
** The estimated annual value is followed by an interval that represents the 95% confidence interval considering the sampling standard errors of the estimated variables using this sample.
Source: CAPMAS, The Annual Statistical Book, 2006/2007

6. Conclusion

At the national level, for women who do domestic and care work (whether done by itself or combined with other types of work), the total assessed value of their domestic and care work varies between £E45 to 113 billion, accounting for about 8% - 19% of GDP. If women are considered who do only domestic and care work, the corresponding assessed value of their domestic and care work amounts to approximately £E23 to 60 billion, accounting for about 4% - 10% of GDP.

This means that females who do domestic and care work (whether by itself or combined with other work) are actually doing a type of work that has a considerable value — if valuated in monetary term — and it forms a considerable percentage of GDP. Hence, these females should not be neglected when planning national policies. Their contributions should not be overlooked and must be given the consideration that is rightly due.

From Tables 7 and 8, it is clear that the higher the considered minimum hours are, the lower the estimated values are and consequently their percentages of GDP. The results are consistent with international reports; the use of the Opportunity Cost Method based on the average hourly wages for occupations leads to the highest values; and the Generalist Replacement Cost Method based on the average hourly wages for housekeepers gives the lowest values. On the other hand, the Specialist Approach yields nearly a medium value between them.

In Procedure 2, predicting the females' wage — for those females with missing wages — has been calculated by simply using the concepts of the approaches OCA1, OCA2 and OCA3 regardless of any other factors that may affect the wages. This prediction would be acceptable provided that:

- The missing wages are completely random
- The model of prediction contains most of wage determinants as possible as the data permit.

In fact, the missing wages are not a random sample where the decision to work or not is made by the woman. Some women who would earn low wages may choose not to work and this forms missing wages. Thus, non-working women constitute a self-selected sample and not a random sample. This may lead to an overestimation of the wages of women in the population. Consequently, there is a need to use information available on non-working women such as the factors of marriage and having children.

Additionally, there are some factors that should be taken into consideration when predicting missing wages such as: the place of residence and experience. Using the Heckman Selection Model may be the solution. The Heckman Selection Model is a two equation model: the regression model and the selection model. The Heckman Selection Model allows using information from non-working women to improve the estimates of the parameters in the regression model.(14)

7. Policy Implication

According to the ESCAP and UNDP report (2003), to make the role of those women who do unpaid domestic and care work more visible in the national economy, further studies about imputing a monetary value for unpaid work are necessary which requires:

- Dealing with the lack of needed data and statistics about unpaid work (for both men and women) by conducting comprehensive time-use surveys or including time-use questions in household surveys on a regular basis. The type and frequency of time-use surveys may be decided on country-basis on available funding. National Statistic Offices and behind them the government ministries, have a central role to play in this respect;
- Using standardized concepts and definition of unpaid work;
- Adopting the standardized activity classifications to local situations;
- Determining the minimum hours of domestic work to consider an individual or worker included in the National Accounts. The ILO Governing Body has agreed to place an item on decent work for domestic workers on the agenda of the 99th Session of the International Labor Conference (2010) with the view to the setting of labor standards;
- Compiling a satellite account where unpaid work can be reflected.

This paper shows that that monetary value of domestic and care work of Egyptian women (1564- years) constitutes a considerable weight of GDP and most women do this type of work and spend a considerable amount of time doing it. This means that the needs and interest of those women should be taken into account when planning policies, that may be done by:

- Increasing the awareness of the great social importance of unpaid work and its contribution to the welfare of society. It is also critical to shed light on unpaid workers, especially women because they do the most;
- The term "economically active" should be reconsidered for Egyptian women, as low labor force participation of Egyptian women leads to the marginalizing their economic contribution. Since considering women, who do only domestic and care work as "not economically active" is inappropriate; where their ability to engage economically is often limited by their heavy responsibility in home.
- Looking for some programs or policies that can help those who have to withdraw from the labor market for any reason such as taking care of children. If women try to re-enter the labor market after a few years of childbearing, they might not have equal access to employment opportunities;
- When planning national policies, some important indicators of time allocation, that reflect the equal/unequal access of men and women to development opportunities should be considered such as:

  o Total time spent by men and women on SNA and non-SNA activities per week;
  o The share of unpaid work in the total work performed by men and women per week;
  o Time spent on multiple simultaneous activities per week that may lead to stress;
  o Personal time per week enjoyed by men and women; and
  o Time spent by children on SNA activities.

8.Further Research

- In Egypt, time-use surveys need to be taken into account by statistical offices. They should work on different ways of constructing this type of survey based on other countries' experiences in this field, e.g. Korea, Japan and Australia. When constructing time-use surveys, international classifications such as the United Nations Classification and Eurostat Classification should be taken into account.
- The currently common methods of imputing a monetary value to unpaid work (input and output methods) need further research to tackle the challenges and disadvantages. Methods dealing with simultaneous activities are not yet feasibly applicable and need harder work to be taken into account when dealing with unpaid activities.
- Further in-depth analysis is needed in studying the time allocation of Egyptian women to understand determinants of their time use.
- Other activities should be studied as well, such as tutoring children and time spent in leisure activities, for both women and men.

Footnotes

(1) The SNA is a conceptual framework that sets the international statistical standard for the measurement of the market economy. It is published jointly by the United Nations, the Commission of the European Communities, the International Monetary Fund, the Organization for Economic Co-operation and Development, and the World Bank. The first SNA was published in 1953 followed by the first revision in 1960 and second revision in 1964. The scope of the national accounts is extended in 1968 and SNA 1993 comes to harmonize the SNA and other international statistical standards more completely than in previous versions. Finally, there are some updates in 2008.

(2) Ironmonger has done some pioneering work in the field of valuation of unpaid work and he published the first input-output table in 1975-76 for the Australian household economy. This input-output table represents the core of the household satellite account (Hirway, 1999b)

(3) Eurostat is the statistical office of the European Union situated in Luxembourg. Its task is to provide the European Union with statistics at European level that enable comparisons between countries and regions. In 1999, it conducted a project to develop a harmonized satellite system of household production to evaluate the quality of the data from the time use pilot survey and its applicability to the calculation of unpaid household labor. (http://epp.eurostat.ec.europa.eu/portal/page/portal/about_eurostat/corporate/introduction).

(4) The 2006 Egypt Labor Market Panel Survey (ELMPS) is nationally representative and collected a wealth of information on employment and unemployment in Egypt. It was conducted by the Economic Research Forum (ERF) in cooperation with the CAPMAS with the support of USAID- Egypt and the Ford Foundation.

(5) Labor force participation rate = Labor Force / Adult population (1564-) x 100[(Dept of Economic and Social Affairs, Statistics Division of the United Nations, 2005).

(6) Figure 1 shows that the unpaid work out of SNA includes domestic work, care work and volunteer work. In this paper, the data used have no information about volunteer work, so, the unpaid work out of SNA here refers solely to domestic and care work.

(7) Both men and women need to spend time in various activities in order to sustain their basic biological functions. It is very difficult to define how much time this should be. On the average, a typical adult is recommended to sleep for eight hours a day (Ting and Malhotra, 2005; Heslopa et al. 2002) and to this should be added time for other self-care activities. As a reference, the average time for personal care and nutrition in Thailand is 2.3 hours a day and in the United States, it is 2.02 hours (NSOT, 2001; USBLS, 2004). Therefore, it is reasonable to assume that, on the average, at least 10 hours per day or 70 hours per week are needed to maintain a person' s biological functioning. Taking this into consideration, the maximum time available for work in a week is set to be 98 hours, discounting the 70 hours from 168 hours in one week (Medeiros et al., 2007).

(8) «An individual is said to be engaged in a paid work activity if the individual receives compensation or remuneration, in cash or in kind, for the work done. Labor input into activities within the SNA production boundary has corresponding compensation, regardless of whether the worker is actually paid or not. Compensation may be in the form of wages and salaries, commission from sales, payments by piece rate, bonuses or in-kind payment such as food, housing or training» (ESCAP and UNDP, 2003, Statistics Division, UN, 2005).

(9) It includes the activities of primary production of goods and services (agricultural activities, raising poultry/livestock, collecting water and collecting firewood or other fuel), the activities of non primary production of goods and services (producing ghee/butter/cheese, preparing food — e.g. vegetables, sewing/embroidery/crochet; producing hey products/carpets/textile/ropes; offering services for others in a house/shop/hotel; selling goods in the market/in the street/at home and buying goods and reselling it and helping on construction; and the activity of training (learning a skill) (ESCAP and UNDP, 2003, Statistics Division, UN, 2005).

(10) It includes the activities of domestic and care work — cooking, washing dishes, doing laundry and ironing, cleaning house, shopping for food and clothing, helping in construction work for the household house, caring for the sick or the elderly and taking care of children) and the activities of volunteer work- references (ESCAP and UNDP, 2003, Statistics Division, UN, 2005). However, the data used in this paper do not have any information about volunteer work; so, the unpaid work out of SNA here simply refers to domestic and care work.

(11)This procedure doesn>t use OCA1 and OCA2 because the average wage rates on the used bulletin doesn>t disaggregated according to age or educational levels which are needed when using OCA1 and OCA2, but it>s only disaggregated according to sex which can be used in OCA3.

(12) £E1.00 = US$0.16

(13) This procedure cannot be applied to the Generalist and the Specialist Replacement Cost Approaches because of incomplete data on all the occupations corresponding to the activities of domestic and care work.

(14) The literatures on wage equation (The Mincerian regression model or Blinder-Oaxaca wage decomposition model) gave this general form, where the dependent variable is the natural logarithm of the observed wage rate for individual and the independent variables are divided into two groups: (a) Group of individual (human capital) characteristics (such as sex, age, education, residence, experience, etc); and (b) Group of occupational characteristics (such as the size of firm, number of workers,

regularity, etc). However, the group of occupational characteristics cannot be applied to the domestic and care work, so, the equation is based on mainly the group of individual characteristics (Kapsos, 2008).

(15) Prediction of missing wages using the Heckman Selection model is not reported here as it is still in progress.

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