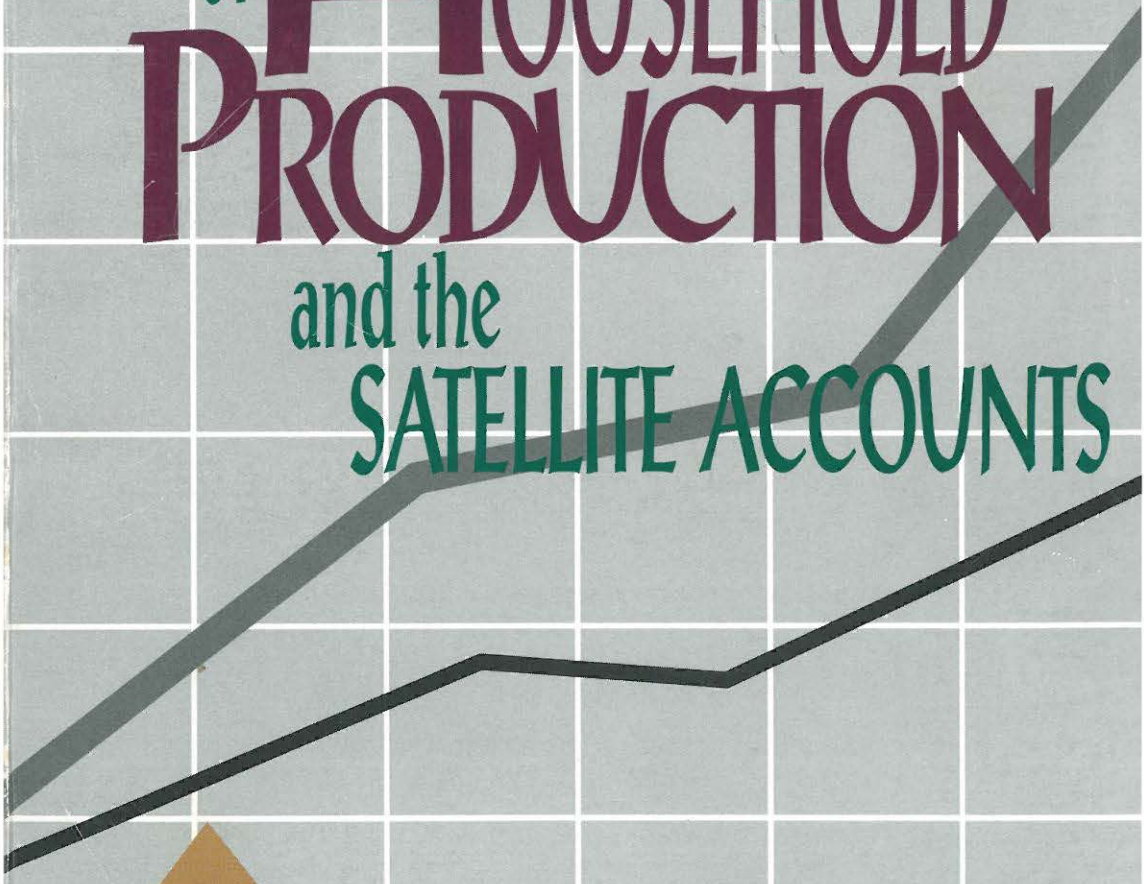
Valuation of HOUSEHOLD PRODUCTION and the SATELLITE ACCOUNTS



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VALUATION OF HOUSEHOLD PRODUCTION AND THE SATELLITE ACCOUNTS

UNITED NATIONS
INTERNATIONAL RESEARCH AND TRAINING INSTITUTE
FOR THE ADVANCEMENT OF WOMEN
(INSTRAW)

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1996

TABLE OF CONTENTS

LIST OF TABLES, CHARTS, MAPS AND FIGURES

TABLES

FOR PART 1

FOR PART 2

CHARTS

MAPS

FIGURES

PREFACE

The need to account for unpaid household production has moved from the realm of "it would be nice", to the realm of "how do we do it?" This is clearly the message delivered over the last few years in national and international fora and in the 1993 revision of the System of National Accounts (SNA). The call to account for household production has become sufficiently consistent and impelling. Arguments against the need and desirability of properly and officially accounting for it are becoming less frequent. The call has come from both lay groups and practitioners. It was clearly echoed at the recently held Fourth World Conference on Women in China (1995) and the Platform for Action specifically defined the need to "seek to develop a more comprehensive knowledge of work and employment through, *inter alia*, efforts to measure and better understand the type, extent and distribution of unremunerated work, and encourage

the sharing and dissemination of information on studies and experience in this field, including the development of methods for assessing its value in quantitative terms, for possible reflection in accounts that may be produced separately from, but consistent with, core national accounts".[1]

In 1983, INSTRAW, convened a consultative meeting with a group of eminent economists to analyze women's position in the world economy. The conclusions of this meeting which were later published in *Women and the World Economy* (1985) emphasized the need to improve the subordinate position of women in the economy. They stressed the importance of making women's social and economic contribution visible in statistics and indicators that measure the wealth and productivity of a nation. Increasingly attention is being directed towards the means of doing so. Estimates of the value of household production have by now been developed in a number of countries. Ten years after the first experience, in 1992, INSTRAW launched a long-term programme designed to develop methods of collecting and analyzing data to measure and value paid and unpaid work as well as methods for ensuring that they are properly reflected in the national accounts. As first result of the above long-term programme in 1995, a monograph *Measurement and Valuation of Unpaid Contribution: Accounting through Time and Output* was published based on the results of the initial research conducted in several countries (Canada, Dominican

[1] *United Nations Department of Public Information, Platform for Action, and the Beijing Declaration*, 1996, p. 119.

Republic, Hungary, Nepal, Tanzania, and Venezuela). In the monograph, a framework for the classification of activities was recommended on the basis of which, a "satellite account on household production" could be established. The strengths and weaknesses of various methods of time-use data collection and techniques for valuing unremunerated work taking into account the structure and objectives of the System of National Accounts (SNA), are also discussed.

The present report, *Valuation of Household Production and the Satellite Accounts*, is a sequel to the *Measurement and Valuation* monograph. It explores approaches to the development of output measures of "satellite accounts" on household production and presents some original output-based valuations in Canada, Finland, and Nepal using the above-mentioned framework. The selection of these three countries was primarily based on 1) availability and quality of time-use and other collateral data collected at the national level [from developed and developing countries]; 2) accessibility to these data; and 3) availability of local expertise who could carry out the study. The primary objective of this exercise was to assess the viability of achieving a common understanding and agreement on the framework and methods for measurement and valuation of unpaid work and its reflection in economic indicators through "satellite accounts".

The results and conclusions contained in this report, besides identifying measurement and valuation problems, make recommendations to help reach this goal. However, it must be noted here that this is just part of a long-term project in progress. Hence, potential users of this report which

include statisticians, economists, researchers, development planners and policymakers are encouraged to forward their substantive observations and comments on the report to INSTRAW.

The completion of the remaining part of this project and the full realization of its primary objectives, i.e., to fully recognize women's contribution to society, will undoubtedly draw a great deal from those comments and suggestions.

Martha Dueñas Loza
Acting Director

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INTRODUCTION

Finding a statistically valid methodology for measuring and valuing unpaid work involves a process of trial and error. New and modified techniques will require testing, refinement and, to the extent possible, standardization.

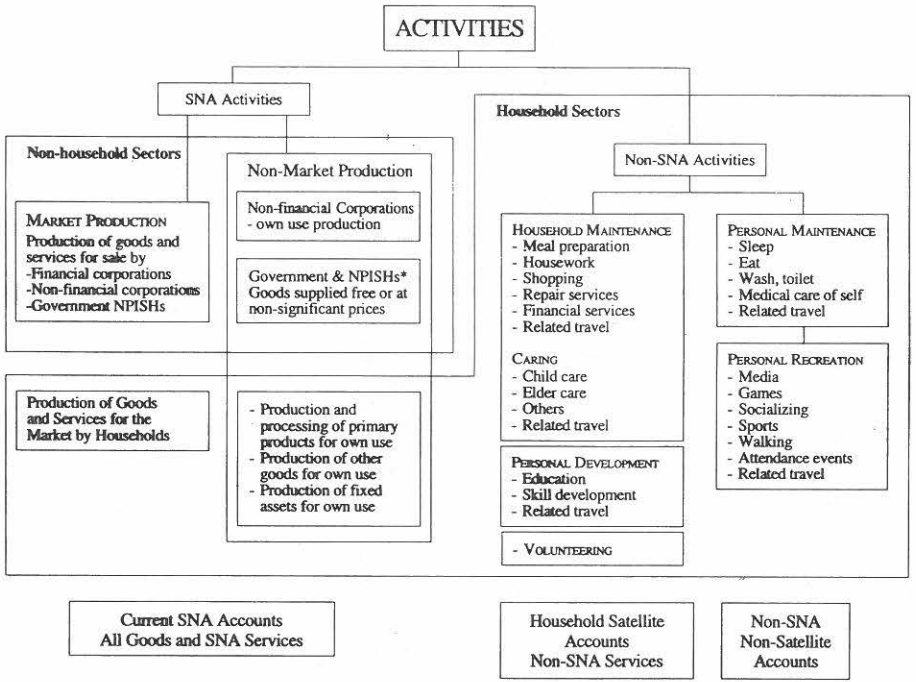
In its publication, *Measurement and Valuation of Unpaid Contribution: Accounting through Time and Output* (1995), INSTRAW recommended a framework for defining activity classification for SNA and *satellite account* activities (Figure 1). The framework defines the following categories:

A. SNA Activities

—*SNA Market Production* includes all activities related to the production of goods and services for the market sector. The market sector is, as defined in the SNA, all goods and services transacted in the market regardless of the institutional unit producing them (Figure 1). Thus, as can be noted,

SNA Based Activity Classification Framework

INSTRAW, Time-Use Measurement and Unpaid Work Project



* Non-profit institutions serving households, based on Table 6.1, 1993 SNA

Figure 1

market output emanates from activities of financial corporations including private enterprises, non-financial corporations, governments, non-profit institutions serving households, and the households themselves.

—*SNA Non-market Production* also covers the non-market activities currently included in the SNA. These include goods and services produced for own use by non-financial corporations, governments and non-profit institutions. And it includes, from the household standpoint, the inputed value of home ownership, goods consumed in kind, etc. (Figure 1). It also includes—as a result of the 1993 revision—all goods production whether sold in the market or not. It includes, for example, the production/storage of agricultural and related products; other primary products, the processing of agricultural and related products, and other kinds of processing such as cloth and dress making, etc.

B. Non-SNA Activities

Non-SNA activities are comprised of two distinct sets of services. One set consists of service activities that can be relegated tq another person and thus can be traded in the market. The other set consists of services that cannot be relegated to others but must be done for oneself. The former should thus be accounted for in an overall accounts framework, through the construction of satellite accounts.

—*Satellite account activities* should include household maintenance activities, caring activities, personal development and volunteering, as proposed by INSTRAW and as reflected in Figure 1. *Household maintenance* includes meal prepara-

tion, household cleaning, domestic and repair services, time attending to financial services (includes banking and paying bills), legal services, etc. *Caring activities* carried out by the household include people-related tasks done for others, primarily for children and the elderly. INSTRAW argues that in addition to the foregoing, the satellite account should also include *personal development* (education) of those receiving education. *Volunteering* essentially involves activities undertaken with no or minimal pay for another institutional unit. In essence, volunteering is the household equivalent of government and non-profit institution outputs provided at an insignificant price.

—*Non-satellite activities* fall into two major groups: personal maintenance and personal recreation—defined by the 'recipient criterion', which simply put says that activities that 'cannot be received for another' are non-tradeable and thus should be considered consumption rather than productive activities. Thus, watching TV, eating, sleeping, etc., would fall outside the SNA and the satellite accounts proposed by INSTRAW.

The use of the *output-based approach* for valuing unpaid activities was also recommended and illustrated in the *Measurement and Valuation of Unpaid Contribution: Accounting through Time and Output*.

Following these recommendations, the Institute conducted three case studies in 1995, using data from Canada, Finland, and Nepal, to test the viability of output-based valuation techniques to establish satellite accounts on household production and the gender division of production using time-use data. These case studies are merely intended to test the feasibility of the recommended framework, test techniques for estab-

lishing satellite accounts and identify measurement issues and problems. They were not undertaken to produce an accurate account.

It was clearly emphasized in an earlier publication of INSTRAW (1995) that, in order to implement the output-based valuation approach, a combination of data from different sources would be required. Some new auxiliary data would also have to be collected to define certain norms such as prices, units of measurement used in specific activities and the volume and value of inputs applied to produce certain outputs. The case study in Nepal represented a scenario where such norms had to be determined through collection of new data. For Canada and Finland, however, the valuation was conducted using existing secondary data.

For the case study conducted in Nepal, the valuation exercise included not only the production of satellite accounts on household production but also an estimation of the value of the "other goods and services produced for own consumption". The latter are technically within the SNA production boundary but have been consistently left out in the accounting process due to lack of data.

The satellite accounts for Nepal include household maintenance activities such as cooking, cleaning, laundry, caring, dishwashing, mending, and similar activities. To impute values to these activities or their equivalent outputs, some new auxiliary data had to be collected in order to develop normative values for each kind of activity. This report describes the development of these normative values based on a small-scale survey and their application to an existing time-use data set which was generated from a national survey conducted in 1984/1985 (Nepal Multipurpose Household Budget Survey).

The satellite accounts do not include, however, the categories related to gaining an education, and volunteer work due to a lack of statistical information which could only be collected through a more comprehensive time-use survey.

Similarly, the studies of Canada and Finland were designed to test the feasibility of developing macro estimates of output measures using large-scale time-use data and collateral data from existing data sources such as establishment or industry data. While some difficulties were encountered, such an approach is clearly feasible for developing estimates for, at least, some of the components of unpaid work with existing data. Estimates of other components, while apparently feasible, will require that attention be paid to one or more problems related to definition and measurement. For example, a reasonable value for volunteer work and education were estimated for Canada using existing data. However, due to lack of data, estimates of the value of unpaid educational activity or volunteer work could not be derived for Finland.

As in the case of Nepal, in both Canada and Finland women account for the major share of the unpaid work. Their shares are approximately 67 and 69 per cent, respectively, based on time allocations to unpaid activities.

ABBREVIATIONS

CHAID	=	Chi-square based Automated Interactive Detector
CMA	=	Census of Metropolitan Area
CREST	=	Canada Research on Statistics
FAMEX	=	Canadian Family Expenditure Survey
FIM	=	Finnish Markka
GDP	=	Gross Domestic Product
GNP	=	Gross National Product
GSS	=	General Social Survey
HES	=	Household Expenditure Survey
INSTRAW	=	United Nations International Research and Training Institute for the Advancement of Women
LFS	=	Canadian Labour Force Survey
MPHBS	=	Nepal Multipurpose Household Budget Survey
RME	=	Raw materials and energy
SNA	=	System of National Accounts
TUS	=	Finnish Time-Use Survey
VA	=	Value added
VDC	=	Village Development Committee
VHO	=	Valuation of Household Outputs

Part 1

VALUATION OF HOUSEHOLD MAINTENANCE WORK AND THE SATELLITE ACCOUNTS **NEPAL**[2]

Meena Acharya

[2] In collaboration with the Institute for Integrated Development Studies (IIDS), Kathmandu, Nepal.

INTRODUCTION

Following previously presented SNA-based framework for activity classification, a tentative structure for a complete account of human productive activities disaggregated by sex is developed for Nepal and is presented in Table 1. Part I of this table contains GDP generated in the market sector, and Part II contains the imputed value of non-market products. Currently, GDP statistics include all market production and part of the non-market production. Major components of the non-market production, which enter GDP are comprised of imputed values of own-account agricultural products and self-occupied housing. According to the revised manual of SNA (1993), future GDP statistics shall include imputed values of additional non-market products which include all goods produced for own consumption, such as agricultural products generated from own backyards, fuel-wood and water collected for home use, by-products of secondary processing, and the like.

TABLE I.1

GDP AND THE HOUSEHOLD MAINTENANCE SATELLITE ACCOUNTS SECTORS: GENERAL SCHEME

Sections/Sectors	*Male*	*Female*	*Total*
I. FORMAL/ORGANIZED SECTOR			
1. Agriculture			
2. Manufacturing			
3. Electricity, Gas and Water			
4. Construction			
5. Trade & Commerce			
6. Transport, Communic. & Storage			
7. Finance & Business			
8. Community, Social & Pers. Serv.			
SUB-TOTAL			
II. INFORMAL/OWN ACCOUNT SECTOR			
1. Agriculture			
2. Manufacturing			
3. Electricity, Gas and Water			
4. Construction			
5. Trade & Commerce			
6. Transport, Communic. & Storage			
7. Finance & Business			
8. Community, Social & Pers. Serv.			
SUB-TOTAL			
III. HOUSEHOLD MAINTENANCE			
1. Subsistence			
2. Child care			
3. Other Services			
SUB-TOTAL			
IV. EDUCATION			
GRAND TOTAL			

The problem, nevertheless, lies in capturing all such products. Particularly in countries which are at an early stage of development such as Nepal, subsistence production constitutes a large part of total household resources. But, much of this is left out of GDP statistics due to the scattered nature of the activities and a lack of reliable methods for accurate estimations (Acharya, 1994).

The issue as to how much and how many of such products are included in GDP is specific to each country and needs to be examined within the country context. Due to cost and time limitations, this issue has not been covered in detail in this study. An *ad-hoc* method based on the proportion of time input in conventional economic and subsistence economic activities has been used to derive estimates of what is left out of the non-market products in current GDP statistics of Nepal. Conventional economic activities include agriculture, production, trade and commerce, services, and construction. Subsistence economic activities include fuel/fodder collection, fetching water, house repair and construction (own use), hunting, and gathering and processing food.

The focus of the current study is on household maintenance activities. Despite recognition that the division of activities as productive and non-productive is tenuous and that a more accurate measurement of human activities is desirable (SNA, 1993), household maintenance activities still remain outside the boundary of SNA. The major arguments advanced for the exclusion of these activities from SNA boundary are lack of data and difficulty of measurement as well as lack of historical comparability. Nevertheless, SNA does not exclude the possibility of constructing satellite accounts through the development of innovative measurement techniques and the collection of additional data.

To make such an account comparable to those of other products included in SNA, it is necessary to develop and devise a product-based valuation system. The current study has been designed specifically to test such a methodology.

1. The Process of Valuation using the Output Approach[3]

The following steps for the valuation of production and services for non-market (within SNA) and household maintenance (non-SNA) activities were recommended.

a) Generating large scale (national) time-use data for all activities.
b) Generating output data for a much smaller sub-sample from the same group.
c) Deriving values for time input on the basis of this smaller sample, in order of preference as listed below:

   i) *Output value derived from the price of comparable or equivalent market product.* For comparable products which are for the market as well as for home consumption, valuation is not a serious problem. For example, food may be cooked for part sale and part domestic use. In such cases, the part that is consumed domestically should be valued at the same price of the part which is sold.
   ii) *Net return to labour*, exclusive of intermediate inputs used in market-oriented activities performed

[3] This chapter is extracted from the INSTRAW publication *Measurement and Valuation of Unpaid Contribution: Accounting through Time and Output*, (1995).

by the household and similar or even identical to domestic activities, e.g., cooking for self and cooking for other households.

iii) *Net return to labour in other comparable non-monetary productive activities* for which output related valuations can be performed. For example, if a person devotes two hours to child care (a type of service done exclusively for own children), this time may be valued at net average returns to her labour input in other activities, the products of which are sold.

iv) *Wages of polyvalent household workers* (inclusive of income in kind) adjusted for skill level and managerial responsibilities.

The process of output-based valuation, thus, requires: (a) an estimate of the household output; (b) an estimate of the intermediate consumption; and (c) determination of the market prices to be used for the conversion of physical volumes of outputs and inputs.

The steps for output-based valuations which would provide an approximate total figure of household production for comparison with what is included in the SNA and an estimate of women's contribution to the total productive process in the society would be:

Step 1 Estimating women's contribution to Regular GDP on the basis of available information on male/female earnings (if available), male/female labour force and gender-disaggregated wage rates.

Step 2 Estimating SNA included output generated in the household e.g., kilograms of paddy, vegetables,

fruits and similar goods; number of mats, carpets; kilograms of milk, meat, wool, etc. This is necessary primarily for two reasons: (a) most of the food and other processing activities are continuous with pre-cooking domestic processing, and to capture such processing, a careful recording is necessary at least to develop norms; and (b) since the SNA still retains a caveat that if the products generated in the household are not important for a country's economy they may be ignored, it is first crucial to collect data on all products so that a decision on their significance can be taken. Situations in each country may warrant some variation on the details of activity and product listing, but the process remains the same. All products and activities must be listed.

Step 3 Estimating the volume of household output in the various domestic activities, e.g., number of meals cooked, number of older persons and children cared for, quality and contents of the meals, quality and frequency of child-care activities, etc.

Step 4 Valuing this product at the market price of products when they are sold in part. When they are not sold, the prices of equivalent goods and services produced in the market may be used. Where this is not possible, wage-based methods may be used as discussed above.

Step 5 Deducting intermediate consumption of both market-purchased and home-produced goods valued at market prices of equivalent goods to derive the

value added within the household sector. One should be careful to avoid double counting. This process should be carried out for each product category separately. If outside labour is employed in the process of generating this value added, the costs of employing such labour must be deducted at this stage in order to derive the value added by the household members. Payments to outside labour must also be disaggregated by gender, in order to derive gender disaggregated wage income from the household sector.

Step 6 Allocating the value, thus calculated, to various members of the household according to their respective labour inputs in production of various goods and services. This labour input must also include time devoted to management.

The analysis followed in this chapter, however, starts with the third step i.e., estimation of volume of products and services generated by household maintenance activities. Own account SNA-included products are not being covered by the present survey. This presents several difficulties in the application of a product-based valuation system to household maintenance activities as proposed above which are discussed in chapter five of this document.

2. *Sources of Information*

The study will use both primary as well as secondary information. The source of primary data is the pilot survey conducted in eight different districts of Nepal which is

described in chapter one. Secondary information sources are 1993-1994 GDP, Population Census 1991, and wage rates for the organized sector and the time budget records of the Multipurpose Household Budget Survey (MPHBS) completed by Nepal Rastra Bank in 1984/85.

A small pilot survey has been conducted to collect in-depth information on the product-based valuation process. Structured questionnaires and checklists were the main instruments administered for data collection. Discussions with local people, hoteliers, and food and grain sellers were the other sources of information.

3. Outline of the Report

This report consists of an introduction and five chapters. The introduction gives the reader an insight of the subject and provides a theoretical framework for the analysis. The first chapter discusses the field survey design and its methodology. General findings on characteristics of the sample population and time allocation are discussed in chapter 2. Chapters 3, 4, and 5 constitute the focus of this current exercise. Chapter 3 develops normative values for different categories of household maintenance activities. Chapter 4 illustrates how to apply these normative values and other estimation methods for constructing an overall GDP account classified in section III of Table 4.4 including the household maintenance satellite accounts and allocating the production in various sectors to women and men. Chapter 5 discusses the validity of the techniques used as well as their limitations, and presents observations of the field enumerators concerning the survey.

Chapter One
THE FIELD SURVEY

I. The Objectives

The pilot survey was conducted to evaluate the practicability of the product-based valuation method to identify reasonable means of resolving the difficulties involved in its implementation. Subsequently, the field survey was carried out to generate information on:

a) output data, i.e., products generated in the households, (what, how frequently, how much, etc.);
b) volume and prices of inputs involved in each product;
c) time and labour used to produce the products, i.e., contribution by whom and how much;
d) market price for all products and services generated by household maintenance activities.

II. The Sample Design

Primarily, the survey was an attempt to collect auxiliary information required to adapt the valuation techniques described earlier. The survey was carried out in eight districts of Nepal (see Map 1 and Map 2). Even though the study could not draw a representative sample at a national level, attempts were made to provide reasonably representative random samples. One district from each of the five Development Regions and three Ecological Belts[4] were selected so as to capture both the geographical and ecological variations (see Map 1 and Map 2). Special attention was paid to ensuring the inclusion of rural and urban samples. A total of 276 households was surveyed, drawing a sample of 26 from each municipality and 18 from each VDC selected from the sample districts. Two wards from each municipality as well as from each VDC in the sample were chosen by the interviewers themselves. Nine households from each VDC, except for the municipality of Dasharathachand in which two extra households were interviewed, and thirteen households from each municipality ward were selected. Because the data collected from the two additional households were considered to be consistent with the remainder of the cases, they were, therefore, kept in the analysis.

To simplify the selection of households and at the same time follow the scientific sampling techniques, the total number of households of a sample ward was divided by the total number of households to be interviewed in that ward.

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[4] Nepal is divided in three Ecological Belts, five Development Regions, and 75 Districts. The 75 Districts comprise of 3,995 villages—termed as Village Development Committees (VDCs)—and each VDC is divided in 9 wards. Similarly, there are 36 municipalities having from 9 to 34 wards.

Map 1


DISTRICT MAP OF NEPAL
FAR WESTERN REGION
MID WESTERN REGION
WESTERN REGION
CENTRAL REGION
EASTERN REGION
CHINA
INDIA
INDIA
INDIA
KATHMANDU
BHAKTAPUR
LALITPUR
HUMLA
DARCHULA
BAJHANG
MUGU
BAJURA
BAITADI
DOLPA
KARNALI
KALIKOT
JUMLA
DADELDHURA
DOTI
ACHHAM
MUSTANG
DAILEKH
JAJARKOT
MANANG
KANCHANPUR
KAILALI
RUKUM
BHERI
GORKHA
SURKHET
SALYAN
MYAGDI
KASKI
LAMJUNG
ROLPA
BARDIYA
RAPTI
BANKE
PYUTHAN
GULMI
SYANGJA
TANAHUN
DANGDEUKHURI
ARGHAKHANCHI
PALPA
LUMBINI
KAPILBASTU
RUPANDEHI
NAWALPARASI
CHITAWAN
MAKAWANPUR
NARAYANI
PARSA
BARA
RAUTAHAT
KASUWA
SINDHUPALCHOK
DOLAKHA
SOLUKHUMBU
SANKHUWASABHA
TAPLEJUNG
NUWAKOT
DHADING
BAGMATI
KABRE
RAMECHHAP
OKHALDHUNGA
KHOTANG
BHOJPUR
TEHATHUM
SINDHULI
SARLAHI
MAHOTTARI
DHANUSA
UDAYAPUR
SIRAHA
DHANKUTA
PANCHTHAR
ILAM
SAPTARI
SUNSARI
MORANG
JHAPA
KOSHI
LEGEND
Boundaries
International
Regional
Zonal
District
Headquarters
Capital
Regional
Zonal
District
SCALE
50 0 50 100
Kilometres


CHINA
NEPAL
FAR WESTERN REGION
MID WESTERN REGION
STUDY SAMPLE DISTRICTS
INDIA
CHINA
WESTERN REGION
CENTRAL REGION
EASTERN REGION
BAITADI
JUMLA
BAGLUNG
BANKE
KATHMANDU
CHITAWAN
DHANKUTA
MORANG
INDIA
LEGEND
MOUNTAIN
HILL
TARAI
INDIA
SCALE
50 0 50 100
Kilometres

Map 2

This resulted in a number showing the sampling interval between two households to be selected. For the first interview, a household was chosen at random. After the random start, the next household was the one located at the sampling interval derived from the above calculations. Other households were located in a similar manner.

The detailed information on sample sites and sample distribution are featured in Tables I.1.1 and I.1.2 respectively.

TABLE I.1.1
SAMPLE DISTRICTS, VDCs, AND MUNICIPALITIES IN THE PILOT SURVEY

Development Region	*Mountain Areas**	*Hill Areas*	*Tarai Areas*
1. Eastern	-	Dhankuta(D) Dhankuta(M) Belhara(V)	Morang(D) Biratnagar(M) Tankisinuwar(V)
2. Central	-	Kathmandu(D) Kathmandu(M) Kapan(V)	Chitwan(D) Bharatpur(M) Gitanagar(V)
3. Western	-	Baglung(D) Laharepipal(V)	-
4. Mid-Western	-	-	Banke(D) Nepalgunj(M) Paraspur(V)
5. Far-Western	Jumla(D) Dillichaur(V)	Baitadi(D) Dasharathachand(V)	-

D = District, M = Municipality, V = Village Development Committee (VDC)

*) Mountain region has no urban areas i.e., municipalities.

TABLE I.1.2
DISTRIBUTION OF SAMPLE HOUSEHOLDS BY VDC AND MUNICIPALITY WARDS

VDC/ Municipality	*Average Number of Households*	*Num. of Wards Selected*	*Num. of Households per Ward*	*Num. of Households Selected*
VILLAGE DEVELOPMENT COMMITTEES				
1. Belhara	97	2	9	18
2. Tankisinuwar	227	2	9	18
3. Kapan	98	2	9	18
4. Gitanagar	233	2	9	18
5. Laharepipal	55	2	9	18
6. Paraspur	67	2	9	18
7. Dillichaur	48	2	9	18
8. Dasharathachand	58	2	10	20
MUNICIPALITIES				
1. Dhankuta	404	2	13	26
2. Biratnagar	1093	2	13	26
3. Kathmandu	2318	2	13	26
4. Bharatpur	780	2	13	26
5. Nepalgaunj	484	2	13	26
TOTAL	-	26	-	276

Source: Population of Nepal by Districts, Village Development Committees/ Municipalities, CBS 1991 Census, 1994.

III. Survey Instruments[5]

As discussed above, the household survey was carried out through focussed interviews and the administration of structured questionnaires. One to two questionnaires were expected to be administered each day to allow sufficient time for the interviewers to interact with all members of the household selected for the interview. In addition to the household members, the questionnaire required interviewers to retrieve information from other knowledgeable persons of the village or town.

Altogether, a total of eight forms were designed to collect the required information (see Annex I-C). These forms are labeled A through H. Since the primary purpose of the survey is to test the practicability of collecting data for a product-based valuation system for household maintenance work, its focus has been on Form 3. Form 3 lists all kinds of products and services generated by household maintenance work, persons involved in its production, total time contributed by each sex, frequency, volume, and cost of input in each of the activities performed. An indicative list of products, which follows on the next page, was provided in order to assist the interviewers in their queries and record the necessary information in a systematical fashion. Information on prices, wages, and other details were collected from the community level informants. Other forms generated information on costs involved in the process of production of goods and services (Form 4), household characteristics—physical

[5] For a detailed discussion about each instrument the reader may consult the *Field Manual* contained in Annex C.

AN INDICATIVE LIST OF PRODUCTS TAKEN FROM FORM 3

1. MEAL PREPARATION
Tea
Lentils
Rice (Bhat)
Vegetable Curry
Pickle (Chat)
Meat
Chapatis
Boiled Eggs
Porridge

2. CLEANING
Room
Washing Clothes
Sweeping yard/patio
Garden
Bathroom/Toilet
Drainage

3. FUEL
Wood
Kerosene
Electricity
Gas

4. TRANSPORTATION
Market
School/Office
Temples

5. CARE
Child
Elderly
Sick

6. FINANCIAL SERVICES
Bank Loan
Repayment

7. EDUCATION
Personal Education
Teaching children
within the household

8. OTHER
Mending
Gardening
Carrying water
Social services etc.

Note: Activities performed by domestic servants were excluded, since their services should already be included in regular GDP accounts.

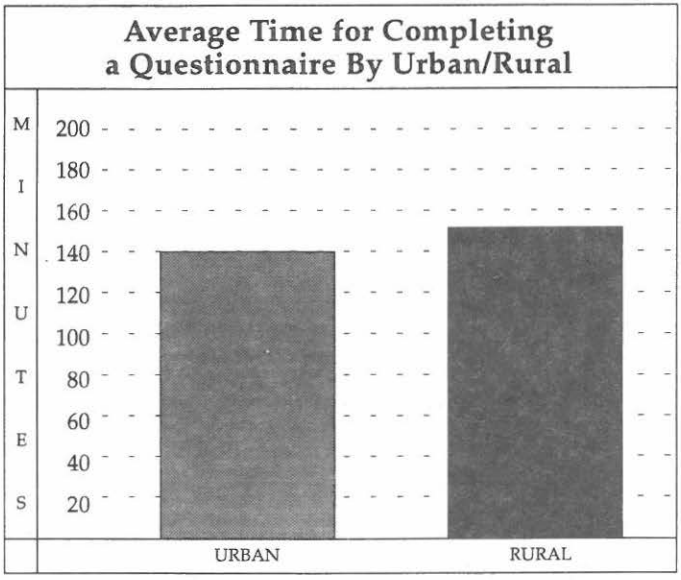
and socio-economic (Form 7), and demographic variables (Form 2).

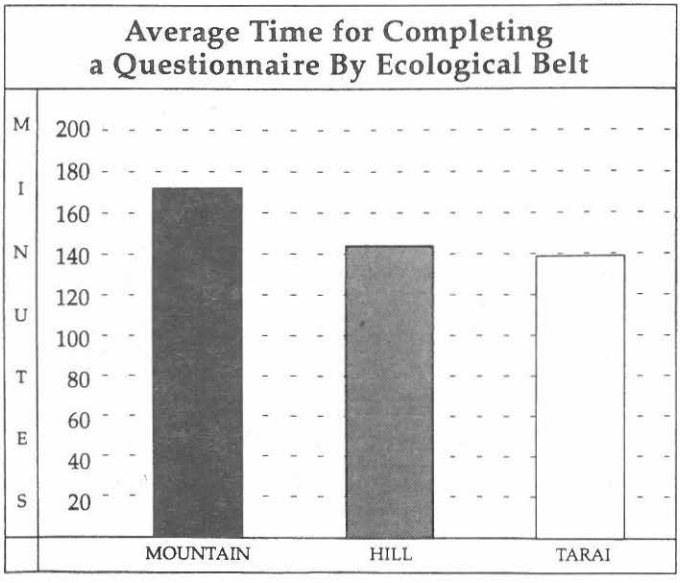
Information from the rest of the forms facilitated cross-checking and enabled related calculations for Form 3. Thus, Form 3 was designed to record all the household maintenance work for a product-based valuation system. Activities were listed in column 2. Similarly, the total amount of products/ services generated at the household was recorded in column 5. The household production cost of each item was calculated separately in Form 4 and the corresponding per unit cost placed in column 6. Another important variable recorded in Form 3 (column 11) was the time input in each activity. Thus, all the inputs necessary for the valuation of household maintenance activities were recorded in Form 3. Only the information on market prices was collected from the community level institutions such as hotels, shops, and other knowledgeable people. Collecting price information from each and every household was found to be rather impractical.

Form 5 was designed to record information for calculating the depreciation cost. In particular, the price of utensils, the cost involved in repair and services, and the total duration (years) of their use were recorded.

—*Average Time for Completion of a Questionnaire.* More than 91.3% of the interviews were completed in one visit. The average time for completing an interview was 145 minutes (about 2.5 hours) with 47 minutes standard deviation. The interview time increased proportionally with the level of illiteracy of the interviewee and underdevelopment of the area. This is more clearly illustrated in Chart I.1.1.

Chart I.1.1


Average Time for Completing
a Questionnaire By Urban/Rural
MINUTES
200
180
160
140
120
100
80
60
40
20
URBAN
RURAL


Average Time for Completing
a Questionnaire By Ecological Belt
MINUTES
200
180
160
140
120
100
80
60
40
20
MOUNTAIN
HILL
TARAI

IV. LIMITATIONS

The survey has limitations in that it attempts to gather and impute market prices to goods which have not undergone common market transactions. It argues that such imputations can be made because similar imputations are made for many items which enter SNA, e.g., value of self-consumed agricultural products, self-owned housing, etc. The household sector makes large contributions to the human reproduction process and complements the market sector. For this reason, and to simplify matters, the study has focussed on the development of a methodology for valuation of household maintenance work rather than determining the exact value of household products.

The survey was not designed to represent the national sample but an attempt has been made to include samples covering most of the heterogeneous factors that influence the division of labour between the sexes. Similarly, the urban/rural division of sample does not reflect national proportions.

In rural areas, the concept of time varies greatly. In addition, exact measurements of quantities cooked could not be made, as households used different informal units of measurement such as glass and bowls for daily cooking. Goods produced for home consumption and those for market also differ substantially in quality. Home produced goods have always been regarded as of better quality than those sold in the market. What is captured, then, is only the minimum value of comparable products. A further complication derived from the open-ended questions has further diversified the responses.

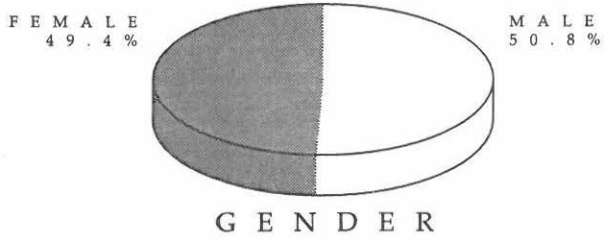
Chapter Two
SURVEY FINDINGS

I. General Characteristics of the Sample Population

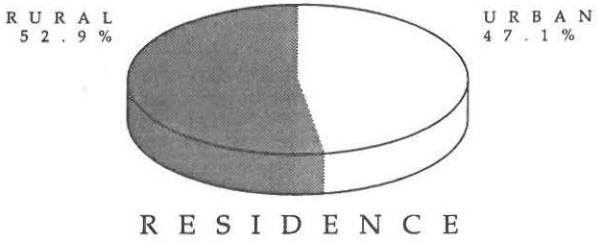
The survey was designed to include sample households from all geographical and ecological regions of Nepal, and from both urban and rural areas. As the type, quality, and time in performing a particular activity may also depend on the economic status and ethnicity of the households, these factors have also been taken into account when designing the survey. However, for sampling purposes, households were stratified only on the basis of geographical, ecological, and residential parameters. Most of the general socio-economic factors influencing the activity pattern are expected to be represented by such a classification (see Chart I.2.1).

Chart I.2.1

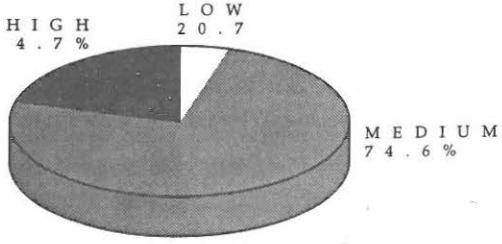
SAMPLE POPULATION BY SOCIO/ECONOMIC VARIABLES



GENDER



RESIDENCE



ECONOMIC STATUS

Three parameters, namely Gender (male and female), Residence (urban and rural), and Economic Status (high, medium, and low), are assumed to play key roles in the composition and distribution of the household maintenance activities. The information on key variables is presented below to highlight the coverage of the sample population.

—*Gender*. The sample population is about equally distributed among males and females. This composition is very close to the 1991 national census statistics (see Table I.2.1).

TABLE I.2.1
POPULATION DISTRIBUTION BY GENDER
(In per cent)

Gender	*Study Sample*	*Census 1991*
Male	50.6	49.9
Female	49.4	50.1
N (Household members)	1,733	18,491,097

—*Residence*. The national figure for urban population is only 9.2 per cent. But, since this survey was designed to contain sufficient number of households from urban areas to facilitate the analysis, the proportion of urban households is 47.1 per cent in the study sample. Normative values, have been derived separately for rural and urban areas.

—*Economic Status*. The economic status, as perceived by the interviewer has been reported. Visits to the household, hours of interaction with the household members, and the reported assets and income are subject to the interviewers'

perception. Households were distributed among the three major economic groups in the following proportions: High (4.7%), Medium (74.6%), and Low (20.7%). The question asked was "If in the locality three economic levels exist, where does the particular household fall?"

—*Sample Population.* The population of 276 selected sample households is 1733, yielding an average household family size of 6.3 members, including live-in servants. Of these, 19.2 per cent of the households had live-in servants, 16.3 per cent of which were from urban and 2.9 per cent from rural areas. Live-in servants constitute 3.5 per cent of the total sample population.

—*Ecological Belt.* The distribution of sample population along the Mountain, Hill, and the Tarai belts is also close to the national figure (see Table I.2.2). Of the eight sample districts, one from mountain, four from hill, and three from Tarai belts were selected.

TABLE I.2.2
POPULATION DISTRIBUTION BY ECOLOGICAL BELTS
(In per cent)

Ecological Belt	*Study Sample*	*Census 1991*
Mountain	6.5	7.7
Hill	45.7	45.5
Tarai	47.8	46.7
N (household members)	1,733	18,491,097

—*Age Distribution*. Division of sample population in various age groups as reflected in Table I.2.3 follows the Multipurpose Household Budget Survey of Nepal Rastra Bank (survey conducted in 1984/85). The contribution to household maintenance work of children between six and nine (6-9) years of age, particularly in rural areas, is significant. This group is separately classified so as to capture their contribution to household maintenance activities.

TABLE I.2.3
POPULATION DISTRIBUTION BY AGE GROUP
(In per cent)

Age Completed Group (years)	*Study Sample*	*Census 1991*
Less than one year	2.0	3.1
1 - 5	9.2	15.0
6 - 9	9.5	11.7
10 - 14	14.5	12.6
15 - 25	23.3	20.7
26 - 50	30.5	26.9
51+	11.0	10.0
N (household members)	1,733	18,491,097

—*Relationship to Household Head*. Besides gender it is important to cover activities of all other members in the households as they carry differential work burdens. For example, the role of daughters-in-law is crucial in a Hindu society as they are the ones who carry the major burden of the household work.

TABLE I.2.4
RELATIONSHIPS OF HOUSEHOLD MEMBERS
TO THE HOUSEHOLD HEAD
(In per cent)

Relationship to Household Head	*Total*	*Male*	*Female*
Household Head	15.9	14.6	1.3
Spouse	14.4	0.1	14.3
Daughter/Son	42.1	25.6	16.5
Daughter-in-law	6.6	-	6.6
Grand-Daughter/Son	11.7	5.6	6.1
Mother/Father	1.7	0.2	1.5
Mother/Father-in-law	0.1	-	0.1
Sister/Brother	1.8	1.4	0.4
Niece/Nephew	0.9	0.7	0.2
Not a Relation	0.2	0.1	0.1
Live-in-Servant	3.5	1.5	2.0
Others	1.1	0.5	0.6
N (household members)	1,733	877	856

Contributions made by the live-in servants are already included in the national accounts and, hence, their share in different household activities and products generated therein has been excluded from current calculations. Live-in servants were found in 53 households, of which 45 were from urban areas. The distribution of population by relationship to the household head is featured in Table I.2.4.

—*Education*. The census figure for literate population in Nepal is 39.3 per cent whereas only 24.7 per cent females

are literate. The study sample contains more than proportionate literate population (Chart I.2.2 and Table I.2.5). This is understandable as the sample is disproportionately skewed towards urban areas.

Chart I.2.2
LITERACY STATUS BY AGE AND GENDER

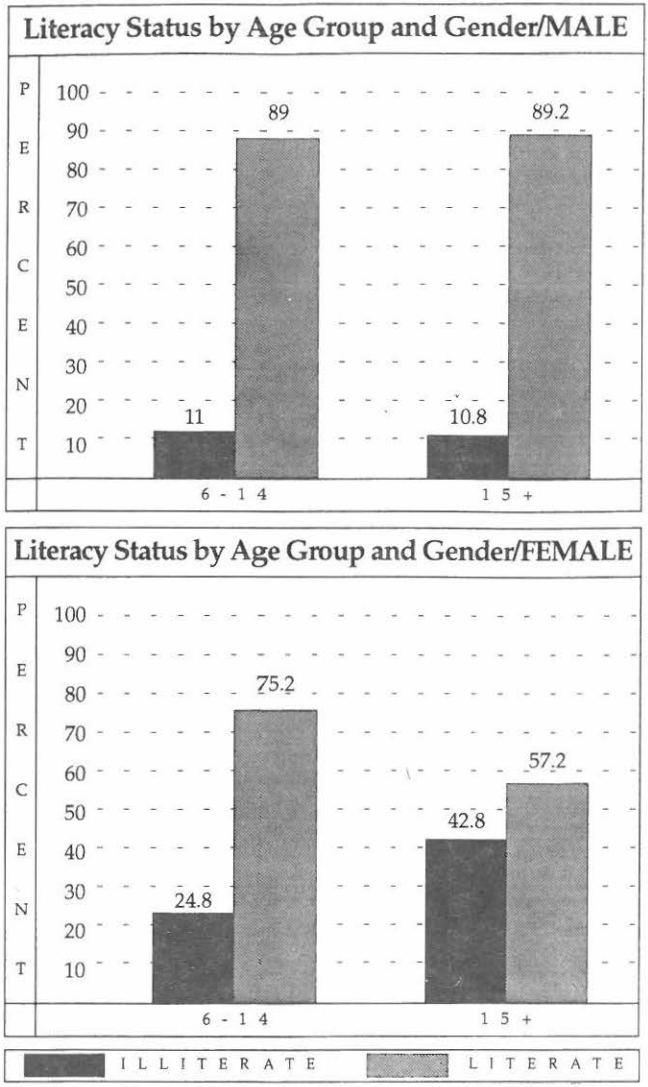


TABLE I.2.5
LITERACY RATE AMONG HOUSEHOLD MEMBERS OF AGE 6 AND ABOVE
(In per cent)

Sex	*Study Sample*	*Census 1991*
Male	78.8	54.1
Female	55.0	24.7
All	67.1	39.3
N (Households)	1,733	18,491,097

II. ACTIVITY CLASSIFICATION AND TIME USE

Activities found in the sample households are categorized in 17 different types of household maintenance work, and sub-classified in 132 sub-activities (see Annex I-A).

1. Meal Preparation

All activities performed in relation to meal preparation fall within this category. This includes all types of dishes prepared and the activities performed in preparing them such as washing or cutting vegetables, etc. A total of 92 products were generated by these activities. These have been listed in Annex I-A.

2. Cleaning of Kitchen and Dishes

This covers activities such as washing the dishes and mopping kitchen areas, mud plastering kitchen, etc. This has

been separated from other cleaning activities because, it is felt that time spent on such activities should be combined with cooking for valuation purposes.

3. Fuel Collection

Any activity performed to provide fuel for the household is listed under this category. Types of fuel encountered were wood, kerosene, gas and/or electricity. Time might have been spent in the collection of fuel wood or buying kerosene or gas cylinders from the market. Similarly, paying the electricity bill or drying cow dung for fuel also consumes one's time. Time spent in all of these types of activities is put under this category.

4. Water Collection

Water collection is one of the major activities in households, particularly in rural areas. Although, according to the revised manual this activity is to be included in SNA, in Nepal this remains outside the national accounts. Time dedicated to this activity is directly related to meal preparation and therefore should be combined with meal preparation time for valuation purposes.

5. Shopping

Time spent on going to the market for shopping and buying goods for the household use are recorded under this category.

6. House Cleaning

This is one of the cumbersome and invisible household activities which takes up much of household time. Other than kitchen, the mopping, sweeping, and cleaning of all the areas are covered by this category.

7. Laundry

This activity is usually performed intensively by the household members once a week. But, the age and health status of the family members may change this situation. All time spent on washing, drying, and ironing the clothes is covered by this category.

8. Mending and Repairing

Mending and repair was supposed to include all kinds of repair activities—clothes, household utensils and houses, but there were very few cases of mending or repair reported in the sample households. However, due to the piece-meal nature of the work, it might have been underreported. Household construction activity was not encountered in this sample.

9. Child Education

This is the time spent by the household members on the education of children. This includes the time taken for checking and helping with homework, buying books, telling stories, taking them to school and back, paying school fees, etc.

10. Child Care

Caring for children involves many activities such as cleaning and washing them, watching and playing with them, feeding them, etc.

11. Elder Care

This is also a major time-consuming activity and, hence, is categorized separately. This includes time spent on care of elderly people at home.

12. Sick Care

This category includes time spent for caring at home and accompanying the sick to the health post/hospital, etc. However, on the day of interview, very few cases with sick persons were found.

13. Self Travel

Time consumed in travelling is recorded under this category. Such travel may be to school, office, field, religious places, etc.

14. Personal Development

Personal development plays an important role in human lives. Therefore, any activity performed towards that is considered to be productive and the time spent on it is recorded separately. Personal development could be related to education or skill. These, however, have not been valued in the current analysis due to lack of data.

15. Religious Activities

In a religious country like Nepal, this activity plays an important role and takes up much of household time. It covers items such as visits to the religious places, worshiping, picking leaves for plates, making leaf plates, making cotton swabs and other materials for oil lamps used in worship, etc.

16. Social Services

Social services include activities such as helping other members of the community, attending social gatherings, labour contribution to community work, etc.

17. Other Household Work

All other household maintenance activities, besides the ones mentioned above, were included in the category 'other'. Each activity in this group was encountered only in a few cases.

III. Time Allocation

Thus all together a total of 132 household maintenance activities (products/services) were observed in 276 sample households, which were later classified into 17 major groups. Time spent per day (hours) by the households on 17 different activities in urban and rural areas is presented in Table I.2.6 below. This information has also been extracted from Form 2.

TABLE I.2.6

HOUSEHOLD MAINTENANCE ACTIVITIES - AVERAGE TIME SPENT IN A HOUSEHOLD

Per day (in Hours), Nepal (1985)

No.	*Activities*	*Total Households*		*Average Time Spent in Household Activities by Residence*					
				Urban			*Rural*		
		Urban	*Rural*	*Male*	*Female*	*All*	*Male*	*Female*	*All*
1	Meal Preparation	130	146	0.36	5.38	5.74	0.48	5.61	6.09
2	Cleaning Kitchen and Dishes	110	137	0.23	0.92	1.14	0.03	1.43	1.45
3	Fuel Collection	31	87	0.20	0.17	0.37	0.60	0.87	1.46
4	Water Collection	50	68	0.01	0.29	0.30	0.16	0.62	0.77
5	Shopping	89	99	0.53	0.14	0.67	0.57	0.12	0.68
6	Cleaning of House	122	141	0.32	0.94	1.26	0.19	0.68	0.87
7	Laundry	103	129	0.03	0.44	0.47	0.07	0.51	0.59
8	Mending	26	12	0.00	0.09	0.09	0.08	0.13	0.21
9	Child Education	39	25	0.18	0.13	0.31	0.15	0.05	0.20

TABLE I.2.6: HOUSEHOLD MAINTENANCE ACTIVITIES... (CONT.)

				Average Time Spent in Household Activities by Residence					
		Total Households		*Urban*			*Rural*		
No.	*Activities*	*Urban*	*Rural*	*Male*	*Female*	*All*	*Male*	*Female*	*All*
10	Child Care	37	58	0.18	1.22	1.40	0.28	1.64	1.92
11	Elder Care	5	2	0.02	0.07	0.09	0.00	0.02	0.02
12	Sick Care	3	0	-	0.04	0.04	-	-	-
13	Self Travel	28	22	1.35	0.13	1.48	0.52	0.06	0.58
14	Personal Development	49	51	1.16	0.86	2.01	0.71	0.29	1.00
15	Religious Activities	38	31	0.02	0.19	0.22	0.12	0.14	0.26
16	Social Services	11	13	0.06	0.05	0.12	0.10	0.01	0.10
17	Other Household Work	70	65	0.09	0.07	0.16	0.10	0.00	0.11

Chapter Three

DEVELOPMENT OF NORMATIVE VALUES

The data reported on Form 3 of the survey questionnaire (see Annex I-C) was used for the calculation of norms, i.e., monetary value of products or services generated per unit of time spent on each category of household maintenance activities. All products and services generated within the household, input costs involved, time required and volume as well as prices of products generated were recorded on this form as discussed in chapter one.

I. Meal Preparation

Output from meal preparation involved an extremely complicated list of 92 products. Service categories were valued at wage rates and did not present many problems. For

meal preparation, various activities had to be regrouped to derive total time input in preparation of meals which needed to be comparable to that available in the market. The product 'meal' which is available in the market is an end product of an activity chain—shopping, cleaning, cooking, servicing, etc.

Moreover, the meal price in the market also includes costs involved in cleaning table, dishes, kitchen, etc. Theoretically, the time involved in collecting water for cooking, washing dishes and kitchen, etc., should also be included under meal preparation. But no information on various other uses of collected water were recorded. Hence, all water collection time enters as a time input in meal preparation. However, in the present calculation, water collection has been included in SNA non-market activities. This represents some double counting which is assumed to be minimum.

Similarly, shopping time could not be estimated separately for food and non-food items. Therefore, it has been assumed, on an *ad-hoc* basis, that 80 per cent of the shopping time is devoted to food purchases. People in urban areas shop for food items everyday both because they lack purchasing power for lump-sum amounts and also because very few people have refrigerators to preserve fresh food. Besides, fresh vegetables are the major elements of daily purchases. In rural areas food items purchased may be much smaller since many of them are produced at home. But shops and markets involve longer travel time due to the distances to be covered.

As such, to create a category of time input spent on meal preparation comparable to that available in the market, the total time spent on cooking meals, cleaning of kitchen and dishes, collection of fuel and water, and shopping had to be

added. This time was calculated from column 11 in Form 3. These time records had to be slightly modified to account for cooking two meals a day. Form 3 recorded the time required to prepare each item at a time. Product records were for the day. For meals which are cooked twice a day, this time had to be multiplied by two.

The calculation of total inputs involved in the production of goods and services generated by household maintenance activities was made directly from columns 5 and 6 of Form 3. A few items, however, need specific discussion. Sample households were found to use gas, electricity, kerosene as well as firewood, husk, and cow-dung for preparing meals. Usually, in rural areas people use firewood which they collect from the nearby forest. In such cases the norm value can be estimated by imputing value to the time spent for fuel collection. On the other hand, for the estimation of fuel consumption of those households which do not go for firewood collection themselves and find it profitable to buy fuel from the market, the cash expenditure on fuel was also recorded.

In the case of urban households, the average fuel consumption was calculated on the basis of expenditures in those households which spent money on fuel consumption. On the average, each household consumed fuel worth Rs 2.00[6] per hour of cooking time. Additionally, in urban areas the time spent on other fuel related activities namely, bill payments or kerosene buying, the charge for transporting the gas cylinders to home, etc., were also included. In the case of rural areas, the only major input involved was the time spent on fuelwood collection. Total fuel-related time, therefore, enters the

[6] 1US$ = 56.80 Rs (Rupees) at the time the study was conducted.

value calculation as time input, i.e., added to the total time involved in meal preparation in calculation of returns to time.

The average depreciation cost per hour use of household utensils is calculated from Form 5, where the parameters for calculating the depreciations have been recorded. Here the basic assumption made is that the depreciation of household utensils for all sizes or quality is the same. Initially, attempts were made to record the depreciation cost of each pot used for a specific purpose. For example, as the kettles are used for tea preparation, the depreciation cost of kettles was calculated separately so that it could be added to the cost of making a glass of tea. But it was found that people use different utensils to prepare tea. While kettles also may be used for other purposes. Irrespective of what a particular pot's intended use is, it is used in the kitchen for multiple purposes. Hence, the calculation of an overall depreciation cost of household utensils as a single unit was found to be more practical and appropriate. Further, this value could be calculated only in terms of hours of use. The average depreciation cost per hour use of household utensils is calculated at Rs 0.07.

II. The process of calculation

Form 3 is the main source of information for calculating the value added. In this form, the average market price for each product and service was recorded as discussed in chapter one. Per-unit price and per-unit household production cost were multiplied by the total volume of products generated in each household. The difference of the sum of such series gives the first approximation of value added. This value

minus total depreciation and fuel costs is the net value added generated in the household.

The following formula has been used to calculate the normative values.

$$Y^h = \sum_{j=1}^{n} X_j^h P_j - \sum_{j=1}^{n} \sum_{i=1}^{m} P_i C_{ij}^h X_j^h - D^h$$

X_j^h = Total volume of product j, generated in household h.

P_j = Market price of product j.

C_{ij}^h = Per unit amount of input i, used in the production of product j, in household h.

P_i = Price of input i.

D^h = Total depreciation cost of household utensils for a day.

Total value added in the Survey Households =

$$\sum_{h-1}^{H} y^h$$

where H = 276

Value added per hour of work in meal preparation is calculated as

$$\sum_{h=1}^{H} y^h / \sum_{l=1}^{L} \sum_{k=1}^{5} t_{lk}$$

where t is time spent by member l on activity k.

k = 1.....5 (five activities, i.e., cooking, kitchen and dish cleaning, fuel collection, water collection, and shopping.)

l = 1.....L (individual members)

Normative values for the urban households are calculated below according to the above formula.

The total market value of the products generated in the sample households in a day was equal to Rs 133272.50. This total was derived by summing up the series of values obtained by multiplying column (5) for urban households in Form 3 by the respective product prices.

Total household input cost (except fuel) equals Rs 76403. This figure was derived by multiplying the per unit cost in column 6 in Form 3 by the amount of products generated in the household and totalling the values thus obtained.

Total time used for the preparation of meal in 130 urban households per day was derived from column 11 of Form 3. The time in Form C was recorded in minutes which has been converted into hours as given below:

1.	Cooking	=	1,175.92
2.	Kitchen and dish cleaning	=	148.20
3.	Time spent on fuel related activities	=	48.10
4.	Water collection	=	39.00
5.	Shopping (80% of the total)	=	69.68
	Total time (hours) for meal preparation	=	1,480.90

From those sample households who were paying bills for electricity or gas or kerosene, the average expense for per hour of fuel consumption/energy use was calculated at Rs 2. As the total cooking time is 1,175.92, the cost for total fuel consumed in the urban households was estimated at Rs 2,352.

The depreciation cost (Form 4) is calculated at Rs 0.07 per hour. Therefore, the total value of depreciation for all the

urban households is Rs 82.31. Thus, the value of household time per hour spent on meal preparation in urban areas is:

= {133,272.50 - (76,402.92 + 2,351.84 + 82.31)} / 1,480.90
= (133,272.50 - 78,837.07) / 1,480.90
= 54,435.43/1,480.90
= Rs 36.76/hour

The calculations for rural households follow a similar procedure. Accordingly, the total market value of the products generated for the rural sample households in a day equals Rs 82,306.75.

Total household production cost equals Rs 50,699.19.

Total time used for the preparation of meals in 146 rural households (in hours):

1.	Cooking	=	1,375.56
2.	Cleaning Kitchen and dishes	=	211.70
3.	Fuel collection	=	213.16
4.	Water collection	=	112.42
5.	Shopping (80% of total)	=	79.42
	Total time (hours) for meal preparation	=	1,992.26

For the rural sample households only the time for collection of fuel has been considered. Only one or two rural households were found to be spending cash on fuel. Therefore, no cash cost of energy has been deducted from the production cost in rural areas.

Total depreciation cost for rural households is Rs 96.29.

Thus, the value of per unit time spent on the meal preparation in rural areas is:

= {82306.75 - (50699.19 + 96.29)} / 1992.26
= (82306.75 - 50795.48) / 1992.26
= 31511.27 / 1992.26
= Rs 15.82 / hour

The quality and the unit of production services produced in the household are assumed to be comparable to goods and services available in the market. Those products which were not available in the market were excluded from the present calculations.

Thus the normative values of each hour of meal preparation time at home are Rs 36.76 for urban areas and Rs 15.82 for rural areas. These values had to be calculated separately for rural and urban areas because the sample is disproportionately skewed towards urban areas. For more proportionate samples a single value may suffice. Further, male and female time input in household maintenance work has been assumed to be of equal value in terms of per unit returns. This probably causes slight over estimation of value of the male time input, as generally women are efficient in household maintenance activities. Such details, however, need not deflect the methodological significance of such calculations.

III. Other Activities

Wage rates had to be used as normative values for activities other than meal preparation (Table I.3.1). Although specific per-piece and monthly rates were available, the time-use data in MPHBS to which the normative values had to be

applied, laundry and cleaning house were lumped in one group. Therefore, wages of polyvalent workers had to be used to calculate the value of such activities. For child care services no market transaction existed separately in rural areas.

TABLE I.3.1

NORMATIVE VALUE FOR HOUSEHOLD MAINTENANCE WORK

S No.	*Activities*	*Norm Value per Unit Product (Rs)*		*Remarks*
		Urban	*Rural*	
1	Meal preparation	36.76/hr	15.82/hr	Per hour of work
2	Cleaning of kitchen and dishes	1,300./m	1,100./m	Wage
3	Fuel collection	50./bhari 130./Qt.	35./bhari 100./Qt.	Per bhari or per Qt.
4	Water collection	1,300./hr	1,100./m	Wage
5	Shopping	50./day	-	Wage
6	Cleaning of house	1,300./m	1,100./m	Wage
7	Laundry	7./piece	-	Per piece
8	Child education	150./hr/m	50./hr/m	Per hour/ month
9	Child care	700./m	-	Wage
10	Elder care	1,300./m	1,100./m	Wage
11	Sick care	1,300./m	1,100./m	Wage
12	Other household work	1,300./m	1,100./m	Wage

Note: /m = Per month
/Bhari = Per load
/Qt = Per quintal

In some urban areas such services were paid on monthly basis. But for comparability purposes, wages of a polyvalent worker have been used both for rural and urban areas. Child education has been valued at monthly prices paid for similar services at home.

Chapter Four

GDP AND THE HOUSEHOLD MAINTENANCE SATELLITE ACCOUNTS

Calculations in the previous chapter have given us normative values per unit input of time in household maintenance activities. This chapter establishes a global account that includes regular GDP, and an estimated value of non-marketed goods, which have remained outside of the national accounts, and a satellite account on household maintenance activities. Gender contribution to each sector is also reflected.

I. Gender Contribution to Regular GDP

Procedures for estimating women's contribution to regular GDP will depend on the availability of gender dis-

aggregated data on wage payments and earnings. In Nepal, such statistics are not available. GDP or value added at factor cost, number of male and female workers by industry and male/female wage rates for agricultural and construction labourers are available. Details on GDP and labour-force data are given in Annex I-B, Table B1.

This information has been used to derive male/female contribution to four major groups of products within the category *household maintenance* (see Table I.4.4). Sectoral GDP and labour force data have been regrouped in three sectors (i.e., *agriculture; trade, restaurants and hotels; and others*) because female/male wage ratios are available only for agricultural and construction sectors. On the basis of available data, the ratio of female/male wages in agriculture is assumed to be 0.85 and in construction 0.60. The wage differential in the construction sector has been assumed to approximate general male/female differential in non-agricultural wages except in trade, restaurant and hotel groups. In the trade, restaurant, and hotel sector, male/female wage ratio has been assumed to be one because this sector employs a large number of women workers, and there seems to be no particular difference in the distribution of male and female workers between high and low paying jobs (subjective evaluation). Furthermore, own-account small business establishments are mostly run by women. Therefore, female/male wage rates are assumed to be equal in this sector.

The methodology applied uses the following formula for calculation of male/female contributions:

(1) Male contribution (MC) + Female contribution (FC) = GDPs.
(2) MC = Male wage rate (MW) x Number of male labourers (ML)
(3) FC = Female wage rate (FW) x Number of female labourers (FL)

$$\therefore, MW = \frac{GDPs}{ML + (FW/MW) \times FL}$$

GDPs = Sectoral GDP.

For example, in the agricultural sector male and female contributions are calculated in the following manner:

$GDP_{(agriculture)}$ = Rs 55,368. million
FW/MW = 0.85
ML = 3,278.6 thousand
FL = 2,683.2 thousand

$$ANNUAL\ (MW) = \frac{GDPs}{ML + (FW/MW)\ X\ FL}$$

= 9,959. (million)

- Male contribution (MC) = 9,959.5 x 3,278.6 thousand
  = 32,653.3 (million)
- Female Contribution (FC) = GDPs-MC = 55,368-32,653 = 22,714.8 (million)

A similar formula was used by Shamin Hamid to calculate women's contribution to GDP in Bangladesh in her paper "Non-market Work & National Income: The Case of Bangladesh" (Hamid, 1993). In the absence of data on male/female earnings, this seems to be an acceptable alternative for such estimations.

II. Additional GDP and Women's Contribution

Although according to the new SNA manual (1993) GDP should include all products and processing activities undertaken within the households, GDP figures in Nepal still leave out many products and services as discussed by Acharya (1994). Since the current survey is not designed to generate data on such activities, an approximate method has been used to derive some estimates of such activities. The MPHBS provides information on time use classified by conventional economic (termed regular here) and subsistence economic activities. As discussed in Chapter one, subsistence economic activities include fuel/fodder collection and fetching water, house repair and construction (self use), hunting and gathering and food processing. Conventional economic activities, on the other hand, include agriculture, production, trade and commerce, services and construction. It is assumed that products generated by conventional economic and subsistence economic activities are proportional to time input in these two sectors by men and women. Annex I-B Table B2 gives time input in these activities by region. Population weights (Annex I-B Table B3) have been used to calculate the national average for daily time inputs in these two categories of activities by men and women. The ratios of these time inputs in urban and rural areas have been used to derive men and women's additional contributions, which is not reflected in regular GDP, e.g., male contribution to additional non-market products (section II in Table I.4.4) equals:

$$\frac{\text{Daily time input in subsistence economic activities by men}}{\text{Daily time input in regular economic activities by men}} \text{ X Male contribution to regular GDP}$$

e.g., male daily time input in conventional economic activities equals 4.758 hours, and male daily time input in subsistence economic activities equals 1.221

$$Ratio \quad \frac{1.221}{4.758} = 0.2566$$

Therefore, male contribution to additional non-market products equals 0.2566 * 84,242 = 21,616 million. Female contributions may be calculated applying similar formula.

III. Household Maintenance Work and the Satellite Account

In Chapter 3, normative values for major categories of household work were derived. In the current chapter these values have been applied to time-use data from MPHBS to derive national averages for normative values of each unit of time input in household maintenance activities classified in three major groups, *cooking, serving and cleaning dishes and pots; laundry and cleaning of house; child care;* and *shopping and other works*. For the last category, i.e., *shopping and other work*, no values have been imputed, because this aggregates qualitatively different kinds of activities such as sick care and shopping. Further, 80 per cent shopping time is already accounted for in the calculations as time input in meal

preparation. The calculations here have been complicated because national averages have to be derived from regional time input data. Population distribution figures by region have been used as weights to derive first rural and urban averages for daily time input by adults (15 years+) of both men and women in each category of activity. Urban and rural daily time-inputs have been multiplied by the normative value of each hour of work in each category, and national averages were calculated once again on the basis of population weights. The outcome has been multiplied by number of days in the year (365) and number of adult male and female population in each category separately. Thus, annual value added from meal preparation generated by women (FCm) has been calculated according to the following formula:

FCm = (DTIUm x NVUm x PFPU + DITRm x NVRm x PFPR) x 365 x TFP

where:

DTIUm = Daily time input in meal preparation by women in urban areas in hours.

NVUm = Value of per hour time input in meal preparation in urban areas.

PFPU = Proportion of urban women 10 years and older to total female population.

DTIRm = Daily time input in meal preparation by women in rural areas in hours.

NVRm = Value of per hour time input in meal preparation in rural areas.

PFPR = Proportion of rural women 10 years and older to total female population.

365 = Days in a year.

TFP = Total female population 10 years and older.

A numerical example of this calculation is presented in Table I.4.1.

For deriving the value of time input in the categories of laundry and cleaning and child care, the following formula has been used:

$$\left(\frac{MWU}{30x10}\times DTIUi\times PFPU+\frac{MWR}{30x10}\times DTIRi\times PFPR\right)\times 365\times TFP$$

where : i = ch = child care, i = lc = laundry & cleaning.

Variables DTIUch and DTIRch represent daily time inputs by women in child care activities in urban and rural areas respectively.

$\frac{MWU}{30x10}$ = Hourly wage of polyvalent domestic workers in urban areas, derived on the assumption of 10 hours working day and 30 working days in a month.

$\frac{MWR}{30x10}$ = Hourly wage of polyvalent domestic workers in rural areas derived on similar assumptions.

Variables PFPR and TFP follow the same definition applied for meal preparation. The daily time inputs and population figures reflected in tables B4 and B5, respectively (Annex I-B), have also been applied in calculating female and male contributions to child care, laundry, and cleaning. Tables I.4.2 and I.4.3 illustrate the numerical calculations for these activities.

IV. Women's Contribution to Total Production

The final outcome of all above calculations is presented in Table I.4.4. Addition of the value generated by additional non-market products and household maintenance activities more than doubles the regular GDP. While women contribute 27.5 per cent of regular GDP, their contribution to additional non-market (but within SNA) products amounts to 58.3 per cent, and to household maintenance activities to 92.8 per cent. In total, women contribute 62.9 per cent of the expanded GDP including the household maintenance satellite account.

TABLE I.4.1
ANNUAL CONTRIBUTION TO GDP
FROM MEAL PREPARATION
BY SEX

		Urban	Rural
I.	Norm value per hour (In Rs)[1]	36.76	15.82
II.	Weighted average time (in hours) per day per person (male)[2]	0.22	0.16
III.	Proportion of males in total male population[3]	0.0957	0.9043
	Daily value (I*II*III)	0.7739	2.2890
	MALE (6,240,910)[4]		
National norm value per day i.e., weighted average of urban and rural (In Rs)			3.06
Annual national contribution to GDP (In million Rs) (Rs 3.06 * 365 * 6,241)			6,971
I.	Norm value per hour (In Rs)	36.76	15.82
II.	Weighted average time (in hours) per day per person (female)	3.10	2.85
III.	Proportion of females in total female population	0.0878	0.9122
	Daily value (I*II*III)	10.0053	41.1284
	FEMALE (6,466,918)[5]		
National norm value per day i.e., weighted average of urban and rural (In Rs)			51.13
Annual national contribution to GDP (In million Rs) (Rs 51.13 * 365 * 6,467)			120,690

Notes: [1] INSTRAW/IIDS Pilot Survey, 1995
[2] Annex B, Table B4
[3] Population Census 1991, CBS, 1993
[4] Total *Male* population age 10+ years
[5] Total *Female* population age 10+ years

TABLE I.4.2
ANNUAL CONTRIBUTION TO GDP
FROM CHILD CARE
BY SEX

	Urban	Rural
I. Norm value per hour (In Rs)	4.27	3.62
II. Weighted average time per day per male (In hours)	0.29	0.33
III. Proportion of males in total male population	0.0957	0.9043
Daily value (I*II*III)	0.1185	1.0803
MALE (6,240,910)		
National norm value per day i.e., weighted average of urban and rural (In Rs)		1.20
Annual national contribution to GDP (In million Rs) (Rs 1.20 * 365 * 6241 thousand)		2,733
I. Norm value per hour (In Rs)	4.27	3.62
II. Weighted average time (in hours) per day per person (female)	0.95	0.98
III. Proportion of females in total female population	0.0878	0.9122
Daily value (I*II*III)	0.3561	3.2361
FEMALE (6,466,918)		
National norm value per day i.e., weighted average of urban and rural (In Rs)		3.59
Annual national contribution to GDP (In million Rs) (Rs 3.59 * 365 * 6467 thousand)		8,474

TABLE I.4.3
ANNUAL CONTRIBUTION TO GDP
FROM CLEANING OF HOUSE AND LAUNDRY
BY SEX

	Urban	Rural
I. Norm value per hour (In Rs)	4.27	3.62
II. Weighted average time (in hours) per day per person (male)	0.15	0.10
III. Proportion of males in total male population	0.0957	0.9043
Daily value (I*II*III)	0.0613	0.3274
MALE (6,240,910)		
National norm value per day i.e., weighted average of urban and rural (In Rs)		0.39
Annual national contribution to GDP (In million Rs) (Rs 0.39 * 365 * 6241 thousand)		888
I. Norm value per hour (In Rs)	4.27	3.62
II. Weighted average time (in hours) per day per person (female)	1.0410	0.7385
III. Proportion of females in total female population	0.0878	0.9122
Daily value (I*II*III)	0.3899	2.4106
FEMALE (6,466,918)		
National norm value per day i.e., weighted average of urban and rural (In Rs)		2.80
Annual national contribution to GDP (In million Rs) (Rs 2.80 * 365 * 6467 thousand)		6,609

TABLE I.4.4
GENDER CONTRIBUTIONS TO GDP AND HOUSEHOLD MAINTENANCE SATELLITE ACCOUNTS 1991[1]
(In million Rs[2])

	Male	Female	Total
I. REGULAR GDP	84,242	31,886	116,128
1. Agriculture	2,653	22,715	55,368
2. Trade, restaurants & hotels	9,848	3,054	12,902
3. Others	41,741	6,117	47,858
II. ADDITIONAL NON-MARKET PRODUCTS	21,616	30,186	51,802
III. HOUSEHOLD MAINTENANCE (Satellite Accounts)	10,592	135,773	146,365
1. Cooking, serving and cleaning dishes and pots	6,971	120,690	127,661
2. Laundry and cleaning of house	888	6,609	7,497
3. Child care	2,733	8,474	11,207
4. Shopping and other work[3]	-	-	-
Total I + II + III	116,450	197,845	314,295

Source: GDP Economic Survey, 1993-1994.

Notes: [1] 1990/1991 GDP was applied because the labour force data used were taken from the 1991 survey.

[2] US$ 1 = Rs 50.00

[3] Value could not be imputed to this category because activities included in this category have different values.

Chapter Five
EVALUATION OF THE METHODOLOGY APPLIED

The first section of this chapter summarizes some of the difficulties encountered by the enumerators in implementing the survey together with some suggestions they have put forth. In the second section, the methodology applied for the imputation of monetary values to different outputs of several unpaid activity groups has been evaluated against the proposed theoretical framework.

I. The Survey

In general, the methodology applied for the small-scale survey conducted in several districts of Nepal, has successfully provided additional information/data required for establishing norms and values to certain unpaid activities. However,

several problems and difficulties have also been encountered which must be carefully taken into account when similar methodology is replicated in another country.

1. Issues/Problems

The following is a list of issues/problems the data collectors identified during the survey:

a) Calculation of per unit cost was made difficult by the differing units of measurement of the input materials.

b) People in the rural areas projected different concepts of time and a majority of them did not wear a watch. This posed a problem in recording the daily time-use pattern as the respondents could not tell exactly how much time they spent in a particular activity.

c) Respondents were reluctant to report on their salary/ income and wealth because this question had them suspecting that the interviewers had been sent by the government to evaluate their property for tax purposes.

d) The units of measurement of land differed from place to place. This became a problem as the questionnaire required all units to be converted to ropani (Hill) and bigha (Tarai).

e) The respondents could not tell the exact price at which they bought the animals/birds, house, etc. Similar difficulties were encountered in determining the rate of

hired live-in domestic worker, as major proportion of their salary was paid in kind.

f) Much time was spent in explaining the goal of the research and the questionnaire to the respondents and also in convincing them to respond to the questionnaire.

g) Quantitative measures can be taken only as approximations since the respondents could not determine the accurate amount of products they cooked or clothes they washed each time, water or fuel they fetched each time and so on.

h) It was not possible to get market price for some of the products because these products are normally not being sold in the market. These goods were generally given for free if a small amount was requested or they were expected to be paid back with the same product or with raw material if the amount was large.

i) Some households did not want to disclose the type of food prepared in the house. This was because food is considered a symbol of social status. Better off households, for example, eat rice daily (which is associated with higher social status) while others have to eat corn. Similarly, even though meat was cooked only once a month, they told the interviewer that they ate meat every day.

2. Recommendations

Most of the suggestions listed below were submitted by the interviewers who administered the actual survey:

a) The interview should be limited to only one hour at a time.

b) The questionnaire should be divided into different sections for different activities and services.

c) It is important for the interviewer to have a common unit of measurement among themselves so that they can better estimate the amounts cooked in each household.

d) In areas where the conventional concept of time is not commonly used, the interviewers will have to take the responsibility and initiative of obtaining additional information that can help establish the amount of time spent in performing a particular activity and the number of activities carried out simultaneously.

e) When inquiring about the income and other types of wealth, it is important to explain to the respondents that such information is necessary only to determine the economic status of the household and that it will be kept highly confidential.

f) It is important to cross-check with other villagers the information on value and amount of land or other assets reported by individual households.

g) A local interpreter is a necessity in areas where the national language (Nepali) cannot be understood by the villagers.

h) Close supervision of interviewers in the field must be provided throughout the survey.

II. Applicability of the Theoretical Framework and Recommendations for the Future

1. This survey has shown that it is possible to impute monetary values to household maintenance activities in countries like Nepal under following limitations:

   a) Quality of the product is completely ignored. This results in underestimation of the value given to unpaid work considering that the quality of products generated at home for own consumption are established to be better than those available in the market.

   b) It is accepted that quantities or monetary values derived are only approximations, because the units of measurement are numerous and are primarily based on utensils of daily use such as plate, bowl, glass, etc.

   c) Further, due to the lack of a market for services in rural areas, no product-based valuation is possible for services such as child care, sick care, etc., in a

practical survey of household maintenance activities. In a more complete survey including all non-market activities, approximate value-based calculations as described in the introduction (1.c.iii) may be performed.

2. The recommended product-based valuation could not be applied in its totality in the current survey because:

   a) The survey did not collect data on SNA-included productive but non-market activities and so imputation of net return to labour in other comparable non-monetary productive activities for which output related valuations can be performed could not be applied. One major difficulty, is the largely compulsory nature of some household maintenance activities e.g., care of children and the sick. In many places there is no choice for the household whether to perform such activities or not, given that there is no market for such activities. The only choice is to hire someone else to perform such activities and a replacement cost (wage) based valuation seems most appropriate in such situations.

   b) No households which produced household maintenance goods and services both for home consumption and market were encountered in the sample. Not all products used domestically were found in the market. Hence, such products have been completely left out in present calculations. The valuation process thus involved goods which were more or less traded in

the market and services for which only labour market transactions for polyvalent domestic workers were encountered.

3. Local market retail prices have been used for all calculations. As there is no taxation on local food stall sales and no delivery services involved, these may be assumed to equal producer prices.

4. Imputed values per hour of cooking obtained from the current survey are Rs36.76 for urban areas and Rs15.82 for rural areas. Given that each household spends 9-10 hours on cooking and related activities and that daily wages for an unskilled labourer amounts to Rs 100 per day in urban areas and Rs 60-70 in rural areas, these figures do seem to be an overestimation. But in Nepal, there is a vast difference between market and non-market share as far as costs are concerned. Eating out is still very expensive if compared to home cooking. Therefore, imputed values of home cooking will tend to be higher than expected.

5. The application of norms derived from the survey to a larger sample of existing time-use data was further complicated by the fact that available time-use data (MPHBS) were grouped under only four categories, namely cooking, servicing, and cleaning dishes and pots; laundry and cleaning of house; child care; and shopping and other domestic work. The problem arises from the fact that laundry and cleaning of house belong to the same category, different valuation techniques had to be

applied for each activity. While product-based valuation may be feasible for laundry, only wage-based valuation can be applied to cleaning houses and it was not possible to average the estimated value from both techniques. A primary necessity, therefore, seems to be that valuation should be performed for a sub-sample of a large scale time-use survey. Survey information collected in two far removed time periods and covering different sample population cannot be used to derive reliable values for household maintenance activities. The valuations presented in this study are presented, therefore, only as methodological examples.

6. For deriving reliable data on contribution of women to formal sector GDP one needs the following information: (1) GDP by sectors; (2) share of wages in its composition; and (3) male/female sectoral earnings. In the absence of the above information, as exemplified in the case of Nepal, the number of economically-active women/men and their wage rates may be used to derive approximate contributions. This assumes that the share of capital is negligible in the GDP, which may not be true at all. In other situations, where wage and earnings data are available by gender, this assumption is not necessary.

7. Once again, because this survey did not cover the non-market SNA products and analyze how much of this is included in GDP and how much is not, some other method had to be used to derive values for products and services which fall conceptually within SNA, but are

excluded in Nepal's GDP calculations. Otherwise, women's contribution to GDP would have been significantly underestimated. The figures in part II of Table 4.1 are derived totally on the basis of ratios of time allocated to economic and subsistence economic activities as defined in the MPHBS. This method has been used only because available data do not allow the use of more accurate methods such as direct measurement.

8. For a more accurate estimation of non-market SNA activities and a more complete product based valuation of household maintenance activities, it is necessary to collect information on all SNA and non-SNA activities performed in the household.

9. However, it would perhaps be best to design separate forms for collecting data on products, prices, and costs generated in the household and detailed recall interviews for all household members, identified by product codes in a separate column if possible. Form C of the questionnaire used in the current survey generated several difficulties in the calculation of time spent on each product. Several products were cooked simultaneously and it seems more practical to record time by individual rather than by product. The products must be listed in detail to capture the total value of household maintenance activities, but time cannot be allocated to each product accurately.

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ANNEXES
PART I

ANNEX I-A

LIST OF PRODUCTS PREPARED IN SAMPLE HOUSEHOLDS

Items	*Units*
I. MEAL PREPARATION	
Tea/Coffee	
1. Tea	Glass
2. Coffee	Glass
3. Boiled Milk	Glass
4. Lassi(Yogurt drink)	Glass
5. Yogurt	Glass
6. Sugar Candy Juice	Glass
Bread	
7. Bread	Piece
8. Rice bread	Piece
9. Wheat Bread	Piece
10. Parotha (Fried Bread)	Piece
11. Puri (Fried Bread)	Piece
12. Millet Bread	Piece
13. Corn Bread	Piece
14. Black Gram Bread	Piece
15. Fried Corn Flour	Plate
Rice	
16. Rice	Plate
17. Pokhreli Rice	Plate
18. Mansuli Rice (Govt.)	Plate
19. Mansuli + Corn Rice	Plate
20. Moto Rice	Plate
21. Hilly Rice	Plate
22. Cooked Rice Fried	Plate

ANNEX I-A

LIST OF PRODUCTS PREPARED IN SAMPLE HOUSEHOLDS (Cont...)

Items	*Units*
23. Uncooked Rice Fried	Plate
24. Rice Pudding	Plate
25. Carrot Pudding	Plate
26. Pulao	Plate
27. Potato Pulao	Plate
28. Corn Porridge	Plate
29. Rice + Porridge	Plate
30. Khichadi	Plate
31. Jaulo (Salted rice porridge)	Plate
Pulses/Soup	
32. Pulses(Mixed)	Bowl
33. Gahat (Pulse)	Bowl
34. Masuro (Pulse)	Bowl
35. Soup	Bowl
36. Black Gram (Soup)	Bowl
37. Jwano (Special soup prepared for Lactating women)	Bowl
Vegetables	
38. String Beans	Bowl
39. Soybean	Bowl
40. Pigeon Pea	Bowl
41. Potato + Spinach	Plate
42. Potato & Cauliflower	Plate
43. Potato & Cabbage	Plate
44. Potato & Eggplant	Plate
45. Potato & Turnip	Plate
46. Potato & Radish	Plate
47. Potato Kebab	Plate
48. Potato & Beans	Plate

ANNEX I-A

LIST OF PRODUCTS PREPARED IN SAMPLE HOUSEHOLDS (Cont...)

Items	*Units*
Vegetables (Cont...)	
49. Potato & maseura (Masted & dried pulses & vegetables)	Plate
50. Potato & Gundruk (Fermented & dried green vegetables)	Plate
51. Potato & Yam	Plate
52. Fried Potato	Plate
53. Boiled Potato	Plate
54. Spinach	Plate
55. Gundruk/Sinki (Fermented Radish)	Plate
56. Radish	Plate
57. Vegetable Stew	Plate
58. Tubers	Plate
Meat	
59. Mutton	Plate
60. Chicken	Plate
61. Pigeon	Plate
62. Fish	Plate
63. Buff (Buffalo meat)	Plate
64. Pork	Plate
65. Boiled Egg	Piece
66. Omelet	Piece
Pickles	
67. Mixed	Plate
68. Coriander	Plate
69. Peas	Plate
70. Sesame	Plate
71. Tomato	Plate
72. Green Salad	Plate
73. Samosa	Piece
74. *Kachauri*	Piece

ANNEX I-A

LIST OF PRODUCTS PREPARED IN SAMPLE HOUSEHOLDS (Cont...)

Items	*Units*
Snacks	
75. *Sabadana Paapad*	Piece
76. Potato *Paapad*	Piece
77. *Dahibada*	Piece
78. *Namkin*	Plate
79. *Pakoda*	Plate
80. Beaten Rice (Flattened Rice)	Plate
81. Beaten Rice & Egg	Plate
82. Fried Beaten Rice	Plate
83. Beaten Rice Pulao	Plate
84. Pop Corn & Soybean	Plate
85. Noodles	Plate
Sweets	
86. Ice Cream	Piece
87. Sweets (Condensed Milk)	Plate
88. *Sewai*	Bowl
89. *Sel Roti*	Piece
90. *Malpuwa*	Piece
91. *Anarasa*	Piece
92. *Khajuri*	Piece
II. CLEANING OF KITCHEN & DISHES	
93. Cleaning Kitchen	
94. Washing Dishes	
95. Mopping Kitchen	
III. FUEL COLLECTION	
96. Fuel Wood	
97. Husk, Bran/Oriel Cow dung	
IV. WATER COLLECTION	
98. Carrying Water	

ANNEX I-A

LIST OF PRODUCTS PREPARED IN SAMPLE HOUSEHOLDS (Cont...)

Items	*Units*

V. SHOPPING

99. Visit for shopping

VI. CLEANING OF HOUSE

100. Sweeping
101. Cleaning Room
102. Cleaning Room/Bed
103. Cleaning the Garden
104. Cleaning Front Yard
105. Cleaning Bathroom/Toilet
106. Cleaning Aquarium
107. Mopping the House
108. Collection of red earth for daily aplication in floor cleaning

VII. LAUNDRY

109. Wash Clothes
110. Ironing

VIII. MENDING

111. Sewing
112. Knitting
113. Repair brooms

IX. CHILD EDUCATION

114. Pay School Fees
115. Teach Children
116. Fetch Child to School/Back

X. CHILD CARE

117. Clean/Wash Children
118. Baby Care

ANNEX I-A

LIST OF PRODUCTS PREPARED IN SAMPLE HOUSEHOLDS (Cont...)

Items	*Units*
XI. ELDER CARE	
119. Care of Elder	
XII. SICK CARE	
120. Helping the Sick Person	
XIII. SELF TRAVEL	
121. Travel to School	
122. Travel to Work Station	
XIV. PERSONAL DEVELOPMENT	
123. Listening Radio/Watching TV/ Reading News Papers	
124. Skill Development (Learning Sewing)	
XV. RELIGIOUS ACTIVITIES	
125. Visit to Religious Place	
126. Pick Leaves for making plates for worship	
127. Worship	
128. Making the *Batti* (cotton swab and similar material for worship)	
129. Making Leaf Plates	
XVI. SOCIAL SERVICE	
130. Social Activities	
XVII. OTHER WORK	
131. Payment of Taxes	
32. Payment of Bills	

TABLE I.B.1
GROSS VALUE ADDED AT FACTOR COST AND
LABOUR FORCE BY INDUSTRY

Sectors	Rs. Million	Labuor force in '000 Male	Female
1. Agricultural Fisheries & Forestry	55,368	3,278.6	2,683.2
2. Mining & Quarrying	575	1.9	0.5
3. Manufacturing	7894	115.6	34.4
4. Electricity gas & Water	815	11.0	0.7
5. Construction	11,078	31.8	3.9
6. Trade restaurants & hotels[1]	12,902	195.4	60.6
7. Transport, Communication & Storage[2]	6,560	48.8	2.0
8. Financial & Real Estate[3]	10,944	18.1	2.8
9. Community & Social Services[4]	9,991	594.3	157.7
10. Others & Not Stated[5]	-	80.1	18.2
GDP at Factor Cost	116,128	4,375.6	2,964.0

Source: - Statistical Pocket Book, Nepal 1994 (p.252)
- Population Census 1991, Vol. I, Part XIII, 1993 (p.325)

1. Under labour statistics it is classified as 'Commerce'
2. Under labour statistics 'Storage' is not mentioned
3. Under labour statistics it is classified as 'Finance and Business Services'
4. Under labour Statistics it is classified as 'Personal and Community Services'
5. Classification only for labour statistics.

TABLE I.B.2

AVERAGE TIME INPUT BY ADULT POPULATION ON CONVENTIONAL AND SUBSISTENCE ECONOMIC ACTIVITIES

(In hours)

	Urban				*Rural*			
	Male		*Female*		*Male*		*Female*	
	Convent. Econ.Activ.	*Subsist.*	*Convent. Econ.Activ.*	*Subsist.*	*Convent. Econ.Activ.*	*Subsist.*	*Convent. Econ.Activ.*	*Subsist.*
Mountain	-	-	-	-	4.74	1.80	3.57	2.43
Hill	5.19	0.41	1.90	1.27	4.21	1.60	2.68	2.54
Terai	5.90	0.34	1.32	1.10	5.10	1.70	1.70	1.86

Source: MPHBS., 1989

Convent.Econ.Activ. = Conventional Economic Activity
Susbsist. = Subsistence

All Nepal population weights from 1991 Censuses have been applied to derive the national averages.

Convent. Economic Activity (A)		**Subsistence Economic Activity (B)**		**Ratio of B/A.**	
Male	4.768	Male	1.243	Male	0.2607
Female	2.107	Female	2.130	Female	1.0109

TABLE I.B.3
POPULATION BY PLACE OF RESIDENCE
(In Number)

	Urban		*Rural*		*Total*	
Regions	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
Mountains	-	-	715,847 (0.0776)	727,283 (0.0785)	715,847 (0.0785)	727,283 (0.0785)
Hills	483,780 (0.0525)	450,572 (0.3932)	3,625,757 (0.3932)	3,859,780 (0.4164)	4,109,537 (0.4457)	4,310,352 (0.4650)
Terai	398,221 (0.0392)	3,997,369 (0.4335)	3,997,369 (0.4335)	3,869,342 (0.4174)	4,395,590 (0.4767)	4,232,488 (0.4566)
Total	882,001 (0.0957)	813,718 (0.0878)	8,338,973 (0.9043)	8,456,405 (0.9122)	9,220,974 (100.00)	9,270,123 (100.00)
Total Population					18,491,097	

Source: Population Censuses 1991.

Notes: 1) Mountains have no urban areas.
2) Figures in parenthesis are the proportion to respective total male/female population.

TABLE I.B.4

AVERAGE HOURS OF HOUSEHOLD MAINTENANCE WORK PER DAY

By Place of Residence and Sex

Activities	*Urban*		*Rural*	
	Male	*Female*	*Male*	*Female*
1 Cooking, serving and Cleaning dishes				
Mountain	-	-	0.22	2.78
Hill	0.26	3.02	0.18	2.76
Terai	0.18	3.19	0.14	2.96
All Nepal	0.22	3.10	0.16	2.85
2 Laundry & cleanings of house				
Mountain	-	-	0.24	0.64
Hill	0.17	0.99	0.10	0.68
Terai	0.14	1.10	0.08	0.79
All Nepal	0.15	1.04	0.10	0.73
3 Child care				
Mountain				
Hill	-	-	0.38	0.71
Terai	0.25	0.76	0.40	1.00
All Nepal	0.33	1.14	0.25	0.98
	0.29	0.95	0.33	0.98
4 Shopping and other domestic works				
Mountain	-	-	1.35	1.10
Hill	0.73	0.84	1.39	0.95
Terai	0.94	1.91	1.32	1.09
All Nepal	0.82	0.91	1.35	1.03

Source: Multipurpose Household Budget Survey, NRB, 1988 (pp 356-360)

Note: Averages are derived applying 1991 population ratios living in respective regions, as featured in total in the annex.

TABLE I.B.5
POPULATION 10 YEARS OLD AND ABOVE

Sex	*Urban*	*Rural*	*Total*
Male	650,025	5,590,885	6,240,910
Female	600,631	5,866,287	6,466,918
Total	1,250,656	11,457,172	12,707,828

Source: CBS, Sub National Population Projections, Nepal 1991-2011, 1994

ANNEX I-C

SURVEY QUESTIONNAIRE

A: Introduction of the Selected Survey Sites and Households - (Form 1)

1. House No. .....
2. Ward No. .....
3. VDC/Municipality .....

01. Dhakuta Municipality	07. Tankisunwari V.D.C.
02. Biratnagar Municipality	08. Kapan V.D.C
03. Kathmandu Municipality	09. Gitanagar V.D.C
04. Bharatpur Municipality	10. Paraspur V.D.C
05. Nepalgunj Municipality	11. Laharepipal V.D.C
06. Belhara V.D.C.	12. Dillichaur V.D.C
	13. Dashrath Chand V.D.C

4. District .....

01. Dhankuta	02. Morang
03. Kathmandu	04. Chitwan
05. Baglung	06. Banke
07. Jumla	08. Baitadi

5. Household Head .....
   (spouse) Mr./Mrs. .....

6. Respondent's Name .....
   Name .....

7. Name of Interviewer .....

Interview taken			
01. No. of times	.....	.....	.....
02. Date	.....	.....	.....
03. Starting time	.....	.....	.....
04. Ending time	.....	.....	.....
05. Total time taken for the interview (minutes)	.....	.....	.....

B : Information of the Household Members - (Form 2)

Respondent's Serial Number	Name of Household Members and live-in Servants (Write HH Head's Name First)	Relation to Household Head	Sex	Age (0 if<1 yr)	For 5 yrs & Above			
					Marital Status	Education	Occupation	Place of Work
(1)	(2)	(3)	(4)	5)	(6)	(7)	(8)	(9)
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								
11								

Relation to Household Head

01 Household Head
02 Mr./Mrs.(Spouse)
03 Son/Daughter
04 Daughter in law
05 Grand-daughter/Grand-son
06 Father/Mother
07 Mother/Father in law
08 Brother/Sister
09 Nephew/Niece
10 Not a Relation
11 Live in Servant
12 Other (Specify)

Sex

1. Male
2. Female

Marital Status

1. Not Married
2. Married
3. Widow/Widower
4. Divorced/Separated

Education

00 Illiterate
01 Grade one completed
09 Grade nine/Test pass
10 S.L.C.
11 Intermediate
12 Bachelor
13 Master
14 Literate

Occupation

0 Working at Home
1 Agriculture
2 Wage Earner
3 Student
4 Service
5 Business
6 Industry

Place of work

1 Own
2 Other's
3 Officer
4 School

C : Products Generated or Work Done at Home and Input Therein - (Form 3)

Code	Product/Activity	Frequency of time the Product Generated or Activities Performed	Products/Activities			Total Persons Involved in Making the Product	Serial No.
			Unit of Measurement	Average Quantity Produced at a time aw per column 3	Per Unit Cost of Preparation at Home (to be calculated from form 4)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Respondent's Serial No. (9)	Name (10)	Time Spent per product/ per activity, each time (11)

* A complementary Product/Activity list is also supplied to fill-in the information.

D : Calculation of Per Unit Cost of Products Generated at Home - (Form 4)
(Contents Ingredients, Period, Volume and Price)

Product/Activity	Contents A	Frequency of time the products generated or activities performed B	Quantity C	Cost D	Per Unit Cost (As of unit mentioned in column 4 of form 3) E
1	2	3	4	5	6

E : Depreciation of Household Appliances - (Form 5)

Code (1)	Daily Used Household Appliances (2)	Total Number (3)	Cost Price (Rs.) (4)	Durability (5)	Yearly Repair Cost (6)

F: Daily Time Use Budget of Household Members - (Form 6)

Daily Time Use Pattern of a Member of the Household who is older than five years.

1. Serial No: ..... 2. Respondent Serial No: .....

3. Name: .....

4. Sex: ..... 5. Age: .....

Code (6)	Activities (7)	Time To - From (8)	Minutes	
			M (9)	P (10)

G : Household Information - (Form 7)

1. Household economic status in the respondent's view.

   1) Rich 2) Middle Class 3) Poor

2. How much areable Land do you own?

Unit	Irrigated Field	Non-Irrigated Field/garden
Ropani/Bigha		
Cost/Value(Rs)		

3. What animals/birds do you own?

Animals/Birds	Adult	Infant
Cow/Ox		
Buffalo/Bull		
Goat/Sheep		
Pig/Boar		
Horse/Mule		
Chicken/Duck/Pigeon		
Fish		
Others (Specify)		
Cost		

Total Price _____

4. Income and Wealth

   (a) Total salary/pension of the household members. Rs. .....

   (b) Other source of income ..... (e.g., Business, house rent, etc.) Rs .....

5. Information of House/Building

(a) How many stories is your house made up of?

1. One Story 2. Many Stories

(b) What type of a house do you own?

1. Mud 2. Brick/Stone 3. Cemented

6. (a) Rooms in use .....

(b) Total area of the house .....

(c) Area occupied by patio, garden, kitchen garden, etc. .....

(d) Current cost of building the house (excluding the occupied land) .....

(e) Price of the patio, garden, kitchen garden and land occupied by the house. .....

7. Toilet .....

1) Inside the house 2) Outside the House 3) Does not exist

8. Electricity .....
1) Yes 2) No

9. Telephone .....

1) Yes 3) No

10. (a) Drinking water

1) Tap inside the house
2) Well/Tap Outside the House (front-yard)
3) Other sources away from the house

(b) If tap is not inside the house, time consumed in carrying water into the house (minutes) .....

11. Local daily wage rate (labour) (Rs.) .....

12. Total cost of employing a person on a monthly basis

Cash .....; Kind .....; Total amount (Rs.) .....

13. Evaluation of the interview

	Code for the answers		
	1	2	3
1) Explanation of questionnaire	Excessive	Some	Little
2) Need of local interpreter	Yes	No	
3) Evaluation in total	High	Medium	Low

H : Market Price of Products Generated at Home - (Form 8)

Information to be collected from the village/town knowledgeable persons (check-list)

1. Informant's Name: .....

2. Occupation/Position: .....

3. VDC/Municipality/Ward: .....

Code (4)	Product Name (5)	Unit (6)	Cost (7)	Remarks (8)

ANNEX D: FREQUENCY DISTRIBUTION

FILE A: INTRODUCTION OF THE SELECTED SURVEY SITES AND HOUSEHOLDS - (Form 1)

	Number	Per cent
Total Respondent	**276**	**100.0%**
A3 Municipality/VDC		
1 Dhankuta Muni.	26	9.4%
2 Biratnagar Muni.	26	9.4%
3 Kathmandu Muni.	26	9.4%
4 Bharatpur Muni.	26	9.4%
5 Nepalgunj Muni.	26	9.4%
6 Belhara VDC	18	6.5%
7 Tankisunuwari VDC	18	6.5%
8 Kapan VDC	18	6.5%
9 Gitanagar VDC	18	6.5%
10 Paraspur VDC	18	6.5%
11 Laharepipal VDC	18	6.5%
12 Dillichaur VDC	18	6.5%
13 Dasharathchanda VDC	20	7.2%
NA3 Residence		
1 Urban	130	47.1%
2 Rural	146	52.9%
A4 District		
1 Dhankuta	44	15.9%
2 Morang	44	15.9%
3 Kathmandu	44	15.9%
4 Chitwan	44	15.9%
5 Baglung	18	6.5%
6 Banke	44	15.9%
7 Jumla	18	6.5%
8 Baitadi	20	7.2%
NA4 Ecological Belt		
1 Mountain	18	6.5%
2 Hill	126	45.7%
3 Terai	132	47.8%
Total Respondent	**276**	**100.0%**
A8 Number of Visits		
1 One Time	252	91.3%
2 Two Times	22	8.0%
3 Three Times	1	.4%
8 Missing	1	.4%
TIME Total time for Completing Ques. (in minutes)	Average	Std.Dev
	144.7	47.0

FILE B:
INFORMATION OF THE HOUSEHOLD MEMBERS- (FORM 2)

		Number	Percent
Total Household Member		**1733**	**100.0%**
Residence			
Urban	Male	402	23.2%
	Female	420	24.2%
Rural	Male	475	27.4%
	Female	436	25.2%
Ecological Belt			
Mountain	Male	56	3.2%
	Female	63	3.6%
Hill	Male	396	22.9%
	Female	405	23.4%
Terai	Male	425	24.5%
	Female	388	22.4%
REL Relationship to Household Head			
1 Household Head		276	15.9%
2 Spouse (Mr./Mrs.)		249	14.4%
3 Son/Daughter		729	42.1%
4 Daughter in-Law		115	6.6%
5 Grand-Daughter/Son		203	11.7%
6 Father/Mother		30	1.7%
7 Mother/Father in-Law		1	.1%
8 Brother/Sister		31	1.8%
9 Nephew/Niece		16	.9%
10 Not a Relation		3	.2%
11 Live-in Servant		61	3.5%
12 Others		19	1.1%
SEX Gender			
1 Male		877	50.6%
2 Female		856	49.4%
AGE Age Group			
0 Year		35	2.0%
1 1 - 4 years		128	7.4%
2 5 - 9 years		196	11.3%
3 10 - 14 years		251	14.5%
4 15 - 24 years		372	21.5%
5 25 - 49 years		535	30.9%
6 50 + years		216	12.5%

(FILE B: CONTD...)

	Number	Per cent
Household Member	**1733**	**100.0%**
AGE Age Group (Male)	877	50.6%
0 Year	15	0.9%
1 1 - 4 years	60	3.5%
2 5 - 9 years	101	5.8%
3 10 - 14 years	126	7.3%
4 15 - 24 years	199	11.5%
5 25 - 49 years	262	15.1%
6 50 + years	114	6.6%
AGE Age Group (Female)	856	49.4%
0 Year	20	1.2%
1 1 - 4 years	68	3.9%
2 5 - 9 years	95	5.5%
3 10 - 14 years	125	7.2%
4 15 - 24 years	173	10.0%
5 25 - 49 years	273	15.8%
6 50 + years	102	5.9%
MAR Marital Status		
1 Unmarried	767	44.3%
2 Married	733	42.3%
3 Widow/Widower	59	3.4%
4 Divorced/Separated	11	.6%
7 Not Applicable	163	9.4%
EDU Education		
0 Illiterate	388	22.4%
1 Grade One Complete	67	3.9%
2 " Two	53	3.1%
3 Three	62	3.6%
4 Four	58	3.3%
5 Five	90	5.2%
6 Six	47	2.7%
7 Seven	60	3.5%
8 Eight	76	4.4%
9 Nine	132	7.6%
10 SLC	163	9.4%
11 Intermediate	103	5.9%
12 Bachelor	61	3.5%
13 Master	60	3.5%
14 Can Read/Write	150	8.7%
77 Not Applicable	163	9.4%
OCCUP Occupation		
0 Working at Home	365	21.1%
1 Agriculture	266	15.3%
2 Wage Earner	67	3.9%
3 Student	598	34.5%
4 Service	153	8.8%
5 Business	106	6.1%
6 Industry	15	.9%
7 Not Applicable	163	9.4%
WORKP Working Place		
1 Own	708	40.9%
2 Other's	111	6.4%
3 Office	153	8.8%
4 School	598	34.5%
7 Not Applicable	163	9.4%

FILE C: HOUSEHOLD INFORMATION - (FORM 7)

	Number	Per cent
Total Respondent	**276**	**100.0%**
G1 Economic Status		
1 High	13	4.7%
2 Medium	206	74.6%
3 Low	57	20.7%
G5A Stories of House		
1 One Story	114	41.3%
2 Many Stories	162	58.7%
G5B Type of House		
1 Mud	74	26.8%
2 Brick/Stone	125	45.3%
3 Cemented	77	27.9%
G6A Rooms in Use		
1 1 - 4 Rooms	155	56.2%
2 5 - 7 Rooms	82	29.7%
3 8 -12 Rooms	37	13.4%
4 13+	2	0.7%
G7 Toilet		
1 Inside House	67	24.3%
2 In Courtyard	118	42.8%
3 Not at all	91	33.0%
G8 Electricity		
1 Yes	204	73.9%
2 No	72	26.1%
G9 Telephone		
1 Yes	64	23.2%
2 No	212	76.8%
G10A Drinking Water		
1 Inside House	53	19.2%
2 Outside House	129	46.7%
3 Other Source	94	34.1%
G13A Explanation		
1 Excessive	35	12.7%
2 Some	137	49.6%
3 Little	104	37.7%
G13B Local Interpreter		
1 Yes	45	16.3%
2 No	231	83.7%
G13C Overall Evaluation		
1 High	86	31.2%
2 Medium	177	64.1%
3 Low	13	4.7%

Part 2

A MACRO APPROACH TO VALUING HOUSEHOLD OUTPUTS CANADA AND FINLAND[1]

Andrew Harvey

[1] In collaboration with the Time-Use Research Program, Department of Economics, Saint Mary's University, Halifax, Canada.

INTRODUCTION

Ultimately, estimation of the value of household production will require, as does the estimation of many economic phenomena, the use of a variety of approaches. This is true for at least two reasons. First, a single approach cannot be expected to be applicable to all cases, thus variety is needed to ensure that there are sufficient approaches to develop exhaustive measures. Even where good measures of a phenomena exist it is helpful to be able to derive confirmatory estimates by other approaches. This chapter explores one approach, a macro approach to the estimation of household production. The major intent of the work presented here is to explore ways of developing estimates of household output and to highlight data deficiencies and needs. The exercise while striving to generate reasonable estimates for Canada and Finland has been less rigorous and more exploratory than recent estimates developed by Statistics Canada and Statistics Finland.

The previous part of this book presented an approach which can be denoted the micro approach to output estimation. It is dependent on the collection, in a common instrument at the household level, of the various values needed to calculate the quantity and value of household production. The micro approach has been used, but not well analyzed or reported, in studies such as the World Bank Living Standard Measurement Studies and the UN Housing Capability Surveys. These studies focus, often in great detail, on specific productive activities but not in a manner that permits accurate integration to account for overall production. The work reported above on Nepal attempts to present a more complete micro picture to permit a proper overall accounting of household production.

This study takes, in contrast, a different approach by attempting to use data collected by a range of vehicles including representative time diary and consumer expenditure surveys to derive estimates cutting across the range of activity undertaken in households. The approach used here, while not without difficulties, looks at households providers of food, shelter and clothing and child/elder care. The premise is that the output must be measured from the consumption side rather than the input side. That is, the outputs are meals, receipt of accommodation, receipt of care to clothes and person. It is the identification, measurement and valuing of these outputs which is the focus here.

Simply put, the approach used here calculates, for specific activities, the volume of output that volume times average price gives the total value of the activities output. It constitutes household production. However, in order to incorporate that value in a satellite account compatible with

the SNA the value of inputs already included in the SNA, purchased inputs (RME) and the value of owner occupied dwellings must be deducted. When this is done the remaining value reflects the services from household capital, and household profit.

The objective was not to provide answers but to raise questions. The work carried out clearly identified both conceptual and data problems associated with the task of valuing household output. It is hoped that these problems can be more extensively explored, and solutions sought, as efforts for fully accounting for household production move forward.

Chapter One
VALUING UNPAID WORK

I. Approaches to the Measurement and Valuation of Household Output

Over the past two decades, increasing attention has been paid to the measurement and valuation of the output generated by unpaid activities in households. Goldschmidt-Clermont (1983,1987) provides a good review of the approaches used which can be broadly classified as an input or output approach.

1. The Input Approach

Input approaches to the valuation of household production have traditionally focused on labour inputs to the production process, deriving the value of household output as

the value of labour that goes into its production. [See, for example, Adler and Hawrylyshyn (1978), Murphy (1978, 1982), Chadeau (1985), Gronau (1980)]. The first major shortcoming of this approach is its failure to account for household inputs other than labour. Any productive output is typically viewed as emanating from a combination of input resources namely, land, labour, capital and entrepreneurial ability. To restrict the value of household production only to the embodied labour fails to portray accurately either the process or the value of household production.

A second shortcoming of the input approach is its failure to account for joint production in the household emanating from the simultaneous activities undertaken by individuals engaged in household production. Often, household workers are engaged in more than one process at a time. Varjonen claims that farm wives in Finland had on average 2.5 activity processes in progress simultaneously (Varjonen, 1991).

Another major shortcoming of the labour input approach is the lack of clear valuation criteria. There are two main methods of valuing labour inputs. The first relates to the labour equivalent chosen while the second relates to the labour value used. The labour equivalent may be defined in several ways. First it may be taken to be the opportunity cost of the time expended on household productive activities by any given individual. This means that the exact same activity undertaken by two individuals with different marginal time values will have different values, and different activities with a priori different values per unit time would have the same value for any given individual. Alternatively, it may be defined in terms of replacement workers which may be defined in terms of a 'global substitute' (i.e., housekeeper) or

in terms of functional replacements (i.e., cook, cleaner, gardener, etc.). Having defined the labour equivalent, the labour value of that equivalent remains to be determined. The appropriate value base is not straightforward. What is the appropriate opportunity cost for the worker? Should replacement values be determined as an average of all workers, or on a gender specific basis, or in terms of particular workers? And, should it be net or gross with respect to costs?

In spite of these shortcomings the input approach has, until recently, provided the operational household production valuation method. The chief reason for its popularity has been the existence of time-use data which has provided the much needed information on time allocated to household work (INSTRAW, 1991). More recently, attempts have been made to improve the input approach by broadening it to include non-labour inputs as well (Ironmonger, 1989; Thoen, 1993; Schafer and Schwarz, 1995; Aslaksen and Gravingsmyhr, 1995; and Rydenstam and Wadeskog, 1995). The extensions have been made by drawing on additional household data collected by central statistical bodies.

2. The Output Approach

In a seminal work on the role of time use in understanding household production it was stated that "the time spent on the household work activities (input) equals the goods and services produced (output)" (Walker and Woods, 1974, p.3). The study noted that this assertion assumes, of course, that labour is the only factor input. The study observed that while outputs of goods and services could be measured or quantified the quantities were calculated in

disparate units such as meals, pounds of wash, etc. and thus were not amenable to summation. However, if these outputs can be expressed in dollar values using realistic prices the problem of aggregation disappears. Use of time to measure household production poses the problem, noted by Walker and Woods, of disentangling time allocated to an array of household activities carried out both concurrently and consecutively.

Despite the shortcomings of the labour input approach, experimentation using the output approach has been slow in coming. Very few studies embodying the output approach have been undertaken and not one of these has been executed within a central statistical office. Curiously, however, an output type approach was used in what may have been the very first attempt to estimate the aggregate value of household output in the economy. Colin Clark (1958) inferred the value of unpaid household activities from the cost of maintaining adult and child inmates in homes and institutions run by local authority welfare services in Britain. The value he thus derived is attributable to the inputs of labour and management. Although the cost of capital is not included in the estimated value, this is essentially an output approach where the institutional cost has been assumed to reflect market value.

Goldschmidt-Clermont (1983) argued in favour of adopting the output approach and defined the value of household productive activity as the difference between the market cost of buying a good or service and the household's monetary outlay in producing an equivalent product. Fitzgerald and Wicks (1990) and Dulaney et al. (1992) have used the direct output approach by defining household outputs and conduct-

ing a sample survey to collect data on the defined outputs and their prices. Elements of the output approach were used in an extensive study undertaken by the Ministry of Social Affairs and Health of Finland in the late 1970s. The Finnish study did not exclusively use an output approach but incorporated such an approach into its comparative study. The product approach was used for meals (Suviranta, 1982); housecleaning (Suviranta and Kiplio, 1982); and laundry (Suviranta, 1982). Sanik and Stafford (1983) estimated the value of home food production using a product accounting approach and Chadeau and Forquet (1981) estimated values for meals and housecleaning.

Chapter Two

TOWARD AN OUTPUT-BASED VALUATION OF HOUSEHOLD PRODUCTION

The output approach identified the value of a good or service produced by a household as the market value of a similar product sold by businesses, less the cost of raw materials, energy, and the use of other fixed assets that go into producing it. As explained later, this basic definition will be slightly modified for the purposes of including the estimates of theses values in the non-SNA Satellite account.

I. Categories of household output

As the first step in developing the output based measurement, the following question needs to be asked: What are the

outputs produced by a household? In various studies, numerous household productive activities have been identified. Table II.2.1 provides a comprehensive list of these activities at a very disaggregated level (Fitzgerald and Wicks, 1990).

TABLE II.2.1
TYPES OF HOUSEHOLD PRODUCTION

Activity		*Unit Definition*
A.	CLEANING	
1.	Garbage disposal	bag
2.	Vacuuming	room (each time)
3.	General pick-up	room
4.	Kitchen floor mopping	floor
5.	Other kitchen surfaces	kitchen
6.	Bathroom floor mopping	bathroom
7.	Bathroom, other surface cleaning	bathroom
8.	Basin, tub, tile, commode cleaning	bathroom
9.	Bedroom other surface cleaning	bedroom
10.	Bedmaking	bed
11.	Bed linen changing	bed
12.	Other rooms floor cleaning	floor
13.	Other rooms surface cleaning	room
14.	Lawn mowing	lawn
15.	Window cleaning	window
16.	Refrigerator or freezer defrosting	refrigerator
17.	Stove cleaning	stove
18.	Cupboard cleaning	cupboard
19.	Garage cleaning	garage
20.	Patio cleaning	patio
21.	Snow shovelling	sidewalk/driveway
22.	Yard raking	yard
23.	Yard litter pick-up	yard

TABLE II.2.1 - TYPES OF HOUSEHOLD PRODUCTION (Continued)

Activity		*Unit Definition*
B.	CHILD CARE	
24.	Child feeding	child/each time
25.	Child changing	child
26.	Child bathing	child
27.	Child transporting	mile
C.	MEALS	
28.	Meal preparation and cleanup	meal for one person
D.	CARE OF CLOTHING	
29.	Washing and drying	machine load
30.	Ironing	article of clothing
31.	Mending	article
32.	Alteration	article
E.	REPAIR AND MAINTENANCE	
33.	Chimney sweeping	chimney
34.	Electrical repair	job
35.	Plumbing repair	job
36.	Interior painting	room
37.	Exterior painting	room
38.	Structural repair	value of job
39.	Landscaping	job
40.	Vehicle cleaning, washing	car
41.	Vehicle tune-up	job
42.	Vehicle lubrication	job
43.	Vehicle tire changing	tire
44.	Other vehicle repair	job
45.	Other appliance and equipment repair	job

TABLE II.2.1 - TYPES OF HOUSEHOLD PRODUCTION (Continued)

Activity		*Unit Definition*
F.	FOOD PRODUCTION	
46.	Homegrown food	Market value
47.	Livestock	Market value
48.	Hunting harvest	Pounds
49.	Fishing harvest	Pounds
50.	Berry gathering	Pounds
G.	MISCELLANEOUS	
51.	House upgrading	Market value of particular job
52.	Yard upgrading	Job
53.	Tax preparation	Federal/State return
54.	Household furnishing and hobby production	Market value of particular job
H.	ACTIVITIES FOR WHICH OUTPUT IS TIME	
55.	Child sitting	Hour
56.	Care of elderly	Hour
57.	Care of sick	Hour

Source: Fitzgerald,J. & Wicks,J. (1990). "Measuring the value of household output: A comparison of direct and indirect approaches", *Review of Income and Wealth*, 36(2): 129-141.

However, it is argued here, in reality the major household outputs are far fewer than activities undertaken to produce them. Since the prime purpose of the present macro approach to valuation is to develop reasonable estimates of aggregate household production it is argued that there exists a parsimonious approach to defining and valuing household outputs. The approach here is based on, and adopts with a slight modification, the five major dimensions of household

production identified by Walker and Woods (1974) in their seminal work on household production in the United States. They identified five major areas of production, as listed in the table below.

TABLE II.2.2
CHARACTERISTICS AND CONTENT OF HOUSEHOLD WORK

Group Categories	*Individual Activities*
All food preparation	• Regular meal preparation • After-meal cleanup • Special food preparation
All house care	• Regular house care • Special house care • Yard and car care
All family care	• Physical care • Non-physical care
All clothing care	• Washing • Ironing • Special clothing care
Marketing and management	• Marketing or shopping • Management and record keeping

Source: Walker and Woods (1974, p.38)

Assuming an output approach is adopted, one is faced with at least two questions. What are the outputs associated with these productive activities? Are these independent or interdependent activities? The answers to these questions

suggest that, in fact, the outputs are far less complex than the activities pursued in their production.

—*Food preparation*: This consists of regular meal preparation, cleanup and special food preparation. While meals have traditionally been valued by means of valuing the activities used to produce them (cooking, clean up etc.) the reality is that the total value of meals produced at home hinges on the meals eaten and is the summation of the value of all consumed meals produced at home. Assuming appropriate values 'prices' can be found for meals, pricing meals obviates many of the steps previously involved in the provision of meals. In reality meal provision entails activities much broader than those proposed above. The price of meals provided in the market represents the sum of the value added in delivering the meal and incorporates a wide array of household activities which combine to produce meals. These activities include at least, menu planning, provisioning (shopping), cooking, serving, cleanup, and garbage disposal.

—*Household upkeep*: Regular housework can be viewed as consisting of house cleaning and maintenance of cleanliness and order (Walker and Woods, 1974, p. 138). Special house care consists of occasional or seasonal home care and repair and upkeep of the house, furniture and equipment. Yard and car care are distinguishable from special house care since they take place outside the dwelling and are often seasonal in nature.

—*Family care*: Family care consists of both physical and non-physical care (Walker and Woods, 1974). The dominant component of family care is child care. The output of child

care is, in fact, getting the child from day to day. Except for when a child's care is handed over to a third party someone in the household has responsibility for each child. When children are in day care, or in school, or placed in the hands of a baby sitter or child minder the immediate responsibility on the part of the household is suspended. However, at all other times someone in the household is responsible for the care of the child. It thus seems reasonable to value child care on a per child/hour basis. However, while this approach may be accepted as a reasonable treatment of children, how such valuation during children's sleeping time is handled represents a real issue.

—*Clothing Care*: Clothing care consists of washing, ironing and special clothing care. Special clothing care includes a wide variety of activities, construction of clothing, hand washing, mending, shoe care, etc. (Walker and Woods, 1974).

—*Residual Marketing and Management*: Marketing consist of all shopping for all goods, whether or not purchases were made. It consisted of all aspects of acquiring goods and services by phone, mail, travel, and time putting purchases away (Walker and Woods, 1974). This category of household activity is a 'residual' one because much of these activities are included in the previous categories of food preparation. Thus, the value created by shopping for food is included in the output of meals and should not be counted separately. The residual group consists of only those marketing and management activities which are not already included in any of the output categories listed above.

II. The Output Measure of Household Output: Methodology

Using the output approach, the value of a non-SNA good or service produced within a household is measured as:

$$VO = P - RME - UOD$$

where

VO = the value of 1 unit of household output

P = the market price, net of taxes and subsidies, of the good or service of like quality

RME = the cost of Raw Materials and Energy used per unit of output. Raw materials include those goods which are produced by the household itself and are included in the SNA GDP.

UOD = the cost of the Use Of (a portion of) Dwelling per unit of output.

Noting that value added (VA) is defined as:

$$VA = P - RME,$$

our measure of household output is:

$$VO = VA - UOD,$$

with VA being calculated net of taxes and subsidies on the product.

The value of household production thus incorporates the contributions of labour, household equipment, and entrepre-

neurship. Subtracting the user cost of dwelling from value added represents a departure from the current notion of calculating the value of household output. This is done here in order not to double-count the user cost of dwelling when relating the GDP of the Satellite SNA account with the SNA GDP. In contrast, the user cost of household equipment, such as kitchen appliances and washing machines, is not included in the SNA GDP, and we include it in the value of household output (VHO). Thereby, we view these equipments as capital stock rather than final consumption items. Some household goods output, such as garden vegetables, are included in SNA GDP, and their values are excluded from VHO by virtue of being a part of RME.

The procedure for estimating the value added (VA) of a unit of household output involves the following steps:

1. Identify broad categories of (non-SNA) output generating activities of households. As explained above, these are:

   - Food preparation
   - Household upkeep
   - Family care
   - Clothing care
   - Residual Marketing and Management

   Each of these categories subsumes within it all activities generating the end product implied by that category. For example, food preparation involves management, shopping, cooking, dish washing, etc., but these specific activities do not constitute separate categories. Instead, all the activities that go into the production of meals are included in the category of food production.

2. Identify *items* of goods and services produced within each category. For example, the outputs of food preparation are: breakfast, lunch, dinner, snacks, etc. Conceptually, it is possible to come up with dozens of items within each category by making fine distinctions, i.e., a lunch may be light, heavy or sumptuous, and any one of them could be further described by varying details. Such distinctions are only useful if corresponding data exist allowing estimations of value created by types. When working with existing data for only breakfast, lunch, and dinner, the identified items under the food preparation category would be necessarily restricted to these three categories, resulting in approximation errors. However, it is useful to bear in mind that the classification of items can be better devised if an opportunity arises to gather detailed data either from existing sources or through a specially designed sample survey.

3. For each item of each category, estimate the *quantity* (X) and, where relevant and possible, identify the *quality* of output produced per person in a household per unit of time.

4. For each good (or service) produced by households, estimate the market price (P) of a good of similar quality. Market price is defined as price to the purchaser and includes taxes and/or subsidies. Identify these taxes and subsidies to calculate the producer's price (called "basic price" in SNA). Available sources may include aggregate industry statistics, price information collected by statistical agencies, and any available industry sources.

5. Identify the raw material and energy components of each item produced by the households. RME is the total cost of these components. There are two distinct sources of data for the RME per unit of output:

   a) business establishments producing and selling the good or service;
   b) households producing and consuming the product.

   Since price data originate only at the business establishments, the value of RME at the business end will have the best item-wise match with price data in the process of calculating value added for each item. Using business RME (with tax adjustments) may, therefore, be the preferred option if data on both price (which is the value of sale per unit of output) and the unit cost of raw material and energy are available for each item in a category of household production. Lacking such information, it will be necessary to use any available data on households' use of RME. A major source, for example, is family expenditure surveys.

   The values of some household goods outputs (e.g., vegetables from kitchen gardens) are already included in SNA GDP, and need to be excluded from the Satellite account in order to avoid double counting. The values of these outputs, therefore, are to be appropriately included in the calculation of RME of households. This will be done only when household expenditure data are used to estimate RME to arrive at VA, and not when estimating VA using RME for businesses. This is because the value of home produced output that is used as raw materials

does not show up in family expenditure data, whereas business RME includes all materials.

6. Value added (VA) is then calculated for each item as ((P*Q) - RME). However, data limitations will likely exclude the possibility of calculating value added for each item in a category. For example, when using family expenditure data on RME, we cannot distinguish the raw material components of different types of meals (breakfast, lunch, dinner), and can only estimate the value added for all food preparations together.

7. The price of household output that is to be used in calculating VA is what is defined as "basic price" in SNA. Basic price is the price to the purchaser less any tax plus any subsidy on the product. For example, in Canada purchaser's price for most goods includes Provincial Sales Tax and Goods and Services Tax. These taxes are deducted from the market price (purchaser's price to arrive at the basic price. SNA currently includes some goods produced by the hosuehold for own consumption, and these are valued at basic prices; likewise, satellite accounts should do the same, estimating the basic price of a similar good that is sold in the market. The fundamental reason why household output should be valued at basic price and not market price is that when the government does not impose any tax on a product, no tax can be imputed without violating the identities in national income accounting. For example, suppose that food bought from restaurants is tax-exempt if less than $4 of food is purchased. In this case, tax should not be

imputed in calculating market value of the tax-exempt food just because the same food bought in larger quantities would be taxed. Doing so would make GDP as calculated by the output measure exceed the total income of households, firms and the government together. In the case of non-SNA household output, one might argue that the imputed tax could be considered a part of household income, thus not violating the national income identities. However, this does create a disparity with the procedures in SNA, and for no good reason. Taxation is purely a prerogative of the government, and when a tax is not actually imposed by the government, there does not exist any implicit value which can be imputed to it. Using the same argument, there should not be any adjustment for tax in calculating the cost of intermediate goods (RME). The cost of these goods to the households includes taxes, while businesses often do not pay some of the taxes or get tax refund for inputs as in the system of VAT (Value Added Tax). To this extent, the cost of producing a good at home is higher than the cost of producing the same thing in a business establishment. Correspondingly, the VA of household output is less, and should be so recorded in the Satellite SNA. If the tax amount is deducted from the cost of raw materials in the process of calculating household VA, then the contribution of household output in GDP would increase by that amount in the Satellite Account while, at the same time, the tax as collected by the government is already being counted in SNA GDP. This is because GDP at market prices = Output (at basic prices) + Taxes, less subsidies, on products - Intermediate Con-

sumption. An input purchased by a household is considered a final output in the SNA, and any tax on it is included in the GDP by the above equation.

8. To measure UOD for each activity, a portion of the imputed or actual rental of a dwelling needs to be assigned to the activity. For example, some 20% of the rental may be ascribed to food preparation and consumption. House cleaning will have no UOD component. To estimate the rental, a macro measure can be used, dividing the SNA household rental figure by the total number of dwellings in the nation. This amount will then be divided by the number of meals prepared in a year in the household.

9. To arrive at the value of household production at successively higher levels of aggregation, the following notations are used:

   a) For each item in a category, the *per-unit* value of household output is:

      VO = VA - UOD,

      and the corresponding *total* value is:

      IVO = Q x VO,

      where Q is the quantity of output of an item, and IVO stands for the total value of output of an item.

   b) The total value produced by a household in a particular category of activity is:

CVO = Sum of IVO, when the summation is taken over all items in the category.

CVO stands for category-wise value of activities.

c) The total value of a household's output is:

TVO = Sum of CVO, when the summation is taken over all categories of activities.

d) Aggregating over all households in the economy, the totals for all households are:

SACVO = Sum of CVO over all households, with SACVO standing for "Satellite Account CVO";

SATVO = Sum of TVO over all households, with SATVO standing for "Satellite Account TVO"

Output based- and input based-valuation methods represent, to a great extent, mirror images of each other. Using the traditional input approach to valuation, one determines the inputs and sums them to arrive at an estimate of total output. Using this method the value of the labour input is itself an input into the valuation process. In contrast, using the output valuation approach output is valued in terms of the market price of equivalent outputs in the market or in terms of prices of closely related goods. Having determined market value of the output, and adjusting for taxes, the value added by the household is determined by subtracting the value of purchased

inputs. The resulting value added consists of two components: one is the value of labour used in the production process and the other is the contribution of household capital. Using the input approach entails the necessity of deriving estimates of the services flowing from household capital in order to calculate the total value of household output. However, no such requirement is imposed by the output approach. Under the output approach, it is only necessary to derive estimates of the services flowing from household capital if one wishes to isolate the contributions of labour and capital to production. The use of the dwelling component is treated differently only because it is included in the SNA. The SNA does not include any estimates of the flow of services from household capital since such "capital" was recorded as consumption in the SNA.

Chapter Three
PREVIOUS OUTPUT-ORIENTED STUDIES OF HOUSEHOLD PRODUCTION

I. The Finnish Housework Study

This study is presented in considerable detail since it represents a landmark study in the measurement and valuation of household production. It incorporated both input and output valuation approaches.

The basic research unit was private households in Finland. A household was comprised of the family and any persons living within it who share meals at least partly or who pool their income in other ways. Sampling involved 2,000 households selected in a stratified two-stage cluster sample. Data was collected by means of interviews, individual housework diaries and meal forms completed by the person in charge of keeping the household. The main data modules

in the interview were: a) structural data on the household; b) data on the dwelling; c) household appliances; d) use of paid domestic help; e) household members receiving special care; and f) occasional activities, with questions concerning, frequency of the task, what products are produced by the household itself and how much is produced by the household itself. The data in the meal form captured data on the number of meals eaten at home, the number of persons taking part in meals at home, the foods eaten at home, and the source or stage of processing of the foods eaten.

Unpaid housework was divided into eight activities: cooking; home chores and laundering; child care; other family care; handicrafts, wood, and metal work; maintenance work, shopping and errands; and other unpaid housework (Tables II.3.1 and II.3.2). A division was made between the work done by the wife, the husband, children age 10 to 17, and other members of the family. Work done by outsiders was not included.

II. Determining the value of unpaid housework

1. Meal Preparation

In the Finnish study meal preparation included all the work involved in preparing food and eating meals: cooking, setting and clearing tables, and washing dishes. It was assumed that the value of all meals eaten at home is the same as those bought and eaten outside the home, and that the value of the work performed in cooking these meals is the same for food prepared at home or outside the home. A meal

TABLE II.3.1
TIME-USE DATA, FINLAND 1979
FAMILIES WITH CHILDREN
FAMILY HOUSEWORK - PER FAMILY MEMBER
(Hours per day)

Activity	*Wife*	*Husband*	*Children aged 10 to 17*	*Other family members*	*Total*
Cooking	2.0	0.3	0.1	0.1	2.5
Home laundering	1.2	0.1	0.1	0.1	1.5
Child care	1.6	0.6	0.1	0.1	2.4
Other family care	0.0	0.0	0.0	0.0	0.0
Handicraft wood and metal work	0.3	0.1	0.1	0.0	0.5
Maintenance work	0.3	0.6	0.1	0.1	1.1
Shopping	0.4	0.3	0.1	0.0	0.8
Other	0.2	0.1	0.1	0.0	0.4
Total	6.0	2.1	.7	.4	9.2

TABLE II.3.2
FINNISH HOUSEWORK STUDY, 1982
RESULTS OF ESTIMATES OF UNPAID WORK VALUE
(In %)

Activity	*Share of GDP*
Cooking	13.3
Home, laundry, and clothes care	6.9
Child care	6.4
Handicrafts, wood and metal work	2.9
Maintenance work	5.8
Shopping and errands	4.1
Other unpaid housework	2.3
Total unpaid housework	41.7

Note: Data based on 1979 time-use survey and 1982 prices.

was defined as the food eaten by one person at one time, i.e., breakfast, lunch, afternoon tea, dinner, evening snack, or packed meal.

The price of a meal bought outside the home includes the costs of raw materials and labour. Labour costs were assumed to be equal to the value of the corresponding work done in the home. The prices chosen were taken from the cafeterias operated by the State Catering Centre, because they include only the costs incurred in the provision of meals, and did not include the cost of maintaining facilities and equipment. The number of meals eaten at home were based on the data collected in the Finnish Housework Study.

The total value of the country's unpaid cooking work (CW) is then derived as:

$$CW = \sum_{i=1}^{n} N_i * LP$$

in which

i: represents the type of meal (breakfast, lunch, etc.);
N: the number of meals per year; and
LP: the labour cost price of one meal.

By dividing the figure by the average time used per household, it was possible to arrive at a computational hourly wage.

2. Child Care

The price of the service purchased on the market determines the value of unsalaried child care at home.

The valuation approach used was as follows:

- the hourly volume of annual child care for families with different number of children was computed.
- the hourly wage rate for a municipal child minder multiplied by the volume provided the value of a single family's annual unsalaried child care, per family size.
- the value of child care of each family group was multiplied by the actual number of families of that size in the population. This gave the actual aggregate cost of total child care per family size (market and non-market.)
- lastly all the groups were aggregated and the volume of market child care multiplied by the same wage rate was deducted from the calculation thus providing the aggregate value of non-market child care.

3. House Cleaning

House cleaning was defined as the unpaid regular and special house cleaning done by household members in their own homes. The cleaning work done in a children's day-care centre was chosen for comparison; because it was considered to correspond in large measure to home conditions.

Value of unpaid house cleaning was computed as:

$$K_i = A_p * r * L_8 - U_a$$

in which

A_p = total dwelling area of nation
L_8 = unit rate for cleaning day-care centres

r = portion of total cleaning cost
U_a = value of outside cleaning help.

The hourly rate for outside cleaning help was determined by the average labour costs for city cleaners.

The computational hourly wage for house cleaning was obtained by using the average time spent in cleaning with adjustments for special house cleaning (interview data).

4. Special Care

Special care includes the care (feeding, bathing, dressing, nursing, and accompanying outdoors) of the elderly, handicapped, or chronically ill persons (asthma, allergies), including those on special diets; and cleaning or laundry work. Wage rate of a municipal home helper was applied in the imputation of value to child care including benefits. This also include time actually spent plus 20% of the time spent in attendance (following the employment agreement for municipal helpers.)

The value of special care was computed as:

Time spent * wage rate

5. Laundry

Laundry includes the preliminary handling, actual washing and final handling of laundry. The amount of laundry accumulating in households and the price of washing it outside the home were estimated from information provided in the househork study. The prices for laundry services were obtained from the Finnish Association of Laundries and Dry

Cleaners. It was assumed that household cost was equal to commercial laundering.

The value of laundry activities was computed as:

$$LW = K * LP$$

in which

K: the annual amount of laundry for all households in kilograms
LP: the labour cost price for one kilogram of laundry.

6. Handicrafts

Handicrafts includes cloth making and other textile work; wood and metal work; and other handicrafts.

Product volume was obtained from the study. Wage costs were obtained from companies in the textile and furniture industries manufacturing similar products.

7. Fitzgerald/Wicks Study

One of the first attempts to compare the labour-value (input) approach and the direct (output) approach was conducted by Fitzgerald and Wicks and published in 1990. In their study, 480 residents of Missoula, Missouri were personally interviewed to reveal the output of, and hours devoted to, 57 different output items in eight household production categories, as shown in Table II.3.3.

In addition, a survey was conducted of local businesses to determine the average market price within each output category with the prices of intermediate goods netted out. Subsequently, the survey design allowed for a direct and relatively easy computation of the value added within each

TABLE II.3.3

MEAN ANNUAL VALUES OF HOUSEHOLD PRODUCTION FOR ADULT MEMBERS OF HOUSEHOLDS OF MISSOULA, MO ESTIMATED BY DIRECT-OUTPUT AND LABOUR-VALUE APPROACHES

(1985 U.S. Dollars)

Output Category	*Direct Output Approach*	*Labour Value Approach*
Interior cleaning	951	812
Exterior cleaning	228	108
Meal preparation	2,781	1,517
Clothing care	725	403
Repairs, maintenance, and home improvements	309	161
Child care	445	764
Home produced food	28	37
Miscellaneous	147	135
Total	5,614	3,937
PROPORTION OF TOTAL (In percentages)		
Interior cleaning	16.9	20.6
Exterior cleaning	4.1	2.7
Meal preparation	49.5	38.5
Clothing care	12.9	10.2
Repairs, maintenance, and home improvements	5.5	4.1
Child care	7.9	19.4
Home produced food	0.5	0.9
Miscellaneous	2.6	3.4
Total	100.0	100.0

production category as the netted average market price was multiplied by the unit outputs. Alternatively, the labour value method utilized average wage data in 24 different occupations. The results of the two approaches appear in Table II.3.3.

Aggregated, the direct output approach exceeds the labour value approach by 43 per cent and the difference between these approaches is statistically significant at the one per cent level. Overall, six out of the eight household production categories yielded higher results as measured by the direct output method; whereas child care and home produced food yielded lower results. As Table II.3.3 indicates, meal preparation represents the largest proportion of total household production, representing 49.5 per cent and 38.5 per cent followed by interior cleaning representing 16.9 per cent and 20.6 per cent as measured by the output and labour value approaches respectively.

To account for the difference between both approaches, Fitzgerald and Wicks suggest that the labour value approach may underestimate the output approach because the labour value approach typically characterizes an activity on the basis of its primary product and ignores any secondary products. Consequently, the output method provides a superiour estimate of household production since it inherently captures all activities, both primary and secondary.

Compromising the accuracy of the output method, Fitzgerald and Wicks believe that there is a difference in the qualities of household- and marketplace-produced goods. In order to test their hypothesis, a survey of 175 Missoula area residents was conducted to assess the quality of his or her household output compared with the quality of similarly

available items in the market.

As Table II.3.4 indicates, the survey respondents perceive household production to be worth 32 per cent more than the market equivalent. Only in the case of "do-it-yourself" projects produced by single-head families was household production viewed as having less worth (10 per cent less). Consequently, the above output estimates may be undervalued and thus represent the minimum household production values.

TABLE II.3.4
QUALITY OF HOUSEHOLD PRODUCTION COMPARED WITH QUALITY OF EQUIVALENT AVAILABLE IN MARKET AS ASSESSED BY HOUSEHOLDS, MISSOULA, MO.

	Average Percentage by which Household Production is Assessed by Households as Better (+) or Worse (-) than Market Equivalent		
Type of Output	*Married Couples*	*Single Heads*	*All Households*
Cleaning	+42	+21	+31
Child care	+66	+27	+54
Meal preparation	+56	+15	+37
Clothing care	+50	+28	+41
"Do-it-yourself" projects	+26	-10	+26
Totals	+46	+15	+32

Another finding of the survey, although unsurprising, is that women (wives and female household heads) have higher

overall household production than men (husbands and single male heads), as shown in Table II.3.5. The aggregated average wives' and single female heads' household production values are $9,694 and $6,572, respectively, compared to husbands and single male heads with household production values of $3,172 and $5,058. Males have higher household production values in exterior cleaning, repairs and maintenance, and home-produced food; however, these activities represent only a small fraction of total household output, as indicated by Table II.3.5.

TABLE II.3.5
MEAN ANNUAL VALUES OF HOUSEHOLD PRODUCTION FOR VARIOUS TYPES OF ADULT MEMBERS OF HOUSEHOLD MEASURED BY THE DIRECT OUTPUT APPROACH ADJUSTED TO REFLECT AVERAGE U.S. URBAN AREA LIVING COSTS
(in 1986 U.S. Dollars)

Output Category	*Husbands*	*Wives*	*Single Male Heads*	*Single Female Heads*	*All Adults*
Interior cleaning	386	1,729	773	1,351	983
Exterior cleaning	358	190	358	173	236
Meal preparation	1,236	5,100	2,591	3,258	2,875
Clothing care	184	1,419	622	827	750
Repairs, maintenance home improvements	569	174	465	172	320
Child care	250	914	0	544	460
Home produced food	52	15	59	3	29
Miscellaneous	137	153	190	244	152
Totals	3,172	9,694	5,058	6,572	5,805

TABLE II.3.5
MEAN ANNUAL VALUES OF HOUSEHOLD PRODUCTION...(Contd.)

Output Category	*Husbands*	*Wives*	*Single Male Heads*	*Single Female Heads*	*All Adults*
PROPORTION OF TOTALS (in per cent)					
Interior cleaning	12.2	17.8	15.3	20.6	16.9
Exterior cleaning	11.3	2.0	7.1	2.6	4.1
Meal preparation	39.0	52.6	51.2	49.6	49.5
Clothing care	5.8	14.6	12.3	12.6	12.9
Repairs, maintenance home improvements	17.9	1.8	9.2	2.6	5.5
Child care	7.9	9.4	0.0	8.3	7.9
Home-produced food	1.6	0.2	1.2	0.0	0.5
Miscellaneous	4.3	1.6	3.8	3.7	2.6
Totals	100.0	100.0	100.0	100.0	100.0

Also worth noting from the survey is that the average value of household production increases as the number of children increases and is highest for the mother, as shown in Table II.3.6. In addition, the age of adult members also has an impact on the average value of household production and is highest for wives between the ages of 26 to 39, as shown in Table II.3.7.

TABLE II.3.6
MEMBERS OF HOUSEHOLDS BY NUMBER OF CHILDREN
MEASURED BY THE OUTPUT APPROACH ADJUSTED TO REFLECT
AVERAGE U.S. URBAN AREA LIVING COSTS
(in U.S. Dollars)

	Number of Children in Household		
Type of Member	*0*	*1*	*2 or more*
Husband	2,754	2,983	3,425
Wife	6,044	9,732	12,464
Single Male Head	4,394	*	*
Single Female Head	4,849	8,634	*

* Sample size was ten or less.

TABLE II.3.7
HOUSEHOLDS BY AGE MEASURED BY THE DIRECT
OUTPUT APPROACH ADJUSTED TO REFLECT AVERAGE
U.S. URBAN AREA LIVING COSTS
(in 1985 U.S. Dollars)

	Member's Age			
Type of Member	*18-25*	*26-39*	*40-61*	*62 and older*
Husband	2,654	3,956	3,444	2,795
Wife	10,569	11,935	7,533	6,079
Single Male Head	*	5,331	5,436	*
Single Female Head	*	7,386	4,886	6,025

* Sample size was ten or less.

III. Measurement of Household Production Using Input-Output Table: Finland, 1992

More recently, Statistics Finland developed estimates of household production, based upon previous work conducted in Australia and Canada, that attempt to measure aggregate national household output via an input-output table that breaks household production into functional categories, for example, meal preparation and child care, that require the use of material, capital, and labour inputs. The household is viewed as a productive entity as it converts these three inputs into valueadded outputs, Table II.3.8. The idea behind the input-output table is that the sum of the inputs is equivalent to the value of the output.

Material inputs, which form the rows of the input-output table, are derived from the 1990 Household Expenditure Survey's consumption goods expenditure (foodstuffs, dwelling, fuel, light, power, etc.) and are allocated to the household production functional categories. Productive activities in the household are subject to the third-person criterion in which an activity is productive if it can be done by someone other than the person who gains its benefit. The activities form the columns of the input-output table, where expenditures are allocated according to the appropriateness and importance of the material input to each household activity. For example, expenditure on washing powder was allocated to cleaning and laundry. However, the allocation of inputs to functional categories becomes difficult when the expenditure must be divided among categories. For example, clothes are assumed to be necessary for all productive activities. To overcome this problem, the author suggests that the best way

to allocate the expenditure is in proportion to the time spent on each category of household activity, which can be obtained from the 1987-1988 Time Use Survey (assuming of course that the breakdown of time use in 1987-1988 is identical to that of 1990). Forms of consumption that do not contribute to household production activities are allocated to leisure activities. Within each functional category, the row entries are vertically summed to arrive at a total purchases entry that can be regarded as material inputs.

The second input, capital consumption, is derived from the 1990 National Account's consumption of fixed capital on durable goods (furniture, household appliances, vehicles, recreation equipment, etc.) according to the perpetual inventory model, where consumption is estimated by dividing the value of the purchased durables evenly over the period they are in use. The supply and costs of durable goods are allocated in proportion to consumption.

The third input, labour, is derived from the data in the 1987-1988 Time-Use Survey. The survey shows how many hours are allocated to each household functional category. The total hours in each category are multiplied by an hourly wage rate to derive total labour cost. The author uses the housekeeper replacement cost (hourly wage including social security contributions, holiday pay, and the consumption of capital) since it is assumed that the tasks performed by household members are broadly equivalent to those of a housekeeper and therefore can be assigned an appropriate value in terms of the wages that a housekeeper commands.

However, there are two problems associated with this method, known as the global substitute method. First, wages of housekeepers vary from one region to another. Second, not

TABLE II.3.8
INPUT-OUTPUT TABLE FOR HOUSEHOLD ACTIVITIES
FINLAND, 1990
(in millions of FIM per year)

	Inputs				
Activity	*Adult per Week (in millions)*	*Material Purchases*	*Capital Consump-tion*	*Value of Labour*	*Total Output*
Meal preparation	24	41,139	1,097	63,836	106,072
Cleaning and laundry	16	4,138	882	43,323	48,343
Repair and	9	2,397	218	22,676	25,291
Other housework	5	1,187	53	14,053	15,293
Child care	8	5,906	58	20,513	26,477
Shopping and errands	11	1,900	25	30,160	32,085
Gardening and pet care	6	1,399	726	15,277	17,402
Housework travels	9	6,923	3,580	22,622	33,125
Total	88	64,989	6,639	232,460	304,088
PROPORTION OF TOTALS (in per cent)					
Meal preparation	27.27	63.30	16.52	27.46	34.88
Cleaning and laundry	18.18	6.37	13.29	18.64	15.90
Repair and	10.23	3.69	3.28	9.75	8.32
Other housework	5.68	1.83	0.80	6.05	5.03
Child care	9.09	9.09	0.87	8.82	8.71
Shopping and errands	12.50	2.92	0.38	12.97	10.55
Gardening and pet care	6.82	2.15	10.94	6.57	5.72
Housework travels	10.23	10.65	53.92	9.73	10.89
Total	100.00	100.00	100.000	100.00	100.00

TABLE II.3.8
INPUT-OUTPUT TABLE FOR HOUSEHOLD ACTIVITIES

Activity	*Inputs*				
	Adult per Week (in millions)	*Material Purchases*	*Capital Consump-tion*	*Value of Labour*	*Total Output*
FACTOR DISTRIBUTION (in per cent)					
Meal preparation		38.78	1.03	60.18	100.00
Cleaning and laundry		8.56	1.82	89.62	100.00
Repair and		9.48	0.86	89.66	100.00
Other housework		7.76	0.35	91.89	100.00
Child care		22.31	0.22	77.47	100.00
Shopping and errands		5.92	0.08	94.00	100.00
Gardening and pet care		8.04	4.17	87.79	100.00
Housework travels		20.90	10.81	68.29	100.00
Total		21.37	2.18	76.44	100.00

all productive activities in the household are such that they would normally be performed by a housekeeper. Subsequently, the author suggests essentially two alternative methods: the specialist substitute method and the opportunity cost method. Obviously, each method will yield different output values.

Finally, there are two areas that can be further developed and explored from this input-output table. The first is the accounting of internal relations between various activities within the household, which is not done in this table. As the author suggests, the inclusion of internal relationships in the

intermediate consumption of households would increase the value of the total output of each activity and bring it closer to the market value. The second recommendation is that separate input-output tables be constructed for different kinds of households so that comparisons can be made between households with, for instance, different income levels and different degrees of participation in paid work.

Goldschmidt-Clermont

In a major departure from previous work Goldschmidt-Clermont (1983) applied a microanalytical approach using the price of market-produced goods and services similar to those produced at home in order to value household production. She argued, among other arguments against using wage valuation methods, that one might expect great differences in efficiency between market and household workers and thus, the use of a market wage may be inappropriate for valuing household time inputs. therefore, she deemed it more appropriate to take a product-oriented approach. To illustrate this approach, she provided a detailed analysis of the preparation of four litres of plain yogurt identifying the inputs of goods, equipment and time. Her conclusion was that the resulting product evaluated against a comparable market product which would have cost $11.36 in the market entailed an outlay of $2.41 for inputs and 18 minutes of production time. This amounted to an $8.95 savings in 18 minutes yielding an implicit hourly wage of $29.83 (Goldschmidt-Clermont, 1983).

Examining a variety of products, Goldschmidt-Clermont found the imputed hourly household wage ranged from a

negative $1.30 for a hand-knit cardigan to the $29.83 for the yogurt. She also argued that the implicit hourly wage tended to over or understate the value of time in home production depending on whether the product was inferior or superior to the market product. In general, the homemade product was deemed to be of higher quality thus suggesting a tendency for the imputed wage to be understated. As the author pointed out the report was based on a wide variety of very particularistic data which could be expected to raise reservations concerning the findings. Notwithstanding, she suggests some clearly defensible conclusions. First, she notes the wide range of observed implicit wages, ranging from negative to about $30.00 per hour. Second, she notes the effect of production circumstances, for example, the number of persons for whom food was prepared, on the results. Finally, she argues that differences in non-economic variables such as preferences may also affect value.

Chapter Four

OUTPUT ESTIMATES OF VALUE ADDED BY HOUSEHOLD PRODUCTION: CANADA AND FINLAND

This project, used two separate primary data files one with time use and one with family expenditure data for both Canada and Finland to derive estimates of household production output units and their related expenditures. Time-use data files reveal how individuals allocate their efforts throughout the day and provide basic data for estimating outputs. Expenditure files capture purchases made—consumption goods and intermediate inputs—at the household level. These files are briefly described below, including details on their population, sample size, stratification, and weighting structure. These data were supplemented, where necessary, by data from various secondary sources, as noted.

1. Time-Use Data

Time-use data is typically presented in terms of time allocations to various activities or in terms of rates of participation in activities. However, time-diaries used to collect sequential time allocation data provide a much richer source of information than that represented by simple durations and participation rates. More specifically, diaries make it possible to determine when and how often certain events occur. For example, they provide information on the amount of time spent eating, on how many meals people eat, and where and when they eat them.

This approach to the data has not been previously exploited in studies valuing household output. The data has gone unexploited for two main reasons. First, the valuation of household production has centered around the measurement of household labour inputs to household production. This approach draws heavily on duration data. Secondly, time use studies fall short of providing the detail necessary to accurately identify household outputs, a problem which exists in the data used for this study. This study shows that a small elaboration of data collected would greatly enhance the value of the use of time allocation studies for the measurement of inputs and outputs in household production. Shortcomings and recommendations for improved data collection in the future have been identified and will be elaborated below.

In Canada, the General Social Survey (GSS) time-use study was conducted from the third week of January to the third week of December 1992. The GSS contains diary data on 8,996 individuals representing the population of all ten Canadian provinces (excluding the Yukon and Northwest

territories) 15 years of age and older (Table II.4.1). Random Digit Dialing, a telephone sampling method, was used in the GSS. The data was collected by the interviewer over the phone from a randomly selected respondent in each household. The respondent was asked general questions relating to time perceptions; unpaid work within the household; educational, cultural, and recreational activities of the respondent; socio-economic background questions for the purpose of classification, etc. A time-use diary was completed for which the respondent indicated what he or she was doing, when the activity started and ended, the place of the activity, and who was with the respondent for a twenty-four hour period commencing at 4:00 a.m.

The Finnish Time-Use Survey (TUS) was conducted by Statistics Finland between April 1, 1987 and March 31, 1988. The population consisted of all persons over the age of ten. In total 7,758 people participated in the study, where each person kept a diary for two consecutive days—only 7,594 people actually kept diaries for both days (Table II.4.1). Diary entries were made for primary and secondary activities in ten-minute intervals. Background socio-economic information was also collected through a sub-sample of relevant companies.

2. Family Expenditure Data

The Canadian Family Expenditure Survey (FAMEX) was carried out by Statistics Canada in January, February, and March 1993 and refers to the calendar year 1992. The survey contains data on 9,492 private households throughout Canada's ten provinces (Table II.4.1). A multi-stage clustered

sample, derived from the Canadian Labour Force Survey (LFS) sampling frame, was used. The sampling methodology of the FAMEX is similar to that employed by the LFS.

The Canadian FAMEX data was collected by an interviewer who asked the respondent to recall the type and amount of household expenditure, where household expenditure is a pooled spending unit of the household members. In the case of larger purchases consisting of more expensive items, such as automobiles and other consumer durable goods, respondent recollection was relatively easy. However, purchases of smaller, less expensive items, such as groceries and health-care products, were more difficult for the respondent to recall; therefore compromising the survey's accuracy. To overcome this problem, the respondents provided weekly or monthly expenditure detail, which was then annualized. To aid recall respondents could refer to documentary evidence indicating the type and amount of the expenditure, usually from receipts, canceled checks, or contractual agreements.

The Household Expenditure Survey (HES) was carried out by Statistics Finland in a slightly different manner than the Canadian FAMEX survey. The HES data is derived from 8,258 households stratified geographically (Table II.4.1). The expenditure amounts and types were derived in different ways, depending on the category of the expenditure. Soft consumer goods expenditure were tallied by means of a two-week diary which was subsequently annualized. Semi-durable goods expenditure was derived by four-week recall, which was then annualized. Finally, for houses and cars, the interview relied on recall over the entire year.

TABLE II.4.1
CHARACTERISTICS OF TIME USE AND EXPENDITURE DATA

Data File	*Target Population*	*Sample Method*	*Sample Size*	*Respons Rate*	*Stratification*	*Weighting*
GSS-7 (Canada 1992)	All persons over 15 years of age (excluding Yukon and Northwest Territories)	Random digit dialing with random selection within each household	12,765	9,815 (77.0%) 8996 Diaries (70.5%)	Province, Census Metropolitan Area (CMA)	Non-response, multiple telephone, province, age, sex, day of week
TUS (Finland 1987-1988)	All Finns aged 10 to 64 years of age	Simple random sample	10,500	7,758 (73.9%) 7,594 Diaries	Region (metropolitan) sex, and age	Region, sex, and age

TABLE II.4.1. CHARACTERISTICS OF TIME USE AND EXPENDITURE DATA (Cont...)

Data File	*Target Population*	*Sample Method*	*Sample Size*	*Respons Rate*	*Stratification*	*Weighting*
FAMEX (Canada 1992)	All private households in Canada (excluding Northwest Territories, Yukon, institutional, and Indian reserves)	Multi-stage stratified cluster	12,862	9,492 (73.8%)	By province	Geography, household type, and non-response rate
HES (Finland 1990)	All Finnish households (except institutional)	Simple random sample	12,000	8,258 (68.8%)	Geographically	Sample based cell reweighting

3. File Linking

Since data adequate for the purposes of the present project did not exist in one data set data linkage was necessary. The project required combined information on both time and money expenditures for each household. There are a number of techniques which can be used to link files or data from separate files in order to carry out analyses not possible with the separate files. Such procedures are known as statistical matching. A common approach is to transfer means aggregated from one file A to another file B. Another approach is to use regression analysis to predict values for variables in one file thus estimating regression parameters which can be used in other files having comparable independent variables. This procedure, called regression imputation or model-based predicting was used in matching the Finnish family expenditure and time use data, in an earlier evaluation of Finnish household production (Djerf, 1993).

The segmentation approach used in this study, also a model-based procedure, examined the relationship between focus or dependent variables—meals eaten or child care—and independent variables, common to the data files such as age, household characteristics etc. The means for significantly different subgroups were calculated using CHAID/CART analysis, implemented by means of a statistical package, *Knowledge Seeker.* The approach facilitates segmentation of a data set by producing a classification tree which splits the dependent variable in sequential sub-groups until a predetermined level of groups has been reached. The data get sequentially split to maximize differences (variance) in the value of the dependent variable among the sub-groups.

Various aspects of the approach are treated by Morgan and Sonquist (1963); Kass (1975); Brieman et al. (1984); and Biggs, de Ville and Suen (1991). The variables and values best reflecting meaningful differences among subgroups and for which there was common data in both data sets were determined. Those variables and values which were found to best segment the dependent variable (e.g. meals per day, child care hours) were used to generate values of the dependent variable in the sending file—the time-use file—to be added to the recipient file—the family expenditure file. This approach made the best use of the information contained in the sending and receiving files limited, however, by the lowest common denominator between the files. Consequently, it is important for statistical bureaus during data collection, file construction and data release operations to ensure the compatibility of significant demographic variables across related data files. Figure II.4.1 shows a tree giving mean values for the number of meals per day. The segmenting variables, age group and labour force status of respondents and spouses provide optimally different means, as discussed below, which were integrated into the family expenditure file given knowledge of the number of weeks persons in the various age groups spent in the household during 1992.

I. Canadian Household Outputs

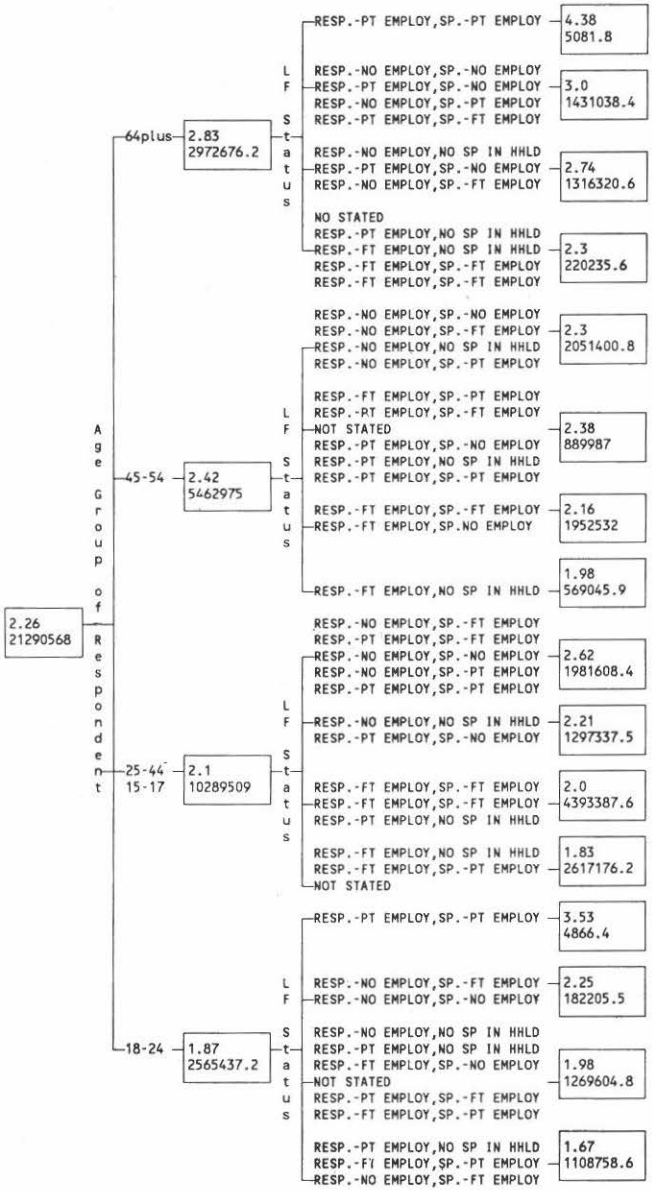
A. Satellite Activities and Output Valuation

1. Meal Preparation

The basic output of all food related activities is the number of meals eaten. Not all meals are eaten at home; not

Figure II.4.1

Figure II.4.1
SEGMENTATION ANALYSIS OF MEALS
AT HOME OR OTHER RESIDENCE



all meals eaten at home are prepared there; and not all meals prepared at home are eaten at home. Thus, the first task in valuing home production of meals is to determine the quantity of meals consumed that were produced at home. Table II.4.2 shows the distribution of adult meals by location and time of day. This information, which was derived directly from the 1992 time-use episode file, provides the necessary data on meals eaten at home per individual. Just over eighty per cent of all meals are eaten at home (Table II.4.2). Lunch is the main meal eaten away from home. Approximately 4 in 10 noon meals are eaten away from home. Unfortunately, given the existing data, it is not possible to identify the proportion of meals eaten away from home, particularly those eaten at school or work which were produced at home. Future time-use studies should gather information on the origin, home prepared or purchased, of food consumed. Additionally, data is needed to determine whether meals eaten at home were produced at home or were brought in or ordered from a carry-out food establishment. Meals for persons under age 15 were estimated in terms of meal behaviour of household residents for which data was available. The number of meals eaten at home per person per day/week were converted to meals per household and annualized. Significantly different means for relevant sub-populations were determined via the CHAID/CART approach using *Knowledge Seeker*, as discussed above. This estimation was done using the age group and household employment structure as shown in Figure II.4.1. There, it can be seen that persons aged 18-24 averaged only 1.87 meals at home—their home or someone else's home—per day, while persons over 64 averaged 2.83 meals. The key variable permitting the integration of the files was,

TABLE II.4.2
DAILY MEALS BY TIME AND LOCATION
POPULATION 15 YEARS AND OLDER
Canada, 1992

Location	*Time of Day*				*Total*
	4:00-10:00am	*10:00am-4:00pm*	*4:00pm-10:00pm*	*10:00pm-4:00am*	
Home	14,438,781	11,089,906	16,642,657	1,009,510	43,180,854
Work	139,778	3,915,405	421,734	23,131	4,500,048
School	76,668	661,684	45,748		784,100
Restaurant	662,045	2,690,084	1,575,113	151,087	5,078,329
Total	15,317,272	18,357,079	18,685,252	1,183,728	53,543,331
Home	94.3%	60.4%	89.1%	85.3%	80.6%
Work	0.9%	21.3%	2.3%	2.0%	8.4%
School	0.5%	3.6%	0.2%	0.0%	1.5%
Restaurant	4.3%	14.7%	8.4%	12.8%	9.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Home	33.4%	25.7%	38.5%	2.3%	100.0%
Work	3.1%	87.0%	9.4%	0.5%	100.0%
School	9.8%	84.4%	5.8%	0.0%	100.0%
Restaurant	13.0%	53.0%	31.0%	3.0%	100.0%
Total	28.6%	34.3%	34.9%	2.2%	100.0%

as discussed elsewhere, age of the respondents. The Family Expenditure File incorporated variables showing the number of weeks per year/persons of differing age groups were members in households. Basically, this variable provided a time-based link. Time-use data showed how many meals individuals of different age groups ate per day. This data was readily convertible into meals eaten per week. Thus, using relevant demographic variables, as elucidated by the analysis, and matching age groups in the two data sets it was possible to construct annual household meal outputs in terms of person weeks per year composition by the several household members.

In total, 21.4 billion meals are eaten at home in a year (Table II.4.3). Further refinement of this figure would require that take-out meals be separated out. Meals not prepared at home would make a smaller, but not necessarily insignificant, contribution to household output. The shopping component as well as cleanup would remain. On the other hand, meals eaten at work may well have been prepared at home and thus should be counted as part of home meals. However, such meals would not make the same contribution to household output as meals eaten at home since some of the associated costs would accrue away from home. Since these two forces operate in opposite directions they offset each other to an unknown extent. Their relative shares in meal consumption need to be identified. Given the number of meals, the average value (price) of a meal produced can be determined.

Several possible avenues were explored to determine the appropriate price of meals. The first meal price estimate was made by calculating the average number of restaurant meals

TABLE II.4.3
ESTIMATED MEALS PER HOUSEHOLD PER YEAR
Canada, 1992

	Number of Households	*Average Meals per Household per year*	*Adult's Meals*	*Children's Meals*	*Total Meals At Home per year*
Single	2,149,234	860	1,847,338,355	1,323,628	1,846,661,983
Couple Only	2,365,325	1,835	4,339,394,495	0	4,339,394,495
Couple with Kids	2,093,572	2,800	3,350,477,378	3,167,388,581	6,517,865,959
Lone parent family	449,701	1,842	342,364,572	602,986,546	945,351,118
Other	2,746,505	2,776	6,166,248,184	1,612,333,078	7,778,581,262
All Households	9,804,337	1,504	16,045,823,034	5,384,031,833	21,429,854,817

eaten per household and dividing this into the total restaurant expenditure as given in the family expenditure survey. This provided an estimated average price of $10.58 per meal. The second estimate was based on prices obtained from the prices division of Statistics Canada. Descriptions of relevant prices collected by Statistics Canada are included in Annex II.A. The unweighted average of the eight prices provided, was $13.88. These estimates are highly speculative since they are gross aggregates incorporating little knowledge of consumer meal purchases. The values seemed high. CREST Canada research has conducted surveys of Canadian food establishments (Schade, 1995) and their data provide information on the type and price (average person bill per eating occurrence) of purchases. The CREST data was used in two ways. First, prices obtained from the prices division of Statistics Canada were weighted by what were deemed to be the relevant market shares as identified in the CREST data. The re-weighted average of the Statistics Canada price including taxes was $6.65 per person meal. Secondly, CREST provided an average "person bill" of $5.57 averaged over all types of eating occurrences. The estimated CREST price was adopted as the most appropriate for valuing meal preparation at home. Many eating occurrences involve little more than coffee and a doughnut. Such occurrences weigh quite heavily in total eating occurrences. Weighting based on expenditure fails to adequately reflect the importance of quick service food occurrences.

—*Estimate A* (quantity times total price approach). Since the design of the CREST survey produces an average over all restaurant meals from coffee to fine dining, it appeared to

provide the best estimate of price (P). One value used to estimate the value of output of the meals was the average restaurant expenditure per meal of $5.57 taken from the CREST survey. The 21.4 billion meals consumed at home in Canada, at $5.57 per meal, gives a total output value of $119.4 billion as shown in Table II.4.4. The cost of purchased and non-purchased (self produced or gifts) inputs and capital consumption (RME) entering into the gross value needs to be subtracted in order to estimate VHW—the value added by the household. The value of the inputs, food purchased from stores, utility inputs and transport expendital, must also be subtracted from the gross value total to arrive at an unduplicated value of household production on an SNA basis. The national total for this is $48.2 billion (FAMEX, 1992). It was assumed that one and one-half rooms in a household are used for meal preparation and serving. Canadian homes have an average of six rooms (FAMEX); therefore, one quarter of the value of housing should also be deducted from VHW on meal preparation. The imputed net residential rent amounted to $20,552 million in 1992 (Statistics Canada, 13-201). UOD, assuming it equals one quarter of this value, is 5,130 million. Making these two adjustments, the value added for meals comes to $66.1 billion, Table II.4.4.

—*Estimate B* (quantity times net price approach). The price of $5.57 per meal included taxes. This price was adjusted for taxes using the before- and after-tax prices for meals obtained from the prices division of Statistics Canada. Calculations using that data indicated that the average before-tax price was 89 per cent of the final price. The use of this factor yields a before-tax price of $4.96 which translates into

TABLE II.4.4
OUTPUT DERIVATION OF VHW FOR MEAL PREPARATION BASED ON MARKET PRICE
Canada, 1992

Output	*Quantity (Q) '000*	*Price (P) Can $**	*Value of Output $'000*	*Purchased Inputs (RME) $'000*	*Use of Dwelling (UOD) $'000*	*VHW of Meals for Satellite $'000*
A. Meals (after tax)	21, 429,855	5.57	119,364,292	48,154,778	5,130,000	66,079,514
B. Meals (before tax)	21, 429,855	4.96	106,292,081	48,154,778	5,130,000	53,007,303

* 1US$ =1.36Can$ at the time the study was conducted.

a total household meal output of $106,292,081. Adjusting for purchased inputs (RME) and dwelling cost (UOD) leaves an estimated value of meals produced of $53,007,303 (Table II.4.4).

—*Estimate C* (expansion of inputs approach). An alternative approach to estimating the value of a meal is to use knowledge of the relationship between the cost of the purchased inputs and the value of the meals produced. Review of data from the *1993 Canadian Restaurant Industry Operations Report* (Peat, Marwick, Stevenson, & Kellog 1993) shows that the proportion of purchased inputs in Canadian restaurants varies from 29.5 per cent in a Quick Service Restaurant to 35.4 per cent in a Fine Dining Restaurant. This value, in conjunction with the household use of purchased and non-purchased (self-produced or gifts) inputs, provides an alternative approach for determining the value of home consumed meals.

Information on purchased and non-purchased inputs is available from the FAMEX survey. Given the total value of purchased inputs of $48.2 billion indicated above and assuming households matched the average value (32.7), suggests a gross value of food produced at home of $147.4 billion [(1/.327) * $48.2]. This yields an implicit price of $6.86 per meal (Table II.4.5). Subtracting the $48.2 billion of purchased and non-purchased inputs (RME) leaves a total value of $98.8 billion before allowance for other deductions. Deducting $5.1 billion for the use of the dwelling (UOD) leaves a VHW of meals of $93.8 billion.

In the foregoing the actual cost of purchased inputs was used. That amounted to approximately $48 billion.

TABLE II.4.5

OUTPUT DERIVATION OF VHW FOR MEAL PREPARATION BASED ON EXPANSION OF PURCHASED INPUTS

Canada, 1992

Output	*Quantity (Q) '000*	*Implicit Price (P) $*	*Value of Output $'000 RME*3.058*	*Purchased and non-purchased Inputs (RME) $'000*	*Use of Dwelling (UOD),$*	*VHW of Food Preparation for Satellite $'000*
Meals	21, 429,855	6.86	147,094,801	48,154,778	5,130,000	93,764,801

2. *Child Care*

Child care constitutes the main family caring activity. The output of child care, or any dependent individual, can be considered to be a child (dependent person) hour or child (dependent person) day. Thus, if an individual is directly responsible for three children for a 24-hour period, the output would be 72 child hours or three child days. While individual direct child care time may be much less, the individual is committed to caring for the children during all hours of direct responsibility. Bonke (1988) denotes such time as "stand-by care." Similarly, as one approach, the authors of the 1979 Finnish study adopted what they believed was the broadest possible concept of child care. "The volume of home care refers to the time when children are at home at the same time with and under the control of some older member of household (Suviranta and Heinonen, 1980)." However, they considered only children under seven years of age.

Prior to the measurement of child (dependent person) output major decisions must be made. First, for what ages of children should care be measured? Second, what time per day is to be included in child care time? Should only direct care be counted, or standby care as well? Third, what level of commitment or weight should be given to secondary or standby child care time? Direct child care poses little problem. However, secondary or standby child care, in which one is responsible for children while doing other things, may represent a different level of commitment which needs to be recognized. Does one consider time spent while the children are sleeping to bear the same weight as time spent when they are playing or studying?

In the Canadian study, child care was defined as direct

child care, such as feeding, clothing, etc., plus indirect or secondary child care, which is being responsible for a child. For this exercise the quantity of child care was determined using the time-use episode file. Child care was totalled for each individual in the episode file. Again, segmentation analysis using *Knowledge Seeker* was used with the time-use episode file to produce averages of child care time for individuals to merge into the family expenditure file. Age group of the household parents and the number of children in the family best segmented child care time. Averages were produced for the matrix of these two estimators. From the FAMEX file it was determined that 11.98 billion hours of household child care are provided at the national level.

With the time spent on child care estimated for the families in the expenditure file, an output based value had to be associated with this time. The cost of full-day care service was used as the value of child care time. These prices were obtained from a study by Child-care Resource and Research Institute (1994). The market price of $1.93 per child care hour was obtained by using a provincially weighted average of monthly prices, adjusted assuming 21 days per month and nine hour days. Since the child care time estimate does not differentiate between infant, preschool and school-age child care, a weighted average of the prices of these types of child care was used. The figures of 11.98 billion child care hours at $1.93 per hour, gives a value of home child care of $23.13 billion (Table II.4.6). Part of the market price of child care includes the cost of the building (UOD) in which the care takes place. Since the cost of one's home is already included in the System of National Accounts, this must be subtracted from the value of child care to arrive at net value added beyond what is included in the SNA figures.

A Cost, Quality and Outcome Study conducted in the United States provides some guidance on the portion of day care costs attributable to shelter (Helbum et al., 1995). It suggests that 6.22% of the cost of child care in the market place, comes from the occupancy cost of the building. Thus, the value of child care is 19.1 billion—i.e., $23.12 billion less purchased inputs (RME) of $2.7 billion and less the imputed shelter cost of $1.4 billion (Table II.4.6).

Care of others, which should also be captured, is not included. Currently, there are no good output measures for this element of household production. It is important that appropriate measures be developed. This is particularly true as health systems push patients out of the market health sector into the unpaid sector shifting the burden of care.

3. Housekeeping

Another major output provided by the household is shelter. A fairly wide range of activities are subsumed in this value including cleaning, general building and grounds maintenance, purchasing household supplies, some aspects of household planning and management. This component of household output is the most difficult to characterize operationally at the category and item level. At this stage in the development it is being defined in terms of nights of accommodation provided by the household. A similar approach was used by Chadeau and Fouquet (1986).

The number of potential person nights of accommodation was calculated in the family expenditure file which provides an accounting of the total weeks individuals spend in household unit. This number was then reduced by the number

TABLE II.4.6
OUTPUT DERIVATION OF VHW FOR FAMILY (CHILD) CARE
BASED ON MARKET PRICE
Canada, 1992

Output	*Child Care Hours Quantity (Q) '000*	*Hourly Price (P) $*	*Value of Output $'000*	*Purchased Inputs (RME) $'000*	*Use of Dwelling (UOD) $'000*	*VHW for Child Care $'000*
Child Care	11,983,623	1.93	23,128,392	2,607,954	1,438,586	19,081,852

of nights, on average, spent outside of the home. An analysis of the time-use episode file showed that 96.9% of nights are spent at home. Another 1.6% of nights are spent at other's homes. The total of this, 98.5%, was the amount used for person nights of accommodation, since a night spent at one's own home or another's home both have value that needs to be measured. Single persons in Canada averaged about one week a year away from home, spending 358 nights a year at home (Table II.4.7A).

TABLE II.4.7A
ESTIMATED PERSON/NIGHTS PER HOUSEHOLD PER YEAR
Canada, 1992

	Number of Households	*Average Nights per Household per year*	*Total Nights At Home per year*	*Total Nights at other's Home per year*
Single	2,149,234	358	769,425,772	12,704,657
Couple Only	2,365,325	713	1,686,476,725	27,846,881
Couple with Kids	2,093,572	1,375	2,878,661,500	47,532,078
Lone-parent family	449,701	942	423,618,342	6,994,730
Other	2,746,505	1,240	3,405,666,200	56,233,910
Total Households	9,804,337	935	9,163,848,539	151,312,256

The market price used for housekeeping is, therefore, based on the price of a motel room. The Canadian average price of motel room accommodations was $51.21 per night, for two person accommodations, or $25.61 per person. The

9.31 billion nights (total nights at home plus total nights at others' home) at $25.61 per night, has a value of $238.6 billion. Purchased inputs (RME) amounted to $16.4 billions (Table II.4.7B). Once again, the cost of the portion of the dwelling used must be subtracted from the above value.

TABLE II.4.7B
HOUSEKEEPING RELATED RME
Canada 1992

	Expenditure per household
Water, fuel, electricity	1,075
Cleaning and polishing preparations	62
Linen cleaning etc.	62
Disinfectants and deodorizers	27
Paper, plastic, and foil household supplies	187
Horticultural goods and services	154
Other household supplies	68
Transportation	40
Total per household	1,675
Total expenditure housing	16,422,266,639

The average home has 2.7 bedrooms, out of a total of six rooms (FAMEX). The adjustment for UOD is equal to 45 % of the imputed rental value which amounts to $10.3 billion. Thus, the value of household work (VHW) in the provision of housekeeping services is $211.9 billion, as shown in Table II.4.8.

4. Clothing Care (Laundry)

Laundry consists of both personal and household components. Clothing care or personal laundry fall outside services typically included in shelter or accommodation costs and must be estimated separately. However, the component of laundry related to shelter maintenance would be included in shelter costs and thus should be excluded when evaluating clothing care output. Kilograms of laundry were used as the measure of household output in the Finnish study, outlined above. Here, machine loads of washing have been used. Typically, one can be converted into the other. However, given the variety and nature of current fabrics, loads may not directly translate into kilograms, or vice versa.

Assuming the output measure to be loads of laundry, it is necessary to quantify the number of loads generated, or produced, in households and the extent to which they are produced at home or in the market. Laundry outputs were based on work in progress in the U.S. (Sanik, 1995). Based on the U.S. survey data on laundry activity, it was estimated for this study that single and couple households average 4 loads of laundry each week while other households average eight loads. This generated 3.1 billion loads of laundry per year.

TABLE II.4.8

OUTPUT DERIVATION OF VHW FOR HOUSEKEEPING BASED ON MARKET PRICE

Canada, 1992

Output	*Quantity (Q)* *'000*	*Price (P)* *$*	*Value of Output* *$'000*	*Purchased Inputs (RME)* *$'000*	*Use of Dwelling (UOD)* *$'000*	*VHW for Household Upkeep* *$'000*
Housekeeping	9,315,161	25.61	238,561,273	16,422,267	10,276,000	211,863,006.5

TABLE II.4.9
OUTPUT DERIVATION OF VHW FOR CLOTHING CARE BASED ON MARKET PRICE
Canada, 1992

Output	*Quantity (Q) '000*	*Units*	*Price (P) $*	*Value of Output $'000*	*Purchased Inputs (RME) $'000*	*Use of Dwelling (UOD), $ '000*	*VHW for Clothing Care*
Clothing Care	1,569,790	loads	$3.60	5,651,244	607,869	In housekeeping	5,043,375

However, part of the weekly laundry is subsumed in the housekeeping output and must be excluded to prevent double counting. The assumption made here is that half the laundry relates to household care and half relates to clothing care. Thus, clothing care is estimated as 1.6 billion loads per year (Table II.4.9). The price used is based on per load costs for use of commercial laundromats for which Statistics Canada collects price data. However, the Statistics Canada data do not reflect charges beyond the machine charges in laundromats. The price of $3.60 per load used here includes washing, drying and a service charge per load for laundry dropped off and processed by laundromat staff. Purchased inputs (RME)—detergents and bleach, and fabric softeners—were calculated from the household expenditure data. This amounted to 9.2 billion. The decision was made to leave UOD in the housekeeping figure and not calculate a separate UOD for clothing care.

5. Volunteerism

Measurement of voluntary or unpaid community oriented activity poses special problems to researchers and there was no current data on this activity for Canada. The problems are the two-fold problems facing any attempt to quantify unpaid activity, determining its extent and valuing it. Much work is needed to solve these problems. Some insight, however, into the value of volunteer activity is available for Canada (Ross, 1990). While the approach used, based on inputs, deviates from the attempts here to measure and value outputs it is useful to suggest the possible magnitude of this sector. Volunteer time estimates were derived from data

collected by means of a special volunteer activity survey. The time was valued using estimated average wages for the class of activities denoted 'community, business, and personal services' since it was deemed that this group best reflected the work of volunteers. Ross made initial calculations, an estimated annual contribution of $12.0 billion, for 1986/87, to correspond with the time data (Ross, 1990). He then projected that forward at the rate of inflation for an estimated $13.2 billion in 1990. That figure was further adjusted for the rate of inflation to derive a rough estimate, $14.7 billion, of volunteer activity for 1992. This provides only a very crude estimate of the value of volunteer work but it does provide insight into its relative dimension with respect to other unpaid work activity.

6. Personal Development

Previous valuation studies have ignored the educational component of non-market production. One reason for this is that time devoted to education has been viewed as a consumption good since it does not fit the 'third person criterion' for defining production. Another, more practical reason is that national accounts statisticians have so far avoided incorporating human capital into the accounting process. Since capturing the flow has implications for handling the stock of human capital, there has been a hesitancy to incorporate it.

As argued in the monograph *Measurement and valuation of unpaid contribution: Accounting through time and output* (INSTRAW, 1995), however, education represent personal and, hence, household investment which yields a return over time. While there is no separation of producer and receiver

there is separation between the time input to education and hence its production and the returns from it.

> While outlays on education are highly significant in economic terms, the outlay-based approach to the measurement of educational investment ignores... the lengthy gestation period between the application of educational inputs—mainly the services of teachers and **the time of their students** (emphasis added)—and the emergence of human capital embodied in the graduates of educational institutions... (Jorgenson and Fraumeni, 1991, p.22).

The authors go on to point out that comparisons between two sets of human capital estimates, one an outlay-based approach and the other their income-based approach showed the latter to be much greater than the former (Jorgenson and Fraumeni, 1992). Thus, the authors argue that "the appropriate value of education is given by its impact on the individual's lifetime income" (Jorgenson and Fraumeni, 1991, p.23).

Suggesting that the value of education can be either a cost-based approach, or an income approach lies close to the heart of the concerns which motivate the current work of INSTRAW. To assume that the value of an activity or output is equal to its cost, assumes, minimally, that the cost of all inputs have been accounted for. To consider the value of an education to consist only of the cash outlays made to obtain it greatly underestimates the value of those outlays.

A recent study of the costs and returns to education in Nova Scotia, Canada, showed the costs of an undergraduate university education to be carried roughly half by the individual student, 40 per cent by the government, and 10 per cent

by other sources (Harvey et al., 1995). Of the students contribution to costs, foregone income was a major component, 63 per cent for males and 48 per cent for females. The reduced importance of foregone income for females being attributable to their experienced lower market incomes. Individual rates of return were estimated at 5.25 per cent for males and 7.04 per cent for females (Harvey et al., 1995). The rates of return to society as a whole from an undergraduate education were 7.29 per cent for males and 13.28 per cent for females. These rates were calculated by setting what were considered the full costs of obtaining the degree against the estimated increased flow of income generated by the degree. Costs included both direct outlays by individuals and society and the individuals foregone income attributable to their student status. The study showed that *loss of foregone income is a significant productive input into the generation of human capital.* An increased income flow is the return.

For this study, also, lost income attributable to student status was taken as the cost 'price' of education. The income differential between students and non-students was calculated for the population aged 12-27 years. Income calculations were made for labour (wages and salary plus self-employment) income using the public-use sample data of individuals from the 1991 Canadian census. For women, the difference, for the census income year, between students and non-students ranged from $809.53 (aged 12-17 years) to $6,841.85 (aged 24-27 years). For men, the comparable range was from $1,362.44 to $11,904.07. The analysis here actually understates the full cost of time allocated to education since it was limited to full time students. A total of 1,251,765 women and 1,257,432 men were full time students. Further work needs

to be undertaken to expand estimates to include part time study as well.

The total cost of education in terms of lost income from paid work was $8.3 billion (Table II.4.10). The major share of that, $5.2 billion was attributable to men. The lost income from market work, however, only addresses part of the cost of obtaining and education.

TABLE II.4.10
NON-OUTLAY COSTS OF EDUCATION
Canadians aged 12-27, 1992

	Paid Work	*Unpaid Work*	*Total*
Females	3,160,589,321	10,500,349,200	13,660,938,521
Males	5,183,697,163	4,343,339,511	9,527,036,673
Total	8,344,286,483	14,843,688,711	23,187,975,194

Non-market work is also a productive activity and to the extent to which it is diminished as a result of student status, total productive activity is diminished. This realization is often as important a detriment to further education of student as is the need to get money income. Particularly in developing countries family alternatives may involve not a trade off between whether one works in the market or not but whether one works in the market or at home so someone else, say a parent can work to earn income.

The value of non-market production foregone for education can be determined using the time-use data to provide a measure of the time cost and using implicit labour returns

from the valuation of the household and caring components of non-market production to provide a value for that time. Male students registered 374 hours less unpaid work per year than their non-student counterparts while female students registered 935 hours per year less than their counterparts. Assuming the implicit value of the time lost in unpaid work per hour, and given the number of students indicated above, the value of foregone unpaid production by women was $10.5 billion and for men $4.3 billion.

Combining both paid and unpaid contributions to education the total cost is $23.2 billion per year.

B. Canadian Unpaid Work: an Overview

The components of household output valued here account for total household production in 1992 of over $411 billion dollars and for a total value added by household work of over $327 billion or 47.5 % of GDP (Table II.4.11). This estimate does not include care to other than children. Inclusion of this would expand the household's contribution to unpaid work. In comparison, Statistics Canada estimates the total value added by household work to be $234.5 billion in 1992 using the generalists replacement cost approach. The Statistics Canada does incorporate care of others. Thus, for Canada the estimates derived here using primarily the output approach yield a higher value added by unpaid work than does the generalists input approach used by Statistics Canada.

The shelter component, housekeeping, accounts for the largest share of total household output followed by meals.

Housekeeping makes about three and one-half times the contribution of meals. Purchased inputs (RME) and the contribution of dwelling (UOD) represent a major portion, about fifty per cent of total household output of meals. For the other components, however, RME and UOD are relatively minor components of each, ranging from ten to 20 per cent.

1. Data Strengths and Weaknesses

A major strength of the Canadian Family Expenditure file utilized in this study was that it provided a crucial link, weeks of household membership by age group, between the household expenditure data and the individual time use data. A major shortcoming was the fact that the age groups in the family expenditure data were not gender specific. Thus, only the total number of months that a specific age group contributed to the household "time budget" was known. It was not possible to distinguish months by women and by men. The age group variables, expressed in terms of weeks per year are ideal for integrating the time and expenditure data where time-use data is at the individual level. Attention should be given to the construction of gender-specific age groups. They should be sufficiently disaggregated to capture the significant time-use and expenditure patterns. Failure to distinguish the type of meal eaten was a major shortcoming of the time-use study data. The time-use data provided little clue, other than time of day and a limited number of eating situations, to the nature of the eating episode. Was an eating episode a complete meal? Was this episode one of eating an apple? Clearly these should be valued differently. Additionally, the time-use

TABLE II.4.11
OUTPUT DERIVATION OF VHW FOR UNPAID WORK BASED ON MARKET PRICE
Canada, 1992

Output	*Quantity '000*	*Units*	*Price $*	*Value of Output $'000*	*Purchased Inputs (RME) $'000*	*Use of Dwelling (UOD) $'000*	*VHW $'000*
Meal Preparation	21,429,855	meals	4.96	106,292,081	48,154,778	5,130,000	53,007,303
Housekeeping	9,315,161	nights	25.61	238,561,273	16,422,267	10,276,000	211,863,006
Clothing Care	1,569,790	loads	3.60	5,651,244	607,869	in housekeeping	5,043,375
Child Care	11,983,623	hours	1.93	23,128,392	2,607,954	1,438,586	19,081,852
Household Maintenance	-	-	-	373,632,989	67,792,868	16,844,586	288,995,535
Per cent of GDP				54.2%	9.8%	2.4%	41.9%
Input share				100.0%	18.1%	4.5%	77.3%
Volunteer Work				14,730,234	-	-	14,730,234
Education	-	-	-	23,187,975	-	-	23,187,975
Total				411,551,199	67,792,868	16,844,586	326,913,745
Input Shares				100.0%	16.5%	4.1%	79.4%
As % of GDP	-	-	-	59.7%	9.8%	2.4%	47.4%

data do not distinguish between a meal brought from home and eaten at work and a meal which is purchased at or near work. Such detail would greatly improve the accuracy of valuations based on meals as outputs.

Failure to distinguish for each episode individual recipients of child care time or time with children presented a real obstacle to getting a precise measure of demand for child care. Better detail on child care and adequate detail on other household members being cared for is necessary. It is also necessary to capture—by some survey instrument—details on household laundry. Very few questions on a related instrument would provide data which could be integrated with the time-use and family expenditure data to improve the laundry estimates. In particular, it would be useful to have separate volume estimates for clothing and for other household laundry.

II. Finnish Household Outputs

A. Satellite Activities and Output Valuation

1. Meal Preparation

Meals eaten at home were estimated, as they were for Canada, from the time use file. For Canada, the estimated meals were linked to the household expenditure file via the age of respondent variable since it was the age variable that was designed to provide information on the overall annual composition of the household in terms of person days. A different method was used by Statistics Finland to capture annual composition. The Finnish consumption file captures

annual household composition by aggregating the number of months each of the members spend in one or a combination of several occupational classes. Thus the total household composition for a year is the sum of months spent by its members as workers, students, disabled/ill, homemakers, pensioners, etc. Consequently, for Finland, total household meals were determined by using the occupational variable. Since all members of the household are broken down in various occupation categories, these final estimates include both children and adults. Analysis using *Knowledge Seeker* indicated that meal estimates were improved by also using level of education and household total annual consumption per consumption unit as independent variables. Thus, average number of meals by main occupation, were incorporated into the consumer expenditure file on level of education and household annual consumption per consumption unit.

Following integration of the meals eaten at home into the consumer expenditure file it was estimated that the Finns ate a total of approximately 3.9 billion meals at home and 1793 per household, per year, for an average of 2.14 meals per person, per day (Table II.4.12). The average price of a meal away from home was estimated, from the consumer expenditure survey data, to be 22.3 FIM. This price, approximately $7.16 Canadian is somewhat higher than the estimated Canadian price of approximately $5.00. The estimated value of meals consumed at home was $86.1 billion FIM. From the value of output it is necessary to deduct purchased inputs (RME) of 39.3 billion FIM (Table II.4.13) and estimate of the value of use of dwelling (UOD) of 11.2 billion FIM (Table II.4.12). This leaves a value of housework estimate for meals of 35.7 billion FIM.

TABLE II.4.12
OUTPUT DERIVATION OF VHW FOR MEAL PREPARATION BASED ON MARKET PRICE
Finland, 1990

Output	*Quantity (Q) '000*	*Price (P) FIM*	*Value of Output 000 FIM*	*Purchased Inputs (RME) '000 FIM*	*Use of Dwelling (UOD) '000 FIM*	*VHW of Meals for Satellite '000 FIM*
Meals	3,862,248,299	22.3	86,128,137.1	39,315,000.0	11,150,442.0	35,662,695.1

TABLE II.4.13
PURCHASED INPUTS (RME) - MEAL PREPARATION
Finland, 1990

	Purchased Inputs
Foodstuffs	32,527
Household articles	764
Household supplies and services	1,604
Fuel, light and power	2,601
Other services	178
Garments and footwear	944
Other goods	123
Other consumption and transfers	520
Transport services	280
Total inputs (RME)	39,261

The 'use of dwelling' figure above is a rough estimate of the value of all kitchens. It is 1/3.7th of the imputed value of owner occupied housing, assuming 1 of the average 3.7 rooms per household is dedicated to meal preparation.

2. Child Care

Child-care time consists of both direct and indirect care, and knowledge of both is needed to develop a proper valuation method. The Finnish time-use survey provided no opportunity to measure indirect child care. The 'with whom' variable in the Finnish data did not include information on being with children. The Finnish data includes a secondary

activity variable which does have a record of child care as a secondary activity; however, that measures direct child care as a second activity, not indirect child care. After attempts to develop child-care time estimates from the Finnish data it was concluded that another approach was required.

The approach applied was the one used in the Finnish Ministry study (Suviranta and Heinon, 1980) to calculate child care hours. It reflects only hours for children under 7 years. Total possible hours were calculated by multiplying the number of children under seven derived from the household consumption file by 365 days per year times 24 hours per day. In 1990 there were 430,672 children under the age of seven, up just slightly from the 427,000 recorded for 1978 in the Ministry Study. This generated a total of 3,773 million child care hours per year. This number was then adjusted for paid child care hours by subtracting 227.5 million hours given by dividing total child care expenditures from the family expenditure study by the average hourly price for child care of 6.08 FIM. The share of paid day care was up just slightly over the decade from 6.82 per cent of the total to 7.36 per cent. This left 3,545.2 million unpaid hours of which 1,414.8 million were between 10 pm and 7 am and 2,357.9 million were between 7 am and 10 pm. Assuming that all paid hours came out of the daytime hours there were 2,130.4 million unpaid daytime hours. The distinction between daytime and nighttime hours was drawn in keeping with the Ministry study approach which noted that hourly wages for child care during the night hours were one-half what they were during the daytime hours. This is an area where procedural agreement must be reached in order to ensure inter-temporal and international comparability.

TABLE II.4.14
OUTPUT DERIVATION OF VHW FOR CHILD CARE BASED ON MARKET PRICE
Finland, 1990

Output	*Quantity Child Care Hours '000*	*Price (FIM)*	*Value*	*Inputs*	*Use of Dwelling*	*Value Added*
Child Care	3,545,204.2	4.87	17,265,144.5	1,946,248.8	1,073,197.5	14,245,698.3

Child-care hours were valued at 6.08 FIM per hour, derived from the consumer-price data based on an average monthly child-care cost per child of 1,216 FIM and assuming 200 hours per month of care. This amount, $1.95, when converted into Canadian Dollars is virtually identical to the hourly cost of day care in Canada of $1.93. In the absence of better data on RME and UOD recourse was made to the Canadian estimates for estimating ratios. Thus, as in Canada, UOD was assumed to be 6.22 per cent of the price (value) of child care, based on the US Cost, Quality and Income Study (Helburn, et al., 1995). Canadian estimates suggested that purchased inputs amounted to 11.28 per cent of the total value of child care. Thus, 17,254 million FIM is the sum of daytime hours times 6.08 FIM plus nighttime hours times 3.04 FIM, on average 4.87 FIM per hour. These give a total value added of 14.2 billion FIM for child care (Table II.4.14).

3. Housekeeping

Derivation of the value of housekeeping for Finland was the same as for Canada. There was no problem deriving the number of nights accommodation provided by Finnish households based on time use data. An estimated 98.3 per cent of all nights were spent at home or at someone else's home. The value of night accommodations was obtained from a Statistics Finland survey of accommodations started in 1993. For the purposes of this study, the 1993 estimate of 147 FIM was adjusted to 1990 using the consumer price index. This provided an estimate of 135.8 FIM per person per night.

TABLE II.4.15
OUTPUT DERIVATION OF VHW FOR HOUSEKEEPING BASED ON MARKET PRICE
Finland, 1990

Output	*Quantity (Q)*	*Implicit Price (P) FIM*	*Value of Output '000 FIM*	*Purchased Inputs (RME) '000 FIM*	*Use of Dwelling (UOD) '000 FIM*	*VHW of Household Maintenance for Satellite '000 FIM*
Nights	1,774,586,794.6	135.8	241,024,379.2	13,970,361	28,159,944.6	198,894,073

Purchased inputs (RME) related to housekeeping were estimated to be 6,484.9 FIM per household per year for a total of 13,361,485 FIM, based on 1990 expenditure. The Finnish household expenditure data did not provide information on the number of bedrooms, thus, it was not possible to allocate UOD as was done for Canada. Hence, remaining unallocated UOD was allocated to housekeeping, yielding UOD of 28.2 billion FIM.

TABLE II.4.16
PURCHASED INPUTS (RME) HOUSEKEEPING
Finland 1990

	Expenditure Per Household
Water and waste water rates	357.32
Separate fuel, light and power	3,285.4
Free-time residence	396.94
Fuel, light and power for free-time	98.0
Household supplies and services	1,856.27
Transportation	491.0
Total household expenditure (RME)	6,484.9

4. Clothing Care (Laundry)

Estimates for clothing care were developed by drawing on the excellent earlier work in the *Housework Study* undertaken by the Ministry of Social Affairs and Health Research Department. As was the case in Canada, the Finnish time-use study contained no clues to clothing care output.

Time-use studies provide only an indication of the input time. Without, the necessary research and data on the productivity of such time it is not possible to convert it to outputs. However, work undertaken for the *Housework Study* in 1979 determined a figure, 143 kilograms for the average annual kilograms per person of laundry (Suviranta and Mynttinen, 1981). This value was used as the basis for estimating clothing care output here. Taking this figure, the population of approximately 4.9 million would generate in excess of 700 billion kilograms of laundry in 1990, which includes laundry relating to household care and that which relates to clothing care. Using the same assumption applied for Canada, it is estimated that half (353 kg.) of the total laundry relate to clothing care (Table II.4.17).

Unlike Canada, Finland lacks laundromats where individuals can do their own laundry, the source of a price for valuing Canadian laundry output. Thus, an alternative valuation approach was necessary. Again, this study drew on the *Housework Study*. The Finnish study derived the value of labour used for laundry using the average per-kilogram price obtained from the Finnish Association of Laundries and Dry Cleaners and the associated cost distribution (Suviranta and Mynttinen, 1981). Unfortunately, the survey used to provide that data is no longer collected. For this study, a check of major laundry firms indicated a price of 13.5 FIM per kilogram would be appropriate for use in valuing home laundry. That value was used. As with Canada, use of the dwelling (UOD) attributable to clothing care was assumed to be incorporated into the housekeeping component. Additionally, lacking a better allocator for purchased inputs related to clothing care, they were assumed to be the same proportion of total output, 10.74 per cent, as they were in Canada.

TABLE II.4.17
OUTPUT DERIVATION OF VHW FOR CLOTHING CARE BASED ON ESTIMATED MARKET PRICE
Finland, 1990

Output	*Kg. of Laundry per year*	*Price '000 (FIM)*	*Value '000*	*Inputs '000*	*Use of Dwelling*	*Value Added '000*
Clothing Care	353,283,071.4	13.5	4,769,321.9	512,702.1	-	**4,256,620.0**

TABLE II.4.18
OUTPUT DERIVATION OF VHW FOR UNPAID WORK BASED ON MARKET PRICE
Finland, 1990

Output	*Quantity (Q) '000*	*Unit*	*Price (P) FIM*	*Value of Output 000 FIM*	*Purchased Inputs (RME) '000 FIM*	*Use of Dwelling (UOD)*	*VHW of Meals 000 FIM*
Meal Preparation	3,862.248.3	meals	22.30	86,128,137.1	39,261,000.0	11,150,442.0	35,716,695.1
Housekeeping	1,774,586.8	nights	135.82	241,024,379.2	13,970,361.4	28,159,944.6	198,894,073.2
Child Care	3,545,204.2	child hours	4.87	17,265,144.5	1,946,248.8	1,073,197.4	14,245,698.3
Clothing Care	353,283.1	kilograms	13.50	4,769,321.9	512,702.1	-	4,256,620.0
Total VHW	-	-	-	349,186,982.7	55,690,312.3	40,383,584.0	253,113,086.6
Per cent of GDP				67.7	10.8	7.8	49.1
Input Share (%)	-	-	-	100.0	15.9	11.6	72.5

B. Finnish Unpaid Work: an Overview

The total estimated value of household production (VHW) in 1990 was $253.1 billion FIM amounting to 49.1 per cent of the 1990 GDP (Table II.4.18). However, this estimate represents a lower boundary for estimated household production since it does not include production related to education or to volunteer work.

Comparison of estimates

For Finland there exist two other sets of estimates of the value of household production. The first set is contained in the very detailed *Housework Study* undertaken by the Research Department of the Ministry of Social Affairs and Health around 1980. The second set, prepared at Statistics Finland, is for the period, 1990, covered by this study draws on major survey data regularly collected by the Statistical Bureau. Both are excellent pieces. The work presented here, essentially draws on the same data as that used in the recent Statistics Finland study and develops estimates for the same year.

This study and that of Statistics Finland take two different approaches. The focus of attention in this study is household output as determined by quantity and price. The focus of the Statistics Finland study was on the value of output derived as the summation of the value of the inputs. The latter approach makes sense if one can assume, as does neo-classical production theory, that in the long run in a perfect market, price will equal the average cost of production. However, it is highly possible that such conditions do not hold for households. Due to structural rigidities, however, such conditions

may well not hold; households do not cease to exist because they are inefficient producers. Only if it is possible to derive independent values for the inputs and outputs of household production, will it be possible to evaluate the functioning of households as economic production units and appropriately measure their output in a manner consistent with the SNA.

The recent Statistics Finland estimate, using the generalists replacement approach of 232 billion FIM, equaling 45.1 per cent of national GDP, was lower than the estimate here. Comparison of the Statistics Finland input-output approach and the output approach used here suggests some very fundamental differences in the estimates.

According to the output estimates developed here the value of household work for meals is 86.1 billion FIM which is 6.9 per cent of the 1990 GDP of 515 billion FIM. In comparison, the earlier Ministry study found that cooking plus related shopping amounted to 15.6 per cent of total GDP of 186.8 billion FIM in 1980. It contrasts even more with the approximately 117.7 billion dollars for meal preparation (106.0 billion FIM) and shopping (11.7 billion FIM) derived in the Statistics Finland study which are estimated to account for 22.9 per cent of GDP. For Canada, meals were about 7.7 per cent of GDP compared with 6.9 for Finland. Interestingly, these shares, both derived by the output approach, are similar. Their divergence from input-based estimates raise interesting questions: Are there problems with the estimates? Or, do the output estimates, in comparison with input estimates, reveal that home-meal production is significantly inefficient relative to the market?

The approach to child care taken here was to use the price for one hour of care for an individual child in a day-

care setting. The input-output approach used a value per hour for the child care giver. The present and input-output approaches yielded estimates of 14.2 billion FIM and 20.5 billion FIM respectively. Thus the estimate here is just a little over two-thirds that of the one by Statistics Finland. Since the approach used here was limited to care of children under 7 years, it is reasonable to assume that a major part of the difference is attributable to the more inclusive definition used by Statistics Finland, however, they used time spent caring, not children cared for, as their measure.

The estimaton approach chosen here limited child care giving to children under age seven. All else equal this would be expected to yield a lower figure since the estimate is based on many fewer children. However, all else was not equal. The Finnish input-output study based its valuation on only direct child care time. This approach to quantifying child care is highly questionable. Frederick showed for Canada that child care time measured by parental contact, a specific child care diary and a direct question were each about four times as great as direct child care time measured on the time diary (Frederick, 1994). Further work is needed to develop a measure of the extent of care-giving required for children seven and over. Additionally, it is likely that one would want to assign a different price for care-giving for older children. Additionally, the child care hour and its price is a very different value from the housekeeper hour and its wage rate.

The estimate here of 86.1 billion for meal preparation (which includes shopping and other meal related components) contrasts sharply with the approximately 117.7 billion dollars for meal preparation—(106.0 billion FIM) and estimated (here for comparison) meal related shopping (11.7 billion

FIM)—derived in the Statistics Finland study. Again, the output approach yielded an estimate approximately two-thirds of that given by the input-output approach. Using the Statistics Finland values the implied average price of a meal is 28.9 FIM in contrast to the 22.3 FIM used here, a difference in price of about 30 per cent.

III. Comparison of Finnish and Canadian Estimates

In constructing the estimates, research decisions between the two countries were essentially made independently as necessary, although the distribution of the components of household activity is very similar between the two. The housekeeping component of household activity accounts for about three quarters of the total value of household output while meals account for 18.3 and 14.1 per cent of the total value of household output in Canada and Finland respectively (Table II.4.19). In Canada, the value of household work (VHW) is about 42 per cent of GDP, while VHW for Finland is 40 per cent of GDP, excluding volunteerism and education.

Comparisons with other Canadian and Finnish estimates are also enlightening. Technically, it is to be expected that estimates derived by means of the output approach would, all else equal, be higher than estimates based on a generalists replacement basis. The output approach encompasses value added through the contribution of household capital services and profit and is thus larger by definition. Failure of the output approach to truly reflect reality must rest with one or a combination of two factors, either the quantity of output is

TABLE II.4.19
COMPARISON OF FINNISH AND CANADIAN ESTIMATES

	Value of Output	Share of GDP (%)	Value of Household Work	Share of GDP (%)	Share of Hhold. Maintenance (%)
Canada $'000					
Meal Preparation	106,292,080.8	15.4	53,007,302.8	7.7	18.3
Housekeeping	238,561,273.0	34.6	211,863,006.0	30.7	73.3
Child Care	23,128,392.4	3.4	19,081,852.4	2.8	6.6
Clothing Care	5,651,244.2	0.8	5,043,375.2	0.7	1.8
Total Household Maintenance	373,632,990.4	54.1	288,995,536.4	42.0	100.0
Volunteer Work	14,730,234.0	2.1	14,730,234.0	2.1	
Education	23,187,975.0	3.4	23,187,975.0	3.4	
Total	**411,551,199.4**	**59.7**	**326,913,745.4**	**47.5**	
GDP	689,652,941.2	100.0	689,652,941.2	100.0	
Finland '000 FIM					
Meal Preparation	86,128,137.1	16.7	35,716,695.1	6.9	14.1
Housekeeping	241,024,379.2	46.8	198,894,073.2	38.6	78.6
Child Care	17,265,144.5	3.3	14,245,698.3	2.8	5.6
Clothing Care	4,769,321.9	0.9	4,256,620.0	0.8	1.7
Total Household Maintenance	349,186,982.7	67.7	253,113,086.6	49.1	100.0
Volunteer Work	n/a		n/a		
Education	n/a		n/a		
Total	**349,186,982.7**	**67.7**	**253,113,086.6**	**49.1**	
GDP	515,430,000.0	100.0	515,430,000.0	100.0	

inaccurate or the assigned price is inaccurate. On, the other hand if the generalists replacement approach is inaccurate, the explanation must lie with the estimated input quantity or the value assigned to that quantity.

IV. A Gender Perspective on Production

One characteristic of output measures is that output is gender neutral. One might determine who is consuming the output but there is no direct link between output and individuals generating the output. To determine the relative roles of women and men in the generation of output one needs to turn to data on the inputs to the household production process. Time-use study data provides the best means of doing this. A comparative set of gender division of time allocation to unpaid work for Canada and Finland is shown in Table II.4.20.

The cross activity patterns are very similar. However, there is a tendency for women to carry a heavier share of the load in Finland than in Canada in all activities except inside house cleaning. The division presented here assumes equal productivity for women and men in each activity. One of the avenues for future research is the relative productivity levels of men and women on the various household tasks.

Work below presents a parallel examination of household production in Canada and Finland. Gender division of the value of household work (VHW) for each activity group was computed by applying the gender division of time allocation provided in Table II.4.20.

There are clear gender differences in the distribution of paid and unpaid work. However, there are no official series

TABLE II.4.20
GENDER DIVISION OF TIME ALLOCATION TO UNPAID WORK
Finland 1987/88, Canada 1992

	Canada		*Finland*	
	Annual hours year	*Gender Share*	*Annual hours year*	*Gender Share*
A. HOUSEHOLD MAINTENANCE				
Meal Preparation				
For Entire Population	7,152,710,009	100.0	1,274,313,260	100.0
FEMALE	5,325,264,733	74.5	1,022,536,288	80.2
MALE	1,827,445,276	25.5	251,776,972	19.8
Inside household cleaning				
Total Population	5,520,990,160	100.0	850,951,755	100.0
FEMALE	3,772,830,503	68.3	540,690,588	63.5
MALE	1,748,159,657	31.7	310,261,168	36.5
Outside household Cleaning				
Total Population	2,788,189,333	100.0	517,004,722	100.0
FEMALE	835,943,721	30.0	182,223,181	35.2
MALE	1,952,245,611	70.0	334,781,275	64.8
Shopping				
For Entire Population	5,848,777,665	100.0	624,000,000	100.0
FEMALE	3,487,180,296	59.6	364,000,000	58.3
MALE	2,361,597,369	40.4	260,000,000	41.7
Combined cleaning and shopping	14,157,957,158	100.0	1,991,956,477	100.0
FEMALE	8,095,954,520	57.2	1,086,913,769	54.6
MALE	6,062,002,637	42.8	905,042,443	45.4
B. CLOTHING CARE				
For Entire Population	1,382,292,283	100.0	282,354,101	100.0
FEMALE	1,267,857,519	91.7	260,746,234	92.3
MALE	114,434,764	8.3	21,607,867	7.7

TABLE II.4.20 - GENDER DIVISION OF TIME ALLOCATION... (Contd.)

	Canada		*Finland*	
	Annual hours year	*Gender Share*	*Annual hours year*	*Gender Share*
C. CARING				
Child care				
For Entire Population	3,328,772,513	100.0	478,348,698	100.0
FEMALE	2,393,536,466	71.9	351,848,406	73.6
MALE	935,236,047	28.1	126,500,293	26.4
D. VOLUNTEERISM				
Volunteer(1986-1987)	1,017,548,000	100.0	n/a	
FEMALE	554,988,000	54.5	n/a	
MALE	462,560,000	45.5	n/a	
E. PERSONAL DEVELOPMENT				
Education	344,672,134	100.0	n/a	
FEMALE	170,485,880	49.5	n/a	
MALE	174,185,374	50.5	n/a	

which provide data on GDP by gender. These, however, can be explored through attribution of GDP to gender based on contributions to its production. Market GDP was distributed between males and females based on their relative time inputs to the market weighted by their wage bills. This approach, while conventional and essentially necessary, is gravely flawed. The flaw lies in the statement 'weighted by wages' Since women's wages are typically significantly lower than men's for the same work using gender-based wages distorts contributions in favour of men. Consequently, shares attributed to men here must be considered the upper boundary of

their contribution. Using labour input weighted by wages males account for 63 per cent of Canadian GDP and 59 per cent of Finnish GDP (Table II.4.21).

The gender division of unpaid production runs exactly counter to that paid production in Canada and in Finland. While in Canada males account for 63 of market GDP, females account for 61 per cent of unpaid production (see Table II.4.21). In Finland, while males account for 59 per cent of market GDP, females account for 59 per cent on unpaid production. Total production, then, is much more equitably spread. In Canada, males account for 55 per cent of total production and females account for 45 per cent (see Table II.4.21). In the case of unpaid production, the time contributions are not gender weighted by wage bills. If such a weighting were imposed, it would have the same effect as in the case of market production: it would inflate the contribution of men. However, unlike the market case there is no clearly justifiable set of wage data to use in the weighting process. Indeed, one of the chief issues in input-based valuation methods is choice of the appropriate wage rates to use.

Taken together, in Canada, females account for 45 per cent of total (paid and unpaid) production, while in Finland, women account for 47 per cent.

TABLE II.4.21
GENDER DIVISION OF UNPAID WORK TIME
Canada (1992) and Finland (1990)

	Canada[1]			Finland[2]		
	Female '000	Male '000	Total '000	Female '000	Male '000	Total '000
Regular GDP	253,792,282.4	435,860,658.8	689,652,941.2	211,326,300.0	304,103,700.0	515,430,000.0
Gender Shares (%)	36.8	63.2	100.0	41.0	59.0	100.0
Meal Preparation	39,490,440.6	13,516,862.2	53,007,302.8	28,644,789.5	7,071,905.6	35,716,695.1
Housekeeping	116,524,653.3	95,338,352.7	211,863,006.0	108,596,164.0	90,297,909.2	198,894,073.2
Clothing Care	4,624,775.1	418,600.1	5,043,375.2	3,928,860.3	327,759.7	4,256,620.0
Household Maintenance	160,639,868.9	109,273,815.1	269,913,684.0	141,169,813.7	97,697,574.6	238,867,388.3
Gender Shares (%)	59.5	40.5	100.0	59.1	40.9	100.0
Child Care	13,719,851.9	5,362,000.5	19,081,852.4	10,484,833.9	3,760,864.4	14,245,698.3
Volunteer Work	8,027,977.5	6,702,256.5	14,730,234.0	-	-	-
Personal Development	11,478,047.6	11,709,927.4	23,187,975.0	-	-	-
Total Satellite Accounts	193,865,746.6	133,047,999.8	326,913,745.4	151,654,647.6	101,458,439.0	253,113,086.6
Gender Shares (%)	59.3	40.7	100.0	59.9	40.1	100.0
Total GDP + Satellite	447,658,028.9	568,908,685.7	1,016,566,686.6	362,980,947.6	405,562,139.0	768,543,086.6
Gender Shares (%)	44.0	56.0	100.0	47.2	52.8	100.0

[1] GDP in Canadian Dollars. 1992 estimates from Statistics Canada. National Income and Expenditure Accounts: Annual Estimates. No. 13201, Ottawa, Canada, 1994.

[2] GDP in FIM. 1990 estimates based on the study of Marjut Vihavainen (1995) *Calculating the value of household production in Finland in 1990: The input-output table*.

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ANNEX
PART II

Annex
PRICE DEFINITIONS

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
Breakfast Meal-1	Egg(s) and Meat (ham, bacon, or sausage), toast and coffee.		1 EA	CH	If representatives added extras, such as jam, are to be included in the price of the meal; the description of meals, including quantities, should be detailed on the pricing form and checked at each pricing. Prices are to be obtained from cafeteria, coffee shops or luncheon outlet (casual sit-down restaurant).
Breakfast Meal-3	Plain pancakes or French Toast, with syrup and coffee	As above			
Luncheon Meal-1	The most representative hot sandwich plate. If typical, the meal can include soup, vegetables, small salad or coleslaw, bread and butter. Include a beverage of either tea, coffee or milk.		1 EA	CH	Description of meals, including quantities, should be detailed on the pricing form and checked at each pricing. Prices are to be obtained from cafeteria, coffee chops or luncheon type outlet (casual sit-down restaurant).

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
Luncheon Meal-2	The most representative fish platter. Include same items as in Luncheon Meal-1.	As above			
Luncheon Meal-3	Other plate selections such as roast turkey, pasta, shepherd's pie, etc. Include same items as in Luncheon Meal-1	As above			
Dinner Meal-1	Full-course evening meal with beef entree. Include the most popular soup or juice, bread, vegetable and/or salad, dessert, tea or coffee.		1 EA	CH	Total price of meal to be shown on pricing form with breakdown for separately priced items if applicable. A complete description of the meal, including quantities if available, should be detailed on the pricing form and checked at each pricing. Select representative outlet for evening meals (i.e., steak house or dining lounge).
Dinner Meal-2	Full-course evening meal with chicken, veal or pork entree.	As above			

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
Dinner Meal-3	Full-course evening meal with seafood entree (fish or shellfish)	As above			
Snacks	Snack food such as hamburger and fries with a soft drink. Extra such as onion rings, coleslaw, etc. should not be priced unless part of a combination.		1 EA	CH	Price the most representative snack and size/type of soft drink in each outlet and price on a continuous basis. Description of snack, size of portions and type and size of soft drink are to be indicated on the pricing form and checked at each pricing. If the size of the soft drink is not available in OL or ML, indicate small, medium or large prices should be obtained primarily in chain type of outlets.
Take Home Fried Chicken	One order picked up (not eaten on premises). Nominally priced order of up to 3 pieces of chicken, deep fried in batter. Order may include fries or baked potato,		1 UT	CH	A complete description of the meal, including quantities should be detailed on the pricing form and checked at each pricing. If more representative in an outlet, BBQ chicken or chicken nuggets (approx 6) may be priced consistently.

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
	coleslaw, roll of bread and should include condiments, serviettes, etc.				
Take Home Chinese Food	One order of Chinese food, packaged in 16 to 20 OL container, picked up. Choose the most representative of fried rice, beef, or chicken, chop suey, beef or pork; sweet and sour chicken balls or spare ribs.		16 OL	ML	Description and size of container (the volume and not the mass) should be entered on pricing schedule and checked at each price. Do not price meals including soup, beverage, etc. or orders on a delivered basis.
Take Home Pizza	Pizza, combination, picked up, 10 to 14 inches in diameter. Most representative combo of 3 toppings (usually pepperoni, mushroom, and green peppers).		1 EA	CH	Type and size selected to be priced on a continuous basis. The size and toppings are to be entered on the pricing form and checked at each pricing. If more representative, the Hawaiian pizza may be priced on a continuous basis.

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
Hotel Accommodation	The non-business rate for one hotel room for one night (a Mon, tues, Wed, or Thurs) for 2 adults. A hotel room is a room located in a main building and can be accessed only from the interior. Rooms accessible directly from both the exterior and interior are acceptable as a hotel room.	Not applicable			The rate reported should include all taxes except PST. Tax values and the effective date of the tax/tax change are to be indicated in the comments section of the pricing form. Select the most representative rate for non-business travelers. Indicate on the pricing form total number of units in the establishment, the number of rooms to which the rate quoted is applicable, the number and type of bed for the room selected and any extras(breakfast, newspaper, pay TV) which are included in the selected rate. If the rate applies to more than one type of room, choose the most representative type.
Motel Accommodation	The non-business rate for one motel room for one night (a Mon, Tues, Wed, or Thurs) for two adults. A motel room is a room which is accessible only from the exterior.	As above			

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
	Hotel rooms as described above are not included.				
Day Care Centres	Day care rates (most representative, daily, weekly, or monthly) in a licensed or provincialiy approved (centre or private home) which provides care for a four year old child outside his/her own home, for 8 to 10 hours per day, between 7:00-10:00 hours.	Not applicable			Rates must include at least lunch and one snack. The rates must exclude all subsidies given to the parents. Do not price centres which operate on hourly rates
Baby-Sitting	Total cost for five hours of baby sitting by a teenage babysitter (8 pm to 1 pm) on a week-day evening (excluding official holidays). Report transportation charge if any.	Not applicable			Data should be obtained from Regional Office personnel, neighbors or relative paying for the service. Different parts of the city should be represented.

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
Home Cleaning	The rate as per frequency of cleaning for a typical house within the city limits.	Not applicable			The description of the typical house is to be entered on the pricing form: square footage, number of rooms, levels in the house, number of bathrooms, flooring type, etc. The typical frequency of cleaning, the number of cleaners in team, the number of hours the team is in the house, if the client must sign a contract, the method in calculating the discount must be included on the pricing form.
Dry Cleaning Men's	Regular Cash and Carry or Pick up and Delivery dry cleaning and pressing service.		1 EA	CH	Do not price same day or 24-hour service if extra charge is made. Indicate price for the most popular service. Exclude insurance charge, if any.
Dry Cleaning Women's	As per above	As above			
Coin operated laundry	Self-service coin operated laundry.		12 LB	KG	Enter price for washing and size of the load. Where an establishment has more than one type or size of

ANNEX - PRICE DEFINITIONS (Contd.)

Activity	Description	Standard quantity	Unit of Measure	Alternate U of M	Special Instruction
					machine, record data for the most popular machine. Change of size load and other pertinent details should be recorded on the CFCF form.
Coin Operated Laundry	As per above		10 MT		Enter price for drying and amount of drying time. Where an establishment has more than one type or size of machine, record data for the most popular machine. Change of drying time and other pertinent details should be recorded on the CFCF form.
Beer Consumption	One 12 fluid ounce bottle (341 ml.) Most representative domestic brand of bottled ale or lager served with a glass at a bar or table at about 17:00 hrs.		12 OL	ML	If Happy Hour prices are in effect at about 17:00 hrs, they are acceptable. Indicate Happy Hour in the Comments section of the pricing form and the time. Do not price imported brands or alcoholic content over 5.5%.

Source: Statistics Canada

CONCLUSIONS AND OBSERVATIONS

The comparative values derived for Nepal, Canada and Finland illustrate different cases (generally defined by the type of data available) in which the INSTRAW recommended framework for establishing "satellite accounts" on unpaid household production and the output-based valuation method can be applied. In each scenario, certain data limitations were encountered, and in the cases of Nepal and Finland, these prevented the study from deriving imputed values for all the activities and products that theoretically fall within the boundary set for the proposed "satellite accounts".

Time allocated to personal development (studying, apprenticeships and related activities) and voluntary work cannot be determined from the time-use database available in Nepal and Finland. Hence, the estimated value of unpaid production represents only those products related to household maintenance activities for these countries. In Nepal, the application of output-based valuation was limited to meal preparation on which more detailed information on products/outputs and relevant normative values could be derived. A

replacement cost approach had to be adopted in valuing the other "satellite accounts" activities.

Notwithstanding these limitations which consequently underestimate the total worth of unpaid household production, the values derived indicate a pattern of interdependence between the market (paid) and household (unpaid) production. In Canada and Finland, the value of unpaid production equals nearly half that of paid production, while in Nepal, the value more than equalled that of GDP (Table C.1). For Canada, unpaid production, by the most inclusive definition, equalled 47.4 per cent of GDP in 1992 while in Finland, by a less inclusive definition (volunteerism and personal development were not included), unpaid production was 49 per cent of GDP in 1990. Not including volunteer work and personal development, unpaid production in Nepal equalled 126.04 per cent of GDP.

The levels of unpaid output derived in this report, for Canada and Finland, fall well in line with other unpaid work estimates for the same populations and time periods. No similar comparisons could be made, however, for the results derived for Nepal, as this study was the first one that attempted to value unpaid production in the country at a wider scale.

TABLE C.1

UNPAID WORK AS PERCENTAGE OF GDP

Comparative Estimates: Canada, Finland, and Nepal

	Value	*Percentage of GDP*
CANADA 1992		
GDP at Market Prices - $ '000,000,000	689.7	100.00
Opportunity cost before tax	374.1	54.24
Opportunity cost after tax	221.1	32.06
Replacement cost-specialist	296.6	43.00
Replacement cost-generalist	234.5	34.00
Output basis-Household maintenance and caring	289.6	42.00
Output basis-Household/ caring/education/volunteering	326.9	47.40
FINLAND 1990		
GDP at market Prices - FIM '000,000,000	515.4	100.00
Opportunity cost-household maintenance/caring	302.0	58.60
Replacement cost-generalist-household maintenance/caring	232.5	45.11
Output basis-household maintenance/caring	253.1	49.11
NEPAL		
GDP at Market prices Rs '000,000,000	116.1	100.00
Replacement cost-specialist	146.4	126.04

Nepal

Results of the study in Nepal concluded that it is possible to construct satellite accounts for household production using a combination of data from large scale time-use surveys and a small scale survey that provides normative values for goods and services generated by various activities.

Although it involves a complicated list of products and calculation of inputs that entered into the preparation of meals, imputation of values to meal outputs was not impossible. However, for services such as laundry, child care, cleaning the house, and related activities, wage rates had to be used as normative values due to the limitations of the time-use data applied (i.e., these activities were not processed separately). Wages of polyvalent workers were used to calculate the value of such activities. The study in Nepal has, therefore, provided estimated values of satellite accounts on household production using a combination of output-based and replacement cost-specialist approaches.

For a more accurate and consistent estimation of unpaid production, particularly household maintenance activities, it is necessary to collect information on all SNA and non-SNA activities performed in the household in a time-use survey. There is a need to carry out household time expenditure surveys which would parallel in sampling, design and collection of current household budget surveys. Such initiative could draw on the extensive experience accumulated in the collection of household expenditure studies. Greater attention will need to be paid to linkage variables so these vehicles can more efficiently contribute to the task of developing output values unless time and money budget studies are integrated in

the future. While there is, to be sure, concern over response burden, a fifteen minute or shorter time-use module collected as part of an extensive household budget survey is unlikely to generate a very significant response revolt. Currently, efforts are being made to develop a more efficient time-use instrument which could be geared specifically to the needs of data for income account purposes.

Canada and Finland

While output-based production levels calculated here for Canada and Finland are consistent with levels derived by input-based approaches, distribution by activity are less so. The output based results presented here show that meal preparation, even though it is a broader concept than in related input based estimates, is a much smaller proportion of GDP or total household maintenance activity than has heretofore been reported using input measures. Findings suggest that the input measures, which are cost measures, are higher, approximately double than the output-based values. A reasonable explanation of this is that household meal production is an inefficient process relative to meal production in the market. Consequently, meal preparation consumes a volume of time incommensurate with the value it produces.

This study shows, as have other studies (Fouquet and Chadeau, 1981:Fitzgerald and Wicks, 1990:Goldschmidt-Clermont, 1993) that output-based valuations are possible for both developed and developing countries. The work highlights both the possibilities and the problems associated with the development of adequate output based measures of household output. First, it illustrates the potential for measuring outputs

using time use data. Secondly, it identifies, clearly, three major challenges facing attempts to fully implement an output-based strategy. One is the need for refined and broadly accepted definitions of household outputs. Second is the need to establish market-based prices for valuing those outputs. Third, is the need to identify adjustments required to the estimated value of unpaid production to bring it into line with the existing SNA accounting framework.

Recent work has gone beyond the traditional approach of limiting estimates of household output to estimates of the value of labour inputs by incorporating non-labour inputs (Ironmonger, 1989; Thoen, 1993; Rydenstam and Wadeskog, 1995; Aslaksen and Gravingsmyhr, 1995; Vihavainen, 1995; Schafer and Schwarz, 1995). This is to be commended. Household output is generated by both labour and non-labour household inputs and both must be counted. The value of household output, derived via an input approach, is calculated as the summation of the value of labour inputs and the non-labour inputs. The problem, however, is that the computed sum represents the cost of producing the unpaid production but not necessarily its market value. To obtain the value of unpaid output there are further, sometimes difficult, steps to be taken. This became obvious in the approach adopted here.

The first challenge is, assuming an accepted definition of household production, to define household outputs. Recent studies, while reflecting the general underlying principle of the third-person criteria, have used disparate household production classification schemes (Vihavainen, 1995; Schafer and Schwarz, 1995; Aslaksen and Gravingsmyhr, 1995; Rydenstam and Wadeskog, 1995; Chandler, 1994; Thoen, 1993). Thus, not only are the outputs unclear, but there is

ambiguity with respect to the components of household production. *There is an urgent need to develop an acceptable international standard with respect to the categorization of unpaid production.*

The approach taken here was to characterize household maintenance production in terms of the most commonly accepted basic needs, namely food, shelter and clothing. Thus, for Canada and Finland, the outputs of household production are measured in terms of the quantity of meals produced at home, the number of day/nights of shelter services provided, the kilograms of clean clothing produced, and the child hours of care.

Time-use data provided a basis for estimating three of the major household outputs, meals eaten, nights of residential accommodation and child care. Since time-use studies have not, to date, even considered the output dimension of activities, the data collected is less useful than it could be if survey instruments encompassed elements designed to provide necessary output information. The time-use data used for both countries provided a count of meals eaten and where and when they were eaten. It provided an indication of home or other residential nights of accommodation. And, finally, for Canada, it provided a reasonable estimate of time allocated to child care drawing on social contact data collected on the diary. There were problems estimating child-care time from the Finnish data as indicated below.

The measurement of meals was fairly straightforward. Similarly, it seems evident in the work undertaken here that it is possible to establish appropriate estimates for meal preparation. There are, however, adjustments to the data collection required to provide a more accurate accounting of

meals. What is needed is to know the number of meals prepared at home, not just those eaten at home, as it was necessary to use here. It must be possible, either as part of the time diary or from ancillary data, to identify the number or proportion of meals eaten out of home, say at work, that were carried from home and the number of meals eaten at home that are carried into the home. With this information, it is possible to more accurately measure the number of home-prepared meals. Further, it may be more appropriate to develop a classification of meals, an approach used in the Finnish *Housework Study,* to allow for differential pricing (Viinisalo, Santti and Kilpio, 1987).

The Finnish social contact data precluded its use in developing a realistic child-care output measure. In lieu of the diary data, an alternative approach was used to measure child-care time in Finland. It covered only children under age 7 years. Child-care hours based on hours of care received is the most logical output metric. However, as discussed above, there are a number of issues which need to be resolved with respect to the definition and measurement of child-care time. It was possible to get reasonably good prices for child care but which hours are to be counted (for what part of the day and for what ages) poses significant problems. Should all hours receive the same rate or should one draw a distinction between certain classes of hours as was done here by assigning a lower price to nighttime hours. The same issues hold true for caring for the elderly or infirm, an area not addressed in this study. Time-use data is relevant in all viable solutions either as a measure of care given or a measure of care received. In the latter case, it will be necessary to have child-level time-use data.

Shelter or housekeeping poses a problem with respect to definition and measurement. As indicated above, housekeeping encompasses a wide range of activities related to inside and outside dwelling. The sheer size of it in the final valuation estimates attests to the need to better understand and measure it. In this report, an overall value of housekeeping, which can theoretically and statistically provide an appropriate measure, leaves one wanting for finer detail with respect to characteristics of the dwelling, lot and nature of the accommodation. Use of shelter or accommodation appears to be detectable by time-use studies. However, the accuracy with which the studies are able to identify home use depends greatly on the sampling and reporting rules adopted in time-use studies. Only if the studies adopt a truly random designated day approach to sampling and reporting will the resultant data accurately reflect time/days/nights spent at home and those spent away from home. This presents a challenge to survey designers.

The clothing care output is currently not measurable via time-use studies. While studies show time allocated to laundry and clothes maintenance, they provide no indication of what that time produces. However, the Finnish *Housework Study* (Suviranta and Mynttinen, 1981) as well as work undertaken in the United States (Sanik, 1995) indicates that it is possible to develop measures of household output in terms of a volume measure such as loads or kilograms. Rough approximations of such estimates were used here.

The foregoing has characterized components of household outputs in rather discrete terms. Similarly, recent input-output table approaches have cast household productions in terms of discrete commodities and industries. Household input-output work, to date, having defined a set of household

activities, has been concerned with estimating and valuing the inputs into each activity. The work has not appropriately recognized the jointness of production which exists in households. Meal preparation, housekeeping, and child care are often co-occurring and valuing time allocated to one or the other inadequately reflects total production. How the outputs are produced is not the issue, rather it is how much of what kind of output is produced.

However, a different kind of jointness of production plagues output-based measurement. Meal preparation is not independent of shopping, cleaning, and travelling. Laundry may be done at one and the same time as clothing for individuals and as bedding for accommodation maintenance. The relevance and the frustration of this realization emerges when, as was tried here, one attempts to define and measure outputs rather than inputs. Having measured and valued total output, it is necessary to adjust for purchased inputs (RME) and dwelling (UOD). To do so, it is necessary to allocate expenditures across the major activities. Thus, for example, how much travel is attributable to meals, to accommodation related activities or to child care? Similarly, how does one reflect purchases such as soap, cleaners, and detergent in the appropriate RME. The problems are not insolvable but they must be faced. Additionally, from both an aggregate accounting viewpoint and when one is trying to study societal change, the overlap is not inconsequential. There is always a potential for altering the inputs required to produce a given output.

In order to accurately account for all household production it is necessary, as in consumer studies, to provide a measure of household composition over the accounting period. It

is not enough to simply rely on cross-section data. In the current project, weeks per year for several age groups in Canada and months per year in main occupations in Finland provided a link between the time use and consumption data. In particular, there is a need to provide the measures on a gender specific basis.

Output-based measures of household production are possible and are necessary if researchers and national accountants are to fully grasp and measure the nature of household production. While there needs to be a shift of emphasis in household production, research toward developing output-based measures work also needs to continue on input-based measures as well. There is a need to understand both the input and the output side of household production. Only when both are fully understood will it be possible to have full confidence in production estimates and to develop appropriate public policies with respect to households and household maintainers.