On Contribution of Women in Domestic Product of Indian Economy

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Abstract

Estimation of Women's contribution in Domestic Product is considered a challenge in the Gender inclusive Macroeconomic Policy Management. This paper considers important macro-economic aggregates in the System of National Accounts (SNA) and Social Accounting Matrix (SAM) Framework and examines conceptual issues underlying domestic product by gender, and measuring non-market work, in particular housewives services in the Satellite Account for Households as extended Net Domestic Product (NDP).

In the estimation of Gross Domestic Product (GDP) through production approach in a situation where activities of women have been fully taken account of, apportionment of NDP by gender is not possible. However, it is possible to apportion the NDP by gender when it is estimated through income approach. Using income approach the apportionment of the domestic product by gender has been made under certain assumptions. It is articulated that it may be possible to attempt the apportionment by gender in the final expenditure aggregates such as Private Final Consumption Expenditure, Government Final Consumption Expenditure and Gross Fixed Capital Formation.

The presentation is thus organized to cover the following topics relevant to the main theme: (i) Gender and Macroeconomics, in particular the Domestic Product by gender- Conceptual issues, (ii) System of National Accounts, 2008 (2008 SNA), (iii) Macro-economic aggregates in SNA, (iv) Gender in SNA and SAM, (iv) Production boundary of 2008 SNA and –unpaid work of women, (v) Measuring Housewives services in Extended NDP and (vi) Share of women in the Extended NDP.

Through certain exercises it has been observed that Women's share in the NDP of Indian economy has progressively risen from 14.1 per cent in 1970-71 to 15.9 per cent in 1980-81; 17.1 per cent in 1990-91; 21.5 per cent in 1999-2000; and 22.1 per cent in 2004-05. This share really should have been little more had we captured the activities of the household production of goods for self-consumption where women predominantly engage themselves in the production of goods.

It has been brought out that the 2008 SNA is flexible since it does provide a room in the form of a satellite account where the contribution of housewives are considered in totality by extending the production boundary i.e., as extended NDP. Women's contribution in the extended NDP has been seen to be significantly higher than that of in the NDP conventionally defined in the SNA. The gender information can be usefully incorporated in the framework of SAM by including gender-distinguished statistics at whichever level it is possible.

Keywords: System of National Accounts, Net Domestic Product, Social Accounting Matrix, Extended Net Domestic Product, Working Force

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1. Introduction

Most macroeconomic aggregates generally considered in the national accounting system or social accounting system are gender neutral. More popular and important macroeconomic aggregate namely the gross domestic product of an economy measures unduplicated production of goods and services by the resident units in a given period of time (usually a year). This measure by concept equals the income (gross domestic income) that gets generated to the owners of resources in the economy while engaged in the production of goods and services. Also the same measure equals the final expenditures (gross domestic expenditure) in the economy. It is the gross domestic income which accrues to the owners of resources (most importantly the labour) that has the clear gender concerns in the society. Besides it hardly needs to be dilated that the productive efforts in the society affecting the micro and macro economy and welfare include not only market production but also household nonmarket production. However, the official statistical system does not fully reflect this. Much of the work of women particularly the household women which forms major part of the household non-market production goes unreported in the accounting framework of the System of National Accounts. It is partly because of convention and partly because the work which connotes human effort devoted to production of goods and services having utility, but it does not necessarily generate income by way of marketability and hence poses measurement problems. So, it is primarily the contribution of women to the economy and welfare that is made invisible (see for example, Eisener 1989, Ironmonger 1989, Goldschmidt-Clermont 1990, Chadeau 1992, and Kulshreshtha and Singh 1996)

This document attempts (i) to examine the coverage i.e. production boundary in the 2008 System of National Accounts (SNA), from the point of view of capturing the activities of women, in the estimation of domestic product by gender, (ii) Macro-economic aggregates in the framework of SNA and Social Accounting Matrix (SAM), (iii) Gender in SNA and SAM (iv) to measure the value of unpaid work of women as housewives' services in the concept of Extended Net Domestic Product (NDP)as suggested by Mukherjee (1985a,b) and also in the satellite accounts provided in the 2008 SNA framework, and (v) to estimate the share of women in the extended NDP. Concepts, data availability and gaps therein for estimating the domestic product by gender have also been discussed inter-alia.

2. System of National Accounts, 2008 (2008 SNA)

The SNA aim to provide a comprehensive, coherent, and consistent picture of the economy that reflects all transactions taking place between the agents that together constitute an economy and other economic flows in an accounting period and the opening and closing stocks of assets and liabilities. The System recommends compilation of set of macro-economic accounts based on a set of internationally agreed concepts, definitions, classifications and accounting rules. It provides comprehensive accounting framework within which data can be compiled and presented in a format i.e. designed for the purposes of economic analysis, decision taking and policy making. The accounts themselves present in a condensed way a great mass of detail information organized according to economic principles and perceptions about the working of an economy. Each account of 2008 SNA gives an important macro-economic aggregate for analytical use. Certain key aggregate statistics such as Gross Domestic Product (GDP) that are

widely used as indicators of economic activity at the level of the total economy are defined within the system.

The United Nations (UN) has played an important role in the development of the SNA. First the 1953 SNA set out a standard national accounting system in order to provide a framework for reporting national income and product statistics; It was revised to 1968 SNA as an elaborate system giving emphasis on consolidated set of accounts and Input -Output Transactions Tables (IOTT). Further revision exercises of the SNA were undertaken under the ages of Inter-Secretariat Working Group on National Accounts (ISWGNA) comprising five international agencies namely UN, World Bank, International Monetary Fund (IMF), Organisation of Economic Cooperation and Development (OECD) and the European Statistics Organisation (EUROSTAT). The ISWGNA developed the 1993 SNA that was comprehensive system harmonized with other statistical systems such as Balance of Payment Statistics, Government Finance Statistics, etc. As on date 2008 SNA is the latest international standard that is in line with new economic environment, advances in methodological research, and needs of users.

As per SNA the national accounts basically encompasses the production, generation of income, allocation, primary distribution, secondary distribution of income and use of income accounts as current accounts to determine the saving which is then available for capital formation in the accumulation accounts. The residents mostly earn their income from production carried out in the economy. Thus, income of all the residents is mainly generated from production activity of goods and services in the economy. Income, thus generated, is spent for purchase of goods and services produced in the economy or imported either for final consumption or for use in further production (as capital formation) or for exports. National Accounts provide a quantitative description of all these processes and their inter-linkages. SNA thus provides a framework for systematic presentation of estimates of macro-economic aggregates relating to national income and wealth; Stocks of economic assets represent 'wealth'. The SNA also has provision of recording 'other flows' caused by events like war, natural calamity, and scientific discovery and changes in general price level affecting the stock of 'economic' assets.

3. Gross Domestic Product

Gross Domestic Product (GDP) of a country, by definition, is equal to the sum of the Gross Value Added (GVA) of all resident institutional units engaged in production plus any taxes less any subsidies on products not included in the value of their output. In measuring the output, it is essential to take account of all the goods and services produced during the period whether these are marketed or bartered or used for self-consumption. This measure should be such that production of any particular item is not counted twice. Certain activities are excluded, as convention, in the estimation of GDP, these primarily relate to the services of housewives for taking care (cooking, care of child and elderly, and cleaning) of the house, mainly because of the problem of measurement. The 20008 SNA recommends inclusion of illegal activities within the production boundary. It also recommends some of the activities undertaken by the women for example, carrying water for self-consumption and goods produced by the household and consumed, in the estimation of GDP.

There are three approaches used in the measurement of GDP. First, known as production approach, where the GVA is estimated in each of the sectors of the economy by considering its

output at basic prices (without any taxes/ subsidies on products) and subtracting the value of material inputs at purchaser's prices. These sectoral GVAs are then added over all sectors and also added is the taxes on products less subsidies on products to arrive at the GDP of the economy. The second approach is the income approach. In the process of production, income generates to the owners of resources, namely, Human resource (compensation of employees), Natural resource (rent), Financial resource (interest), and Produced resource (capital service). In other words, the income is distributed in the form of either compensation of employees (CE to owners of human resource for labour) or operating surplus (OS for usage of other resources to their owners) or mixed income (MI) to individuals who are self-employed/own account entrepreneurs (CE and OS mixed). These primary incomes (CE, OS, MI) when added along with the consumption of fixed capital (CFC) and taxes on less subsidies on domestic products and imports make the Gross Domestic Product by income approach. In the expenditure approach the GDP is arrived at by adding the categories of final expenditures namely, Private Final Consumption Expenditure (PFCE) which is the sum of Household Final Consumption Expenditure (HFCE) and Non-Profit Institutions serving Households Final Consumption Expenditure (NPIHsFCE), Government Final Consumption Expenditure (GFCE), Gross Capital Formation (GCF) and net exports (exports less imports). The GCF includes Gross Fixed Capital Formation (GFCF), Changes in inventories (CII) and net acquisition (acquisition less disposals) of valuables. The Net Domestic Product (NDP) is obtained from the GDP by subtracting consumption of fixed capital (CFC). The Gross National Income (GNI) is the sum of GDP and the net primary income earned from abroad (primary income receivable less primary income payable). In India, the GDP is estimated by mixed approach i.e. in some of the sectors, production approach is followed and in other sectors, income approach is followed. Broadly, the production approach is followed in the sector of agriculture, forestry, fishing, mining and manufacturing. The income approach is followed in the service sectors.

4. Macro-economic aggregates in SNA

The SNA is founded on the macro-economic framework that gives a set of identities – relationships between different flow and stock variables. These identities form the basis of the SNA sequence of accounts consisting of measures of economic flows and stocks in monetary values. A set of standard procedures of valuation is recommended for attributing monetary values to flows and stocks. The macro-economic framework is based on the premises that all goods and services produced in the domestic economy are put to "use" of one kind or other; and the circular flow of income and expenditure of the residents and the non-residents participating in transactions of the domestic economy. The framework establishes the equivalence of supply and use of goods and services produced: equivalence of the value of production of goods and services, income generated in production and expenditure on final uses. The SNA recommends preparation of Goods and Services account in the form of Supply and Use tables to reconcile the supply or availability of each good and service in the economy and its utilization both intermediate and final use. Once the detailed data of supply and use of goods and services coming from various sources of official statistical system is reconciled, the measure of production of an economy within a period of time, complete for all resident units without duplication is arrived at. The current accounts in the form of production account and income accounts comprising generation of income account, allocation of primary income account, secondary distribution of income account, and use of income account can then be attempted as:

Production: In the SNA, the measure of production is Gross Value Added (GVA). Defined as GVA = GVO − IC, where GVO stands for Gross Value of Output and IC for intermediate consumption. Gross Domestic Product (GDP) is the sum of GVAs of all enterprises in the economy and taxes on products less subsidies on products. GVA and GVO are at basic prices whereas intermediate consumption (IC) is at purchaser's price. Following rules of accounts of the SNA, the uses on left hand side and resources on the right hand side the **Production Account** is as under where GVA or GDP is the balancing item (B1):

	Uses	Resources

Production Account	Intermediate Consumption
	
	GVA / GDP (B1)
		Output, of which:
		    Market output;
		    Output for own final use and
		    Non-market output
		(Taxes-subsidies) on products and imports

Generation of Income: GVA resulting from the process of production is the income generated, which in turn is distributed to the owners of resources (human resource, natural resource, financial resource and produced resource) as primary incomes Primary incomes are in fact incomes accruing to units for their involvement in or for ownership of assets used in production processes. Households as employees receive Compensation of employees (CE) for their labour in an enterprise and remaining primary income in the enterprise is termed as Operating surplus (OS). Own account entrepreneurs/ Self-employed cannot distinguish CE or OS, thus for them the primary income is termed mixed income (MI)-a mix of CE and OS. Government receives taxes on products (both domestic products and imports) less subsidies on products which the system considers part of income in GDP. It may be noted that OS includes rent which the Government receives as owner of natural resources/assets for its usage; interest which the owners of financial resource receive for usage of their money capital; and profit/loss which accrues to owners of entrepreneurship. Primary income is also received from (and paid to) rest of the world (RoW). Gross OS also includes consumption of fixed capital (CFC), estimated by the national accountants, to keep the supply of capital stock uninterrupted to the production process in the system. **Generation of Income Account** is presented below showing mixed income and operating surplus as the balancing item

	Uses	Resources
Generation of income Account	Compensation of employees (Taxes – subsidies) on production and imports **Mixed income(B3) +Operating surplus (B2)**	**GVA / GDP (B1)**

Allocation of Primary Income: For an institutional unit Balance of Primary Income is the total value of the primary incomes receivable less total of the primary incomes payable. At the level of the total economy, the same is called Gross National Income (GNI). The **Primary**

Distribution of Income Account showing allocation of income at total economy is presented below showing GNI as the balancing item

	Uses	Resources
Primary Distribution of Income		**Mixed income (B3) +Operating surplus (B2)** Compensation of employees receivable (Taxes – subsidies) on production & imports Property Income receivable
	Primary Income payable **Gross National Income (B5)**	

Secondary Distribution of Income: Out of the balance of primary income (gross), the institutional units may pay and/or receive current transfers: that is transactions in which an institutional unit provides part of primary income to another unit without receiving from the latter anything in return as a direct counterpart. After making the current transfers, the institutional units are left with Gross National Disposable Income (GNDI). Thus

GNDI = GNI + Current Transfers receivable - Current Transfers payable

Secondary Distribution of Income Account presented below shows GNDI as the balancing item

	Uses	Resources
Secondary Distribution of Income	Taxes on income and wealth payable Social contributions and other social benefits payable Other current transfers payable **Gross National Disposable income (B6)**	**Gross National Income (B5)** Taxes on income and wealth receivable Social contributions & other social benefits receivable Other current transfers receivable

Use of Income: GNDI, the available income is spent by the households, government and NPISHs on final consumption. The balance Gross Saving = GNDI- Final Consumption Expenditure. **Use of Income Account** presented below shows Gross Saving as the balancing item

	Uses	Resources

Use of disposable Income Account	Final Consumption Expenditure, of which:
	    Household FCE;
	     NPISHs and Government FCE
	Adjustments for households pension funds payable
	Gross Savings (B8)
		Gross Disposable income (B6)
		
		Adjustments for households pension funds receivable

The balance gross saving, then flows to the financial market. Enterprises borrow from the financial market for their acquisition of non-financial capital assets, i.e., gross domestic capital formation. This leads to the accumulation accounts in the form of capital account and financial account. Using the expenditure and income side identities, this reduces to

Gross Saving = Gross Domestic Capital Formation (GDCF)
+ Acquisition less disposal of non-produced non-financial assets
- (net) Capital transfer receivable + Net lending (to RoW)

Where, GDCF is the sum of gross fixed capital formation (GFCF), changes in inventories (CII), and acquisition less disposal of valuables.

Following rules of accounts of the SNA in the accumulation accounts, the changes in assets on left hand side and changes in liabilities and net worth on the right hand side the **Capital Account and Financial Account** presented below show net lending/ borrowing as the balancing item

	changes in assets	**changes in liability and net worth**
Capital Account	Gross Fixed Capital Formation Change in Inventories Acquisition less disposal of valuables Acquisition less disposal of non-produced non-financial assets Minus CFC **Net lending / borrowing (B9)**	**Gross Savings (B8)** Capital transfers receivable **minus** capital transfers payable
Financial Account	Net acquisition of financial assets **Net lending / borrowing (B9)**	**Net lending / borrowing (B9)** Net incurrence of liabilities

It may be noted that each account has a balancing item that is significant as a macro-economic aggregate like gross / net domestic product (GDP / NDP), gross / net national income (GNI/ NNI), gross / net disposable income (GNDI/NNDI), saving; and in the capital/ financial account as Net lending/borrowing.

Summarizing above in short the main identities in the SNA, each providing an account and there in an important macro-economic aggregate, are:
Commodity balance: Gross value of output of Goods and services at market prices (mp)

$$GVO_{mp} \equiv IC + PFCE + GFCE + GFCF + CII$$
$$+ \text{Acquisition less disposal of valuables} + X - M \quad \ldots \ldots \ldots [1]$$

Where, PFCE stands for private final consumption expenditure, which is final consumption expenditure of household and Non-Profit Institutions serving Households; GFCE stands for Government final consumption expenditure, GFCF stands for gross fixed capital formation, CII stands for change in inventories, X for exports and M for imports.

Production-side identity:

$$GDP_{mp} \equiv GVO_{bp} - IC + \text{product (t-s)} + \text{(t-s) on imports} \quad \ldots \ldots \ldots \ldots \quad [2]$$

Where product (t-s) denotes taxes on products less subsidies on products

Income-side identities:

$GDP_{mp} \equiv (CE + OS + MI)$ generated in domestic enterprises

$\qquad$ + Product (t-s) + (t-s) on imports $\qquad$ … … … … $\qquad$ [3]

Where CE, OS, MI denote compensation of employees, operating surplus, mixed income

$\qquad GNI \quad \equiv (CE + OS \ \& \ MI)$ generated in domestic enterprises

$\qquad\qquad$ + Product (t-s) + (t-s) on imports

$\qquad\qquad$ + CE from RoW (net) + PI from RoW (net) $\qquad$ … … … … $\qquad$ [4]

$\qquad GNDI \equiv GNI +$ (net) current transfers

$\qquad\qquad$ + (Net) taxes on income and wealth from RoW $\quad$ … … … … $\qquad$ [5]

Expenditure-side identities:

$\qquad GDP_{mp} \equiv PFCE + GFCE + GFCF + CII$

$\qquad\qquad$ + Acquisition less disposal of valuables $+ X - M$ $\qquad$ … … … … $\qquad$ [6]

Gross Savings $\equiv GNDI - (PFCE + GFCE)$ $\qquad\qquad\qquad$ … … … … $\qquad$ [7]

Net lending from RoW $\equiv$ Gross Savings + (net) Capital transfer receivable

$\qquad\qquad$ - (GDCF + acquisition less disposal of valuables)

$\qquad\qquad$ - Acquisition less disposal of non-produced non-financial assets … … $\qquad$ [8]

5. Macro-economic aggregates in Social Accounting Matrix (SAM)

A Social Accounting Matrix (SAM) represents flows of all economic transactions that take place within an economy. It is at the core, a matrix representation of the National Accounts. SAMs refer to a single year providing a static picture of the economy. SAM captures transactions in the economy— both income and expenditure – like double-entry SNA accounting but it contains much more than just the macro aggregates. A SAM, though similar to a standard input-output framework which systematically captures production technology and relationships, has the added advantage of capturing income distribution and consumption relationships within the economy in an internally consistent manner. SAMs are square (columns equal rows) in the sense that all institutional agents (Producing Sectors 'Firms', Households, Government, Capital 'Investment' and 'Rest of the World' sector) are both buyers and sellers. Columns represent buyers (expenditures) and rows represent sellers (receipts). SAM's are created to identify all monetary flows from sources to recipients, within a disaggregated national account. SAM is read from column to row, so each entry in the matrix comes from its column heading, going to the row heading. Finally columns and rows are added up, to ensure accounting consistency, and each column is added up to equal each corresponding row. In the illustration below for a basic open economy, a schematic Social Accounting Matrix shows the input-output flows in aggregated form as output flow in the first row and inputs in the first column. Second column and row depict the allocation of primary incomes. Third column relating to households shows the expenditures

A Schematic Social Accounting Matrix

	Producing Sectors (1)	Factors of Production (2)	Households (3)	Government (4)	Capital (5)	Rest of World (6)	Total (7)
Producing Sectors	I/O flow		Consumption Expenditure	Government Consumption	Investment	Exports	Gross Output
Factors of Production	Allocation of VA to Factors					Primary incomes from ROW	Total income of Factors
Households		Allocation of incomes	Transfer	Transfers to HHs	_	Current transfers from ROW	Total income
Government	Taxes on products		Direct Taxes	_	_	_	Total Govt. Receipts
Capital			Saving of HHs	Current Account Deficit	_	Capital transfers from ROW	Total Financing for Investment
Rest of World	Imports	Primary incomes to ROW	_	_	Capital transfers to ROW	_	Foreign exchange expenditure
Total	Total Inputs (Cost of output)	Total expenditure of FOP	Total expenditure of HHs	Total Govt. Expenditure	Aggregate Investment	Foreign Exchange	

of households on final consumption, transfer to government (taxes) and saving; the corresponding row shows the total income of households received as owners of resources (predominantly labour) and transfers. Fourth column and row representing government transactions depict the current expenditures and income respectively of the general government. Fifth column and row relating to accumulation (capital formation) shows the investment and it's financing from saving, capital transfers and borrowing equivalent to the current account deficit. Once the endogenous and exogenous accounts are decided the transaction matrix can be transformed into corresponding matrix of average expenditure propensities. This can be obtained by dividing a particular column entry in the matrix by the column total. The proportions obtained from the endogenous accounts are the coefficients used to obtain the multipliers and other uses.

In real situations we need to have several rows and columns depending upon the industries and products we consider. Thus in the magnified first cell we see the disaggregated production account. The production account is composed of two parts: the activities (industries) and the products (goods and services or commodities). The distinction between production activity and products accounts enables correct treatment of joint production and by-products. The activity shows that various products are made by means of a number of quite distinct technologies, which coexist in the economy. On the other hand, the products account explains the production of a major product by an industry along with the industry's by-products.

SAMs are useful in analyzing issues of distribution, as in such a framework households by ownership of resources and economic classes and different production sectors can be

explicitly classified and the interaction of these with each other and other economic variables can be studied. The income distribution effects can also be studied in greater detail through the use of SAM multipliers. It is well known now that a SAM approach integrates the distributional dimension within the system of social accounts in a way that reflects the interrelationship between employment, distribution of income and the structure of production. SAMs focus particularly on the distribution of income through disaggregation of household sector income and outlay accounts together with disaggregation of production, factors, etc. Integrating distribution statistics into a SAM considerably increase their utility. It is more useful to have income sources for classifying households then income sizes in an analytical SAM. Information regarding the households such as location, possession of assets (e.g., agricultural land) and size and its composition are considered relevant in such classifications.

6. Gender in SNA and SAM

In the previous sections we noted that in the SNA income accounts the balancing item of each of the accounts represent an important macro-economic aggregate and the SAM describes basic transactions of money flows in the economy. Productions in the economy utilize the intermediate inputs (materials) and the primary inputs i.e., factors of production, in SNA language CE and OS; and we can distinguish these by gender to start with. These factor endowments are contributed by the institutions, and the owners of resources receive payments for the use of resources (as components of value added). A gender distinction would involve in CE the wage differentials for male and female. Beside income generation there would be certain transfers of income among the institutions as also with rest of the world (this is more difficult to break up by gender) to arrive at the Disposable Income. The Disposable Income is used or spent as the final consumption expenditure on goods and services and the rest is saving. The saving along with net capital transfers and net borrowings is used to acquire the capital assets (gross capital formation). A gender distinction of the owners of producing units who acquire the capital assets during the period could also be considered as useful information for looking the asset owners, gender-wise. The gender information can be usefully incorporated in the SAM by including gender-distinguished statistics at whichever level it is possible. As a matter of fact the SAMs are useful in analyzing issues of income distribution, as in such a framework households by ownership of factors of production and economic classes and different production sectors can be explicitly classified and the interaction of these with each other and other economic variables can be studied. A SAM approach integrates the distributional dimension within the system of social accounts in a way that reflects the interrelationship between employment, distribution of income and the structure of production. The SAMs focus particularly on the distribution of income through disaggregation of household sector income and outlay accounts together with disaggregation of production, factors, etc. The classification of households is of crucial importance in a SAM analysis. In SNA 2008, importance of household classification is explicitly discussed. Integrating distribution statistics into a SAM considerably increase its utility.

7. Estimation of GDP by Gender

Directly it is not possible to determine the share of GDP by gender when the approach followed is either the production approach or the expenditure approach. However, by following income approach, the share of GDP by gender can be arrived at making use of the information on the working force and the corresponding wage per worker by gender. Thus, in the sectors where

the income approach has been followed in the estimation of GDP, GDP by gender can be arrived at provided information on working force by gender and wage differentials are available. The working force by gender is available from the Population Census Data decennially and through the Employment and Unemployment Surveys (EUS) conducted regularly by the National Sample Survey Office (NSSO) but the data on wage differentials in various sectors of the economy are scanty. It may be mentioned that as far as organised sectors are concerned, particularly the public sector, where there is no wage differential, the GDP by gender can be arrived at just by using information on the working force. It is the unorganised segment of the economy where concerted efforts have to be made to obtain the information on wage differentials and more importantly capturing the women's participation in the economic activities through the working force by carefully asking questions at the time of Population Census or NSSO surveys.

In the sectors where production approach is followed in the Indian national accounts for the estimation of GDP, directly the share of GDP by gender cannot be obtained. But even for these sectors, factor incomes have been estimated utilising information from various sources. In the factor incomes, the compensation of employees is as usual the product of working force and the wage rate and so it can be divided by gender. As regards the operating surplus, ideally speaking, one can attempt the division of operating surplus by gender provided the ownership of enterprise/activity is available by gender. This information therefore needs to be gathered in the surveys planned to collect production data. There would no doubt be difficulties in getting the requisite data for determining the operating surplus by gender.

As regards the expenditure approach, where the GDP is the sum total of the final bill of goods, one can think of identifying the final consumption by gender. This would require information on Private Final Consumption Expenditure (PFCE), Government Final Consumption Expenditure (GFCE) and Gross Fixed Capital Formation (GFCF), Change in Inventories (CII), etc. by gender and so on. The PFCE can be divided into male female components by using population sex ratio provided consumption within the household is assumed to be gender neutral and if not, then consumption differentials by gender have to be estimated by mounting special surveys/ studies. Since GFCF is the acquisition less disposal of the capital assets by the enterprises, one can think of GFCF by gender if the ownership of enterprises is available by gender. Too many assumptions would be involved and thus, there is only limited interest in deriving GDP by gender through expenditure approach.

8. Production boundary of 2008 SNA and Unpaid Work of Women

The production boundary of 2008 SNA draws on the distinction between goods and services. It includes the production of all goods within the production boundary and the production of all services except personal and domestic services produced for own final consumption within households [other than (i) the services of owner-occupied dwellings i.e. imputed housing services for own consumption produced by owner occupiers in their capacity as un-incorporated enterprises and (ii) domestic services produced by paid employees who are to be treated as independent un-incorporated enterprises serving households]. The 2008 SNA excludes all production of services for own final consumption except for paid domestic services and owner occupied housing on the grounds that:

(a)   production of such services within households is a self-contained activity with limited repercussion on the rest of the economy;

(b)   there are typically no prices that can be satisfactorily used to value such services and the estimated values would not be equivalent to monetary values for analytical or policy purpose; and

(c)   if personal and domestic services by members of households for own final consumption are included, all persons engaged in such activities would become self-employed, making unemployment virtually impossible by definition.

All goods produced within the households, even though for own final consumption, are included within the production boundary of the system and if non-marketed, have to be evaluated at equivalent market price. These for example include:

(i)   agricultural produce and their subsequent storage, gathering of uncultivated crops for own consumption, wood cutting, collection of firewood, hunting and fishing

(ii)   mining salt, cutting peat

(iii)   supply of water which is a kind of activity similar to extracting and piping of crude oil.

(iv)   processing of agricultural products, production of dairy products (butter and cheese)

(v)   production of baskets and mats; weaving of cloth, tailoring, etc.

(vi)   production of footwear, production of pottery, utensils, making furniture and furnishings and all other productive activities of similar type

In all these activities women are active participants. Production of all goods which are marketed is accounted for in the estimates of GDP through various sources of data including the Enterprise Surveys conducted as the follow-up surveys of the Economic Census. It is only the own account production for self-consumption which needs to be covered. Here, the own account consumption of the agricultural products whose output is estimated based on the cultivated area is included in the official estimates of National Accounts. For capturing the value added from other activities, however, suitable household sample survey have to be conducted. It may be mentioned that in the existing National Sample Surveys (50th, 55th, 61st and 68th Rounds) we do get information (Table 1) on proportion of rural women engaged in household duties and also participating in specified activities for household use to total women engaged in household activities. If only we had a time disposition study and some information on the opportunity cost we could get the value added from the activities mentioned above, where the contribution of women is just getting missed for want of requisite data.

As mentioned earlier, personal services for own final consumption within the same household such as preparing meals, child care, house cleaning, transport and culture services (except for services produced by employing paid domestic staff) are excluded from the production boundary of 2008 SNA. The 2008 SNA does, however, suggest that in satellite accounts an alternate concept of GDP be elaborated which is based on an extended production boundary, including activities of household production of services for own use and their estimates. There are three possible ways to construct a satellite account - the net approach, the input approach and the output approach. The most commonly used perhaps being the net approach, which takes into account only of working time and its value. The difference between the net approach and the input approach is that the input approach covers intermediate consumption.

TABLE 1. Proportion of rural women engaged in household duties and also participating in specified activities for household use to total women engaged in household activities

Specified Activities	NSS 50th Round (all ages)1993-94	NSS 55th Round (all ages)1999-2000	NSS 61st Round (ages 5 +)2004-05	NSS 68th Round (ages 5 +)2011-12
Maintenance of Kitchen Garden, etc	16.9	16.4	15.2	23.3
Work in Household Poultry, Dairy, etc	36.0	54.3	32.8	21.5
Free collection of fish, etc	19.5	17.9	16.3	18.8
Free collection of firewood	40.3	53.4	39.6	43.5
Husking of Paddy (own produce)	10.8	11.1	8.9	5.4
Grinding of food grains (own produce)	10.4	8.6	7.5	4.1
Preparation of Gur (own produce)	0.4	0.8	0.3	0.2
Preservation of Meat, etc (own produce)	0.5	0.6	0.9	0.7
Making Basket, etc (own produce)	1.8	4.1	2.5	1.7
Making Basket, etc (acquired)	2.4	3.8	4.3	3.2
Husking of Paddy (acquired)	4.9	6.1	5.0	3.9
Grinding of food grains (acquired)	7.6	8.9	7.3	4.6
Preparation of Gur (acquired)	2.2	3.6	3.4	2.7
Preservation of Meat (acquired)	2.3	4.2	4.3	3.2
Preservation of cow dung cakes	53.7	63.4	46.0	40.9
Sewing, Tailoring, etc	22.1	27.3	27.6	27.3
Free Tutoring own / other children	4.2	4.8	6.7	6.8
Bringing water from outside houshold premises	58.1	58.5	44.5	30.6
Bringing water from outside village	2.7	1.8	1.2	0.9

Source: (i) NSS 50th Round; Table 4.1; Page 13; Report No. 416; Female of all ages
(ii) NSS 55th Round; Table 92; Pages A- 31 to A-32; Report No. 465; Female of all ages
(iii) NSS 61st Round; Table 3.4; Page 19; Report No. 518; Female of age 5 and above
(iv) NSS 68th round: Table 3.4, Page 24, Report No. 559: Female of age 5 and above

9. Valuation of Services of Housewives (UNPAID)

As mentioned earlier, the value of the household services is usually not included in the GDP. If one wishes to measure household production it is necessary to calculate the economic value of the productive activity involved, but the difficulty with unpaid housework is that it has no market value in the form of wages. Many possible valuation methods have been proposed, which give differing results depending upon the wages figures used. In the literature three different methods are used to evaluate the value of household services. All of these require the information on the time put in by the housewives and the corresponding rate at which this time or its proper parts are to be evaluated. Weekly person-hours may be converted to person-years (N). We need this N and an average annual rate of earning (E) for evaluation. Choice of E differentiates one method from the other for evaluating the household services. E is taken to be

either the opportunity cost of the housewife or the cost of hiring a single individual to do all the household work (market substitute), or if N is split into its proper parts, for example, time devoted to cooking and preparation of meals, house cleaning, child care, elderly care, shopping etc. say N_i , i running to as many household activities undertaken by the housewives and each function is separately evaluated by the corresponding nearest market alternatives (E_i), thus instead of NE we have $\sum_i N_i E_i$ as the measure of the household services. The opportunity cost estimate has been arrived at in different ways in the literature by various authors. Nordhaus - Tobin (1972), for example, by and large, used the wages of female earners in manufacturing. In the Indian context, Mukherjee (1985,b) used two alternatives, namely, earning per worker (national average) and earning per worker in agriculture. Kulshreshtha and Singh (1996) following approach of Mukherjee (1985,b) estimated the value of the service of housewives (unpaid) for 1970-71, 1980-81 and 1990-91 at 1980-81 prices by using the average earnings per worker and the number of married women in the reproducible age group. The average earnings per worker were obtained by using the information on respective net domestic product (NDP) published in National Accounts Statistics and female work force estimates compiled from the results of respective population censuses conducted by the RGI. Estimated earning per workers and contribution of women to unpaid household work for the years 1970-71, 1980-81 and 1990-91 at 1980-81 prices are reproduced in Table 2.

Table 2. Earning per workers (Rs) and contribution of women to unpaid household work (Rs. crores) at 1980-81 prices

Items	1970-71	1980-81	1990-91
(1)	(2)	(3)	(4)
Earnings per worker (Rs.)			
National average	4610	4959	6601
Agriculture	2978	2882	3224
No. of married women (in crores) between 15-44 years	9.67	11.57	14.17
Women's contribution to unpaid household work (Rs. crore)			
National average	44,579	57,376	93,536
Agriculture	28,797	33,345	45,684

In the new series of national accounts since 1993-94 followed in the 1999-2000 series, 2004-05 series, and 2011-12 series the work force estimates used in the estimation of GDP particularly of unregistered manufacturing and services sectors are obtained using results of household large scale sample surveys on Employment Unemployment survey conducted by the National Sample Survey Office (NSSO). Earlier national accounts series used work force estimates based on Population census results. This change was inducted mainly for the reasons that Population census based estimates of work force did not capture adequately the activities of women particularly in rural areas. We have thus taken work force estimates of men and women separately from the NSS survey reports of 55th and 61st Rounds on Employment Unemployment for the years 1999-2000 and 2004-05. The estimates on number of women, women between reproducible age group 15-49 years and the percentage of married women between 15-49 years for the years 1999-2000 and 2004-05 are based on the information on 'Projected Population Characteristics as on 1st March: 2001-2026' from RGI. Using this information, number of

married women between 15-49 years in 1999-2000 and 2004-05 comes out to be 19.13 crores and 21.19 crores respectively (see, Table 3).

Table 3. Number of women, percentage of married women and number of married women between 15-49 years for 1999-2000 and 2004-05.

Items	1999-2000	2004-05
(1)	(2)	(3)
No. of women (in crores)	48.86	52.09
No. of women (in crores) between 15-49 years	24.97	27.66
Percentage of married women between 15-49 years	76.61	76.61
No. of married women (in crores) between 15-49 years	19.13	21.19

Table 4. Earning per workers (Rs) and contribution of women to unpaid household work (Rs. crores) at 2004-05 prices.

Items	1999-2000	2004-05
(1)	(2)	(3)
Earnings per worker (Rs.)		
National average	30131	33198
Agriculture	15885	15558
Women's contribution to unpaid household work (Rs. crore)		
National average	576,406	703,466
Agriculture	303,880	329,674

The working force estimates for men and women and estimates of NDP at 2004-05 prices for the years 1999-2000 and 2004-05 are given in given in Table 5. We have used the estimates of NDP by economic activities at 2004-05 prices which are available in the 2004-05 series of the National Accounts Statistics (NAS). Using the figures of this table we get the average earnings in Rs. per worker at 2004-05 prices. Using the average earnings per worker and the number of married women in the age group 15-49 years we can obtain the estimates of the women's contribution to un-paid household work at 2004-05 prices. These are presented above in Table 4.

10. Women's Contribution to NDP and Extended NDP

Household services are largely the contribution of women. Apart from this, a part of NDP is also contributed by women. For obtaining the share of women in the NDP we have simply allocated the aggregate contributions to NDP by various industrial categories by gender in proportion to their share in the working force. It may be observed from Table 5 that there is a systematic rise in the women's share in the working force in all industrial categories except for trade, Hotels and Restaurants where it has slightly gone down from 13 per cent in 1999-2000 to 12 per cent in 2004-05.

TABLE 5. Working force and Contribution to NDP by GENDER at 2004-05 Prices, 1999-2000, 2004-05

Industrial Sectors (1)	Working Force in Million						Percentage Share of Women in Working Force		NDP at 2004-05 Prices (Rs crore)		Women's Contribution at 2004-05 Prices (Rs crore)	
	1999-2000			2004-05								
	M	W	T	M	W	T	99-00	04-05	99-00	04-05	99-00	04-05
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Agriculture, etc	197.8	116.1	313.8	206.6	132.3	338.8	37	39	498712	527289	184422	205836
Mining and quarrying	2.1	0.4	2.5	2.5	0.5	3.0	16	17	58323	70464	9478	11832
Manufacturing industries	34.0	12.5	46.6	41.8	18.5	60.3	27	31	276304	346495	74453	106231
Electricity, Gas and Water supply	1.1	0.0	1.2	1.3	0.1	1.3	4	5	31940	33789	1176	1565
Construction	18.2	2.5	20.7	28.1	3.7	31.8	12	12	143056	218511	17028	25480
Trade, Hotel and Restaurants	38.6	5.5	44.1	47.2	6.7	54.0	13	12	319725	464750	40060	58055
Transport and communication	15.0	0.4	15.4	19.3	0.6	19.9	3	3	131252	219585	3600	6160
Real estate, Renting and Business service	2.5	0.2	2.7	4.5	0.5	5.0	8	10	178346	229767	14608	22510
Banking and Insurance	2.0	0.3	2.3	2.8	0.4	3.2	12	14	129998	168112	15691	23176
Other services	25.0	9.8	34.8	26.0	13.1	39.1	28	33	300840	372811	84523	124771
Total	**336.3**	**147.7**	**484.0**	**380.2**	**176.4**	**556.5**	31	32	**2068496**	**2651573**	**445040**	**585617**
Total as percentages of total NDP											21.5	22.1

Note: M: Men; W: Women; T: Total; Estimates of Working Force are the Labour Input (Estimates after population Correction as per RGI projection - in million)
Source: NSS survey Reports of 55th and 61st Rounds and National Accounts Statistics, 2010, MOSPI

The contribution of women in the NDP which was 21.5 per cent in 19990-2000 has gone up to 22.1 per cent in 2004-05 or from Rs. 445,040 crores in 19990-2000 to Rs. 585,617 crores in 2004-05 all expressed at 2004-05 prices. Such a contribution of women in the NDP in the years 1970-71, 1980-81 and 1990-91, was estimated by Kulshreshtha and Singh (1996) at 14.1 per cent, 15.9 per cent and 17.1 per cent respectively. This indicates that the contribution of women in the NDP has been continuously increasing during all this period. It may also be noted (Table 6) that among the various industrial sectors share of women's contribution to NDP is highest in

the agriculture sector (41.4 per cent in 1999-2000, 35.1 per cent in 2004-05) followed by other services sector (19.0 per cent in 1999-2000, 21.3 per cent in 2004-05) and manufacturing sector (16.7 per cent in 1999-2000, 18.1 per cent in 2004-05). Lowest contribution is noticed in transport and communication sector (0.8 per cent in 1999-2000, 1.1 per cent in 2004-05).

In Table 7, we present estimates of extended NDP and contribution of women in it which has been computed both when household work is evaluated at the rate of national average earnings per worker and at the rate of average agricultural earnings, at 2004-05 prices. Men's contribution to NDP is obtained as the difference of total NDP and Women's contribution taken from Table 6 (Rs 2068496-445040 =1623456 crore) in 1999-2000 and (Rs 2651573-585617 = 2065956 crore) in 2004-05. For the purpose of estimating the extended NDP the contribution of women to unpaid household work has been added to the contribution of women in the SNA activities. Women's contribution to unpaid household work valued at national average earnings for the year 2004-05 is estimated in Table 4 at Rs. 703466 crore. Thus when household work is evaluated at the rate of national average earnings per worker at 2004-05 prices, women's contribution to extended NDP in 2004-05 is Rs 703466+585617 = 1289083 crore. Similarly when household work is evaluated at the rate of average agricultural earnings, at 2004-05 prices, women's contribution to extended NDP in 2004-05 is Rs 329674+585617= 915291 crore.

TABLE 6. Percentage Share of Women's Contribution in Industrial Sectors

Industrial Sectors (1)	NDP at 2004-05 Prices (Rs crore)		Percentage Share in total NDP		Women's Contribution at 2004-05 Prices (Rs crore)		Share of Women's Contribution	
	99-00	04-05	99-00	04-05	99-00	04-05	99-00	04-05
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Agriculture, etc	498712	527289	24.1	19.9	184422	205836	41.4	35.1
Mining and quarrying	58323	70464	2.8	2.7	9478	11832	2.1	2.0
Manufacturing industries	276304	346495	13.4	13.1	74453	106231	16.7	18.1
Electricity, Gas and Water supply	31940	33789	1.5	1.3	1176	1565	0.3	0.3
Construction	143056	218511	6.9	8.2	17028	25480	3.8	4.4
Trade, Hotel and Restaurants	319725	464750	15.5	17.5	40060	58055	9.0	9.9
Transport and communication	131252	219585	6.3	8.3	3600	6160	0.8	1.1
Real estate, Renting and Business service	178346	229767	8.6	8.7	14608	22510	3.3	3.8
Banking and Insurance	129998	168112	6.3	6.3	15691	23176	3.5	4.0
Other services	300840	372811	14.5	14.1	84523	124771	19.0	21.3
Total	2068496	2651573	100.0	100.0	445040	585617	100.0	100.0

It may be seen that women's share in the extended NDP goes to 31 percent in 2004-05 which is much higher than their share in NDP at 22 per cent, when agricultural earnings rate are used to evaluate the unpaid household work. When we use the national average earnings per worker for evaluation of unpaid household work, women's share in the extended NDP goes to 38 per cent in 2004-05. There seems to be some fall in the women's share in the extended NDP in comparison to NDP during 1999-2000 to 2004-05 (32 per cent to 31 per cent) when agricultural

earnings per worker are used for evaluation. This is largely due to stagnancy of real agricultural earnings during 1999-2000 to 2004-05. The slight increase in the women's participation rates in the working force (37 per cent to 39 per cent) has not brought about any appreciable improvements in their overall position.

TABLE 7. Extended NDP and Women's Contribution in it at 2004-05 Princes (Rs in crore)

Items (1)	1999-2000 (2)	2004-05 (3)
At National Average		
Men's contribution	2068496-445040 =1623456 (61)	2651573-585617 = 2065956 (62)
Women's contribution	576406+445040 = 1021446 (39)	703466+585617 = 1289083 (38)
Extended NDP	2644902 (100)	3355039 (100)
Women's contribution as percentage of NDP	49.4	48.6
At Average Agricultural Earning		
Men's contribution	2068496-445040 = 1623456 (68)	2651573-585617 = 2065956 (69)
Women's contribution	303880+445040= 748920 (32)	329674+585617= 915291 (31)
Extended NDP	2372376 (100)	2981247 (100)
Women's contribution as percentage of NDP	36.2	34.5

These estimates of contribution of women could be improved if time-use-studies were available at the national level for the years considered to quantify the amount of time devoted by women for the household services. The study of Jain and Chand (1982) conducted in the selected districts of West Bengal and Rajasthan reveals that about one third of the women who reported as non-worker when standard questionnaire was addressed to them, were actually found to be spending few hours each day on productive activities when their time disposition was analysed.

11. Final Use of Extended NDP by Gender

After having considered the contribution of women in NDP/extended NDP it would be pertinent to consider their role in final consumption. No such study has been attempted in the Indian context so far. Subramanian and Deaton (1991) have examined the gender effects in the consumption pattern of the people of Maharashtra using the consumption expenditure data from the 38th Round of the National Sample Survey from Maharashtra State Sample. They have estimated a fairly flexible model of Engle curves including detailed demographic variables. It has been found by them that gender plays a role in consumption patterns. Basic food stuffs, rice, wheat, other cereals, pulses, milk, meat, fruit and vegetables and sugar are either gender neutral or are consumed in larger quantities when there are more women in the household. For only two

foodstuffs, non -alcoholic beverages and processed food, there is a gender bias indicating higher male consumption.

Estimates of private final consumption are available by object like food, clothing and footwear, furniture, appliances etc. Some of these for example, food, clothing and footwear etc. can be taken to be consumed by individuals within households while others for example, furniture, utensils etc. are consumed by the household taken as a whole. Gender differentials can be applied only when an article can clearly be conceived as of need to a person. Consumption of other items can then be split up using the gender ratio in the population. It would be difficult to apportion the consumption expenditure on items like gross rent, fuel and power by gender. The share of women in (i) education and cultural services, recreation and entertainment (ii) transport and communications and (iii) medical and health expenditure would be less than those of men. For food including beverages and tobacco the average per head intakes and hence the aggregates for almost all the items in this category are known to be lower for women than for men.

In the Input-Output frame work, the GDP as final use of goods and services comprise private final consumption expenditure, government final consumption expenditure, gross capital formation and net exports. Since current capital formation is intended to enhance production and thus for future final consumption, we need not split up capital formation by gender. In the extended NDP, one option could be to determine the owners who acquired the capital assets during the period by gender. The other option could be to apply to capital the same sex ratio which is worked out for the aggregate final consumption. For apportioning the government consumption expenditure by gender one can perhaps argue with two different approaches, one is that since the government does not discriminate by gender its activities of public administration and defence, therefore, GFCE need to be apportioned by sex ratios in the population, i.e. almost equally. Alternatively GFCE need to be apportioned proportionately taking individual sub-activities of the government and the proportion to beneficiaries therein. For example, the expenditure on education may have to be divided by the enrollment of male/female students, expenditure on health may have to be divided in proportion to the male/female beneficiaries, the expenditure on law and order and prison, the expenditure may have to be divided in proportion to the inmates - where male are likely to be more in number, etc.

12. Concluding Remarks

In the estimation of GDP through production approach in a situation where activities of women have been fully taken account of, apportionment of GDP by gender is not possible. However, it is possible to apportion the GDP by gender when it is estimated through income approach. Using income approach the apportionment of the domestic product by gender has been made under certain assumptions. It is possible to attempt the apportionment by gender in the final expenditure aggregates such as PFCE, GFCE and GFCF.

It has been brought out in this presentation that the 2008 SNA is flexible. It does provide a room in the form of a satellite account where the contribution of housewives are considered in totality by extending the production boundary i.e., as extended GDP. Women's share in the NDP of Indian economy has progressively risen from 14.1 per cent in 1970-71 to 15.9 per cent in 1980-81; 17.1 per cent in 1990-91; 21.5 per cent in 1999-2000; and 22.1 per cent in 2004-05. This share really should have been little more had we captured the activities of the household

production of goods for self-consumption where women predominantly engage themselves in the production of goods.

In the concept of Extended GDP where women's contribution in the form of housewives' services are included, women's contribution in the extended NDP has been seen to be significantly higher than that of in the NDP conventionally defined in the SNA. In the estimation of GDP through production approach in a situation where activities of women have been fully taken account of, apportionment of GDP by gender is not possible. However, it is possible to apportion the GDP by gender when it is estimated through income approach. Using income approach the apportionment of the domestic product by gender has been made under certain assumptions. It is possible to attempt the apportionment by gender in the final expenditure aggregates such as PFCE, GFCE and GFCF.

A SAM approach integrates the distributional dimension within the system of social accounts reflecting interrelationship among employment, distribution of income and structure of production. Gender information can be usefully incorporated in the framework of SAM by including gender-distinguished statistics. Thus if household labour is classified according to gender, SAM model would be useful in analyzing issues of income distribution.

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