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Implementation of 2008 System of National Accounts - Challenges

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Abstract

In implementing recommendations of System of National Accounts, 2008 (*2008 SNA*), various developing countries are facing several challenges on account of the large volume of quality data from various producing industries producing market and non-market outputs and its uses by the industries as intermediate use and categories of final uses as final consumption expenditures by General Government, Non-profit Institutions serving Households and Households, Gross Capital formation comprising Gross Fixes Capital Formation, Changes in Inventories (Stocks) and Valuables, and net Exports for constructing a balanced Supply and Use Tables (SUT) which is must for attempting the various income and accumulation accounts as a sequence of accounts without any statistical discrepancies/errors and omissions. Any statistical discrepancies/errors and omissions that appear in the supply and use of various products is to be reconciled in the SUT and SUT made an integral part of the compilation of national accounts statistics. There are a large number of other issues which also needs attention to implement recommendations related to conceptual, classifications, production and asset boundaries, new financial instruments, details of institutional sector accounts and so on; however we shall concentrate mainly on issues related to SUT.

Key words: 2008 System of National Accounts, Supply and Use Tables, Production Boundary, Gross Domestic Product, Final Consumption Expenditures, SUT Reconciliation, Balanced GDP

1. Introduction

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

The System of National Accounts (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

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perceptions about the working of an economy. The 2008 SNA may be implemented at different levels of aggregation: at the level of individual economic agents, from institutional units to the level of the total economy. Each account 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 System of National Accounts (SNA). For example, the 1953 SNA, the first one, set out a standard national accounting system in order to provide a framework for reporting national income and product statistics which is of applicability and it did influence the development of national accounts statistics all over the world. The 1968 SNA as a result of revision was an elaborate system giving emphasis of 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 much more elaborate and comprehensive system harmonized with other statistical systems such as Balance of Payment Statistics, Government Finance Statistics, etc. The 1993 SNA was considered a major advance in national accounting. The United Nations Economic and Social Council by its Statistical Commission 27^{th} session recommended that member countries consider adopting the recommendations of the 1993 SNA as the international standard for the compilation of their National Accounts Statistics, to the extent possible, to promote the integration of economic and related statistics as an analytical tool and in the international reporting of comparable national accounts statistics. In Nineties the socialist countries were following the Material Product System (MPS) where services in general were not taken into account, but the 1993 SNA was recommended to be adopted by all the countries. The ISWGNA treated such countries which were in transition (from MPS to SNA) as special case. In 2003, the UNSC called for an update of the 1993 SNA to bring the SNA into line with new economic environment, advances in methodological research, and needs of users but without making fundamental or comprehensive changes to the 1993 SNA that would impede its implementation. The task was assigned to the ISWGNA which ultimately brought out the draft update with the help of an Advisory Expert Group. In 2008 the UNSC adopted draft of Volume 1 of the revised SNA. The revised SNA named as 2008 SNA (latest revision). Volume 2 of the 2008 SNA was adopted by the UNSC in February 2009 and the latest international Standard was published in single volume as 2008 SNA. The history of SNA combines two concerns; the development of national accounting; and the internationalization of statistical concerns. The internationalization history, in turn, encompasses two concerns, the comparability of economic statistics and the development of international standards and guidelines.

As per SNA the national accounts basically encompasses the production, generation of income, allocation of primary income, 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.

1.2. Gross Domestic Product

Gross Domestic Product (GDP) of a country, by definition, is equal to the sum of the gross value added of all resident institutional units engaged in production plus any taxes less any subsidies on products not included in the value of their output. So, gross value added by all production activities within the geographical boundary of a country is not its GDP because it may exclude some of the production of a resident institutional unit taking place abroad. Conversely, some of the production within the country may be attributable to foreign institutional units. An institutional unit is said to be resident within the economic territory of a country when it maintains a center of economic interest in that territory - that is, when it engages or intends to engage in economic activities or transactions on a significant scale either indefinitely or over a long period of time, usually taken as one year. In measuring the output, it is essential to take account of all the goods and services produced during the period whether these are marketed (i.e. exchange for money) or bartered (i.e. exchanged for other goods and services) or used for self-consumption (e.g. agricultural products consumed by the farmers). This measure should be such that production of any particular item is not counted twice. The 20008 SNA as also the 1993 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 domestic product.

There are three approaches used in the measurement of GDP. First, known as production approach, where the gross value added (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, which is always at market prices. 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 (CE)), Natural resource (rent), Financial resource (interest), and Produced resource. 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 GDP by income approach. Without CFC the income generated is the net domestic product (NDP), the taxes less subsidies on products are considered as part of income in the system. The third approach of the estimation of GDP is the expenditure approach which consists of the final bill of goods and services. Thus, 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 (NPIHs FCE), 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 difference between the GDP and Gross National Income (GNI) is the net primary income earned from abroad (primary income receivable less primary income payable). The popular term national income is the Net National Income (NNI) at basic prices. 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. Basically, the production approach is followed in the sectors of agriculture, forestry, fishing, mining and manufacturing. The income approach is followed in the services sectors.

2. Macro-economic aggregates in 2008 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 and equivalence of the value of production of goods and services, income generated in production and expenditure on final uses of products. 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, use of income account can then be attempted as under.

Production: In the SNA, the measure of production (in 'gross' terms) 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 engaged in undertaking various economic activities 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 are placed on left hand side and resources on the right hand side. The *Production Account* is as follows where GVA or GDP (when taxes less subsidies on products are included) 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 (gross) 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 (investment income); 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. The *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). Thus

GNI = primary income generated in the domestic economy (GDP) + (net) primary income receivable from RoW

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

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

The Secondary Distribution of Income Account is presented below showing GNDI as the balancing item

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

Use of Income: The GNDI the available income is spent by the households, government and NPISHs on final consumption. The balance is the gross saving

Gross Saving = GNDI- Final Consumption Expenditure

The Use of Income Account is presented below showing Gross Saving as the balancing item

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

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* are presented below showing 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

Summarizing above in short the main identities in the System of National Accounts, 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)

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

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

Production-side identity:

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

Where product (t-s) denotes taxes on products less subsidies on products; and (t-s) on imports denotes taxes on imports less subsidies on imports.

Income-side identities:

$$GDP_{mp} \equiv (CE + OS + MI) \text{ generated in domestic enterprises} + \text{Product (t-s)} + \text{(t-s) on imports} \quad [3]$$

Where CE denotes compensation of employees, OS denotes operating surplus, and MI denotes mixed income, the mix of CE and OS due to self-employed/ own account enterprises.

GNI ≡ (CE + OS & MI) generated in domestic enterprises
+ Product (t-s) + (t-s) on imports
+ CE from RoW (net) + PI from RoW (net) [4]

GNDI ≡ GNI + (net) current transfers
+ (Net) taxes on income and wealth from RoW [5]

Expenditure-side identities:

GDP_{mp} ≡ PFCE + GFCE + GFCF + CII
+ Acquisition less disposal of valuables + X – M [6]

Gross Savings ≡ GNDI – (PFCE + GFCE) [7]

implies

Net lending from RoW ≡
Gross Savings + (net) Capital transfer receivable
- (GDCF + acquisition less disposal of valuables)
- Acquisition less disposal of non-produced non-financial assets [8]

SNA Framework- Sequence of Accounts: SNA framework basically reflects the economic processes through sequence of accounts that provides an overview of a given economy. Sequence of Accounts is the core of the accounting framework and is structured by institutional sectors (including ROW) in three sub-sets of accounts. Three subsets of Accounts are: Current accounts, Accumulation accounts and Balance sheet accounts. Institutional sectors are Corporate Financial, Corporate Non-financial, Government, Non-Profit Institutions serving Households, and Household sector and sequence of accounts are to be compiled for each of the institutional sectors.

Current accounts: Current accounts record production, distribution and redistribution of income. This subset consists of

Production account ← identity [2]
Income accounts comprising:
Generation of income account ← identity [3]
Allocation of primary income account ← identity [4]
Secondary distribution of income account ← identity [5]
Use of income account ← identity [7]

Accumulation accounts: These accounts record all changes in assets and changes in liabilities:
Capital and Financial account ← identity [8]

Other changes in assets account includes, Other changes in volume of assets account and Revaluation account. The Balance sheets record the stocks of assets and liabilities and the difference between them

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.

3. Production Boundary in the 2008 SNA

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;
(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.

With regard to own account production of goods by households, the 2008 SNA (like 1993 SNA) has removed the 1968 SNA limitations which excluded the production of goods not made from primary products, the processing of primary products by those who do not produce them and the production of other goods by households who do not sell any part of them on the market.

As indicated earlier 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, (vi) weaving of cloth, tailoring, etc., (vii) production of footwear, production of pottery, utensils, making furniture and furnishings and all other productive activities of similar type.

4. Consolidated Accounts in the 1968 SNA

It may be mentioned that as per 1968 SNA, countries were not required to reconcile supply and use of goods and services in the framework of Supply and Use Tables as an integral part of compiling national accounts. Reconciliation of supply and use of goods and services (commodities) was thus not a pre-requisite for compilation of the Consolidated Sets of Accounts that had provisions for errors as statistical discrepancies/ omissions as shown below.

Account 1: GROSS DOMESTIC PRODUCT AND EXPENDITURE

1.1	Net domestic product at factor cost (3.6)	1.6	Government Final Consumption Expenditure (3.1)
1.2	Consumption of fixed capital (5.6)	1.7	Private Final Consumption Expenditure (3.2)
1.3	Indirect taxes (3.9)	1.8	Gross Fixed Capital Formation (5.1.1)
1.4	*Less* Subsidies (3.10)	1.9	Change in Stocks (5.1.2)
		1.10	Exports of goods and services (6.1)
		1.11	*Less* Imports of goods and services (6.7)
		1.12	Discrepancies
1.5	**Gross domestic product (1.13)**	**1.13**	**Expenditure on GDP (1.5)**

Account 3: NATIONAL DISPOSABLE INCOME AND ITS APPROPRIATION

3.1	Govt. Final Consumption Expenditure (1.6)	3.6	Net domestic product at factor cost (1.1)
3.2	Private Final Consumption Expenditure (1.7)	3.7	Compensation of employees from ROW, net (6.2-6.8)
3.3	Saving (5.5)	3.8	Property and entrepreneurial income from ROW, net (6.3-6.9)
3.4	Statistical discrepancies	3.9	Indirect taxes (1.3)
		3.10	*Less* Subsidies(1.4)
		3.11	Other current transfers from ROW, net (6.4-6.10)
3.5	**Appropriation of national disposable income (3.12)**	**3.12**	**Disposable income (3.5)**

Account 5: CAPITAL FINANCE

5.1	Gross Capital Formation	5.5	Domestic saving (3.3)
5.1.1	Gross Fixed Capital Formation (1.8)	5.6	Consumption of fixed capital (1.2)
5.1.2	Change in Stocks (1.9)	5.7	Capital transfers from the ROW, net (6.15)
5.1.4	Errors and Omissions		
5.2	Purchase of intangible assets from ROW, net (6.18)		
/5.3	Net lending from the ROW, net (6.20-6.16)		
5.4	**Gross accumulation (5.8)**	**5.8**	**Finance of Gross accumulation (5.4)**

Account 6: EXTERNAL TRANSACTIONS

	Current transactions		
6.1	Exports of goods and services (1.10)	6.7	Imports of goods and services (1.11)
6.2	Compensation of employees from ROW (3.7)	6.8	Compensation of employees to ROW (3.7)
6.3	Property and entrepreneurial income from ROW (3.8)	6.9	Property and entrepreneurial income to ROW (3.8)
6.4	Other current transfers from ROW (3.11)	6.10	Other current transfers to ROW(3.11)
6.5	Adjustment of merchandise exports to the change of ownership basis	6.11	Adjustment of merchandise imports to the change of ownership basis

		6.12	Surplus of the nation on current accounts
6.6	Current receipts (6.1-6.5)	6.13	Disposal of current receipts
	Capital transactions		
6.14	Surplus of the nation on current accounts	6.18	Purchase of intangible assets from ROW, net (5.2)
6.15	Capital transfers from the ROW (5.7)	6.19	Capital transfers to the ROW (5.7)
6.16	Net incurrence of foreign liabilities (5.3)	6.20	Net acquisition of foreign financial assets (5.3)
6.17	**Receipts**	**6.21**	**Disbursements**

5. Supply and Use Tables

The Supply and Use Tables (SUT) provide the framework for estimating GDP consistently from both the production and expenditure side. The balanced SUT provides consistency and coherency among the first three accounts of the SNA framework, namely Goods and Services Account, Production Account by industry and Generation of Income Account by industry. The SUTs are based on the principle that the amount of the product available for use within the economy must have been supplied either by domestic production or by imports. The amount of product supplied must be used in the same accounting period for either or both of intermediate consumption and final uses which comprise final consumption expenditure by households, NPISH and General Government, Gross Capital Formation and exports.

SUT is an integrated, first and important part of SNA which depicts interrelationship of industries in an economy with respect to the production and uses of their products as well as imports and exports. With a complete set of product balances SUT can be created. It exists in pairs with common valuation (usually purchaser's price) and level of detail for products identified. Looking into the structure of SUT, each industry (or industry group) is listed across the top in two tables depicting outputs produced in the Supply table and depicting inputs that are consumed in the Use table. SUT is often advocated as a compilation tool for (a) data checking and reconciliation, and (b) data gap filling.

As mentioned earlier, following 1968 SNA, countries were not reconciling supply and use of goods and services in SUT. However since the 2008 SNA requires reconciliation of supply and use of all products in the framework of SUT to obtain a balanced GDP that is used first as proxy of income and then used for deriving the sequence of current and accumulation accounts. Thus for implementing recommendations of the 208 SNA the foremost challenge for countries is to make the SUT as an integral part of the national accounts compilation.

5.1. Supply Table is in the form of products (commodities) by industries matrix showing which industry supplies or make which product. Thus a row shows supply of a product (or product group) coming from main industry or other industries where it might be a by- product or from the rest of the world as imports. To make the supply of a product at purchaser's price adjustment is made by adding the taxes less subsidies on the product and trade and transport margins. Whereas industries are classified as per International Standard on Industrial Classification (ISIC) in columns the products in rows are classified as per Common Product Classification (CPC). Imports are also to be classified as per CPC, harmonized to products considered though in the source data they would be as per trade classification (HS or SITC). Besides, the industries are to

be further classified for producing market products, products for own final use and non-market products because the valuation of products coming out of industries is different for market, non-market and own final use. A simplified supply table is presented below where industries is shown in one column actually comprising of several columns representing homogeneous industry groups by ISIC and further classified by market/non-market products. Similarly products are shown in rows of several homogeneous products classified by CPC which are recorded in actual. It is just for illustration of the structure.

A *Simplified Supply Table*

Supplies	**Industries** **1 2 3……n**	**Imports ROW**	**Adjustments for Taxes on products, Trade, Transport margins**	**Total**
Product 1	Output by product and industry	Imports by products	Taxes on products, Trade, Transport margins	Total Supply by product
Product 2				
Product 3				
Product m				
Total	**Total output by industry**	**Total imports**		**Total Supply**

5.2. Use Table is in form of a rectangular matrix with four quadrants. The upper left quadrant depicts use of different products by different groups of producing industries (units), thus showing intermediate consumption of industries (in columns) by products (in rows). The upper right quadrant shows final uses of different products (in rows) under final consumption expenditure (Households, Non-profit Institutions serving HHs, General Government in separate columns), Gross Capital formation (Gross fixed Capital Formation, Change in Stocks, and Valuables in separate columns) and Exports. The lower left quadrant contains information of gross value added to show components of income generated in different industry groups. The lower right quadrant is empty. A simplified use table is presented below where industries are shown in one - column actually comprising of several columns representing homogeneous industry groups by ISIC. Products are shown in rows classified by CPC presenting intermediate consumption of products by industries which are recorded in the use table. It is just for illustration of the structure.

A Simplified Use Table

Uses	**Industries** **1 2 3……n**	**Final Consumption Expenditure**	**Gross Capital Formation**	**Exports (ROW)**	**Total**
Product 1 **Product 2**	Intermediate Consumption by product and industry	Final Cons. Exp. (HHs, NPISH, Gen Govt.) by product	Gross Capital Formation (GFCF, CIS, Valuables) by product	Exports by product	**Total Use by product**
Product 3					
Product m					
GVA by Components	Gross Value Added by industry				
Total	**Total inputs by industry**				

The products and industries in the use table are classified the same way as in the supply table. Both supply and use tables are product by industry tables adopting same classifications for products as well as industries, the basic difference between the two tables is that whereas supply table contains information on output, the use table contains information on intermediate inputs. In the use table allocation of exports requires the same conversion of SITC/ HS codes to CPC used for products desegregation. The final consumption is categorized into those of Households, NPISHs and General Government; and Gross Capital Formation into gross fixed capital formation, changes in stocks and acquisition less disposal of valuables. All final use categories in columns record information product-wise as per CPC to have harmonized row entries. The value added part of the use table in the lower left quadrant shows Gross Value Added by industry also showing components of total gross value added/GDP as compensation of employees, mixed income, net operating surplus, consumption of fixed capital and taxes less subsidies on production and imports, separately for each industry irrespective of the industry providing market production, production for own final use, and non-market production.

The upper part of the use matrix showing the flow of products classified as per CPC into the intermediate and final use quadrants can be valued at purchasers' prices or at basic prices. From the source data it will be at purchasers' prices and for converting it to basic prices we need to identify trade and transport margins and taxes (less subsidies) on products for each of the cell entries, remove and place these in the columns against the rows of trade, transport services and an additional row made for taxes on products. Two identities hold, one the identity by industry [*Output by industry = Input by industry*] and the other the identity by product [*Total supply by product =Total use by product*].

5.3. Reconciliation of Supply and Use of Products

Reconciliation of supply and use of products can be undertaken either manually, or mechanically, or a combination of both. If estimate of supply of a product coming out from Supply Table is considered firm, the estimate of the use of the product in the Use Table is to be reconciled by making adjustments in one or more categories of final uses of the product, depending upon the lack of confidence on account of the quality of the estimates. Unfortunately there is no statistical knowledge of the errors (sampling and non-sampling) in the categories of final use estimates in the present scenario of national income estimation practices. It is thus a challenge to national accounts statisticians to identify weak and robust estimates according to the data collection procedure followed and estimation methodology adopted in various sectors of the economy for arriving at estimates of supply and uses of products, while undertaking the reconciliation exercise. For example, aggregates like general government final consumption expenditure, exports and imports are considered more firm than the estimates of household/ private final consumption expenditure, gross fixed capital formation and the weakest one appears to be estimate of change in inventories. The mechanical methods popularly known as the RAS or Modified RAS involve the pro-rata adjustment in the rows and columns of the inter-industry transactions matrix (keeping firm figures as fixed in the Modified RAS), where sum of the row totals and column totals is the same. For practical reasons in order to have only logical adjustments, it is considered advisable to apply mechanical methods (RAS or Modified RAS) only when discrepancy between supply and use is small, say, less than five per cent. Thus reconciliation exercise should begin with manual method to take account of larger discrepancies followed by mechanical method.

Since the detailed data on supply and use- both intermediate and final use categories come from various sources of very different quality, it is not considered advisable to assume all aggregates as firm. Interestingly in the Indian national accounts statistics the final use category Private Final consumption Expenditure (PFCE) that is supposed to include final consumption expenditure of both the Households and the NPISH, is compiled following commodity flow approach which means that all errors and omissions are already included the PFCE and that supply and use of all consumable products in the economy should match in the exercise of compiling the SUT. Similarly in the present Indian national accounts statistics, the compilation of gross fixed capital formation by type of assets and in particular the construction follow concept of commodity flow that is supposed to ensure supply and use of all capital goods as well as basic materials that go in the construction activity as inputs to match in the exercise of compiling the SUT. Despite following commodity flow approach in the estimation of PFCE, GFCF and construction output most developing countries (the ones which follow similar methodology of estimation of various aggregates) including India face acute challenge in the reconciliation of supply and use of products while undertaking exercises on SUT compilation. The answer to the question as to why the supply and use estimates of various products do not match despite countries following commodity flow approach in the estimation of PFCE, GFCF and construction output is that in the compilation of various aggregates a large number of rates and ratios are used at various stages and those may not hold true at the time of reconciliation exercise. The rates and ratios may relate to intermediate consumption ratio of a product, input-output ratios, product-wise break-up of raw materials, chemicals, packing materials, category of

others, consumables, 'rent, rates, taxes', office expenditure, partly capital goods, parts of capital and partly capital goods, trade transport margins, index of prices and volume, and so on.

Gap between supply and use of products could arise on various counts, like miss-classification of the product, under-estimation of output, over-estimation of final consumption, miss-appropriation of aggregated intermediate inputs, outdated rates, ratios, IO coefficients, type studies and so on. Some real examples may be quoted for illustration. While undertaking reconciliation exercises for 2011-12 SUT a huge gap was found in the case of water supply. Deeper examination revealed that the hydro-electric generation company consumed a huge amount of water. This water was not purchased from municipal corporation supplying water (the output) but purchased from Government Irrigation Department which was not considered a part of output of water supply. Another big gap was noticed in the case of mica, the export figure was much bigger than the production. Deeper examination revealed that it was a case of miss-classification as mica exported was from manufacturing and not mining.

6. Other Challenges

Beside the SUT as an integral part of the compilation of national accounts there are several other challenges that the national accountant has to face for implementing the 2008 SNA recommendations. These challenges essentially arose from the 44 issues which were considered in the 1993 SNA updating (Annex 1). These issues basically relate to conceptual, classifications, production and asset boundaries, new financial instruments, details of institutional sector accounts and so on and can be classified under (1) Specification of statistical units and Institutional Sectoring (2) Enlargement of scope of the production boundary (3) Extension and further specification of assets, capital formation and CFC (4) Transactions relating to Government and Public sector (5) Change in the treatment and definition of Financial instruments and assets.

Some examples of 2008 SNA recommendations that have been implemented are: Producer unit undertaking ancillary activities recognized as a separate establishment, Branch of a non-resident unit recognized as an institutional unit, Special purpose entities (units with no employees and no non-financial assets, little physical presence, a subsidiary and often resident in a territory other than the territory of residence of its parent) treated as an institutional unit and allocated to sector and industry according to its principal activity, holding companies allocated to the financial corporations sector and treated as captive financial institutions even if all of their subsidiary corporations are non-financial corporations, Definition of financial services enlarged, Sub-sectoring of the financial corporation sector revised to reflect new developments in financial services, markets and instruments, Research and Development expenditure capitalized, Method for calculating financial intermediation services indirectly measured (FISIM) using reference rate, Output of the Central bank (RBI) using cost approach for non-market activities and placing in financial corporate sector, output of the non-life insurance activity calculated using adjusted claims and adjusted premiums supplements, Asset boundary extended to include research and development, Asset category "computer software" to include databases purchased from market or developed in house, Originals and copies of intellectual property products recognized as distinct products, Exceptional payments from government to public quasi-corporations to cover accumulated losses treated as capital transfers. Some examples of 2008 SNA recommendations that could not be implemented are: Valuation of output for own final use by households and

corporations to include a return to capital, Extension of the assets boundary and government gross capital formation to include expenditure on weapons systems, Concept of capital services introduced, Water resources treated as an asset in some cases, Treatment of guarantees, Treatment of securities repurchase Agreement, Transactions related to index-linked debt securities, Treatment of debt instruments indexed to a foreign currency, Unallocated gold accounts treated as financial assets.

7. Scenario at Regional Level- Challenges

The 2008 SNA does give clear guidelines for constructing SUT at the national level and compiling national sequence of income and accumulation accounts but unfortunately no specific guidelines are provided for regional SUT and regional accounts. Some Countries (Australia, U.K.) prepare regional accounts purely by allocation. In India the official guidelines on Regional Accounts are pretty old as dates back to 1976 and no official committee has been setup to update the guidelines for regional accounts despite updating of international Standard SNA from 1968 to 1993 to 2008. Thus the National Statistical System needs to pay urgent attention to constitute an Expert Group/ High Level Committee to review the guidelines for Regional Accounts. It is important to note that for implementing 2008 SNA recommendations on preparing sequence of accounts it is necessary to reconcile the supply and use of products to obtain a reconciled GDP at market prices. Thus at regional level special exercises on reconciling of supply and use of products need to be taken up as challenge. Once a reconciliation procedure is made feasible, exercises on regional SUT could be undertaken by the State Directorates of Economics and Statistics (DESs) to obtain their balanced Gross State Domestic Product (GSDP).

A regional SUT in principle should appear exactly similar to the one for the economy elaborated above with of course, a redefined interpretation of exports/ imports from other regions (States) and other countries. However there would be detailed data availability problems. In regional SUT exports could be to the other regions within the country or to the other countries. Similarly imports could be from the other regions within the country or from the other countries. Important point to be noted is that in an open economy for a region exports/ imports information is not readily available with the official statistical system. Thus special surveys are required to obtain such information of export/ import for a region to/from other regions in the economy as well as from other countries (Rest of the World).

State DESs at present compile only GSDP estimates for their States. Until 2015 State DESs were compiling GSDP at factor cost prices, which is equivalent to GVA only, since taxes on products less subsidies on products at State level were not compiled. In short at State level only estimates of GSDP by economic activity are available. None of the State DES is compiling estimates of final consumption expenditures. Only major States are compiling estimates of GFCF. Even the States that prepare GFCF estimates are mostly doing for public sector only. At District level GDP estimates have been compiled for several States in connection with Human Development Reports supported by UNDP. Such estimates were basically obtained by allocation of State level GSDP estimates.

As regards data availability on final consumption expenditures (FCE), Estimates of Household FCE at State level can be obtained using the results of Household Consumption

Expenditure Surveys conducted by the NSSO. Estimate of NPISH FCE at regional level can be worked out either applying a proportion of PFCE to HFCE at national level or assuming ratio of PFCE to Gross Domestic Product invariant at regional and economy level. Estimates of GFCE can be obtained through the analysis of the State government and the local bodies' budget documents of the State and taking central government expenditure allocation for the State.

8. Concluding Remarks

i. In implementing recommendations of *2008 SNA* most developing countries are facing several challenges on account of the large volume of quality data from various producing industries producing market and non-market outputs and its uses by the industries as intermediate use and categories of final uses as final consumption expenditures by General Government, Non-profit Institutions serving Households and Households, Gross Capital formation comprising Gross Fixes Capital Formation, Changes in Inventories (Stocks) and Valuables, and net Exports for constructing a balanced Supply and Use Tables (SUT) which is must for attempting the various income and accumulation accounts as a sequence of accounts without any statistical discrepancies/errors and omissions.

ii. Any statistical discrepancies/errors and omissions that appear in the supply and use of various products is to be reconciled in the SUT and SUT made an integral part of the compilation of national accounts statistics.

iii. There are number of other issues which urgently need attention to implement recommendations related to conceptual, classifications, production and asset boundaries, new financial instruments, details of institutional sector accounts and so on.

iv. At regional level international guidelines for regional accounts are not available. The National Statistical System need to constitute an Expert Group to provide updated regional accounts guidelines.

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Central Statistical Organisation (1976). *Final Report of Committee on Regional Accounts*. Department of Statistics, Government of India.

Annexure 1

List of issues considered in 1993 SNA updating- The Challenges

1	Repurchase agreements (IMF);	2	Employer retirement pension schèmes (IMF)
3	Employee stock options (Eurostat);	4	Non-life insurance services (OECD Taskforce)
5	Valuation of non-performing loans, loans and deposits (IMF-EDG, BOP Committee)	6	Financial services (Taskforce on financial services), Allocation of output of central bank (IMF)
7	Taxes on holding gains (Canberra II);	8	Interest under high inflation (UNSD)
9	Research and development (Canberra II);	10	Patented entities (Canberra II)
11	Originals and copies (Canberra II);	12	Databases (Canberra II)
13	Other intangible fixed assets (Canberra II);	14	Cost of ownership transfer (Canberra II)
15	Cost of capital services: production account (Canberra II)	16	Government owned assets (Canberra II);
17	Mineral exploration (Canberra II)	18	Right to use/exploit non-produced resources (Canberra II and BOP Committee)
19	Military expenditures (Canberra II);	20	Land (Canberra II)
21	Contracts and leases of assets (Canberra II);	22	Goodwill & other non-produced assets (Canberra II)
23	Obsolescence & depreciation (Canberra II);	24	Build-own-operate-transfer schemes (Canberra II)
25	Ancillary units (UNSD); Institutional units: (Holding companies, special purpose entities, trusts; Multi-territory enterprises; Unincorporated branches Recognition (BOP Committee); Privatization, restructuring agencies, special purpose vehicles (SPVs) (TFHPSA)		
26	Cultivated assets (Canberra II);	27	Classification and terminology on assets (Canberra II)
28	Amortization of tangible and intangible non-produced assets (Canberra II);	29	Assets boundary for non-produced intangible assets (Canberra II)
30	Definition of economic assets (Canberra II);	31	Valuation of water (Canberra II)
32	Informal sector (UNSD/Delhi Group);	33	Illegal and underground activities (UNSD)
34	Super dividend, capital injections and reinvested earnings (government transactions with public corporations (earnings and funding)) (TFHPSA)	35	Tax revenues, uncollectible taxes, and credits (recording of taxes) (TFHPSA)
36	Private/public/government sector delineation (sectorization boundaries) (TFHPSA)	37	Guarantees Activation (contingent asset) and constructive obligation (TFHPSA, BOP Committee)
38	Transaction concept: Change of economic ownership; Migrant transfers- Assets, liabilities and personal effect of individuals changing residence (BOP Committee);		

Application of accrual principles to debt in arrears (UNSD)

39 Residence: Meaning of national economy, Predominant center of economic interest (BOP Committee) Non-permanent workers and entities with little or no physical presence (UNSD)

40 Goods sent abroad for processing (BOP Committee)

41 Merchanting BOP Committee November 2005(BOP Committee)

42 Retained earnings of mutual funds, insurance companies, and pension funds (BOP Committee)

43 Interest and related issues: Treatment of index linked debt instruments; Interest at concessional rates;
Fees payable on securities lending and gold loans (BOP Committee)

44 Financial assets classification (BOP Committee)

[Note: The institution that prepared the agenda papers on the issue is shown in parenthesis]