
UNIT 23 NATIONAL ACCOUNTS AND THE ENVIRONMENT

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23.0 OBJECTIVES

After going through this unit, you will be able to:

- explain the relationship between environmental protection and pollution;
- describe the concept of environmental defensive expenditure and its various components;
- list the environmental physical indicators;
- distinguish between internal and external cleansing services;
- classify environmental production services in different groups; and
- discuss the objectives of environment accounting system.

23.1 INTRODUCTION

Environment protection and pollution control go hand in hand. It is the pollution in different forms which affect the environment and make living hazardous.

One of the major worries today particularly in the urban areas is the problem of pollution. The problem has become so acute that at the directive of the Supreme Court the automobile industry has been forced to follow strict exhaust emission norms. The principle of sustainable development has directed efforts towards ensuring clean air, pollution control, water protection, noise abatement, waste management etc. All this requires extensive organizational management and services of environmental scientists. Environmental science covers resource management - particularly forests, water and wildlife, industry and social sciences.

One of the most important resources that help sustain life on earth is forests. Therefore, proper maintenance and management of forests and wildlife within forest is of vital importance for pollution control. The work involves protecting the forests and waste lands, preventing deforestation and encouraging afforestation, apply engineering principles to control land, minimise environmental hazards particularly those causing, water, air and soil pollution of surrounding areas and treatment and elimination of toxic and polluting wastes.

23.2 NEED FOR ENVIRONMENTAL DATA

It is estimated that by the turn of the century air pollution from large-scale industries would go up nine times, waste discharge four times, and hazardous waste 14 times. It is also known that the pressure of demand for natural and environmental resources has increased enormously in the recent decades, due to economic growth and larger population. While the scarcity of natural resources like oil has been recognised since quite some time back, it is only recently that environmental resources like air and water are being considered to be economic goods. A shortage in near future may be a realistic possibility, and this worry is of course at the root of the proposals to spend significant amount of resources to collect data about the environment. The willingness to collect data however is not enough, the absence of market prices for environmental resources like air and water implies that it is difficult to integrate data on physical assets with data on standard economic activities.

In the sphere of the problems of ecologically sustainable development, environmental *defensive expenditures* may be defined as expenditures due to qualitative degradation of the environment caused by the economic activities and the expenditures aimed at improving the use of natural resources. Thus, environmental defensive expenditure would include (a) costs of management and protection of the environment (preventive and restorative actions); (b) expenses sustained to avoid the consequences of environmental degradation, (c) expenditures sustained to compensate for the consequences of the environmental degradation.

It will be desirable to identify which natural resources and pollutants are the most important, to gather data on them and finally to create a data bank containing information on the physical, quantitative and qualitative nature of

stocks and flows. This would enable the monitoring of the most significant elements of the economy/environment relationship. This quantitative data, organised in satellite accounts, could be successively integrated into the framework of the national accounts using separate items which illustrate how the natural resources are used in the economic system and the efficiency of the defensive expenditures in terms of pollution abatement. By organising the data into satellite accounts, the traditional structure of the national accounts could be maintained, and the quantitative base necessary for eventual modifications of these aggregates could be developed.

23.3 PRODUCTION ACTIVITIES AND ENVIRONMENTAL ISSUES

23.3.1 Effect of Production Activities on Environment

In recent years, as a result of new legislation and greater social awareness about the ecological damage caused by production and polluting products, increasing, firms have been paying increasing attention to environmental issues. In an effort to meet the challenge of managing the environment strategically, firms have adopted new tools designed for the quantitative and qualitative analysis of the environmental impact of their activities. In fact, the relation between firms and natural resources is characterised by the modifications that productive activities cause to ecosystems, not only at the local level, but also over vast geographical areas.

Before production starts, firms acquire intermediate consumption goods, both through the extraction of raw materials from their natural site (extraction of mineral resources, forest use and fishing) and through purchase of marketed goods produced by other firms, thus reducing, directly or indirectly, the stock of the natural resources.

During the productive process, various polluting by-products (such as atmospheric emissions, waste water, solid waste and noise) are discharged into the environment.

But the global environmental impact of firms' activities does not only depend on the physical characteristics of the product, the type of production process used and the level of activity. Firms may also adopt appropriate strategies to manage or reduce this impact or to protect the natural environment. These efforts can be measured in monetary terms in order to evaluate the costs associated with activities specifically devoted to environmental management and protection. These activities include depuration of gaseous emission, industrial water purification, appropriate waste disposal and the use of less polluting inputs and production techniques.

23.3.2 Environmental Problems

Environmental themes can be used as an inventory framework of current environmental issues. The environmental themes lead to a limited number of physical environmental indicators:

- i) A decreasing concentration of ozone in stratosphere leads to a higher exposure to UV-B radiation which may have negative effects on human health and ecosystems.

- ii) Extensive deposition of acid substances leads to changes in the composition of soil and surface waters. This process is likely to cause major damage to ecosystems, buildings and crops.
- iii) The accumulation and removal of waste is a major environmental problem and needs to be tackled.
- iv) Finally, the net change in the combined proven oil and gas reserves during the reference year is reflected in the last indicator. The balance of extraction and all other changes in proven reserves determines this change.

Most of the environmental themes allocate pollutants to certain environmental problems and are therefore an empirical reflection of highly complex cause - effect relationship in the environment. Many environmental losses are the result of a combination of different types of environmental stresses. The actual environmental effects caused by the single environmental theme are in general difficult to measure. An objective determination of the relative seriousness of a particular environmental theme is even more troublesome. Social preferences are crucial in this respect.

23.3.3 Environmental Cleansing Services

Environmental cleansing services can be distinguished under two different categories: external and internal environmental cleansing.

External cleansing services are sold to other activity units as intermediate consumption or to government or households as final consumption. These services are considered as production in national accounts. Collection and incineration of waste by cleansing companies is an example of external cleansing services. The same establishment that uses this service within its own production process produces internal environmental cleansing services. Internal environmental cleansing services are produced by the same establishment that uses this service within its own production process. These are therefore often not explicitly identifiable either as production or as intermediate consumption. If these are to be explicitly shown then both production and intermediate consumption will become higher but net domestic production and other related aggregates remain unchanged. Examples of household expenditure for pollution control is, say, extra costs of cars fitted with catalytic converters for protection of environment .

23.3.4 Measurement of Bad Effects on Environment

The environmental protection services could be classified under:

- 1) waste disposal;
- 2) water purification and protection;
- 3) noise abatement; and
- 4) preservation of air quality.

Other general examples which can be cited are, for example, a decreasing concentration of ozone in the atmosphere leading to higher exposure to UV-B radiation which may have negative effects on human health and ecosystems.

Similarly, extensive deposition of acid substances would lead to changes in the composition of soil and surface water resulting in major damage to ecosystems, buildings and crops. The accumulation and removal of waste is another major environmental problem which demands constant attention. The measurement and quantification of such environment related themes is not easy. One could, for example, consider indicators like emission of greenhouse gases, depletion of ozone layers, acidification and collection of amount of waste.

The environmental cleansing and pollution prevention expenditures are incurred by government, households and branches of industry. Environmental cleansing services would normally be incurred by the government while types of such expenditures incurred by the households or branches of industry have already been exemplified above. Possible ways in which environmental degradation may increase are diversion of land from forest to farming and a change in levels of fertilizer and pesticide use.

The environment gives rise to many external effects. For example, pollution and nuisances created by producers may have negative effects on final consumers. These negative effects might be estimated and recorded as negative transfers from producers to households. In order to balance these negative transfers, one possibility might be to introduce a concept of production of externalities which would result in an output of negative or positive services and the corresponding final consumption.

One has also to consider the degradation of environmental quality and consequential effects on human health and welfare and quantify the damage.

23.3.5 Data Collection Categories

The data collection and measurement would get classified as under:

- a) description of changes in environmental quality;
- b) description of human activity and its influence on environmental quality, with particular reference to:
 - i) use of renewable and non-renewable resources;
 - ii) land cover and land use;
 - iii) pollution from emissions.
- c) Description of the response to environmental damage and risks, evaluation of expected costs and benefits, description of the performance of environmental policy, with particular reference to:
 - conservation and substitution of natural resources;
 - modifications to production processes and changes in consumption;
 - direct or indirect (clean technologies) prevention and reduction of emissions and pollution;
 - conservation and protection of nature, land, flora and fauna;
 - statistics on expenditures for environmental protection;

Recent Issues

- statistics related to the management of waste and dangerous substances;
 - statistics on water quality and management.
- d) Linking statistics on transport with environmental statistics including the transport of goods and hazardous waste;
 - e) Linking energy statistics with environmental statistics;
 - f) Integrating environmental statistics;
 - g) Integrating environmental statistics into agricultural and forestry surveys;
 - h) Linking environmental statistics with statistical data related to other sectors by means of a geographical information system.

Check Your Progress 1

- 1) Explain briefly the effects of production activities on environment.

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- 2) Distinguish between internal and external environmental cleansing services.

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- 3) Name the four categories of environmental protection services.

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23.4 ENVIRONMENT AND ACCOUNTS

23.4.1 Topics in Environmental Accounting

The main objective of environment accounting system is to present, in a satellite type of accounting system, the aggregate expenditure for the management and protection of the environment in the national territory and the main components of this aggregate. The system should provide for a link between monetary aggregates and quantitative data expressed in physical units on the management and state of the environment.

A set of standardised accounts forms the basis of the system. The topics relevant from the point of view of environmental accounting are:

a) **Statistics of Waste**

This would include quantity of production of waste, expenditure and investment for collection and treatment of waste, its recycling and reuse by types of materials; disposal of waste after location of its site and capacity of the plants available for waste disposal by methods of disposal if possible, the details of transport of hazardous waste by site of loading and unloading and types of hazardous waste.

Further for collection of data and presentation of statistics on waste it will be desirable to classify by the list of organizations which manage waster disposal and identify the sectors which produce waste.

b) **Environment and Transportation**

The details of transportation will have to be collected under the heads of :

- i) infrastructure;
- ii) modes of transport;
- iii) employment;
- iv) traffic levels;
- v) energy consumption and emissions;
- vi) accidents, particularly those involving hazardous substances;
- vii) costs and prices;
- viii) other related information like noise, population's exposure to the same, expenditures required for noise reduction and taxes and subsidies levied to meet noise reduction costs.

c) **Environment and Energy**

The information should normally relate to emission of carbon dioxide from different categories of fuels i.e. liquid fuels and solid fuels. The carbon dioxide emission will have to be measured in terms of coefficients which have to be determined separately for each category of fuel.

d) **Environment and Industry**

With reference to environment in the context of industry, the following information which are of particular relevance will have to be collected:

- 1) impact of industrial activities on the environment;
- 2) use of natural resources and degradation of natural environment;
- 3) control of hazardous substances and prevention of industrial accidents;
- 4) development of economic instruments for environmental protection;
- 5) impact of environmental protection activities on job creation;

- 6) measurement of extent of emissions of air, water, soil and noise and pollutions;
- 7) measurement of industrial waste;
- 8) expenditure for environmental management and protection;
- 9) expenditure on management of renewable and non-renewable resources (water, energy);
- 10) eco-industries, eco-products and new technologies.

The annual surveys for the industrial sector should be modified to include questions on environmental issues. These should cover:

- i) Distinction between internal expenditures and purchase of outside services with internal expenditures separated into investments and current expenditures.
 - ii) Physical data related to expenditures for measures such as 'end-of-pipe' and 'integrated'.
 - iii) Data on financing represented by revenues linked to recycling and to the production originating from environmental protection measures.
 - iv) Physical data linked to environmental expenditures (emissions reduction, distinction between those obtained through "internal" expenditure and those obtained through "end-of pipe" measures).
 - v) Desegregation of physical data on emission (waste categories, interested environmental sectors).
 - vi) Quantitative measures of emissions in terms of absolute values, concentration values etc.
- e) **Environment and Agriculture**

The influence of agricultural practices on environment will have to be measured in terms of flow of those materials which are required for raising livestock, manure, its use and its impact on environmental processes such as the soil, the air and the climate. Also, the impact of fertilisers and pesticides on environmental processes, non-renewable resources, soil, water and their ecosystems. For the latter, the impact of fertilizers is specially important.

23.4.2 Data Bank for Accounts

Having identified the different types of necessary environment related information necessary, it will be necessary to take stock of all the available data, elaborate their content and finally develop proposals for data collection and their collation.

There are some practical difficulties with the collection of data for firms and households. Unlike in the public sector where potential environmental adjustments are limited to some macro aggregates, in the private sector, a more detailed surveys on single firms are needed. In fact, the data collected directly from firms may not be very reliable since only a few firms have at their disposal an environmentally-adjusted balance sheet. In this case, the data obtained has to be supplemented by engineering estimates on pollution prevention and

monitoring activities. The collection of data on households' defensive expenditures presents even more difficulties, since households do not have a balance sheet per se and the classification of expenditures is more subjective and probably more unreliable. These difficulties can be overcome by using aggregate data.

23.4.3 Environmental Defensive Expenditures in Accounts

Environmental defensive expenditures are included in national accounting, even though some relevant parts of these expenditures remain hidden because of lack of clarity in the classifications used at the aggregate level. At the aggregate level, defensive expenditures are classified as intermediate consumption (expenditures sustained by firms).

In principle, in a framework of integrated economic and environmental accounting one should take into account the connection between environment defensive expenditures and those economic activities (production, consumption etc.) which, because of their environmental impact, create a demand for these expenditures.

However, in some important cases of environmental protection activities the process of identification is complex because the relevant activities and products appear only to a small extent in the central framework classifications.

The matter is further complicated by the fact that some establishments specialise in the production of environmental protection services for delivery to other units (e.g., waste disposal, sewage treatment or goods which are used for environmental protection (e.g. filters). Other direct only part of their activity to delivering such goods and services to third parties. Moreover, an important part of environmental protection activities is internal to establishments. They are ancillary activities in the central framework and have to be externalised if one wants to measure the environmental activities more broadly.

The overall measure of gross domestic product therefore will need to be adjusted for environmental protection costs. However, the problem of gross domestic product adjustment will have to be considered together with a definition of environmental pollution level and the state of the environment during the reference period. Without this definition it is impossible to determine whether the environmental protection expenditures would improve the quality of the environment or merely maintain the existing state. This adjustment to GDP is on the basis of the internal and external expenditures for environmental protection.

23.4.4 Relation between Natural Assets and Economic Activities

It is possible in environmental accounting to record the relations between natural assets and economic activities differently, by recording the depletion of subsoil or other natural resources and the degradation of natural assets. In these approaches the economic process itself is depicted differently, and complementary or alternative aggregate are calculated.

23.4.5 Framework of Environmental Accounts (Satellite Accounts)

The analysis of an important field such as environment may benefit from building a framework to accommodate elements which are included in the central accounts.

The central framework of the SNA presents a number of characteristics which give it the advantages of an integrated accounting structure. It is exhaustive and consistent within the boundary of the economic activities it covers; that is to say, each unit, transaction, product and purpose is given a place, and only one, in the classifications and accounts of the system. Moreover, the set of concepts adopted by the system is fully coherent.

The counterpart of these benefits is that there are certain limitations as to what may be accommodated directly in the central framework. The central framework may be used in a flexible way, in order to put greater or lesser emphasis on specific aspects of economic life. However, the margins of flexibility allowed by the central conceptual framework do not permit conflicting approaches to be covered simultaneously.

It becomes desirable therefore to consider the question of satellite accounts or systems which generally stress the need to expand the analytical capacity of national accounting for selected areas of social concern in a flexible manner, without overburdening or disrupting the central system. Satellite systems or accounts allow for the provision of additional information on particular social concerns of a functional or cross-sector nature.

Thus, the satellite accounts are not only linked with the central framework of national accounts and through them to the main body of integrated economic statistics but also because they are more specific to a given field or topic, they are linked to the information system specific to this field or topic.

Environmental accounting which is of such importance as to deserve special consideration needs to be presented in a SNA satellite accounting framework. However, in the case of environmental protection activities, the process of identification is complex, because the relevant activities and products appear only to a small extent in the central framework classifications.

23.4.6 Satellite Account and SNA

The relationship between the satellite account and the central framework of the SNA implies some rearrangement of central classifications and the introduction of complementary elements that differ from the conceptual central framework without drastically diverging from the concepts on which the central framework is built. They deal with accounts specific to the given field like environmental protection expenditures. Introducing their content into the central framework would overburden it and would not be totally possible, doing it in a specific satellite accounting framework allows additional margins of flexibility. Thus, the satellite accounts and analysis concentrates on one individual field to give a full picture of it, in a systematic way, by establishing a specific accounting framework articulated with the central framework. The measurement and presentation of details of environment, its conceptualisation, measurement through expenditure and similar other means like environmental

economic accounts are best expressed through satellite accounts. Satellite account in a given field covers the analysis of uses or benefits out of the national expenditure, production and its factors, transfers and other ways of financing the uses, both in value terms and, when relevant, in physical quantities.

Environmental protection expenditure is generally defined in terms of objectives pursued through actions and programmes related to its such s waste disposal preservation of air quality, protection of other natural media, public administration in environmental affairs etc.

Notwithstanding the difficulties, the effort to integrate the SNA-through satellite account-with the most relevant information about the environment is considered to be of increasingly crucial importance. In the future new environmental problems like climate change may require even more information than what is thought to be useful at present. Active intervention of government protection authorities can be possible only if they can rely on sufficient information on the state of environmental resources. An Economic Account thus become a crucial supporting instrument for any country aiming at preventing or reducing environmental damages caused by economic growth. Economic Account involves reclassification of environment related protective expenditures which would imply subtracting from GDP a few items which can be considered as a protection against the damages to the environment caused by production of goods and services. The argument in favour of such a correction is that the level of gross domestic product may overestimate welfare to the extent that some economic activity is carried out simply to undo the negative effects of other economic activities. The environmental accounting system should be an integrated accounting system aimed at representing the relevant economic, ecological and socio-cultural phenomena. The system should be linked to the national accounting system through the environmental satellite account. The environmental satellite accounts are intended to represent statistically the entire interrelationship between the economy and the environment.

23.4.7 Objectives of Environmental Accounting

The main objective of the economic environmental accounting system proposed by the United Nations Statistical office (UNSO), is the analysis of the interrelationship between the economy and the environment.

With regard to accounting in value terms, the following are of particular importance:

- a) an analysis of the cost of protecting the environment, referring to both non-market activities (internal activities of environmental protection) and the goods and services bought in the market (external activities of environmental protection);
- b) an analysis of other costs connected with environmental degradation (which, together with the costs of environmental protection, are defined as defensive expenditures); and
- c) an analysis of the stocks and flows of renewable resources.

Environmental defensive expenditures are included in national accounting, even though some relevant parts of these expenditures remain hidden for a lack of clarity in the classifications used at the aggregate level. These

expenditures partly refer to the period when the expenditures were carried out (the accounting period) and partly to past and future periods (such as investment expenditures).

At the aggregate level, defensive expenditures are classified as intermediate consumption (expenditures sustained by firms), final consumption (private and public consumption), and investments.

In principle, in a framework of integrated economic and environmental accounting one should take into account the connection between environmental defensive expenditures and those economic activities (production, consumption etc.) which, because of their environmental impact, create a demand for these expenditures. Firms interact with natural environment in two distinct phases:

- 1) before production starts, firms acquire intermediate consumption goods, both through the extraction of raw materials from their natural site (extraction of mineral resources, forest use and fishing) and through the acquisition of marketed goods produced by other firms, thus reducing directly or indirectly the stock of natural resources .
- 2) during the productive process, various pollution by products (such as atmosphere emission, waste water, solid waste and noise) are discharged into the environment.

But the global environmental impact of firms' activities does not only depend on the physical characteristics of the product, the type of production process used and the level of activity. Firms may also adopt appropriate strategies to manage or reduce this impact or to protect the natural environment. These efforts can be measured in monetary terms in order to evaluate the costs associated with activities specifically devoted to environmental management and protection. These activities include depuration of gaseous emissions, industrial water purification, appropriate waster disposal and the use of less polluting inputs and production.

23.4.8 Approaches to Environmental Accounting

There are three main approaches to environmental accounting, and they complement and overlap each other. The first one generally referred to as *natural resource accounting*, focuses on accounts in physical terms. The second approach, which is linked to national accounts and is in monetary terms, is generally called monetary satellite accounting. It identifies the actual expenditures on environmental protection and deals with the treatment of environmental cost of natural and other assets caused by production activities in the calculation of net product. *Monetary satellite accounting* is generally more limited in coverage of environmental concerns than physical resource accounting. The third approach is a welfare oriented one. It deals with the environmental effects borne by individuals and producers other than the production causing these effects. The latter effects may often be much larger than the cost caused and do not affect net product but rather net income through transfers of environmental services.

Environmental accounting to be comprehensive has to fully cover depletion. The EUROSTAT (the European Community Statistical System) is engaged in developing a satellite accounting type accounting and so are some of the other

countries. The system is designed in such a way as to allow for, whenever possible, a connection between the monetary aggregates and the quantitative data related to the management of and the state of the environment.

The OECD focuses on three main areas of research:

- a) environmental adjustment of national accounts;
- b) preparation of satellite accounts of the environment; and
- c) construction of natural resource accounts and natural asset accounts to be linked with economic accounts.

Regarding the environmental adjustment of national accounts, the OECD maintains that the central core of the economic accounts should not be modified for both theoretical and practical reasons. Instead priority should be given to the development of satellite account of the environment and natural resource accounts.

Satellite accounts should register environmental protection expenditures and the market value of natural assets as well as provide an estimate for the environmental damage. Finally they should include physical data related to these monetary values. In this way satellite accounts can become the link between the central core of national accounts and the natural resource accounts.

Finally, attempts need to be made to integrate national accounts, environmental accounts and socio-demographic accounts in a single information system that also yields the core economic, social and environmental indicators for monitoring human development.

The role of environmental resources in the determination of level of welfare of a nation and of the quality of economic development need to be dealt with exhaustively. In fact, the environmental resources are a stock of capital goods, which have to be taken into account when calculating the consumption potential of an economic system in time. The use of the environment implies negative externalities which regard both flows, such as for instance the emission of pollutants, and stock, such as the negative effects on health derived from stored pollution, or the indirect effects on consumption disutility resulting from the depletion of natural resources such as landscape and animal species.

These negative external effects of environmental deterioration should be adequately evaluated by a system of national accounts aimed at measuring not only income or growth, but also welfare and the change in the quality of life.

Check Your Progress 2

- 1) State the importance of environmental defensive expenditures in accounting systems.

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2) Explain the relationship between satellite accounts and SNA.

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3) Describe the main approaches to environmental accounting.

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23.5 LET US SUM UP

In this unit we have dealt with the relationship between economic activities and the environment. We also looked at the method by which the impact of economic activities on the environment is measured and accounted for in the national income accounts.

The unit discussed the relationship between production activities and environmental issues. The effects of production activities on the environment were discussed. The very important issue of environmental cleansing services was examined.

Data collection categories were elaborated and described. Then the unit came to the area of the relation between the environment and accounts - accounts of several types. How environmental defensive expenditures in accounts are considered was explained. A very important relationship, that between natural assets and economic activities was described. Subsequently, the unit discussed the concept of satellite accounts and their relationship with the United Nation's System of National Accounts. Finally the unit discussed the objectives of environmental accounting and the various approaches to environmental accounting.

23.6 KEY WORDS

- Environmental Protection Services** : Services which are carried out in order to protect the environment from damage from production activities.
- Satellite Account** : Accounts which are supplementary to the main accounts in the national income accounting system.

23.7 SOME USEFUL BOOKS

Agarwala, S.K (2004) *National Income Accounting* (4th edition), Bookland Publishers, Delhi.

Beckerman, W. (1976), *An Introduction to National Income Analysis*, Macmillan, London.

Roy Choudhury, Uma Dutta (1995) *National Income Accounting*, Macmillan Delhi.

23.8 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See subsection 23.3.1
- 2) See subsection 23.3.3
- 3) See subsection 23.3.4

Check Your Progress 2

- 1) See subsection 23.4.3
- 2) See subsection 23.4.6
- 3) See subsection 23.4.8



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UNIT 24 RECENT CHANGES IN THE ANALYSIS AND PRESENTATION OF NATIONAL ACCOUNTS

Structure

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 - 24.2.2 Priorities set up by UNSD
 - 24.2.3 Tasks Ahead
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- 24.3 Suggestions about Updating of 1993 SNA
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24.0 OBJECTIVES

After going through this unit, you will be able to:

- discuss the need for updating the SNA system of accounts;
- explain some of the suggestions put forward to update the SNA system;
- analyse some concepts regarding treatment of financial institutions and other organizations in the revised system of SNA; and
- describe the features of a specific software for compiling national income accounts.

24.1 INTRODUCTION

The current UN System of National Accounts was formulated in the year 1993 and the countries were expected to modify the System in the manner that was desired by each country to suit its requirements before implementing it. Since then the UN Statistics Division and particularly the Inter-Secretariat Working Group on National Accounting (ISWGNA) have decided to focus its attention on how best it can assist countries in implementing the 1993 SNA. For this purpose it has decided to focus attention on organising workshops, preparing manuals, handbooks and encouraging research and understanding of the SNA concepts etc. The ISWGNA has thus gone into several questions of not only implementation of SNA but also its interpretation. It has also looked into several of the questions which have not been dealt with in the 1993 SNA but require attention/inclusion in order to make the System comprehensive and extensively useful.

24.2 IMPLEMENTATION AND DATA DEVELOPMENT

24.2.1 Phases of Implementation

The implementation of the System of National Accounts has to be in phases and the first two phases which have the most immediate and general use for policy makers are expected to be ready with results in most of the countries. These cover estimates of gross domestic product by industry at current and constant prices, final expenditure on gap at current and constant prices and external transactions on current and capital account.

For India also these results are already available and India is now on its way to implementation of the institutional sector accounts including these for the general government. Phase 3 and 4 will cover production accounts of all institutional sectors including those of general government. Also included in the programme are the financial accounts for all institutional sectors other than general government. In India the work is only in its preliminary stage and the work of review of available data on the subject and their collection has been initiated.

Phase 5 will cover financial account. In the last phase of the implementation of the SNA the other changes in asset accounts for all institutional sectors and the balance sheets are to be prepared. For India though some attempts are being made now to prepare the other changes in asset accounts for institutional sectors it will be quite sometime before either these accounts or the balance sheets are likely to be ready.

These later three phases involve the development of comprehensive flow accounts for the institutional sectors which have been introduced for the first time and a full set of accounts for general government. Quite reliable data are generally available for the government sector and the main balancing items - government saving and net lending - are of particular interest for economic policy.

In India gross domestic product by cost components is also being developed currently along with production account by sectors including the generation

of income account. Attempts are also being made to prepare accounts for the household sector and the non-financial corporations for which the data sources much weaker. But from the point of view of policy implications and their usefulness particularly for the developing countries construction of these accounts should be given priority and in India a special expert committee has been set up to examine these problems and take steps for preparation of these accounts in general and the household accounts in particular at an early date and efforts are being made to collect the data on household through all India sample surveys.

Preparation of "other changes in asset" accounts for all institutional sectors and the balance sheets are much more difficult to construct and only countries with a highly developed system of basic data including a wide range of price statistics and detailed information on stocks of produced and non-produced assets can attempt. For India this set is not likely to become available in the near future and only the beginning has been made by producing the estimates of reproducible tangible wealth i.e. capital stock at the industry level by type of assets following the perpetual inventory method. This method also allows estimation of consumption of fixed capital at the industry level.

Preparation of the accounts as listed above require extensive data system and availability of such data at the country level. These include statistics on agricultural and industrial output, foreign trade, prices, employment, retail trade, construction output and household expenditures. Also it would be desirable to have complementary data systems on supply and use at current and constant prices with details by products to the extent possible. These will help in improving the consistency between value added and expenditure data.

24.2.2 Priorities set up by UNSD

The UN Statistical Department (Office) also has suggested phases for implementation of the 1993 UN System of National Accounts which are expected to be followed by different countries and are as follows:

- Phase-1:** Basic indicators of gross domestic product (GDP) i.e. Final expenditures on GDP at current and constant prices as well as GDP by industry at current and constant prices.
- Phase-2:** Gross National Income and other related aggregates which would demand the construction of the trade balance, external account of primary incomes and transfers as well as the capital and financial account of the rest of the world.
- Phase-3: First Step:** This covers production account of all institutional sectors, generation of income, allocation of primary income , secondary distribution of income and capital and financial accounts for general government.
- Phase-4: Intermediate Step:** Generation of income, allocation of primary income, secondary distribution of income and capital accounts for all institutional sectors other than general government.
- Phase-5:** Covers the last of the transaction accounts of the institutional sectors i.e. the financial accounts for all institutional sectors other than general government.

Phase-6: Other changes in asset accounts and balance sheets for all institutional sectors as well as the balance sheet for the economy as a whole.

Phase 3,4 and 5 involve the development of comprehensive flow accounts for the institutional sectors. **Phase 3** involves the compilation for the production accounts for the institutional sectors which is an innovation of the 1993 SNA as well as the full set of account for the general government. Most of the countries (including India) have quite reliable data for the government sector and the main balancing items i.e. government saving and net lending are of particular interest for economic policy. In **Phase 4** the construction of accounts of household sector and the non-financial corporations which are particularly important for policy point of view become desirable though these are the sectors where the data sources are weaker and therefore requires special efforts for countries to obtain the data. **Phase 5** covers the last set of accounts for the institutional sectors i.e. the compilation of financial accounts and with the construction of these accounts, the accounting presentation suggested in the SNA takes its shape in full.

The balance sheets which, in the 1993 SNA, is for the first time fully integrated with the rest of the accounts (Phase VI) requires very extensive data on stocks of produced and non-produced assets as well as a wide range of price statistics. Completion of other changes in assets accounts and balance sheets can only be achieved by countries with highly developed system of basic data.

At each phase the countries have to decide the priority between allocation of resources for the next phase or for improvement of estimates for the earlier phases just as it is essential to consider the question of availability and quality of existing data systems such as agricultural and industrial output, foreign trade, prices, employment, retail and wholesale internal trade, construction output and households and government expenditure. In India just as substantial amount of finance and effort is devoted to improvement and collection of basic data, the national accounts and improvement of accounts already in existence.

24.2.3 Tasks Ahead

The other refinements and additional accounts which demand attention from different countries are the quarterly and regional accounts, the former having proved of great value for monitoring short-term economic developments. Input-Output tables are also of importance in this context. Satellite accounts, particularly for the environment are of particular importance though in India no work on this has been undertaken so far. Countries like the EUROSTAT countries on the other hand, are very intensively engaged in developing a system of satellite accounts and many of the countries are currently preparing such accounts on the basis of a system developed by them. This is facilitated by the fact that UN System for satellite accounts in this area is designed to be flexible allowing to proceed on a step-by-step basis.

Simultaneously with the preparation of the 1993 SNA in stages it is essential to devote some attention to the development of the production, financial and price data which are required as IMF indicators and are at the same time included in the SNA.

It is now suggested that the SNA approach may be combined with the IMF approach. Since SNA approach is geared towards middle and long term economic analysis - which may be extended towards environmental and social areas - and the IMF approach is more for short term information which require not only quarterly but also monthly data, combination of the term information which require not only quarterly but also monthly data, combination of the two would imply providing more short term data within the SNA e.g. quarterly estimates and at the same time middle and long term effects of monetary or financial policy decisions could be assessed within the SNA framework and specially within its environmental and social extensions. India has launched a project of preparing quarterly estimates of macro-aggregates and this with the short-term financial data will lead to their more direct use for policy purposes.

24.2.4 Suggestions about Updating Mechanism in 1993 SNA

It has however been recognised in the introduction to the 1993 SNA that this system like its predecessors, represents a stage in the evolution of national accounting as it existed at the time of its finalisation. To carry on that evolution and to incorporate the real changes that take place continuously within economies continuous updating of the 1993 SNA is necessary. This will allow the SNA to incorporate the new developments fast and also provide a way to introduce changes in an incremental manner. The UN Working Group on the subject has considered the question and suggested the following proposals for an appropriate updating mechanism:

- 1) First and foremost the updating process should be efficient and timely and at the same time broad based. This should include such editorial amendments which will mainly refer to working errors and apparent contradictions in the present text. But such corrections or changes should neither affect the concepts nor the structure of the system and tables therein;
- 2) Secondly incorporate such clarifications which will arise when a new economic situation has emerged which was negligible when the 1993 SNA was designed but has since grown considerably in importance. This will be accompanied by explanations, as required, so as to arrive at unambiguous interpretations of existing SNA concepts etc. In this case it will also be necessary to establish clearly that there is no conceptual issue concealed with the clarification;
- 3) In such situations when new economic situations might have emerged but their treatment in national accounts is not very clear, the various solutions on how to treat the phenomenon in national accounting may be put forward indicating that there seems to be possibilities for different interpretations consistent with the scope and concepts of 1993 SNA and finally adopt the one which is agreed upon by the countries working on the system; and
- 4) Finally, due to changes in the macroeconomic environment some of the basic concepts in the 1993 SNA may become irrelevant and may even result in figures that might mislead users. In such cases it might even become necessary to rewrite those particular portions of the SNA to reflect those changes.

Check Your Progress 1

1) Who determined the priorities in adopting SNA (1993) by different countries?

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2) What is the advantage of integrating 1993 SNA with IMF system?

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3) Name the four suggestions given by the UN working Group modernising mechanism of 1993 SNA.

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24.3 SUGGESTION ABOUT UPDATING OF 1993 SNA

The incorporation of all the above aspects within the current SNA will require their widespread distribution to the user countries after their final adoption by the UN Statistical Commissions. These however are stages of changes which will appear from time to time and will get incorporated as and when the situation permits. Some of the aspects which have already come up in this context are FISIM i.e. *financial intermediation services indirectly measured*, consumer subsidies, informal-formal distinction in classification and environmental accounting. Some clarification on coverage of the items may be useful.

24.3.1 FISIM

Banks make a large part of their money by lending at a high rate of interest, and borrowing at a low rate. The difference between the two, results in banks receiving net interest receipts. Because this income arises from the difference between interest rates, banks do not need to charge directly for all the services they provide in arranging borrowing and lending. For example, checking accounts are usually maintained free by the banks, and the associated costs are met by the difference between the low interest payments awarded on credit balances in such accounts whilst the bank lends it at a higher rate to a borrower.

There is a notional reference rate of interest at which lending and borrowing

can take place directly between a lender and a borrower, satisfactory to both parties. So consider the situation where I want to borrow 100 rupees and I am prepared to pay back 105 rupees after one year. If I could find the right person at the right time, its quite possible that they will accept this as good business, and lend me 100 rupees in exchange for the 105 in a year's time. However, as we all know, finding a counterpart who would be interested at the same time in the same deal over the same time period is not easy so we go to a bank to help us. Banks bundle together various lending offers and match them against the array of borrowers so that they effectively provide a market for borrowing and lending. iF in order to make a living out of such transactions, it turned out the bank had to charge 5 rupees, then they could choose to directly charge 5 rupees for the introduction and facilities to make the transaction. If the bank does it through the interest rates then in the above example I could be asked to pay back 108 rupees at the end of the year, but the lender might receive only 103 rupees. The net interest receipts of the bank are equal to 5 rupees (8-3). If we accept that the reference rate of interest for this kind of small borrowing and lending is 5 p.c. then we can see that I have paid 3 rupees, and the lender 2 rupees.

In national accounts, interest payments are not considered to be payments for a service rendered but a form of property income and so are recorded in the generation of primary income account and not the production account. But because of the peculiar way that banks income account and not the production account. But because of the peculiar way that banks make their money, by loading the interest rates, this makes it seem that the banks are given all the money for their services in the income accounts rather than "earning it" for services provided in the production account. So the operating surplus of banks would show as a negative item, given that most of the income earned from borrowing and lending would appear later in the current income and expenditure account. As this would give a false impression of the size of the operating surplus of banks compared to other industries, the system of national accounts adopts the following solution.

Let the output of banks include net interest receipts as if customers paid for the service (termed as FISIM). However, since no such payments are shown in the production accounts of industry or the final consumption expenditure of households, to be consistent with showing the net interest receipts contributing to the bank output, the corresponding intermediate consumption of banking services must be shown in the production accounts of industries using banking services and in the corresponding final demand component of consumer expenditure. These banking services have therefore to be deducted as intermediate consumption of industries and bank charges of consumers. India has developed indicators to determine the amount of banking services utilised by different industries and final consumers and makes corresponding adjustments as intermediate consumption of industries and household consumer expenditure thus accounting for Financial Intermediation Services Indirectly Measured (FISIM).

24.3.2 Consumer Subsidies

1993 SNA defines subsidies as : current unrequited payments that government units (including non-resident government units) make to enterprises on the basis of the levels of their production activities or the quantities or values of

the goods or services which they produce, sell or import. They are receivable by resident producers or importers. In the case of resident producers they may be designed to influence their levels of production, the prices at which their outputs are sold or the remuneration of the institutional units engaged in production.

It also states that subsidies are not payable to final consumers, and current transfers that governments make directly to households as consumers are treated as social benefits. Subsidies also do not include grants that governments make to enterprises in order to finance their capital formation or compensate them for damage to their capital assets, such grants being treated as capital transfers. Since enterprise is an institutional unit engaged in production and can be a corporation, a non-profit institution or an unincorporated enterprise one can assume that non-market production units within the sectors of general government and non-profit institutions serving households may also receive other subsidies on production. This would suggest that non-market producers within the households would also receive subsidies.

24.3.3 Informal-Formal Distinction

Is with reference to sectors and legal status of the enterprises. The 1993 SNA does not clearly define the distinction and this needs to be looked into. The Indian national accounts system talks of organised and unorganised sectors with reference to legal status of the enterprises (whether registered under any legal systems) but not of formal and informal. A classification of the economy into formal and informal may be important and desirable though not easily definable.

A general definition of formal and informal that is acceptable across a wide range of countries may not be easy to find, but a definition similar to that of an unincorporated enterprise may be meaningful. In other words, *all enterprises for which a complete set out accounts, including a balance sheet of assets and liabilities exist or for which it is possible and meaningful from both an economic and legal viewpoint to compile a complete set of accounts if they were required could be classified as the part of the formal sector with the rest as the part of the informal sector.* If such a definition is adopted, household market and non-market enterprises as well as some in government could be categorised under the informal sector and the rest under formal.

Within the informal household sector it is also envisaged that unincorporated financial enterprises such as individuals engaged in financial intermediation or in services auxiliary to financial intermediation will be included. Thus money lenders who make loans from their own resources are also to be considered as producers of financial services within the household sector.

It is important that classification of the economy according to formal and informal is integrated within the 1993 SNA.

24.3.4 Environmental Accounting

The central framework of the 1993 SNA presents a number of characteristics which give it the advantages of an integrated accounting structure. It is exhaustive and consistent within the boundary of the economic activities it covers; that is to say each unit, transaction, product and purpose is given a

place, and only one, in the classifications and accounts of the system. Moreover, the set of concepts adopted by the system is fully coherent.

As against these benefits there are certain limitations as to what may be accommodated directly within the central framework. The central framework may be used in a flexible way, in order to put greater or lesser emphasis on specific aspects of economic life. However, the margins of flexibility allowed by the central conceptual framework do not permit conflicting approaches to be covered simultaneously.

It becomes desirable therefore to consider the question of satellite accounts or systems which generally stress the need to expand the analytical capacity of national accounting for selected areas of social concern in a flexible manner, without overburdening or disrupting the central system. Satellite systems or accounts allow for the provision of additional information on particular social concerns of a functional or cross-sector nature.

Thus the satellite accounts are not only linked with the central framework of national accounts and through them to the main body of integrated economic statistics but also because they are more specific to a given field or topic, they are linked to the information system specific to this field or topic.

Environmental accounting which is of such importance as to deserve special consideration needs to be presented in a SNA satellite accounting framework. However, in the case of environmental protection activities, the process of identification is complex, because the relevant activities and products appear only to a small extent in the central framework classification.

All the above and possibly many other similar factors need careful consideration and also elaboration in the context of their integration with the SNA and will continue to be an important part of future SNA development.

24.3.5 Definition of Public Enterprises

In the context of IMF data, a question may be raised as to the definition and scope of the public enterprises in the 1993 SNA and how different are they from the coverage recommended in 1968 SNA. In practice, the scope of public enterprises has not really changed at all between 1968 SNA and the recent 1993 SNA but the terminology used has changed. It might be useful therefore to define clearly the concept propounded in the recent SNA which is likely to be followed during time to come. The critical issue involved in determining whether the enterprise is a public enterprise or not is through the question as to whether or not the government controls the business of the enterprise. The issue actually hinges on whether the government is in a position to control the activities of the enterprise even if it own less than 50 per cent of the shares. In general, an individual institutional unit or group of units owning more than half the voting shares of a corporation can exercise complete control where control is defined as the ability to appoint directors of its own choice. However, owning more than half the shares of corporation is evidently a sufficient but not a necessary condition for control. Control is not to be limited to merely appointing directors but also to determine general corporate policy. Also, a corporation which government is able to control as a result of special legislation should be treated as a public corporation even if the government does not own a majority of the shares.

Check Your Progress 2

1) What are FISIM?

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2) Define subsidy.

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3) What are formal sector enterprises?

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**24.4 CLARIFICATION OF SOME CONCEPTS OF
1993 SNA**

Several other aspects touched in 1993 SNA needs some clarification to make them understandable to the general reader. An attempt is made here to clarify some of these concepts besides elaborating the software particularly developed for SNA.

24.4.1 Central Banks

The treatment of central banks in 1993 SNA needs clarification. The 1993 SNA recommends that the implicit part of the output of central banks, similar to other financial intermediaries, is measured as the difference between interest receivable less interest payable. This method of measuring output of central banks often leads to large positive or negative measures of gross output and even a volatility in output.

It was now been suggested that in such cases where this approach leads consistently to inappropriate results, output could, as a second best approach, be measured at cost as for other non-market producers.

It has also been clarified that under no circumstances central banks should be considered as a part of general government sector which is quite contrary to what had been adopted for India in the past i.e. - Reserve Bank of India treated as a part of Central Government.

It is also to be noted that contrary to 1993 SNA recommendations separate institutional units including public bodies, that are primarily involved in regulating financial institutions should be classified as financial auxiliaries rather than as a part of the central bank sub-sector. This is important as they are not intermediaries by nature and therefore deserve to be treated as auxiliaries only.

24.4.2 Interest: Full Accrual Accounting of Interest

The 1993 SNA implicitly uses the debtors' viewpoint in order to derive measures of interest accruals. It is however, felt that the treatment in the 1993, SNA of interest accruals on tradable debt securities may be modified by applying current market interest rates rather than the interest rates at the time of issue, to calculate interest flows. This methodology would be consistent with the requirements to use current valuations within the accounts, and prevent discrepancies between the positions and transactions of creditors and debtors.

24.4.3 Asset Transfer Costs

According to 1993 SNA the costs of transferring the ownership of existing non-financial assets should be treated as gross fixed capital formation. Broadly, ownership transfer costs include all professional charges and commissions incurred by either the buyer or the seller plus all taxes payable by either party. If 1993 SNA recommendation is followed then one has to accept the fact that asset is created by the transfer process i.e., an asset which changes hands several times is more valuable or productive than an identical asset, which remains under same ownership for its entire life. This recommended treatment is different from the one recommended for transfer costs associated with financial assets. It will be desirable to treat transfer costs as current expenses rather than as capital expenditure and 1993 SNA suggestion should be revised.

24.4.4 Treatment of Lotteries

The 1993 SNA does not discuss at length the treatment of lotteries as producers of services or the treatment of profits that are transferred from lotteries to government. 1993 SNA does make it clear that the total payment for lottery tickets is composed of two elements, a service charge paid to the lottery organisation and the amount of winnings paid. In the case of lottery tickets on which a tax is paid, the gross output may be measured at basic prices by excluding the tax.

A point has often been raised as to whether public lotteries should be treated as ordinary public corporations whose payments to government output of operating surplus should be classified as property income or as fiscal monopolies, in which case the payments to government should be treated as taxes on products. The 1993 SNA describes fiscal monopolies as public corporations, public quasi-corporations or government owned unincorporated enterprises that have been granted a legal monopoly over the production or distribution of a particular kind of good or service in order to raise revenue and not in order to further the interest of public economic or social policy. As public lotteries are invariably established to raise revenue (although they may not constitute true monopolies), the argument is often made that they should be treated as fiscal monopolies.

Treating publicity owned lottery corporations or quasi-corporations as fiscal monopolies rather than ordinary public corporations would reduce value added measured at basic prices and operating surplus of non-financial corporations sector. GDP would not change as the payments to government would be treated as part of taxes less subsidies on products, which must be added to the sum of sectoral value added to arrive at GDP. Taxes on products received by government would increase and property income would decrease. But primary and disposable income of government would be the same under both treatments.

The questions which need to be looked into in this context are : (i) should public lotteries be treated as fiscal monopolies or as ordinary public corporations particularly in national accounts and (ii) if public lotteries are treated as fiscal monopolies should the statistics of government revenue record transfers of lottery profits as taxes on products?

24.4.5 Intangible Assets: Patents and Copyrights

Patents and copyrights are legal instruments which constitute evidence of their holders' ownership rights over certain kinds of intangible assets which may be described as 'originals' because they are the outputs produced by creative or innovative activities of a scientific, engineering, entertainment, artistic or literary nature. Patents confer ownership rights over scientific originals or inventions, whereas copyrights confer ownership rights over entertainment, artistic, literary or programming originals (new recordings, films, manuscripts etc. and computer software). The ownership rights conferred by patents and copyrights are often described as 'intellectual property rights'.

Copyrights

The 1993 SNA explicitly recognises the process of creating an entertainment, literary or artistic original as falling within the production boundary of the SNA. The output consists of an original in the form of a new visual and/or sound recording, manuscripts, musical composition etc. The original is then used to produce copies which are themselves used in further processes of production or for consumption. The original must, in fact, be an intangible fixed asset provided it is itself used repeatedly or continuously in the production of copies for more than one year. Nothing material is transferred from the original in the process of producing the copies.

An entertainment, literary or artistic original is therefore classified as an intangible fixed asset in 1993 SNA. By definition, therefore, the acquisition of an original, whether through own account production or purchase on the market, counts as gross fixed capital formation. It should be noted that copyright as such does not appear anywhere in the asset classification because copyright itself is not an asset, being only a legal instrument providing evidence of ownership over an asset. Any payments received by the owner of the asset i.e. the holder of the copyright from other units who are licensed to use the asset are conceptually equivalent to the rentals received by the owners of assets who lease them out. They are thus treated as payments for services provided by the owner of the asset.

Writing new computer software is counted as production in the same way as writing a new book or musical composition. In the 1993 SNA, a new computer programme is therefore treated as an original intangible fixed asset when it is

used repeatedly or continuously in the production of other goods and services for more than one year and is classified alongside artistic originals.

Patents and Scientific Originals

In the 1993 SNA the situation is different for scientific originals such as inventions, new drugs, new processes etc. and associated patents. Their treatment is linked to that of expenditures on research and development (R and D) and all expenditure on R and D is classified as current.

In consequence, the outputs of R and D establishments are treated as being consumed as they are produced. As a result, though scientific originals may be produced which are assets from an economic point of view; they cannot be recognised as assets within the 1993 SNA.

The treatment of programming, entertainment, literary and artistic originals and their associated copyrights is thus dealt with satisfactorily in the 1993 SNA but this is not true in the case of patents as because of the classification of R and D expenditures as current expenditures it is not possible to treat creative or innovative scientific activities as producing assets. Two possible alternatives exist to remove this anomaly:

- 1) one possibility is to accept the fact that treating R and D expenditures as current implies that no assets are produced by R and D activities. Assets in the form of scientific originals (i.e. patented entities) cannot therefore exist. The patents themselves, as legal instruments, have therefore to be treated as non-produced assets and royalties treated as property incomes.
- 2) Alternatively, one has to accept the fact that scientific originals do actually exist. This implies that intangible fixed assets may be produced as outputs from R and D activities so that some expenditures on R and D have to be classified as gross fixed capital formation. In other words, the treatment of scientific originals and also computer software.

The point to be recognised is that in the long run one of the two above alternatives has to be accepted and the approach in the 1993 SNA has to be amended accordingly. There is no doubt that ultimately in the long run the second approach along with its implied changes will have to be accepted.

24.4.6 Wages Paid in Arrears

Currently, in some countries, government workers are not being paid until several months after the work is actually done. If it is clear that the wages will be ultimately paid, it is appropriate for the accrued income to be shown as part of the national accounts estimates of production. However, a problem as interpreting the accounts will arise when this income is attributed to households. The actual measure of household saving derived as the difference between total income (including a non-paid" element) and total consumption will not be realistic. It might therefore be desirable, in such cases, to show compensation of employees, disposable income and saving in a more disaggregated form where cash-based estimates are shown separately from the accrual elements. In this way, the extent of household saving that may be involuntary because of the accrued lag will be immediately apparent. Obviously, the counter part entries in the government will need to be similarly disaggregated. All this implies that the wages due will be eventually paid. To the extent that such

wages are never paid, neither they nor the corresponding government output should be recorded.

24.4.7 Women's Contribution to Production

It has been recognised that lack of concrete knowledge about the activities of women has been a major hurdle in the formulation of policies and programmes at both the national and international levels, to achieve equality. The 1993 SNA and elaborations within the same to reflect women's contribution to production may be one of the answers to the question. Since the satellite accounts can be used to extend definitions of production boundary and thus facilitate the in-depth analysis of the real magnitude and economic significance of the production of personal services within the household and therefrom the contribution of women to production, it might be desirable to structure a set of satellite accounts for the purpose. As far as household production is concerned, the central framework of the 1993 SNA includes all production of goods in households whether sold or not and services if they are supplied to units other than their producers. This production boundary results in the incorporation of quite a few activities in which women are active participants in the production process, such as the production and processing of agricultural, dairy and fishery products, including the production of butter and cheese on the farm, the preservation of meat and fish, the production of flour by milling, weaving, dress making, tailoring, the production of footwear, the production of baskets and mats, pottery, the carrying of water etc. Personal services for own final consumption with the same household such as preparing meals, child care, elderly care, house-cleaning; transport and leisure services (except for services produced by employing paid domestic staff) are excluded. The measurement of women's contribution to household production would be a good starting point for measurement of women's contribution.

24.5 MICRO-COMPUTING PACKAGE FOR NATIONAL ACCOUNTS COMPILATION

With the advance of technology and demands for high quality macroeconomic information from both national economic agents and international level increasing due to the progressing globalisation of the world economy it has become essential to consider the question of computerisation of the compilation process. This has the advantage of satisfying the demand for higher transparency with regard to the compilation procedures employed.

A software termed 'ERETES' has been developed by a group of national accountants. A server permits to control the entire compilation process. It also supports the reconciliation phase. The work is distributed for certain phases over various work stations.

The overall compilation process is organised in three phases:

- 1) Data collection.
- 2) Balancing of supply and use, of the industry accounts and of the transaction matrices....
- 3) Cross-sectional tasks related to the above.

For the most frequent tasks, special tools exist which ensure an automatic interface with the data base. It is for instance, possible to download certain data into a spreadsheet. No automatic reconciliation of statistical discrepancies is suggested, leaving the responsibility of making certain adjustments entirely to the national accountants. Finally, the software offers the following features to facilitate the work of the accounting team:

- i) a control screen, in order to follow the various tasks being executed;
- ii) a note pad, in order to store information on decisions taken or difficulties encountered;
- iii) an on line help function, which is linked to the different screens, offering all related information related to a specific task.

The proposed methodology is an integrated one. A statistical source is fed to all users in a unique prespecified manner. Further more, the proposed method allows to indirectly estimate data items, which are often not covered by the statistics such as the informal sector. This requires of course a well coordinated procedure of working with the given data base and the establishment of a clear iterative process leading progressively to the final reconciliation.

At this point, tools are being offered, which permit to organise publication of the results and to transfer the accounts into the data base to be used for the compilation of the subsequent years.

In its present form the software offers a coherent instrument for the annual compilation of the supply and use table and the industry accounts at constant prices. It does not yet provide the same infrastructure for the elaboration of institutional sector accounts, however, the data base certainly constitutes an excellent starting point for such efforts.

Check Your Progress 3

- 1) Should asset transfer cost be treated as capital expenditure or current expenditure? Give your reason in brief.

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- 2) Why are patents and scientific invention not treated capital formation in 1993 SNA.

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- 3) Give some examples of intellectual property rights.

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- 4) Give some examples of activities of women in households which are treated as production activities.

24.6 LET US SUM UP

The above gives very broadly not only the recent changes in the analysis of data on national accounts in India but also indicates the direction of changes which are being considered at the international and national level for either elaboration or clarification in the system as presented in 1993 SNA. It is also obvious from the above discussion that many of the aspects covered in the 1993 SNA need clarification and substantial technical work is called for to make it a more usable document for all countries. There is no doubt that the United Nations Statistics Division and its sister organizations are offering a variety of training programmes related to the new SNA and these will go a long way in making its implementation smooth and easy.

24.7 KEY WORDS

- Asset** : A commodity or service that provides a stream of returns and increases the wealth of the holder.
- Balance Sheet** : A statement showing the balance (or lack of it between assets and liabilities of some organization).
- International Monetary Fund (IMF)** : An international multilateral lending institution that lends to members.

24.8 SOME USEFUL BOOKS

Agarwala, S.K (2004) *National Income Accounting* (4th edition), Bookland Publishers, Delhi.

Roy Choudhury, Uma Dutta (1995) *National Income Accounting*, Macmillan Delhi.

Kendrick, J.W (1972), *Economic Accounts and their Uses*, McGraw Hill Book Company, New York, Tokyo and Singapore.

24.9 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See subsection 24.2.2
- 2) See subsection 24.2.3
- 3) See subsection 24.2.4

Check Your Progress 2

- 1) See subsection 24.3.1
- 2) See subsection 24.3.2
- 3) See subsection 24.3.3

Check Your Progress 3

- 1) See subsection 24.4.3
- 2) See subsection 24.4.5
- 3) See subsection 24.4.5
- 4) See subsection 24.4.7

