Indicators Of Sustainable Development

The commonly used economic measures of welfare or well being are GDP and GNP. The former is the value of final goods and services produced in the domestic economy, where as latter is the value of goods and services produced in the domestic economy plus overseas income other than exports. These measures may biased or overstated view of human welfare because they do not consider depreciation of the natural capital stock as a result of economic exploitation and environmental degradation. Here some of the shortcomings of national accounts which respect to the environment.

- They neglect the scarcities of natural resources that can pose a serious threat to sustainable economic productivity and development.
- They pay only limited attention to the effects of the environmental quality on human health and welfare
- They treat environmental protection and defensive expenditure as increases in national product, which should, instead, are consider as social costs of the preservation or upgradation of environmental quality.

For about half a century, national income accounting has been a useful tool in understanding national economies, their compensation and growth. Its usefulness apart from the annual changes in natural and environmental resource stocks are not reflected in this system. These trend to trickle in to affect the conventional accounts over a period. There is no unique approach to accounting for environment and integrating the same with conventional economic accounting. However, recent efforts of the 1990's promise revised methods of accounting. One need not to be an obsessed environmentalist to appreciate the relevance, role and limitations of integrating environmental accounting with existing national income accounts.

Green Accounting

National accounts estimate gross national product (GNP) and net national product (NNP). At present, besides GNP and NNP, other economic data such as prices and employment statistics are also widely used to judge the economic performance of a country. However, all such macroeconomic estimates neglect factors such as environment pollution, congestion of parks and wilderness areas, depletion of natural resources and the ozone layer, as well as global warming which comprise the unfortunate side of economic growth.

It was only in the 1960s and early 1970s, that the importance of environment highlighted this deficiency in national accounts. More recent criticism leveled against national accounts accents on the fact that these measure the depreciation of man-made capital such as plant and machinery, but neglect the stock of natural resources as well as environment, and their depletion coupled with the degradation in environmental quality. Pollution and accumulations such as new finds of sub- soil resources, new uses of environmental assets, etc. comprise significant varieties, which cannot be neglected. For example, no adjustment is made for the depletion in petroleum energy stock when oil is extracted and consumed. Logging of tropical forests invites no estimation of the loss of an asset and its effects. Again, when land cultivation increases, no allowance is made for the harmful effects on soil or water storage. When chloro-fluro carbons were first used, no anticipation of the damaging loss to the ozone layer was perceived.

Neglecting the depreciation of natural resources and environment necessarily implies that the net income of product is overstated. It was thus stated by the 1992 Earth Summit in Rio de Janeiro that without better stewardship of the quantities as well as qualitative changes in natural assets, development would be undermined. GNP and NNP, without showing the effect of deterioration in environment and natural resources, may provide a distorted picture. For instance, any increase in

expenditure on medical services, or on household cleaning due to increased pollution levels will result in an increase in economic activity, and thus, an increase in GNP and NNP, whereas actually speaking, this increase is negated if the social costs are weighed against the social benefits. Further, in assessing the cost and capital, national accounts have neglected, on the one hand, new scarcities of natural resources which threaten the sustained productivity of the economy and on the other hand, the degradation of environmental quality and its consequential effects on human health and welfare. In addition, the expenditure for restoring the environmental quality is accounted as increases in national income and product. This is contrary to the fact that such outlays could be considered as maintenance cost to society rather than social progress. These flaws in the conventional system of national accounts (SNA) have sent wrong signals to the decision-makers and have set the society in the non-sustainable path of development.

The emphasis on sustainable development, in particular, by the Earth Summit, the United Nations conference on Environment and Development in Rio de Janeiro (3 - 14 June 1992), draws attention to modify national income indicators. The modified income indicators aim to reflect the sustainability of economic growth as conventionally measured by increases in net domestic product (NDP) and its main determinant the capital formation.

In response to the criticisms of the conventional economic accounts, several countries and researchers have suggested various approaches. The various approaches can be grouped under four headings. These are: 1) Pollution expenditure accounting; 2) Physical accounting; 3) Development of green indicators and 4) Extension of the SNA type systems. Pollution expenditure accounting includes developing data series on pollution abatement and other environmental expenditures. Such data series has been maintained by USA since 1972 and are also available for other OECD countries. As these data refer to expenditure already incurred, either due to policy or standard business and household practice, they should not be considered as additions to the conventional economic accounts. In fact, the data is a re-specification of the information already accounted for. Another approach to improve the conventional economic accounts is to supplement these accounts with physical information about the natural environment and its status . The information can be arranged in conventional input-output type of matrices. An example of complete input-output matrix system is the National Accounting Matrix including Environmental Accounts (NAMEA) as done for Netherlands, which fully integrates economic and physical environmental information (Keuning, 1995). A physical accounting can provide the inputs for the construction of various environmental indicators and thus be used for scorekeeping purposes . Although, physical accounts are necessary, and play an important role in policy formulation, several factors complicate their use for policy purposes. In the first place, the choice of appropriate physical units of measure is not obvious. Second, the problem arises due to incomparability of units. Further, the units are not similar and hence, it is difficult to get a condensed description, which is an important precondition for economic and environmental accounting. Thus, the difficulty of using figures in physical terms lies in the development of huge data sets due to different quality indicators for forests, air, land and water without reaching general conclusions on their (economic and non-economic) significance. The physical accounts also do not reflect the potential severity of the environmental problem and hence the decision-makers will not be able to set relative environmental priorities while taking various investment decisions . A third approach to resource and environmental accounting, perhaps the one with the longest history, is to construct a green GDP or some other economic index to replace the conventional GDP or NDP. This work has proceeded along two parallel paths. In the first path, there has been efforts to construct entirely new indicators of well being, usually by altering one or more of the components of the conventional aggregates (e.g., subtracting out pollution abatement expenditures from the GDP or by adding some new components such as factors measuring the negative effects of urbanisation). The best-known examples of this approach are the Nordhaus - Tobin MEW (Measure of Economic Welfare) indicator (Nordhaus and Tobin, 1973), the NNW (Net National Welfare) indicator developed for Japan (Economic Council, Japan, 1973) and the Index of Sustainable Economic Welfare (ISEW, Daly and Cobb, 1989). Another conservative example of the green indicator approach has been provided by Repetto and his colleagues at the World Resources Institute (WRI; Repetto et al., 1989). The principal thrust of their efforts is not to

replace the conventional gross income aggregates but to modify the conventional measures of net product, i.e., net national product (NNP) or NDP. The main criticism of the approach is that while various indexes may indicate that society is worse off than might be suggested by the conventional GDP, they give the policy maker a little indication of what to do about it.

The fourth group builds upon the existing SNA. The approach can be said to be most ambitious as they focus not on just one element of the conventional accounts, such as depreciation or pollution expenditure accounting, but tend to cover all the sectors that may interact with the environment. Examples of such an approach are the United Nations SEEA (SEEA, 2000) and Environmental and Natural Resource Accounting Framework (ENRAP). Both the approaches require sector-specific information on the use of environmental assets, and are concerned with the management and score keeping functions of accounting. But the principal difference between these two lie in extent of their adherence to SNA concepts. SEEA appears much more concerned with adherence to the principle of SNA than to economic theory. The ENRAP framework, on the other hand, stresses more on the consistency with economic theory than with the SNA (Peskin, 1998, page 387) .

In the absence of international consensus on how to incorporate environmental assets and the costs and benefits of their use into national accounts, the United Nations Statistical Division approved the "satellite" System of Integrated Environmental and Economic Accounting framework rather than modifying the core SNA itself (United Nations 1993). The satellite system becomes a link between the SNA and the accounts describing the natural environment. The United Nations Conference on Environment and Development (UNCED) in its Agenda 21 also ratified this approach.

The integration of environmental and economic objectives, which is the goal of sustainable development, and mainstreaming the environment in economy wide policies, requires information at the macro level, which includes both economic and environmental variables. This is the goal of integrated environmental accounts or environmental accounting.

The development of such accounts is a major development in many countries. The need for consistent data, which allows international comparisons, has prompted the Statistical office of the United Nations to prepare a set of guidelines on the preparation of such accounts. These are known as the System of Environmental Economic Accounting. In turn, this has helped in bringing about more appropriate environmental policies that are integrated in economic development plans. A countries system of national account should accurately indicate a depleted natural capital base to highlight the costs of inaction in the face of environmental degradation. In the short run, the negative impacts of proper national economic policies should be reminded at the sector, programme and project levels

SEEA (System Of Integrated Environmental and Economic Accounting)
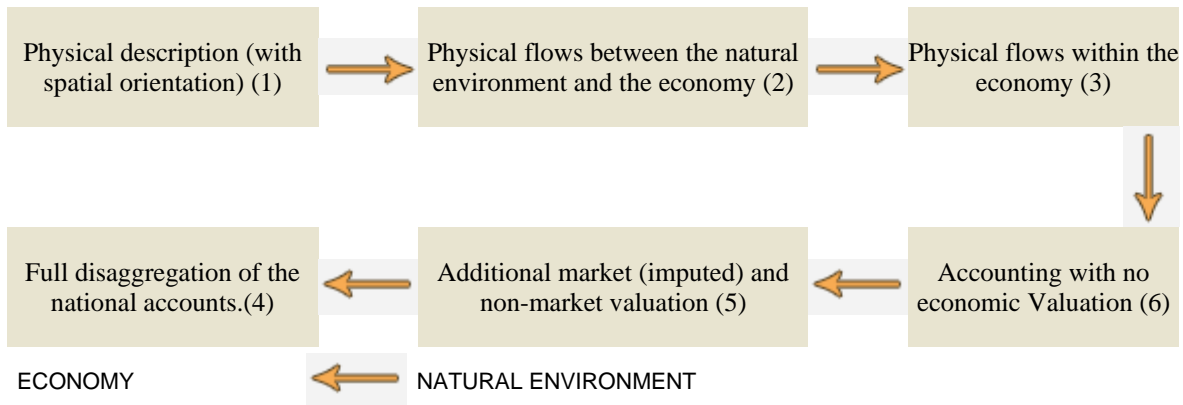
The UN Statistical Office (UNSO), in collaboration with Carsten Stahmer, designed this System of Integrated Environmental and Economic Accounting (SEEA). These are commonly termed as Environmental Accounting. These accounts are designed for linking with the system of National Accounts, measuring national income. After the necessary linkages are done they are called as environmentally adjusted economic accounts to arrive at Environmentally Adjusted Domestic Product (EDP). The objectives of the SEEA involves the segregation and elaboration of all environment-related flows and stocks of assets, assessment of deterioration of environment in terms of costs, linkage of physical resources accounting with monetary accounting, and lastly, measurement of indicators of environmentally adjusted domestic income and product (EDP).

The description of economic activities in monetary terms has been extended in the case of the SEEA to the valuation of the use of natural environment. The comprehensive measurement of costs and benefits of economic activities and their environmental impact is the purpose of such calculations. The diagram below illustrates it.

DIFFERENT SYSTEMS OF NATIONAL ECONOMIC-ENVIRONMENTAL ACCOUNTS

NATURAL ENVIRONMENT ➡️ ECONOMY

DIFFERENT SYSTEMS OF NATIONAL ECONOMIC-ENVIRONMENTAL ACCOUNTS

Physical description (with spatial orientation) (1)	➡️	Physical flows between the natural environment and the economy (2)	➡️	Physical flows within the economy (3)

⬇️

Full disaggregation of the national accounts.(4)	⬅️	Additional market (imputed) and non-market valuation (5)	⬅️	Accounting with no economic Valuation (6)

ECONOMY ⬅️ NATURAL ENVIRONMENT

1+2: Natural resource accounts and environment in a broader sense

2+3: Material and energy balances

5+6: Extended accounting systems

1+2+3+5+6: Satellite system of integrated environmental and economic Accounting

(Source: United Nations 1993)

ENRAP (Environmental and Natural Resource Accounting Package)

The ENRAP accounting structure is based on the principle that an economic account should attempt to cover all the economic inputs and outputs that together, comprising an economic system. For inputs and outputs to be "economic," they need not have market prices; rather they must be scarce enough, if they are marketed, to attract a non-zero price. The natural environment is one major source of non-marketed but economically scarce inputs and outputs. It essentially develops conventional economic accounting structures to cover the input and output services of non-marketed capital.

The reason for ENRAP's emphasis on a complete accounting of all economic inputs and outputs is that ENRAP is primarily a tool of policy. By "policy", we mean those governmental actions that are intended to alter the amount, composition, and distribution of system outputs. The ultimate object of economic policy is to find the level, the composition, and the distribution of economic outputs that attain agreed upon social objectives in an efficient and fair manner. Even though ENRAP is popularly viewed as a system of environmental accounts, because it attempts to cover all economic inputs and outputs, whether environmental or non-environmental, it is more than a tool of environmental policy. It is also, a tool of more general economic policy.

Although the principal motivation for ENRAP has been on its policy or "management" role in particular, its support of environmental management--its coverage of the services of both conventionally marketed capital and environmental capital makes ENRAP consistent with the theoretically "correct" performance or "scorekeeping" measures put forth in the economic literature.