UNIT 12: GREEN ACCOUNTING

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12.1 LEARNING OBJECTIVES

After reading the unit, you will be able to:

- put forward meaning of the concept of green accounting
- discuss and comprehend the need and importance of green accounting in economic development of the country
- appreciate and evaluate the impact of corporate decisions on environmental economics
- understand and examine other alternative indicators for measuring sustainability

12.2 INTRODUCTION

As studied in the previous unit 10 and 11 related to Sustainable Development- Part I and Part II, an elaboration was provided to understand the concept, need, importance, policies and regulations to promote sustainability of the environmental resources to support the existence of humankind. Efforts are being made to plan, implement and upgrade skills and technology to

create equilibrium between the needs of human race and its growing impact on the environmental resources.

It is well-evident that the 21st century has marked an ambitious era of development and growth in technology by experimenting and exploiting resources at its disposal. As per the United Nations World Population Prospects 2017, it is reported that there is rapid rise in global human population at 83 million annually or 1.1% per annum resulting in swelling of the population size of 7.616 billion in 2018 from 1 million in 1800. The tremendous increase in population has exerted enormous pressure on the environment by rapid urbanization, industrialization, technological development, infra-structural development, weapons for wartime, etc. These human actions have already damaged the environment ecology beyond reparability. Deforestation, soil erosion, drying of water reservoirs, frequent occurrence of massive tsunamis, landslides, drought, floods and drastic change in weather conditions across the global are the reasons of concern and attention among the governments, corporate and people of the nation.

The importance of the environment for the survival of the humankind cannot be undermined. In order to evaluate and measure the human action and its impact on the environment ecology, Prof. Peter Wood had introduced the term and concept of “Environmental Accounting” in 1980 as a new stream of accounting which shall aim to provide information backed by facts and figures for the environment and its well-being as a result of growing businesses and industries in the country. It propagated the understanding of corporate profit/loss and revenue/expenses along with its cost/benefit on the environment as a result of corporate operations and use of resources. The concept emphasized three factors which included – Planet, People and Profitability. “Environment Accounting” is also known as “Green Accounting”, “Resource Accounting”, “Sustainable Accounting” or “Integrated Accounting”.

12.3 GREEN ACCOUNTING

The role of environmental resources as a source of supply, waste absorber and the equalizer in maintaining livable habitat, though fundamental, has been completely ignored in our traditional development models. But any conventional economic accounting system that lacks the disclosure of environmental cost/benefit does not represent the true economic system of the country and universe as a whole. The reasons for the ignorance of accounting the natural capital can be attributed to two factors –

- Firstly, the human activities with the use of natural resources at the local levels were considered reversible and were assumed to have no likely effect on the environment so as to endanger the contribution of environment to the economy and human welfare.

- Secondly, due to lack of systematic structure and quantitative methodology to account the environmental contribution to economy and human welfare, it was difficult, time-consuming and ambiguous to collect wide data and information without proper methodology and direction.

Green accounting has been developed as a new system of sustainable accounting that provides the calculation of national income after accounting the economic damage and diminution of a nation's natural resource base. Green Accounting attempts to measure the sustainable levels of income that can be achieved without depleting the natural assets stock of a nation.

Green Accounting considers natural resources as the bundle or stock of natural capital and their use by humans. Thus, in principle, these natural resources shall have an economic value which shall be accounted in the similar manner as the value of other types of capital (land, labor, capital and entrepreneurship) that are used to produce goods and services. According to green accounting, while calculating the GDP of any nation it will be incomplete, inaccurate and misleading if it excludes the accounting of its natural capital which has been deployed as a useful resource or as a waste depository for production of goods and services in a year. We know that while computing Net Domestic Product (NDP), depreciation is deducted from Gross Domestic Product (GDP) as an allowance for the consumption of man-made capital.

NDP = GDP – depreciation

However, this method of NDP computation ignores three important aspects –

- Non-accounting of depletion in natural resources resulting from use of farmland, stock, minerals, fishes, etc.,
- Effect of pollution on environmental degradation, and
- Defensive or remedial expenditures incurred to encounter the external effects of the environmental deterioration and degradation.

To overcome these drawbacks of conventional method of national income computation, the Statistical Division of United Nations has formulated the System of Environmental Economic Accounting (SEEA) which aims to focus on:

- Maintaining records of depletion of scarce natural capital,
- Computing the cost of environmental degradation, restoration and prevention.

Under the SEEA, the conventional NDP is replaced with computation of Green NDP or Environmental Domestic Product (EDP). The EDP takes account of the economic cost of degrading natural capital (natural resources) required to produce goods and services, directly or indirectly, in a particular year.

Conversion of NDP into EDP: Under macro economics, Net Domestic Product (NDP) is defined as,:

NDP = Net exports (X - M) + Final Consumption (C) + Net capital accumulation (I)

To calculate EDP, the net capital accumulation needs to be replaced with net capital accumulation of produced and non-produced economic assets after deducting net accumulation of non-produced natural assets. Thus, EDP can be stated as,

EDP = Net exports (X - M) + Final Consumption (C) + Net capital accumulation of produced economic assets (NAp.ec) + ((Net capital accumulation of non-produced economic assets (NAnp.ec) - Net capital accumulation of non-produced natural assets (NAnp.n)).

12.3.1 Objectives of Green Accounting

The green accounting concept has been devised to provide information which will be material in establishing the relationship between environmental resources and its impact on human activities. It establishes the cost-benefit relationship between environment and organizations, corporate and countries. The accounting details the categorization and segregation of various environmental costs pertaining to human activities as a result of use and intervention in the natural resources. These accounting records create the link between man-made capital and environmental capital through monetary valuation. As elaborated in the System of Environmental Economic Accounting (SEEA), developed by the Statistical Division of United Nations, the objectives of green accounting can be elaborated as follows:

- **Segregation and Elaboration of all Environment related Flows and Stocks of Traditional Accounts:** The segregation of all flows and stocks of assets related to environment permits the estimation of the total expenditure for the protection of the environment. A further objective of this segregation is to identify that part of the gross domestic product that reflects the costs necessary to compensate for the negative impacts of economic growth, that is, the defensive expenditures.
- **Linkage of Physical Resource Accounts with Monetary Environmental Accounts:** Physical resource accounts cover the total stock or reserves of natural resources and changes therein, even if those resources are not affected by the economic system. Thus natural resource accounts provide the physical counterpart of the monetary stock and flow accounts of SEEA.
- **Assessment of Environmental Costs and Benefits:**
  - The use (depletion) of natural resources in production and final demand;

- The changes in environmental quality, resulting from pollution and other impacts of production, consumption and natural events, on the one hand, and environmental protection, on the other.

- **Accounting for the Maintenance of Tangible Wealth:** The SEEA extends the concept of capital to cover not only human-made but also natural capital. Capital formation is correspondingly changed into a broader concept of capital accumulation allowing for the use or consumption and discovery of environmental assets.
- **Elaboration and Measurement of Indicators of Environmentally Adjusted Product and Income:** The consideration of the costs of depletion of natural resources and changes in environmental quality permits the calculation of modified macro-economic aggregates, notably an environmentally adjusted net domestic product (EDP).

12.2.2 Identifying and estimating Environmental Costs

- It is not easy to identify and estimate the environmental costs. However, certain relative measures such as replacement and/or restoration cost can be computed to provide cost data. While calculating replacement and/or cost of natural capital few questions can be answered to gain the monetary value attached towards the replacement of natural capital. For example, the questions may includes –
- In case of the damage or elimination of any species in the particular area, how much would be the cost for restoring it?
- How much would it cost to local authorities to eliminate or treat dirtier water clean-up as a result of degraded ecosystem function due to increase in water pollution?
- What shall be cost of additional flood control and safety cost as a result of ecosystem degraded functioning?
- These questions would serve the basis for computing environmental cost only when information related to ecosystem is available and hold true in the eyes of law. The construction of highways and business corridors has brought drastic ecological problems which are yet unaccounted for. The wildfires due to electric malfunctioning are resulting in damage to wild lands, property, resources and species worth millions of dollars. These unaccounted environmental costs are to be addressed by strong government policies and awareness about them to be spread among the individuals, organizations, corporate and governments.

12.3.3 Elements of Green Accounting

Environment or Green Accounting guidelines issued by Ministry of Environment, Japan 2005 indicates the purpose of green accounting to attain two types of benefits that includes, firstly, the benefit of environmental conservation, and secondly, economic benefit to be achieved by incurring cost on environmental conversation activities. Based on these guidelines, the elements of the green accounting can be classified as – (a) structural elements and (b) basic elements.

- *Structural elements:* Structural elements of green accounting can be classified as follows:
  - *Environmental conversation cost:* Investments and expense related to the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities are measured in 'monetary value'. Investment amounts are expenditures allocated during a target period for the purpose of environmental conservation. The benefits from these investments are seen over several periods and are recorded as expense during the depreciation period (the amount of depreciable assets recorded during the period under financial accounting standards). Expense amounts refer to the expenses or losses recorded under financial accounting standards resulting from the consumption of goods or services for the purpose of environmental conservation.
  - *Environmental conversation benefits*: The benefits obtained from the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities are measured in 'physical units'.
  - *Economic benefits associated with the environmental conservation activities*: Benefits to a company's profit as a result of carrying forward with environmental conservation activities are measured in monetary value.
- *Basic elements:* Basic elements of green accounting aim to ensure the conformity of the goals of environmental accounting with the organizational managerial policies and decision-making related to environmental conservation. The basic elements comprise of identification of the following:
  - *Target period*: It states that the information related to the company's financial accounting, environmental activities and its accounting should all be coordinated to match the company's fiscal year.

- *Aggregation Scope*: The scope of the environmental reports maybe either company-wide or corporate group-wise. In principle, under the company-wide reports, information pertaining to financial accounting, environmental conservation activities, and environmental accounting should be coordinated to use identical reporting units for the entire company. However, in case of corporate group-wise, the corporate group comprises of subsidiaries and affiliates of the company and therefore, the scope of reports should include their activities to provide a consolidated understanding of the corporate actions on the environment and establish a correlation between the economic activities and environmental data.
- *Calculation of standards for environmental conservation costs*: The objective standards have to be identified depending upon the business type to categorize any cost as environmental conservation cost in monetary terms.
- *Calculation of standards for environmental conservation benefits*: The benefits obtained from the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities are measured in 'physical units'. There are no established valuation methods, yet integrating various environmental impacts into a single indicator as monetary value by valuating the economic benefits of environmental conservation activities can act as the standard for such benefits from the business activities. Environmental conservation benefits are divided into 4 categories in relation to its business operations. i) Environmental conservation benefit associated with the inputs of resources into business operations, ii) Environmental conservation benefit associated with environmental impact and waste emissions from business operations, iii) Environmental conservation benefit associated with the goods and services produced by business operations, iv) Environmental conservation benefit associated with transports and other operations.
- *Calculation of standards for economics benefits associated with the environmental conservation activities*: The economic benefits are the contribution to the profits of the company or organization as a result of environment conservation activities undertaken, as measure in monetary terms. These economic benefits can be categorized as A) actual benefits (benefits calculated

based on confirmed data available), B) estimated benefits (benefits calculated based on certain assumed data).

12.3.4 Types of Green Accounting

Green Accounting has been designed to consider key environmental factors to be incorporated in the business plan so as to provide accurate and efficient economic position of the organization and country, as a whole. Green accounting revolves around 3 important aspects viz., planet, people and profitability. It aims to include environmental costs into the financial strategy of any corporate, organization and country and examine the social, economic and environmental impact of business operations and the cost to conserve environment to form an important part of economic budgets for the business and country. As broadly identified by Environment Protect Agency (EPA) of United States, the green accounting covers three areas of accounting, as below-

- *National income accounting* is a macro-economic measure. Gross Domestic Product (GDP) is a measure of the flow of goods and services through the economy. It is often cited as a key measure of our society's economic well-being. The term environmental accounting may refer to this national economic context that can use physical or monetary units to refer to the consumption of the nation's natural resources, both renewable and nonrenewable. In this context, environmental accounting has been termed "natural resources accounting."
- *Financial accounting* enables companies to prepare financial reports for use by stakeholders. Publicly held corporations report information on their financial condition and performance through quarterly and annual reports, governed by rules set by the Securities and Exchange regulatory authorities of the countries with input from industry's self-regulatory body. Generally Accepted Accounting Principles (GAAP) is the basis for this reporting. Environmental accounting in this context refers to the estimation and public reporting of environmental liabilities and financially material environmental costs.
- *Management accounting* is the process of identifying, collecting, and analyzing information principally for internal purposes. A key purpose of management accounting is to support a business's forward-looking management decisions. Management accounting can involve data on costs, production levels, inventory and backlog and other vital aspects of a business. The information collected under a business's management accounting system is used to plan, evaluate, and control in

a variety of ways. Similarly, environmental management accounting refers to the use of data about environmental costs and performance in business decisions and operations.

12.3.5 Importance and Scope

The environmental changes and economic activities are interrelated, thus a change in environment has negative impact on economy, and similarly a change in economy has a direct impact on business and its operations. These grossed up changes have a long-term impact on the society, which makes it important and mandatory for corporate to be transparent and governments to be stringent towards corporate disclosures and regulatory compliance for environmental issues.

Under the traditional accounting parameters the facts and figures ignore to account the expenditures on damage control, quantum of deterioration or damage caused, and the cause and effect relationship between business activities and its related impact on environment. Thus green accounting acts as a measure to procure information to assess, both qualitative and quantitative, impacts on environment resulting from the business activities in any economy.

In order to broaden the scope of green accounting nationally and internationally, efforts have been made to unify the code and standards for the disclosure of the environment protection activities of the corporate across the global through various Environmental Financial Accounting and Reporting standards that have been set–up under the International Accounting Standard (IAS) issued by International Accounting Standards Board (IASB). These include –

- IAS 1 on Disclosure of accounting policies
- IAS 16 on Property, Plant and Equipments
- IAS 36 on Impairment of Assets
- IAS 37 on Provisions, Contingent liabilities and Contingent assets
- IAS 38 on Intangible assets

Other than these standards the International Organization of Standards (ISO) has designed the framework on ‘Environmental Management System’ under the ISO 14001 certification which provides voluntary certification to the interested organizations that wish to operate on plan-do-check-act (PDCA) concept on continuous improvement.

ISO 14001 provides standards for specific requirements for effective environmental management system thus helping in reducing the efforts of the organization to establish its own environment performance requirements or standards.

12.3.6 Green Accounting: Indian Perspective

In India, it is necessary to avail environmental clearance from all the competent Government authorities. Union Ministry of Environment and Forest (MoEF) coordinates with the states and other ministries on the issues related to environment protection and pollution control mechanism. It has issued several legal and regulatory compliances towards environment protection for the individuals, organizations, corporate and governments to follow and abide by. The few prominent Acts include:

- Indian Penal Code
- Indian Port Act, 1908.
- The Factories Act, 1948.
- Merchant of shipping Act, 1958.
- Water (Prevention and Control of Pollution) Act, 1974.
- Water (Prevention and Control of Pollution) Cess Act, 1977.
- The Air (Prevention and Control of Pollution) Act, 1981.
- Forest (Conservation) Act, 1980. e) The Environment (Protection) Act, 1986.
- Indian Fisheries Act, 1987.
- Hazardous Waste (Management & Handling) Rules, 1989.
- Public Liability Insurance Act, 1991.
- Motor Vehicle Act, 1991.
- The National Environment Tribunal Act, 1995.

The Central Pollution Control Board (CPCB) has been set up to handle the violation of standards by corporate or industries in case of contamination of water bodies or air pollution. Any person undertaking any industrial operations or processes is required to submit environment statement to the CPCB. The MoEF has made it mandatory for all companies to disclose briefly about the activities undertake or proposed to be undertaken for adoption of clean technologies in prevention of pollution, waste recycling, management and its utilization, pollution control measures, investment quantum on environment protection activities and the impact of these measures on

environment conservation and waste reduction, to form part of the Board of Directors reports.

Under the National Voluntary Guidelines on Social, Environment and Economic Responsibilities of Business, the Securities Exchange Board of India (SEBI) has made it mandatory for all listed companies to report Environmental, Social and Governance (ESG) initiative undertaken by them.

To make companies socially responsible for their activities, the GOI under the Companies Act 2013 propagates mandatory acts of Corporate Social Responsibilities (CSR). Under this Act CSR is mandatory for all companies under the following 3 categories:

- Companies having net worth of INR 500 crore,
- Companies having turnover of INR 1000 crore, or
- Companies having net profit of INR 5 crore

The companies under the above category must spend at least 2 % of its average net profits of last 3 years on its CSR activities and mention the details of all these activities in the Board of Directors reports, annually.

CHECK YOUR PROGRESS

Q 1: State whether the following statements are True (T) or False (F):

(a) GDP is the true measure of the economic progress of the country. (T/F)

(b) NDP = GDP – Depreciation. (T/F)

(c) Environmental costs include both private and societal costs. (T/F)

(d) Private costs are borne by society. (T/F)

(e) Environmental conservation benefits are measured in monetary value. (T/F)

(f) Under Companies Act 2013, all company under the specified category has to spend 2% of the average profits of last years for the CSR initiatives. (T/F)

Q 2: Examine the factors leading to ignorance of accounting natural capital. (Answer in about 30 words)

Q 3: How can NDP be converted into EDP? (Answer in about 30 words)

Q 4: State the mandatory requirements of CSR under the Companies Act 2013. (Answer in about 30 words)

12.4 ALTERNATIVE INDICATORS OF SUSTAINABILITY

Several efforts have been made in the past to develop various qualitative and quantitative measures to indicate corporate development and sustainability. The sustainability development indicates the need of economic growth with environmental conservation/protection and social equity. The measures shall indicate the technical and social activities for fulfilling the needs of the current generations and also ensure that the needs of the future generations are not compromised.

Other than the measures like Environmentally- Adjusted Net Domestic Product (EDP) and System of Environmental and Economic Accounting (SEEA) discussed in the previous section of the chapter, there are other qualitative indicators used to assess sustainability which are discussed as follows:

- **Life cycle Assessment**: Life cycle assessment deals with recording the environmental impacts of a product from the use of raw material through its disposal at the end of its useful life. It is an important tool for corporate/industries to administer and develop a blue-print of activities affecting environment and decide on actions to minimize harm and also to take advantages of the eco-friendly product, process or service.
- **Ecological Footprint**: The ecological footprint is a measure of quantum of human demand on the earth ecosystem. It indicates the amount of biologically available productive land and sea area which shall be needed to regenerate the resources the human population consumes and to absorb and provide harmless the corresponding waste, under the given technology and resource management practice.
- **Environmental Performance Index (EPI)**: The method offers quantifying and numerically benchmarks for the environmental performance of a country's policy. The index has its origin from the Pilot Environmental Performance Index published in 2002 by U.N. Millennium Development Goals.

- **Adjusted Net Savings (ANS)**: Under the national accounting methods, in addition to GDP, calculations are made for savings and investment rates. Net domestic saving is estimated after making adjustments of borrowings and fixed capital depreciation from Gross domestic savings. On lines of measuring EDP, the World Bank has developed the method of Adjusted Net Savings (ANS) also called as 'Genuine Savings'. The ANS analysis is mostly appropriate for developing countries which indicates that – what may appear to be a development "success story" can conceal serious natural capital depletion and in some cases even a negative adjusted net saving rate. ANS is normally calculated as a percentage of national income, although it could also be expressed in monetary units.
- **Genuine Progress Indicator**: EDP, ANS, GDP, etc., are indicators that ignore social welfare costs. In order to create measure for social welfare Index for Sustainable Economic Welfare (ISEW) also known as Genuine Progress Indicator has been developed. Economists Herman Daly and John Cobb, Jr. had first described the ISEW in their 1989 book *For the Common Good*. The non-profit organization Redefining Progress (based in Oakland, California) developed the GPI in 1995 as essentially a second-generation version of the ISEW.GPI is measured in monetary terms. ISEW is used in many European countries, U.S. and Chile, whereas GPI is widely used in U.S. Both these indicators apply five categorizations of costs to compute the index that includes - A. Consumption Base, B. Additions for services not counted as consumption, C. Subtractions for Implicit overestimates of welfare, D. Subtractions for depletion of natural resource base, and E. Adjustments for capital accumulation and flow.
- **Human Development Index (HDI)**: One of most referred and recommended index to measure quality-of-life is United Nations – Human Development Index (HDI). HDI is calculated on yearly basis, based on three components life-expectancy, income and education. It ranks the nation on the basis of their policies activities and recommendations in the 3 components.
- **Better Life Index(BLI)**: As inspired by HDI, Organization for Economic Cooperation and Development (OECD) has developed a comprehensive index to capture data on well-being in different nations by the Better Life Index (BLI). BLI considers 11 dimensions of well-being that includes – i) Income, wealth and inequality, ii) Jobs and earnings, iii) Housing conditions, iv) Health status, v) work and Life balance, vi) Education and skills, vii) Social connections, viii) Civic engagement and governance, ix) Environmental quality, x) Personal security, and xi) Subjective well-being. The results for each dimension are standardized across countries resulting in a score from 0-10.The BLI has been measured for the 34

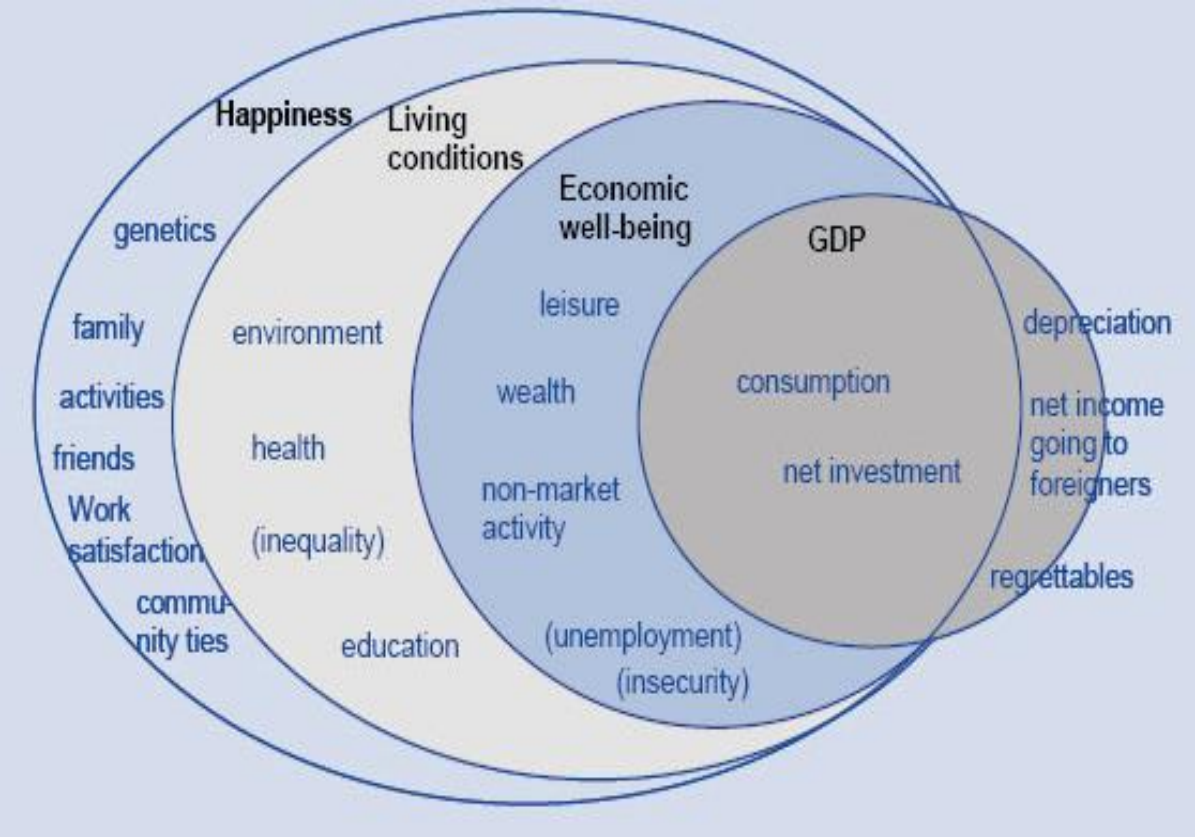
OECD nations, with plans to expand it to Brazil, China, India, Indonesia, Russia, and South Africa.

- **Gross National Happiness Index (GNHI)**: The index was developed by King of Bhutan, King H. M. Jigme Singye Wangchuk in 1972 with the focus on 4 policy objectives including – equitable economic development, environmental preservation, cultural resilience and good governance. The index was further elaborated by Centre for Bhutan Studies (CBS) and operationalized the index in 2011 to add 9 dimensions including - i) Psychological well-being, ii) Standard of living, iii) Corporate governance, iv) Health, v) Education, vi) Community vitality, vii) Cultural diversity and resilience, viii) Time use, and ix) Ecological diversity and resilience.

Figure 12.1 indicates a board view of the various elements considered to evaluate happiness and well-being indices. As discussed these indicators are designed to provide some guidance on the issues of sustainability.

However, all the above mentioned indicators are an option to address the deficiencies in the conventional methods of computing economic performance of the countries around the world. But the success of these indicators depends upon the data collected and its interpretation of results to access environmentally sustenance of the society.

Figure12.1: Elements of Happiness and Well-being



Source: Deutsche Bank 2006

CHECK YOUR PROGRESS

Q 5: Expand the following:

(a) EPI : ……

(b) HDI : ……

(c) ANS : ……

(d) BLI : ……

(e) GPI : ……

(f) ISEW : ……

(g) GNHI : ……

Q 6: Fill in the blanks:

(a) Adjusted net savings index is also known as _____ .

(b) The three components of HDI includes ----------,---------- ---------- and ----------.

(c) BLI is based on ---------- dimensions of well-being.

(d) GNHI focuses on 4 policy objectives viz., ----------, ----------, ---------- and ----------.

12.5 LET US SUM UP

- Green Accounting has been gaining popularity and demanding further propagation to become the integral part of the economic activities of the business and act as a check for the business operations and its impact on the environment.
- The human activities and have to a large extend damaged the environment ecology which has resulted in an adverse effect on the economic status of countries, whether developed, developing or under-developed.
- Efforts to account the human activities causing depletion, damage and deterioration to the natural resources have been initiated through the concept of environmental accounting or green accounting.
- These accounting records aimed to create awareness among individuals, organizations, corporate and governments of the nation of the growing importance to conserve natural resources and to implement financial strategies to incorporate the environmental conservation costs that shall be dedicated towards environment protection and conservation.
- Various legal, regulatory and accounting standardhave been set-up world-wide to bring countries together to make them responsible for natural resource depletion and persuade them to indulge in economic activities to protect natural resource.
- Countries are working diligently to continuously evolve more uniform measures to apply for collecting environmental data, its interpretation standards and implementation strategies.
- Various reporting norms and indicators are applied by countries to suggest environmental sustainability at economic and social well-being levels.

12.6 FURTHER READINGS

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(4) Manual on – *An introduction to environmental accounting as a business management tool: Key Concepts and terms.* United States Environmental Protection Agency. Washington D.C. EPA 742-R-95-00. June. 1995.

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(6) Manual on – *Alternative Indicators of Economic Welfare:Environmental Strategies.* Cornell University. New York. NTRES 454.December, 2003.

12.7 Answers to Check Your Progress

Ans to Q No 1: (a) False (b) True (c) True (d) False (e) False (f) True

Ans to Q No 2: The reasons of the ignorance of accounting the natural capital can be attributed to two factors:

- Firstly, the human activities with the use of natural resources at the local levels were considered reversible and were assumed to have no likely affect on the environment so as to endanger the contribution of environment to the economy and human welfare.
- Secondly, due to lack of systematic structure and quantitative methodology to account the environmental contribution to economy and human welfare, it was difficult, time-consuming and ambiguous to collect wide data and information without proper methodology and direction.

Ans to Q N 3: Conversion of NDP into EDP:

Under macro economics, Net Domestic Product (NDP) is defined as,

NDP = Net exports (X - M) + Final Consumption (C) + Net capital accumulation (I)

To calculate EDP, the net capital accumulation needs to be replaced with net capital accumulation of produced and non-produced economic assets after deducting net accumulation of non-produced natural assets. Thus, EDP can be stated as,

EDP = Net exports (X - M) + Final Consumption (C) + Net capital accumulation of produced economic assets (NAp.ec) + ((Net capital accumulation of non-produced economic assets (NAnp.ec) - Net capital accumulation of non-produced natural assets (NAnp.n))

Ans to Q No 4:

Under the Companies Act 2013, CSR is mandatory for all companies under the following 3 categories:

(a) Companies having net worth of INR 500 crore,

(b) Companies having turnover of INR 1000 crore, or

(c) Companies having net profit of INR 5 crore

The companies under the above category must spend at least 2 % of its average net profits of last 3 years on its CSR activities and mention the details of all these activities in the Board of Directors reports, annually.

Ans to Q No 5:

(a) EPI = Environmental Performance Index

(b) HDI = Human Development Index

(c) ANS= Adjusted Net savings

(d) BLI = Better Life Index

(e) GPI= Genuine Performance Index

(f) ISEW= Index for Sustainable Economic Welfare

(g) GNHI = Gross National Happiness Index

Ans to Q No 6:

(a) Genuine Savings.

(b) Expectancy, income and education.

(c) 11

(d) Equitable economic development, environmental preservation, cultural resilience and good governance.

12.8 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: Differentiate between internal and external functions of green accounting.

Q 2: Differentiate between private and societal costs of green accounting.

Q 3: Briefly describe the structural elements of green accounting.

Q 4: State the relationship between BLI and GNHI of sustainability measurement.

Essay-type Questions (Answer each question in about 300-500 words)

Q 1: State the meaning and objectives of green accounting.

Q 2: Briefly discuss the types of green accounting.

Q 3: Describe the basic elements of green accounting.

Q 4: Write short note on any 4 alternate indicators of sustainability.

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