

Indicators of Sustainable Development

Indicators are meant to support decisions. They do this by simplification and quantification. Indicators perform many functions. An elaborate discussion on indicators of sustainable development can lead to better decisions and more effective actions by simplifying, clarifying and making aggregated information available to policy makers. They can help incorporate physical and social science knowledge into decision-making, and they can help measure and calibrate progress toward sustainable development goals. They can provide an early warning to prevent economic, social and environmental setbacks. They are also useful tools to communicate ideas, thoughts and values.

The United Nations Conference on Environment and Development in 1992 recognized the important role that indicators could play in helping countries make informed decisions concerning sustainable development. At the international level, the Commission on Sustainable Development (CSD) approved its Work Programme on Indicators of Sustainable Development in 1995. The first two sets of CSD Indicators of Sustainable Development (henceforth CSD indicators) were developed between 1994 and 2001. They have been extensively tested, applied and used in many countries as the basis for the development of national indicators of sustainable development.

1. Social Indicators:

a) Equity:

Social equity is one of the principal values underlying sustainable development, with people and their quality of life being recognized as a central issue. Equity involves the degree of fairness and inclusiveness with which resources are distributed, opportunities afforded, and decisions made. It includes the provision of comparable opportunities of employment and social services, including education, health and justice. The notion can be relevant both within and between communities and nations. Significant issues related to the achievement of social equity include poverty alleviation; employment and income distribution; gender, ethnic and age inclusiveness, access to financial and natural resources; and intergenerational opportunity. Impoverished people may feel powerless and isolated, and face pervasive and systematic problems related to insecure livelihoods, malnutrition and poor health, illiteracy, civil

insecurity linked to violence and strife, and corruption. The concentration of the rural poor on marginal land leads to resource over-exploitation and land degradation.

b) Health

Health and sustainable development are closely connected. Safe water supply and sanitation, proper nutrition and a safe food supply, unpolluted living conditions, the control of disease, and access to health services all contribute to healthy populations. Conversely, poverty, lack of information and education, natural and human-induced disasters, and rapid urbanization can all exacerbate health problems. Development cannot be achieved or sustained when a high proportion of the population is affected by poor health and inadequate access to health care facilities. While economic growth and development can contribute to improved health and better health care facilities in the poorest countries, there are also high and middle-income countries where further improvements are warranted. A clean environment is important to citizens' health and well-being. Unsustainable economic growth can also cause environmental degradation which, together with inappropriate consumption, can adversely influence human health.

Societal interventions are aimed at strengthening primary health care systems related to the provision of clean water, adequate sanitation, and safe food through community-based, scientifically sound, and socially acceptable approaches. Safe water and sanitation, vaccine use, and education are recognized as the principal tools to tackle communicable diseases such as malaria, cholera, and HIV/AIDS. In meeting basic health care needs, particular attention must be given to vulnerable groups, including children, women, indigenous people, the poor, and the elderly and disabled.

c) Education

Education, as a lifelong process, is widely accepted as a fundamental prerequisite for the achievement of sustainable development. It cuts across all areas of Agenda 21, being a particularly critical element in meeting basic human needs, and in achieving equity, capacity building, access to information, and strengthening science.³⁵ Education is also recognized as a means of changing consumption and production patterns to a more sustainable path. Education, both formal and informal, is regarded as a process by which human beings and societies can reach their full potential. There is a close association between the general level of education attained and the persistence of poverty irrespective of the level of a country's development. It is vital to changing people's attitudes to achieve ethical awareness, values,

attitudes, skills, and behaviour consistent with the goal of building a more sustainable society. In this way, people are better equipped to participate in decision-making that adequately and successfully addresses environment and development issues.

The primary objectives in addressing these issues include: striving for universal access to basic education, reducing adult illiteracy, integrating sustainable development concepts in all education programmes to achieve interdisciplinary learning, promoting broad public awareness, and strengthening vocational and scientific training.

d) Population

Population provides an important contextual reference on sustainable development for decision makers looking at the interrelationships between people, resources, the environment and development. Population change is a significant signal as countries try to reduce poverty, achieve economic progress, improve environmental protection, and move to more sustainable consumption and production. More stable levels of fertility can have a considerable positive impact on quality of life. In many countries, slower population growth has bought more time to adjust to future population increases.

e) Housing

Adequate shelter is one of the essential components of sustainable development. The availability of adequate shelter substantially contributes to safer, more equitable, productive, and healthier settlements. Living conditions, especially in urban areas, are influenced by excessive population concentration, inadequate planning and financial resources, and unemployment. Rural-urban migration exacerbates this situation contributing to the development of slums and informal settlements. Poor living conditions are associated with poverty, homelessness, poor health, social exclusion, family instability and insecurity, violence, environmental degradation, and increased vulnerability to disasters.

f) Security

Crime prevention and criminal justice are an integral part of the development process. Civil society, good governance, and democracy rest on the promotion of justice as an essential condition for social stability, security, peace, human rights, and long-term sustainable development. Such a stable and secure climate is necessary to support the goals of poverty eradication, economic investment, environmental stewardship, gender equality, participation,

and sustainable livelihoods. This recognition of security as an indicator of sustainable development reflects the growing priority given to security, including crime prevention, within the context of sustainable development in recent years. In Agenda 21, for example, while social security is a persistent theme, the aspect of crime is only briefly mentioned with respect to urban disorder and related health issues, violence against women, and the need for public awareness. Subsequently, the World Summit for Social Development and Habitat II advocated stable, safe, and just societies for promoting social integration and development. Member states were encouraged to address the problems of crime, violence and illicit drugs as factors of social disintegration.⁴⁹ As a follow-up to the Summit, the UN Economic and Social Council made

2. Environment

a) Atmosphere

Priority atmospheric issues include climate change, stratospheric ozone depletion, acidification, eutrophication, urban air quality, and tropospheric ozone levels. The impacts of these issues relate to human health, biodiversity and the health of ecosystems, and economic damage. Many of the effects are long-term, global in nature, and irreversible with consequences for future generations. Most of the popular issues related to environment are improving the scientific basis for addressing uncertainties; · preventing stratospheric ozone depletion; · addressing transboundary air pollution; and · promoting more sustainable and efficient energy use, transportation, consumption, industrial development, and land and marine resource use. The principal human activities contributing to atmospheric change relate to fossil fuel consumption for energy production and transportation. In addition, land use change, including deforestation, industrial processes, intensive agriculture, and waste disposal contribute to atmospheric pollution. Conversely, forest ecosystems are also significant carbon sinks for greenhouse gases. While some gains have been achieved through greater efficiency, fuel substitution, and the use of renewable energy, emission levels have continued to climb due to overall increases in energy use and transportation.

Climate change is widely recognized as a serious threat to the world's environment and is largely a consequence of unsustainable consumption and production patterns. Expected impacts include sea level rise with the possible flooding of low lying areas, higher temperatures, melting of glaciers and ice caps, and more extreme weather patterns with implications for floods and droughts. The socio-economic effects are expected to be

widespread, but have particular significance to agriculture, forests, marine ecosystems, and small island states.

b) Land

Land consists not only of the physical space and the surface topography, but includes the associated natural resources of soil, mineral deposits, water, and plant and animal communities. Use of the land in an unsustainable way affects these resources, as well as the atmosphere and marine ecosystems. Land is becoming an increasingly scarce resource, particularly quality land for primary production of biomass and for conservation, due to expanding human requirements. The implementation of such an approach is intended to resolve conflicts between competing land uses, while addressing access and rights to land; and to increase productivity, while protecting the environment and natural resources. This approach is supported by the United Nations Convention to Combat Desertification, the United Nations Convention on Biodiversity, the Habitat Agenda of the Second International Conference on Human Settlements, and the Plan of Action of the World Food Summit. The priority land-based issues faced by many countries include land degradation, desertification, deforestation, urban growth, and agricultural and rural development. Other significant challenges associated with land use, such as the maintenance of particularly valued ecosystems are covered by other themes of the CSD indicator framework, for example coastal zone and biodiversity.

c) Freshwater

Freshwater is essential to support human life, ecosystems, and economic development. It supports domestic water supplies, food production, fisheries, industry, hydropower generation, navigation, and recreation. The ecosystem services of freshwater systems include food production, reduction of flood risk, and the filtering of pollutants. The global issues of health, poverty, climate change, deforestation, desertification, and land use change are all directly associated with the water resource and its management. The long-term sustainability of water is in doubt in many regions of the world. Currently, humans use about half the water that is readily available. Water use has been growing at more than twice the population rate, and a number of regions are already chronically short of water. The freshwater indicators in the core set capture the two essential dimensions of quantity and quality. The withdrawal of available water measures a country's demand for water and reveals its vulnerability to water shortages.

d) Biodiversity

Biological diversity consists not only of variety among species, but also genetic variation within species, and variation between communities of species, habitats and ecosystems. This biodiversity of genes, species, and ecosystems contributes essential products and services to human welfare. Maintaining biodiversity helps ensure that the Earth will continue to perform natural ecological processes upon which all life depends. Major changes, loss, or degradation of biodiversity can result in serious economic, social, and cultural impacts; and have profound ecological and ethical implications. More than 40% of the world's economy and about 80% of the needs of the world's poor are dependent upon biological diversity. Food security, climatic stability, freshwater security and human health needs are all directly associated with the maintenance and use of biodiversity.

3. Economic

a) Economic Structure

Trade and investment are important factors in economic growth and sustainable development. Improved access to markets, transfer of financial resources and technology, and debt relief are critical to assisting developing countries meet the objectives of sustainable development. Poverty, natural resource exploitation, and consumption and production are all intimately connected to economic growth or the lack of it. It represents a considerable challenge to ensure that economic growth leads to social equity and does not contribute to environmental degradation. To support economic performance within the context of sustainable development, trade liberalization is necessary; making trade and environment mutually supportive; providing new and additional financial resources to developing countries; and encouraging macroeconomic policies favourable to environment and development. Trade liberalization usually has positive effects on sustainable development. It can stimulate economic diversification, improve the efficiency of resource allocation, reduce environmentally unsound trade restrictions, and encourage the transfer of cleaner, more efficient technology. Free trade can also result in increased resource use when the environmental costs of production are not fully internalized and reflected in market prices.

b) Consumption and Production Patterns

Unsustainable patterns of consumption and production, particularly in developed countries, are the major cause of the continued depletion of natural resources and deterioration

of the global environment. It is widely acknowledged that the Earth cannot support the consumption levels of industrialized countries on a global scale. In addition, such high levels of consumption affect the current and future consumption and production options of developing countries. A change to more sustainable lifestyles calls for the concerted, combined efforts of governments, producers, and consumers. It requires less emphasis on material consumption, more emphasis on resource and energy-efficient technologies, a stronger commitment to meeting the needs of the poor, and a focus on economic systems that account for social and environmental costs. Such a fundamental change is very difficult to achieve because of strongly ingrained beliefs and behaviours.

4) Institutional

a) Institutional Framework

Appropriate legal and policy instruments are required as an institutional framework to encourage and implement sustainable development. The integration of social, economic, and environmental factors is a particular important feature of such instruments. Implementation of sound sustainable development strategies and international treaties by countries should contribute to improved socioeconomic and environmental conditions, and help reduce potential sources of conflict between countries. The objectives of adoption of national strategies of sustainable development should be to ensure socially responsible economic development while protecting the environment and the natural resource base for future generations.

b) Institutional Capacity

The ability of a country to progress towards sustainable development is largely determined by the capacity of its people and institutions. Capacity can be measured by a country's human, scientific, technological, organizational, institutional, and resource capabilities. Institutional capacity enhances participatory planning, implementation, and monitoring related to sustainable development. An increase in capacity improves community skills and abilities to address crucial questions, evaluate policy options and implementation approaches, and appreciate constraints and limitations. Communication systems, information access and availability, the support for science and technology, and the prevention and mitigation of natural disasters are all elements of a country's institutional capacity.