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Glossary of Selected Terms in Sustainable Economic Development

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SUSTAINABLE AGRICULTURE PROGRAMME

This **Gatekeeper Series** is produced by the International Institute for Environment and Development to highlight key topics in the field of sustainable agriculture. Each paper reviews a selected issue of contemporary importance and draws preliminary conclusions of relevance to development activities. This glossary of thirty entries covers a variety of terms commonly used in the literature on sustainable economic development. Each entry includes a brief description and references for further information on the subject. Cross references to other terms are indicated in bold upper case. References are provided to important sources and background material.

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GLOSSARY OF SELECTED TERMS IN SUSTAINABLE ECONOMIC DEVELOPMENT

ABSORPTIVE CAPACITY

The ability or capacity of developing countries to absorb aid and other investment. This capacity is often limited by the extent of resources of qualified people and other technical and managerial capabilities available in these countries. For example, one indicator of absorptive capacity is the proportion of total aid flows to a country actually disbursed as implemented projects and programmes. (IMF, 1987)

APPROPRIATE TECHNOLOGY and INTERMEDIATE TECHNOLOGY

APPROPRIATE TECHNOLOGY (AT) is the generic term for a wide range of technologies characterised by one or several of the following features: low investment cost per work-place, low capital investment per unit of output, organisational simplicity, high adaptability to a particular social or cultural environment, sparing use of natural resources, low cost of final product or high potential for employment. (Carr, 1985). **INTERMEDIATE TECHNOLOGY (IT)** is a technology which stands halfway between traditional and modern technology. Intermediateness is a relative notion: in Africa, the ox-drawn plough is an intermediate technology (more sophisticated than the traditional hoe, but less complex than the tractor) but in south-east Asia, it can be considered as a traditional technology (Carr, 1985; Schumacher, 1973)

AUSTERITY POLICIES

Policies for cutbacks in Government spending sometimes laid down by the International Monetary Fund (IMF) as a prerequisite for extending credit to meet short-term balance-of-payments needs. The approach has been criticised for contributing to sharp declines in per capita incomes, increasing unemployment, and necessitating cutbacks in environmental amelioration/conservation spending. (IMF, 1987)

CARRYING CAPACITY

The maximum number of users that can be sustained by a given set of land resources at a particular level of technology. The concept originated in ecological studies where the users were plants; it was later used in connection with livestock production, and then recreational activity (Odum, 1975, Mahar, 1985)

CASH CROPS, FOOD CROPS, EXPORT CROPS

The term **CASH CROP** is often used synonymously with **EXPORT CROP**. Strictly speaking, however, a cash crop may be sold at home or abroad and may be either a food or non-food commodity, whereas an export crop is a cash crop that is ultimately exported from the country producing it. The major non-food cash crops that are exported are cocoa, coffee, fibre crops, rubber, tea and tobacco. In contrast, the term **FOOD CROP** usually refers to domestic production of basic staples (cereals, pulses, roots and tubers). Although these are the principal subsistence crops, they are also often marketed. For example, in Asia a sizeable proportion of rice and wheat, which are basic food staples, is sold for cash. (Barbier, 1987b; Braun and Kennedy, 1986)

COMMON PROPERTY RESOURCES

Resources collectively owned and managed by a well-defined group of users. Irrigation systems and upland pastures are common examples. Ideally, common property resources are governed by a common property regime (i.e. a system of rights and duties) which prevents overexploitation. Many traditional societies have institutional arrangements to manage common resources in a sustainable manner. In Northern Pakistan, for example, the specific dates that certain upland pastures can be used are set each year, and punishment for violating the rules is severe. In the absence of fear of punishment, sustainable management of common property depends basically on mutual trust among members of the user group. That is, each person will adhere to his/her duties and responsibilities with the expectation that others will do the same. But in the face of rapid population growth and poverty, many common property resource management institutions have broken down. The result may be that common property resources are converted to **OPEN ACCESS RESOURCES**. (National Research Council, 1986.)

COST-BENEFIT ANALYSIS

A procedure for evaluating the desirability of a project by weighing benefits against costs over a period of time. The recent emphasis on the role of environmental quality and the long-run productivity of natural resource systems in sustaining economic development has led to the extension of social cost-benefit analysis to include environmental impacts. This expanded approach considers not only the direct benefits and costs, but also the external and environmental improvement benefits (plus the benefits from environmental protection), as well as the costs of external and/or environmental damages and of environmental control measures. The basic methodology is first to identify and measure the environmental effects and then to translate them into monetary terms for inclusion in the formal project analysis.

However, extending cost-benefit analysis to incorporate the environmental impacts of projects encounters a number of problems:

1. physical estimation of environmental effects is often difficult
2. as many environmental resources are non-marketed common-property 'goods', economic valuation of their services is not straightforward. In these cases various valuation techniques may be used to determine monetary values
3. shadow prices are used to adjust market prices for distortions due to government policies or other market imperfections
4. little consensus exists regarding methods for monetary valuation of 'intangible' environmental goods, such as the need to preserve unknown species for their intrinsic value.

(Barbier, 1987a; Dixon and Hufschmidt, 1986; Markandya and Pearce, 1987)

DEBT RESCHEDULING

A country that is unable to meet its debt servicing obligations may agree with its creditors (eg., commercial banks, bilateral or even multilateral lending agencies) to reschedule its debts. That is, the borrower may ask to escape its immediate repayment commitments by converting short-term loans into those with a longer payback period but with lower current repayment rates, or interest rates. One indication of whether debt rescheduling may be necessary is a country's debt/service ratio, which is usually defined as interest plus capital repayments in a particular year as a percentage of export earnings. (World Bank, 1987a). (Quote: "If you owe a bank £100, you have a problem. If you owe it flmn, it has a problem." John Maynard Keynes)

DECISION CRITERIA

The criteria used to decide among alternatives in economic analysis. The most commonly used are 'rules of thumb', such as the 'payback period' approach etc. The more formal approaches are those found in **COST-BENEFIT ANALYSIS** - net present value (NPV), internal rate of return (IRR), and benefit-cost ratio (B/CR). All of these criteria depend on an examination of benefits and costs (placed in a cash flow table) over time. The NPV and B/CR require use of a pre-selected discount rate. The IRR calculation is used to find the discount rate that makes the present value of benefits just equal to the present value of costs.

Another commonly used decision making approach focusses on the costs of meeting a goal or target. Cost-effectiveness analysis, CEA, does not try to estimate the value of the benefits of a project (e.g., public education or health care delivery) but

rather focusses on the least-cost way to meet a given goal (e.g. person-years of education provided; number of children immunised). (Dixon and Hufschmidt, 1986)

DESERTIFICATION

Although no satisfactory definition of desertification exists, the term is often used to describe a process of sustained decline in the biological productivity of arid and semi-arid land. The end result is desert, or skeletal soil that is irrecoverable. Desertification takes two distant forms: desert spread and induced desertification in more humid areas. The former may often be linked to desertisation - the increase in deserts due to natural processes. More recently, however, desertification has been linked to the sustained process of **LAND DEGRADATION**. Common indicators of desertification include a reduction in the amount and diversity of plant and animal species, loss of water retention capacity, lessened soil fertility and increasing wind and water erosion. Eventually, plant and animal communities become so radically simplified that species formerly common in an area can no longer survive under the drastically altered circumstances even if they are deliberately reintroduced. (Kotschi et al., 1986; World Bank, 1985).

DEVELOPING COUNTRIES

The World Bank divides developing countries into low-income economies with 1985 GNP per person of \$400 or less; and middle-income economies with 1985 GNP per person of \$401 or more and describes seven other non-industrial countries (Bahrain, Brunei, Kuwait, Libya, Qatar, Saudi Arabia and the United Arab Emirates) as high-income oil exporters. The United Nations General Assembly, responsible for defining **LEAST-DEVELOPED COUNTRIES**, does so on the basis of per-capita GDP and indicators of manufacturing and literacy. Another commonly-used term, sub-Saharan Africa refers to all countries south of the Sahara excluding South Africa (World Bank, 1987b)

DISCOUNTING

The process of adjusting future values to the present by means of a discount rate. This procedure recognizes that, for example, an amount invested today at the discount rate (an interest rate) would grow to a larger future value over time; conversely, an amount received in the future has a smaller value today. It can be argued that a lower discount rate promotes a more sustainable development policy by encouraging longer term benefits; i.e. there is more incentive to invest in resource conservation measures when the discount rate is lower. But the effects are uncertain as lower discount rates, by encouraging more investment, can result in greater demands on resources. (Markandya and Pearce, 1987)

ECONOMIC RENT

Economic rent is usually referred to as the difference between the total value of a factor of production (e.g., land, natural resource, labour or capital) to its users or owners above what it actually costs them to use or supply it. Rent is thus defined to be that part of a person's or firm's income which is above the minimum amount necessary to keep that person or firm using or supplying a particular factor of production.

In the case of natural resources, economic rents are usually referred to as 'scarcity rents' - they naturally arise as valuable resources, such as oil, minerals and tropical resources, become depleted. In principle, rent can be determined in any natural resource activity by deducting from gross extractive income the cost of labour, materials and capital inputs (including the costs of paying a 'normal' return, or profit, to capital). In other words, the existence of scarcity rent indicates surplus value, or profit, available for appropriation either by the users who own property rights to the resource, by the owners of resource extraction enterprises, or the government through taxation and other fees. Thus the failure of government to 'capture rent' by imposing appropriate taxes or fees may encourage 'rent seeking' behaviour by the other parties. This means that the owners and users may seek to develop and extract more of the resource to appropriate yet more surplus profit. (Gillis, 1988; Repetto, 1986)

EXTERNALITIES

An economic externality occurs when some activity or action has an impact, usually unintentional, on a third party that is not part of the decision making process. The resulting change in welfare of the third party is thus not taken into account in the decision making process. The classic example of an economic externality is smoke emissions from a factory affecting nearby residents. The smoke-induced impacts (e.g., health effects, smoke damage to clothes and buildings, harmful effects on plants) are not seen as a "cost" to the factory and therefore mitigative measures are not usually taken. Soil erosion and downstream sedimentation or water pollution and downstream effects are other examples of common economic externalities. Many major development projects have sizeable off-site impacts on the environment or natural resource base. If these impacts are not taken into account they are then economic externalities. If externalities are "costs", ignoring them will lead to an overestimate of the net benefits of the project. Externalities can also be benefits, and, in this case, including them in the analysis of the project will increase the net benefits of the project. For example, a reforestation program can produce positive economic externalities via improved hydrology or water quality below the replanted area.

In recent years considerable work has been done on recognising economic externalities as legitimate costs or benefits and therefore including them in the economic analysis of the project. When this is done, the effects are no longer externalities but are internalised as part of the analysis. (Dasgupta, 1982; Dixon and Hufschmidt, 1986; Fisher, 1981).

FOOD SECURITY

Food security is usually defined as access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it. For example, the lack of food security in many developing regions may increasingly arise from a lack of purchasing power on the part of nations and households rather than from inadequate global food supplies. However, it is also important to distinguish between two types of food insecurity: chronic and transitory. Chronic food insecurity is a continuously inadequate diet caused by the inability to acquire food. It affects households that persistently lack the ability either to buy enough food or to produce their own. Transitory food insecurity is a temporary decline in a household's access to enough food. It results from instability in food prices, in food production, or in household incomes - and in its worst form it can lead to famine. (World Bank, 1986b)

INTERGENERATIONAL JUSTICE

This basic theory of intratemporal (single-generation) justice, developed by Rawls (1971), can be extended to encompass the notion of intergenerational justice. That is, in the intratemporal case, if each individual seeks to avoid the risk of being the poorest member of society, then social justice is achievable only if society maximises the 'primary goods' available to the most disadvantaged individual in society - where primary goods are rights and liberties, opportunities and powers, income, self-respect and wealth. Consequently, intergenerational justice is also ensured if each generation has the opportunity of obtaining primary goods. If the opportunity of equal access to natural resources is a condition for each generation's survival, let alone its fulfillment of primary goods, this suggests a **PERMANENT LIVABILITY** criterion ensuring that the resource base is kept intact (Page, 1977; Pearce, 1986c)

LAND DEGRADATION

Degradation is defined as a reduction in the capability of land to satisfy a particular use; i.e. the process where formerly productive land is rendered economically unproductive. It is therefore a social problem; environmental processes such as leaching and erosion occur with or without human interference,

but for these processes to be described as 'degradation' implies social criteria which relate land to its actual or possible uses.

Degradation is best viewed as a result of both natural and man-made forces:

Net degradation =

$$\begin{aligned} & (\text{natural degrading processes} + \text{human interference}) \\ & \quad \text{minus} \\ & (\text{natural reproduction} + \text{restorative management}) \end{aligned}$$

The impact of natural reproduction on net degradation is illustrated by comparing the soil-loss tolerance in the mountains of Ethiopia and the hills of Northern Thailand. In the former case, cultivation has been going on for 2000 years with a fairly low rate of soil loss. However, the cumulative loss and slow rates of natural soil formation have both served to produce very serious land degradation. In Northern Thailand, however, with higher rates of soil loss, the local land-management system has 'compensated' for this and the capability of the land, in which soil formation is more rapid than in Ethiopia, is maintained. Where extreme processes of land degradation are sustained in fragile environments or where soil formation is severely impaired the end result may be **DESERTIFICATION**. (Blaikie, Brookfield et al., 1987; Hurni, 1983)

MARGINAL COST

The additional cost of an extra unit of production. This is distinct from the average cost, which is the total cost of production divided by the total number of units produced. For example, if it costs a total of £20 to produce 5 pairs of shoes, the average cost of each pair is £4. However, if the 5th pair cost an additional £5 to make, then the marginal cost of that last pair of shoes is £5. Note that in economics, the costs of production should not be calculated solely in terms of financial costs (i.e., monetary outlays), but in terms of the true **OPPORTUNITY COST** method. For example, the 'marginal opportunity cost' of non-sustainable resource use is made up of the direct harvesting costs, a user cost element, the **EXTERNALITIES** and any other inefficiency costs. (Pearce, 1986b; Samuelson and Nordhaus, 1987)

MARKET FAILURES, MARKET DISTORTIONS AND GOVERNMENT FAILURE

Economic analysis relies heavily on the functioning of the market - the process of buying and selling and the flows of information in an economy - to provide efficient allocation of scarce resources. In theory, buyers and sellers will interact in the market so that resources go to the highest value use.

MARKET FAILURES occur when this system breaks down. A classic market failure in natural resources management is when there are off-site impacts (e.g. water pollution, soil erosion and sedimentation) that create costs that are not paid for by the resource user. For example, logging practices can be very destructive and lead to soil erosion. The eroded soil ends up downstream behind a dam, in an irrigation canal or in coastal waters. The costs created by this eroded soil (economic externalities) are not paid for by the logger and therefore his costs of production are lower than if the off-site costs were included. The logger, therefore, receives greater private profits by ignoring the off-site costs, and therefore is encouraged to log more than is socially optimal. A market failure has occurred and total social welfare is reduced.

A similar phenomenon is that of **MARKET DISTORTIONS** caused by the impact of taxes or subsidies. For example, many countries heavily subsidise fertilisers and pesticides, thereby creating the perception that they are "cheap" (they are not) and encouraging much more use (frequently in inefficient or environmentally damaging ways) than would be the case if they were priced at their true cost. In much the same way, "free" agricultural water can lead to over-application of water, excessive runoff of nutrients, waterlogging and salinisation. In the case of market distortions, incorrect signals on resource scarcity lead to misuse of resources.

GOVERNMENT FAILURE describes the situation where government intervention in the economy either fails to correct adequately for market failures or distortions or is actually the source of these problems. Examples of government intervention include price controls, exchange rate controls, management of marketing outlets, local taxes, compulsory sales of proportions of food output to government agencies, land use controls, labour market interventions, and so on. Government failure can exacerbate resource degradation when these sort of interventions distort the signals to resource users in such a way that responses are not conducive to resource conservation and augmentation. (Pearce, 1986a; Repetto, 1986).

OPEN ACCESS RESOURCES

Any natural resource that does not have a barrier or obstacle to its use or exploitation (sometimes also referred to as nonproperty resources). The atmosphere is the classic open access resource. Examples are fisheries, the ocean, certain freshwater sources, and, in the absence of regulation or control, many upland forest resources. Hardin's **TRAGEDY OF THE COMMONS** is one example of an abused open access resource.

Because these resources are available free or at minimal cost, they are frequently overexploited leading to degradation, pollution or exhaustion. (Haefele, 1974)

OPPORTUNITY COST

The value of something foregone. For example, the direct cost of a man-day of labour is what the person would otherwise have produced had they not been taken away from their usual occupation to be employed in a project. The concept of opportunity cost is important in determining the true costs borne by society of losses in environmental functions. These costs would include

1. **user costs** - the direct costs to the user of a resource for a particular function (i.e. the private cost)
2. **intertemporal user costs** - the benefits foregone by those who might use the resource in the future for the same function. Unless a user owns all future rights to the resource, these costs will be borne by others, including possibly future generations.
3. **social costs** - the inefficiency and external costs imposed on non-users, both now and in the future, from any loss of other functions due to exploitation of the resource.

(Barbier, 1988; Pearce, 1986b; Samuelson and Nordhaus, 1987)

PERMANENT LIVABILITY

A criterion coined by Page (1977) that requires present generations to ensure that future generations are possible, i.e., that we do not remove the conditions for future life. If one of these conditions is that future generations inherit a 'sound' resource base, then the resource base should be preserved for all generations. That is, each generation should have equal access to the resource base, which should thus be managed as though it were jointly owned over time. The only justification for unequal resource endowments for each generation is if all generations can be made better off as a result of this inequality. Such a condition thus implies both a principle of **INTERGENERATIONAL JUSTICE** and a necessary criterion for **SUSTAINABLE DEVELOPMENT**. (Pearce, 1986c)

RENEWABLE AND NON-RENEWABLE RESOURCES

The general convention is to call natural resources renewable or nonrenewable depending on whether they exhibit economically significant rates of regeneration. Thus resources such as oil, coal and mineral ores are considered nonrenewable as they are only regenerated on a geological, rather than a human, time scale. In contrast, resources such as water, terrestrial and aquatic biomass are called renewable resources as they are naturally regenerated on a time scale that is relevant to human exploitation. For example, although it is possible to exhaust a renewable resource this will not occur if the rate of natural regeneration or growth of the resource exceeds the rate of

exploitation or harvesting. However, some resources and environmental functions, such as soil quality, the assimilative capacity of the environment and ecological life support systems are not completely nonrenewable but are only regenerated at very slow rates (i.e., over human generations). These resources are usually termed semi-renewable. (Barbier, 1988; Fisher, 1981).

SPECIAL DRAWING RIGHTS

A form of international financial asset, created by the International Monetary Fund (IMF) in 1970 and designed to supplement gold and dollars in settling balance of payments accounts. SDRs can be exchanged through the IMF for national currencies, or held by a country as reserve. They are only traded between central banks; they are not used in commercial transactions. (IMF, 1987)

STEADY-STATE ECONOMY

This is usually assumed to mean a 'zero growth' economy. Proponents of a steady-state economy argue that this is necessary to limit ecological damage, thus extending the lifetime of natural ecosystems and consequently of the entire economic-environmental system. This implies a direct relationship between economic growth and increased resource depletion and waste generation. Consequently, a 'growth' economy may maximise the 'throughput' of material and energy in the economic process - i.e., the continuous conversion of raw materials extracted from the environment into waste - whereas a steady-state economy is "an economy with constant stocks of people and artifacts maintained at some desired, sufficient levels by low rates of maintenance throughput".... The steady-state perspective seeks to maintain a desired level of stocks with a minimum throughput, and if minimising the throughput implies a reduction in GNP, that is totally acceptable". (Daly, 1977)

STRUCTURAL ADJUSTMENT PROGRAMS

A series of policy reforms, usually recommended by the IMF and World Bank as a condition for further lending, aimed at instigating major structural economic changes in developing countries with debt repayment problems. Typically these reforms encourage more of an export orientation, efficient import substitution and a reduction in public sector intervention in the economy through excessive regulation, public enterprise and trading monopolies and distortionary taxation and subsidies. In some instances where domestic inflation is high and domestic resource mobilisation by governments is inadequate, a drastic reduction in all areas of public expenditure is recommended. The negative impact of structural adjustment on certain income groups, notably the urban and rural poor dependent on nontradable and informal services, may require specially targetted subsidies

to protect these vulnerable groups (World Bank, 1986a; Addison and Demery, 1986)

SUSTAINABLE DEVELOPMENT

Two interpretations of sustainable development are now emerging: a wider concept concerned with sustainable economic, ecological and social development and a more narrowly defined concept largely concerned with 'environmentally sustainable development' i.e. with optimal resource and environmental management over time. The former interpretation has been endorsed by the World Commission on Environment and Development (WCED, 1987) who define the concept as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". More specifically, a sustainable development approach "argues that real improvement cannot occur in developing countries unless the strategies which are being formulated and implemented are environmentally sustainable over the long-term, are consistent with social values and institutions, and encourage 'grassroots' participation in the development process... In general terms, the primary objective is reducing the absolute poverty of the world's poor through providing lasting and secure livelihoods that minimise resource depletion, environmental degradation, cultural disruption, and social instability" (Barbier, 1987a).

In contrast, a more narrowly defined concept of environmentally sustainable economic development is:

"Sustainable economic development involves maximising the net benefits of economic development, subject to maintaining the services and quality of natural resources over time". (Pearce et al., 1987).

Where "maintaining the services and quality of the stock of natural resources over time" implies, as far as is practicable:

- a) utilising renewable resources at rates less than or equal to the natural or managed rate at which they can be continuously generated;
- b) emitting wastes at rates less than or equal to the rates at which they can be absorbed by the assimilative capacities of the environment; and
- c) optimising the efficiency with which exhaustible resources are used, subject to substitutability among resources and technological progress.

SUSTAINABLE LIVELIHOOD SECURITY

Sustainable livelihood security integrates population, resources, environment and development in four respects: stabilising

population; reducing migration; fending off exploitation; and supporting long-term sustainable resource management. The Brundtland Commissions' Advisory Panel on Food, Agriculture, Forestry and Environment developed sustainable livelihood security as an integrating concept, with these meanings: livelihood is defined as adequate stocks and flows of food and cash to meet basic needs; security refers to secure ownership of, or access to, resources and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies; and sustainable refers to the maintenance or enhancement of resource productivity on a long-term basis. A household may be enabled to gain sustainable livelihood security in many ways - through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires of activities (Source: Chambers, 1987) (Food 2000, 1987)

TRAGEDY OF THE COMMONS

The widespread argument that common ownership of resources is the major 'cause' behind resource degradation because individual and collective interests do not coincide; i.e., "freedom in the commons ruins all" (Hardin, 1968). For example, graziers with herds on common land will add to their herds for so long as the marginal return from the additional animal is positive; in the absence of a binding mutual agreement each herdsman will typically ignore the cost he imposes on the others when introducing another animal into the commons. However correct interpretation of this argument requires distinguishing between **COMMON PROPERTY RESOURCES**, where each of the herdsmen could benefit if they jointly were to exercise some control over the commons, and **OPEN ACCESS RESOURCES**, where the lack of such mutually binding agreements or controls increases the risks of over-use and degradation. (Dasgupta, 1982; Pearce, 1986b).

URBANISATION

The process of becoming urban. In general usage urbanisation is association with the concentration of populations into towns and cities; three linked concepts are frequently applied: (1) a demographic phenomenon - the absolute and relative growth of towns and cities within a defined area; (2) the structural change in society consequent upon the development of industrial capitalism; (3) a behavioural process - urban areas, especially large cities, have been identified as centres of social change; attitudes, values and behaviour patterns are modified in the urban environment, characterised by its size, its density, and the heterogeneity of its inhabitants. (Johnston et al., 1986). (Hardoy and Satterthwaite, 1986; United Nations, 1987)

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