Measuring Development

In order to review the various ways of measuring development it is first necessary to define 'development' and to explain why numerous groups of researchers (planners, agronomists, political economists) might wish to measure it.

The definition of development will clearly influence how it is measured. Development is defined as 'the process of change operating over time'. Traditionally the term is synonymous with economic growth and it is seen as the process by which countries and societies advance and become richer. The roots of this traditional approach can be traced to Victorian England, in the Colonial era, where indigenous people (the natives!) were deemed to be less developed than their colonial masters. The **Three Worlds Model** evolved as a result, in which the First and Second Worlds were advanced or developed nations (the First World via Capitalism and the Second World via Socialism) and the Third World countries were the undeveloped or developing nations. Traditional measures of development focused on economic data, to show rates of economic growth, and the acquisition of wealth, using indices such as GNP or GDP per capita. The emphasis was on the rapid economic growth of poorer nations to enable them to catch up and narrow the Development Gap with richer nations.

A more modern 20th Century definition sees development as the process of change which allows all the basic needs of a region to be met, thereby achieving greater social justice and quality of life and encouraging people to fulfil their potential. Economic growth can both hinder and help this kind of development. In trying to measure it, we need to look at factors which affect the quality of life; social indicators such as health, education and well-being and political factors, such as people's personal freedom. Such **qualitative** aspects of development become increasingly difficult to measure using numerical or **quantitative** measures. How do you quantify for instance, aspects of daily life such as freedom of speech, the right to vote, freedom from discrimination or the role of disadvantaged groups in society?

A second trend in the late 20th Century has been the 'greening' of development. The key issue has become sustainable development; development which uses resources responsibly, ensuring future generations can live at least as well as current generations. Thus, traditional measures of economic output, such as the amount of energy used (measured in tonnes of coal equivalent) have no place in this approach. Indeed, an over rapid rise in energy use could signify a lack of genuine commitment to green development. Sustainable development cannot allow damage to the environment or the loss of traditional customs. It may even be opposed to economic growth if it hinders the improvement of quality of life for peoples, or widens the gap between rich and poor.

A modern definition of development such as **Todaro's** - 'the process of improving the quality of all human lives', has three main elements:

1. Raising people's living standards, their incomes, consumption levels of food, medical services, education etc. through relevant economic growth processes.

2. Raising people's self-esteem through the establishment of social, political and economic systems and institutions that promote dignity and respect.

3. Increasing people's freedom by enlarging the range of their choices, e.g. varieties of consumer goods.

Development is clearly a complex and wide ranging process involving cultural, economic, environmental, political, social and technological change. The analysis of a range of variables (called multivariate analysis) is therefore necessary to provide **useful** information.

Why do we need to measure development?
Fig 1 likens development to an electric cable.

Fig 1. The development cable
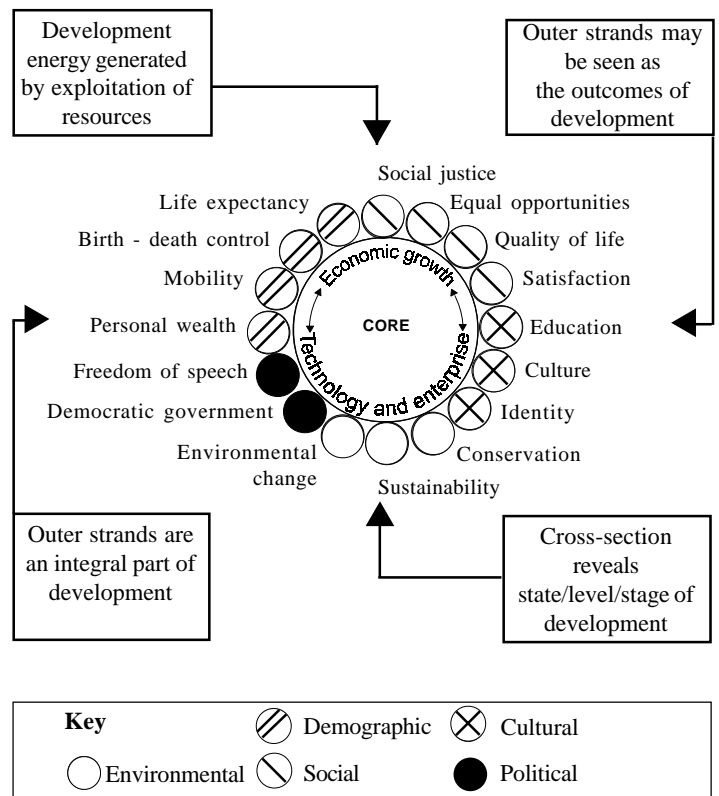
In Fig 1 the core of the cable is an amalgamation of economic growth, technology and enterprise. Any progress achieved is driven by the use of physical resources as well as the enterprise and technology generated by human resources. The rate of development depends on the carrying capacity (or voltage) of the cable.

If we cut the cable at any point along its length it will reveal a cross section which represents a snapshot in time. If we have the ability to measure the wide range of development factors shown, we can look at development over time, since the condition of the components exposed in the cut cable constitutes what is often termed a **level of economic development.**

The measurement a range of development variables, not just economic growth, allows further analysis of what has been achieved and can perhaps pinpoint more effective ways of encouraging development. We can also explore progress (or the lack of it) within a country and make comparisons between countries to identify disparities at a continental or global scale. This has led to global concepts such as the **North-South Divide**, and the **Development Gap**.

Traditional Measures of Economic Development

The most widely used measure for international comparisons is the GNP (Gross National Product) per capita. The GNP is defined as the 'total value of a country's economic production in one year'. It includes:

1. Production of food/goods
2. Provision of services
3. Profits from overseas investments
4. Money earned in the country by foreign people and foreign businesses

GNP is nearly always calculated on a per capita basis so that differences in population are neutralised. An annual league table can be made. In 1996, for example, Luxembourg at $41,210 headed the list and Mozambique at $80 was at the bottom. Fig 2a shows a standard map of GNP per capita by country.

Fig 2a. GNP per capita by country

Key

Gross National Product per capita

| ■ High $8626 or more | ▨ Middle $696 - $8625 | ☐ Low (or no data) $695 or less |
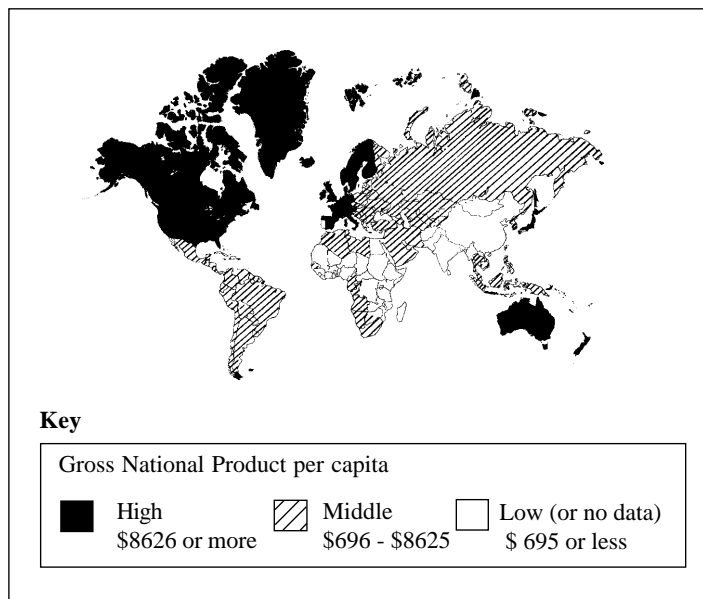
Whilst the measure is extremely widely used, the use of money units to assess development has a number of problems:

1. The real value of the unit of currency for each country will change significantly over short periods of time - hence the use of US dollars as the means of comparison. Inevitably, the conversion process creates distortions because of different and changing inflation rates.

2. International exchange rates do not necessarily reflect the relative purchasing power of one currency against another. For instance domestic or personal services cost widely differing amounts in various countries.

3. As a large part of the country's output does not enter international trade, official exchange rates are unrepresentative of the domestic market prices. Thus the World Bank (Fig 2b) has attempted to devise the Purchasing Power Parity per Capita Index (an indication of buying power) so that GNP per capita figures give a better indication of relative standards of living within each country.

Fig 2b. Purchasing Power Parity per Capita index by country

Key

Purchasing Power Parity per capita

| ■ High ≥ $8526 | ▨ Middle $696 - $8525 | ☐ Low ≤ $695 (or no data) |
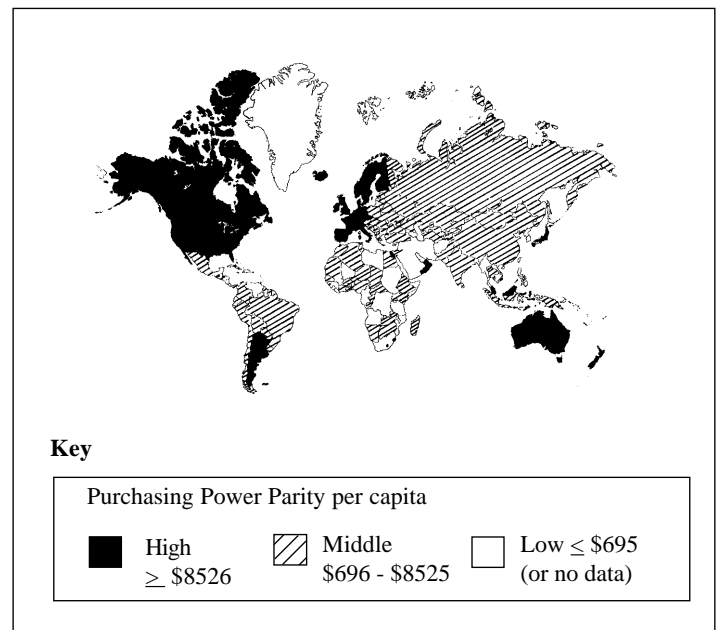
4. There are special problems with Second World countries (the former planned economies) such as Russia because of different definitions of national income.

5. In places like Russia, further variations occur because the intensely cold winters lead to high expenditure on clothing and heating and the enormous size of the country leads to a greater expenditure on transport and communications.

6. The biggest single reason for what has been described as the dethronement of GNP, as a true indicator of development and economic well being' is that it gives no indication of how national income is actually distributed. A rising level of both absolute and per capita GNP can completely hide the fact that the poor are no better off. GNP is largely a calculation of the rate of growth of the incomes of the upper 40% of the population, who receive a disproportionately large share of the national product.

GNP growth rates of a country can therefore be a very misleading index of the welfare of its poorest citizens, many of whom in LEDCs are subsistence farmers.

In the 1970s, when development was seen almost exclusively as an **economic** phenomenon in which rapid overall growth and per capita growth would **trickle down** to the masses in the form of jobs, the GNP per capita was the key measure. It was on the basis of GNP that the world's countries were divided into groups such as high income countries (MEDCs - more economically developed countries), middle income countries (including many NICs - newly industrialised countries) and low income groups including LEDCs.

Exam Hint - Candidates must clearly show that they understand:

(i) What is meant by the term development.
(ii) The advantages and disadvantages of different techniques for measuring development.

Contemporary Measures Of Development

(A) Multivariate Analysis

Berry pioneered the concept of multivariate analysis (analysing several variables at once) and in 1970 an Atlas of Economic Development was produced which analysed 43 important development variables (Table 1).

Table 1. Berry's list of variables

1 *Transportation*	4 *Communications and other per capita indices*
• Kilometres of railways per unit area • Kilometres of railways per population unit • Tonnes or kilometres of freight per population unit per year • Tonnes or kilometres of freight per kilometre of railway • Kilometres of roads per unit area • Kilometres of roads per population unit • Motor vehicles per population unit • Motor vehicles per kilometre of roads • Motor vehicles per unit area	• Fibre consumption per capita • Physicians per population unit • Petroleum refinery capacity per capita • Newspaper circulation per population unit • Telephones per population unit • Domestic mail flow per capita • International mail flow per capita **5 *GNP*** • National product per country • National product per capita **6 *Trade*** • Value of foreign trade turnover • Foreign trade turnover per capita • Exports per capita • Imports per capita • Percent exports to North Atlantic region • Percent exports raw materials
2 *Energy* • Kilowatt hours (kwh) of electricity per capita • Total kwh of energy consumed • Kwh of energy consumed per capita • Commercial energy consumed per capita • Percent of total energy commercial • Kwh of energy reserves • Kwh of energy reserves per capita • Percent of hydroelectric reserves developed • Developed hydroelectricity	**7 *Other*** • Percent population in cities 200,000 and over • Percent land area cultivated • People per unit cultivated land
3 *Agricultural yields* • Rice yields • Wheat yields	**8 *Demographic*** • Population density • Crude birth rates • Crude death rates • Population growth rates • Infant mortality rates

Berry used sophisticated statistical analysis to apply this data short list to 140 countries. Fig 3 summarises the findings.

Using technological and demographic scales, each country is represented by a dot on the two dimensional diagram. Together, these summarised most of the variations in the original 43 categories. The cluster of countries in the top left hand segment are considered to be at the highest level of economic development, whereas the most disadvantaged are found at the bottom right. Note however that most of the indicators are economically based.

Fig 3. Two dimensional respresentation of development
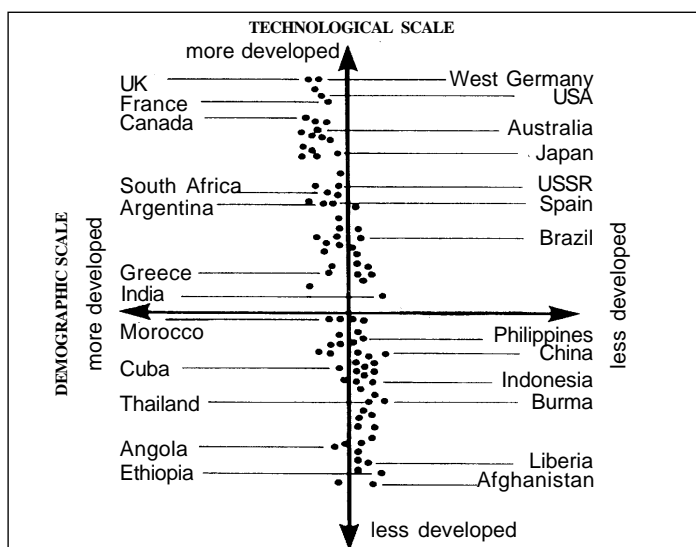
(B) Development Indices

Increasingly, the problems associated with using per capita GNP as a measure of development became more apparent. As a result in the 1970s, numerous efforts were made to both remedy its defects and use other multivariate indicators which could serve as alternatives to this traditional measure. Fig 4 shows some of the most important measures of social development based on health, education and housing.

Fig 4. Most useful social indicators for showing quality of life.
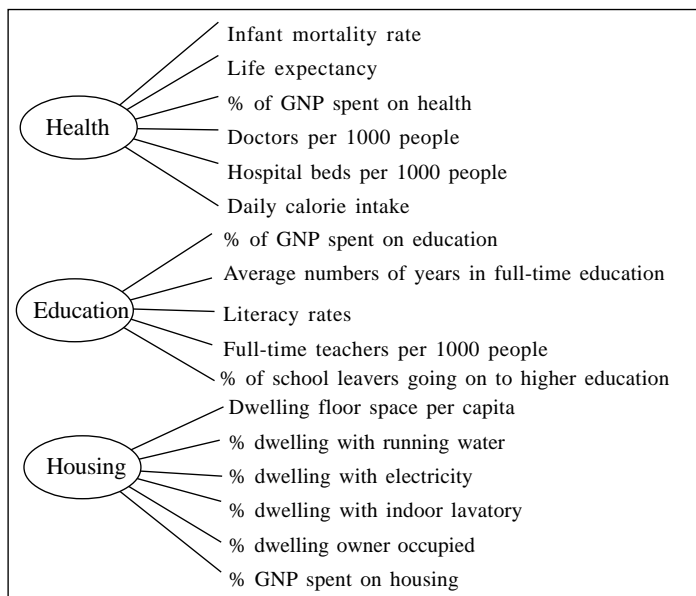
One of the earliest attempts to use multivariate analysis was carried out by the United Nations Research Institute on Social Development (UNRISD) in 1970. A Social Development Index was developed using 16 core indicators (9 social and 7 economic).

Interestingly, this social development index correlated less highly with per capita GNP for MEDCs than LEDCs. In particular, social development was notably lagging behind economic development in some OPEC (oil producing and exporting countries) which had very high GNP per capita figures. A major criticism of the development index is its concentration on measuring inputs e.g. the numbers of doctors or teachers per 1000 population, or school enrolments and also that some indicators, such as animal products consumption were inappropriate for LEDCs.

Fig 5 shows an example of a **development profile** which enables countries to be compared on a representative cross sectional view of socio-economic conditions. To achieve a development profile each country is ranked on a world scale for each of the indicators and then the profiles are drawn.

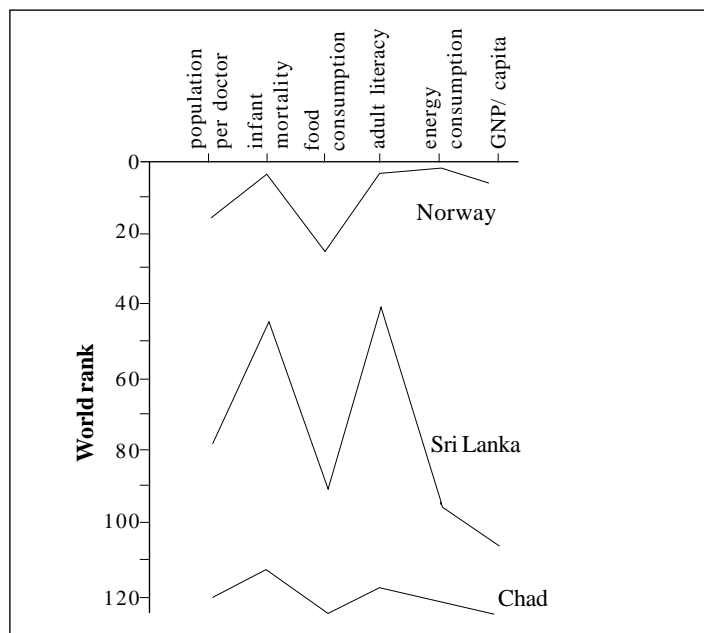**Fig 5. An example of the development profile of countries**

Fig 5 shows the uneven pattern of development of Sri Lanka and the uniform but low level of development in Chad. The figure also shows the marked differences between the three countries.

(C) Quality of Life Indices

Physical Quality of Life Index (PQLI)
This is an average of three key characteristics; literacy, life expectancy and infant mortality. Each is scaled from 0 to 100. For example, literacy rates of zero to 100 per cent would be scaled as 0 to 100 respectively, exactly as in the raw data. However, with life expectancy and infant mortality, the scaling is done in a different way. Each year the world's shortest life expectancy and highest infant mortality is scaled as 0 and the opposite of each as 100. The composite index for each country is then calculated by averaging the three rates, giving equal weightings to each (Table 2).

Table 2. (GNP) and (PQLI) for selected LDCs.

Country	Per capita GNP ($)	PQLI
Gambia	348	20
Angola	790	21
Sudan	380	34
Pakistan	349	40
Saudi Arabia	12 720	40
India	253	42
Iraq	3 020	48
Qatar	27 790	56
Tanzania	299	58
Zimbabwe	815	63
Brazil	2 214	72
China	304	75
Sri Lanka	302	82
Singapore	5 220	86
Taiwan	2 503	87
Costa Rica	1 476	89

As can be seen from Table 2 some interesting patterns emerge. Although there is a broad general correlation with per capita GNP ($), positive and negative anomalies are apparent. For example, oil rich states in the Middle East show a much higher GNP than PQLI's largely because there is a lag time before improvements made in health and education take effect. Conversely, countries such as Tanzania, China or Sri Lanka register lower GNP figures compared to their PQLI largely because the GNP measure undervalues their level of development in the basic essentials of a satisfactory quality of life.

Human Development Index (HDI)
Since 1980, the United Nations (UN) has been working on the construction and refinement of the Human Development Index which it uses in its annual Human Development reports. Like the PQLI, HDI attempts to rank all countries based on three goals/outputs which result from overall development:

1. Longevity (life expectancy at birth).

2. Knowledge (measured by a weighted average of which 66.6% is from adult literacy and 33.3% is from mean years of schooling).

3. Income as adjusted to measure real per capital including purchasing power adjusted to local cost of living.

As can be seen from Table 3 it is then possible to rank countries into groups. In the sample of nations shown, it is possible to see many anomalies between the ranks achieved for HDI (column 2) and adjusted GNP per capita especially amongst low income countries.

Table 3. Rank of grouped countries.

Country	Relative ranking (lowest to highest)	Human development index (HDI)	Gross domestic product (GDP)	GDP rank minus HDI rank
Low H.D. (0.0-0.5)				
Guinea	160	0.050	602	-41
Chad	150	0.088	582	-1
Bangladesh	135	0.185	820	15
Tanzania	126	0.268	557	32
Cameroun	118	0.313	1699	-30
Vietnam	102	0.464	1000	55
Medium H.D. (0.51-0.79)				
Algeria	95	0.582	3088	-37
Oman	82	0.598	4997	-45
Sri Lanka	76	0.651	2253	44
Saudi Arabia	67	0.687	4944	-34
Cuba	61	0.732	2500	1
Brazil	59	0.739	4851	-5
United Arab Emirates	57	0.740	5079	-45
High H.D. (0.8-1.0)				
Mexico	46	0.804	4888	15
Costa Rica	42	0.842	4413	25
South Korea	34	0.871	4901	5
United Kingdom	10	0.962	5016	11
United States	6	0.976	5074	2
Japan	2	0.981	5018	1
Canada	1	0.982	5051	10

Inevitably, there are limitations with the HDI:

1. Its creation by the UN was partially politically motivated to specifically focus on health and development issues.

2. The three indicators are good but not ideal - possibly a nutritional index of, for example, children under 5, would be an even more diagnostic indicator but the data for this was just not available in most countries.

3. A national HDI can mask tremendous regional disparities especially between urban/rural or core/periphery areas or between different ethnic groups such as whites/blacks in South Africa.

4. This index may do no more than a development profile which pinpoints anomalies between economic and social development in a more standardised way.

5. The index is one of relative not absolute development, so that if all countries improve at the same rate, the poorest countries will not get credit for any progress.

The International Human Suffering Index (IHSI)

The International Human Suffering Index (IHSI) was developed in 1987 by the Population Crisis Committee of Washington USA. The index measures development based on the 10 variables shown in Table 4. A low score (lowest of 4 achieved by Switzerland in 1991) indicates minimal human suffering.

Table 4. The International Suffering Index

Country	Life expectancy	Daily food intake	Clean drinking water	Infant immunisation	Secondary school enrolment	GNP per head	Rate of inflation	Communications technology	Political freedom	Civil rights	Human suffering index	World position - 141 nations
Australia	0	0	0	0	0	1	2	1	0	0	4	6
Bangladesh	10	5	2	8	10	10	6	10	2	5	68	100
Belgium	1	0	0	0	0	1	0	0	0	0	2	2
Bhutan	10	-	7	1	10	10	6	10	8	4	73	111
Brazil	4	0	0	5	10	6	10	6	3	6	50	59
Bulgaria	2	0	0	0	4	3	10	6	2	5	32	34
Canada	0	0	0	0	0	0	1	0	1	1	3	4
China	3	0	2	0	10	10	7	9	10	10	61	78
Finland	1	3	0	0	0	1	1	0	2	0	8	15
Germany	1	0	0	0	1	1	0	0	0	3	6	9
Hong Kong	0	1	0	5	5	1	5	2	5	5	29	30
India	8	4	2	2	10	10	6	9	4	8	63	84
Netherlands	0	1	0	0	0	1	0	0	0	0	2	2
Nigeria	10	5	5	8	10	10	0	10	6	6	70	105
Singapore	1	1	0	4	6	1	0	2	6	7	28	28
Taiwan	1	0	1	4	1	3	1	5	4	5	25	25
UK	1	0	0	0	3	1	5	1	1	4	16	22
USA	1	0	0	0	0	0	2	0	10	1	5	8

The table shows that many areas of extreme human suffering are found in Africa (the poorest continent), but that there are some surprising areas of high human suffering such as Brazil.

The index is successful in that the 10 indicators selected have been chosen to genuinely reflect the overall quality of life. However some of the points awarded do rely more on qualitative data than is normal for such indicators.

Conclusion

This Factsheet has reviewed most of the basic ways of measuring development and showed how they have evolved to fit changing perceptions as to what development actually means. However no amount of measuring and monitoring will actually answer such important questions as:

- Is development designed to meet people's basic needs?
- Should development take account of the environment?
- Is development an economic prescription from the rich countries, or should the people in poorer countries be empowered and have political control over the process?

What measuring development does do is to enable researchers to make comparisons both spatially and over time in order to encourage greater understanding of the development process. With the greening of development, the task for the Millennium will be to devise indices which measure successful sustainable development in all aspects of economic activity.

Typical Exam Questions

Typical styles of exam questions on Measuring Development include:

(i) Discuss the extent to which it is possible to measure Development.

(ii) Measuring Development using Economic Indicators is no longer a real indicator of Development. Discuss.

(iii) Analyse the ways in which researchers have tried to measure Economic Development.

(iv) There is no one way of measuring Economic Development. Discuss.

(v) Development Indicators reveal disparities in Development levels. Assess this statement either globally or regionally within one country.