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*Research Article*

# Indicator of Development: Per Capita Income to Human Development Index

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**Abstract*:*** Today the greatest challenge of mankind is that of economic development. Every year huge investment are undertaken, numerous policies are formulated, elaborate plans are laid down, large foreign capital flows in so as to meet the challenges of development or at least move closer to a reasonable level of development.
But there are several questions relating to development. How do we measure the degree of development? How do we know that a country is developed or under development at any point of time? How do we compare the relative successes? To answer these questions we need a meaningful operational indicator of development for this purpose. Indicator of development may be simple and unambiguous only in a one commodity Robinson Crusoe economy. Then development means expansion of output to the individual. But as soon as we step into multiproduct economy with multitude of population indicator of development becomes a complex affair. Because production of some commodities may rise and that of some may fall. Similarly, some persons may gain and some other may lose. How can we determine whether the whole production has increased or decreased? How we assess the economic well being of the people?

D. Morris advocated the acceptance of physical quality of life index (PQLI) as a test of the degree of development. PQLI has three indices-literacy rate, infant mortality rate and life expectancy at the age of 1. Prof. Amartya Sen has been advocating two concepts which can be used as indicators of development. They are –capability and entitlement.

**Keywords:**Human, development index-physical quality of life index-capability-entitlement-life expectancy.

## 1. Introduction:

In the broader sense, development means improvement of the quality of life, better nutrition and health, higher education, less poverty, clean environment, greater freedom and richer cultural life. All these are the elements of development. Better quality of life requires higher income, but higher income is only a necessary condition not sufficient one.

In an economy, every year a huge investments are undertaken, numerous policies are formulated, elaborate plans are laid down, large foreign assistance flows in to meet the challenges of development. The market prices are used to evaluate products and to compare total value of products to understand what has happened to total output. In practice, prices are affected by many other factors like monopoly, product differentiation, advertisement, externality etc. so the aggregate value arrived through market prices is not a satisfactory solution. But in a multi commodity world no suitable alternative is available similarly, to overcome the problem of multitude of population per Capita income is also used. But it has also many limitations. Because it ignores distribution of income, extent of poverty, actual quality of life of the people, the advocates of per capita income expect that high income leads to many benefits like better health, improved education etc. World Bank has been releasing data only on per capita income as an index of development till recently.

## 2. Per Capita Income:

To be meaningful indicator of development must be capable of revealing the degree of development. In other words, it must be appropriate for compariative static exercises involving the achievement of different countries at a point of time. But to do that per capita income of different countries will have to be denominated in a single currency. Till recently the practice was to convert the per capita income of every country into dollar (US) equivalents on the basis of rate of exchange.

The legitimacy of the computation depends on the accuracy of such conversion. For several reasons such conversions are doubtful-exchange values of currencies are often determined not freely, even in the absence of any restrictions mobility of goods between markets using dollars and using rupees is extremely limited- as a result the conversion has every possibility of being inaccurate. Sometimes exchange rates are subject to violent fluctuations. It affects the dependability of conversion.

### 3. Improvement of the Index

Two different approaches have been undertaken to avoid the above problems. First is to improve the calculation and conversion of per capita income, to make it strictly comparable and second is to devise alternative measures of degree of development that is more easily computable.

Let us start with the first. It aims at more accurate cross country comparison. To achieve that instead of exchange rates emphasis is given to purchasing power parity of currencies. The basic logic is considering quantities of different currencies as equivalents when their purchasing powers are equal.

There are several methods of constructing a purchasing power parity ratio in order to make binary comparisons. One approach is to select a comparable basket of goods and services in each country and to estimate the purchasing power equivalent of each item in country A relative to country B. A possible formula for this purpose is

$$\frac{Qi\ Pi\ A}{Qi\ Pi\ B}$$

Where pi A and pi B are prices of good I in the countries respectively and Qi is the geometric mean of the quantities of each good consumed in the two countries. This purchasing power equivalent ratio can then be used for converting national income of one country in local currency into its equivalents in another country's currency. But this method is useful only in the case of a binary purchasing power parity ratio.

Methods for multilateral companison have also been devised. It was attempted by Kravis in 1975. Allan Heston and Robert Summers created a new data set in 1988 (Penn World Tables) for a very large set of countries. Its entries are denominated in a set of international prices. They claim that international comparison of real GDP can be made on the basis of that (Real GDP) both between countries and over time. Heston and Summers used the international prices released by ambitious International Comparison Programme (ICP) of united Nations.

Briefly ICP comprises following steps. First a set of countries is selected having relatively adequate and dependable data. Sometimes through surveys data are collected too. Data on prices of 400-700 items are collected from each country. Price of each item is divided by the price of the item in the US dollar to obtain a relative price. Items are then classified in 150 categories (110 consumption, 35 investments and 5 governments). Average relative price is worked out for each category. Thus 150 relative price data are obtained or price-parties. Next national currency expenditures Pij Qij are obtained on each of the 150 categories. Dividing the expenditure on each category by its relative price,

$$\frac{Pij\ Qij}{Pij/\ Pi\ US}$$

an estimate of the quantity in the category valued at its corresponding US price is obtained. It is possible to make international comparison of these quantities valued at US prices. But US prices alone do not reflect the tastes of all countries. So we still have to construct international prices.

International price is constructed by obtaining specialized weighted average of the relative price of the respective items in all the countries. The quantities earlier obtained from expenditure data are valued at the international prices which yields the value of national output at these prices. The purchasing power parity (PPP) for any country is the ration of its domestic currency expenditures to the international price value of its output.

The Purchasing Power Parity are undoubtedly more useful than the official exchange rates for conversion of per capita income or valuation of consumption. It does not help remove computational problems. PPP estimates are based on price comparison of comparable items but not all items can be matched perfectly in quality across countries and over time. Services are particularly difficult to compare. Government activities often have to be measured on the basis of costs. Different countries have different efficiency levels. So imperfections are considerable.

### 4. Human Development Index (HDI):

The realization that notwithstanding the best efforts the per capita income approach to degree of development will have considerable imperfections induced economists to search for alternatives. Such alternatives tried to highlight either the quality of life or the changes in the economic conditions of relatively deprived sections in the developing countries. During the 70's it was noticed that in spite of fairly rapid growth of per capita income in many countries poverty, unemployment. Inequality etc. changed little or even increased in a number of countries. Economists started to worry about the conditions of the people for whom development is more important, more desirable. Reduction of poverty unemployment and inequality is taken as an essential test of development. Content of GDP became equally important with the growth of GDP.

With the support of the World Bank a new approach-Basic needs approach was developed. Fulfillment of some basic needs was accepted as indicator of the degree of development. A country is more advanced when it fulfills greater proportion of such basic needs relatively less controversial measures were suggested like-

Condition of Health expressed in Nutrition, Life Expectancy

Condition of Education expressed in Literary, Enrollment etc.

Condition of Water supply expressed in percent of population having access to safe drinking water

Condition of sanitation expressed in infant mortality

Condition of Housing expressed in covered floor space per person.

Of course this approach was criticized too as many expressed apprehension that focusing basic needs may induce allocation of resources more for consumption at the cost of investment. However many considered increased fulfillment of basic needs as a way of promoting human capital. A major problem with this approach is the possibility contradictory indication.

In 1979 Morris. D, wrote a book advocating acceptance of Physical Quality of Life Index as a test of the degree of development. PQLI is an unweighted average of three indices like literacy rate, infant mortality rate and life expectancy at the age of 1. These indicators are measured in the aggregate without particular focus to any section of population. It therefore solves little the problem of distribution. Yet it has to be admitted that the measurement is much less controversial.

In recent years Prof. Amartya Sen has been popularizing two concepts which can very well be used as indicators of the degree of development. They are capability and entitlement. Admittedly no one of them has been decomposed in its measurable elements. Still they seem to be very much relevant and meaningful. The capability of a person stands for the different combinations of functioning the person can achieve, it reflects the freedom to achieve functionings. And the functionings of a person refer to the valuable things the person can do or be the improvement of capability may be considered as the process of development and state of capability the indicator of the degree of development.

Along with capability entitlement is also important. Entitlement depends on the ability of individuals to exchange productive resources and goods for desired commodities and services. It depends on such factors as the ownership and employment status of individuals, productivity, non-working income in the form of subsidies and transfer payments, and on the terms of trade between different goods. Entitlement may be acquired or may be guaranteed by the Govt. It substantially affects the distribution of GDP.

## 5. Conclusion:

Very recently since 1990 we have been obtaining from the World Bank a dependable index of desired development in the form of Human Development index. It is rather an improved version of PQLI of Morris D Morris. Per capita income facilitates development only indirectly through its effects on physical amenities of a comfortable life. But these physical amenities are observable and very often measurable. Many countries themselves collect data on these amenities these days. Even internal agencies have been collecting informations. These informations are assuming increasing importance because often do we find the performance of the countries in improving these physical amenities not commensurate with the level of per capita income. In other words high per capita income has not led to expected improvement in the standard of living. Therefore it was considered advisable to concentrate directly on amenities instead of adopting an indirect rout.

UNDP since 1990 have started to present informations on some physical indicators as components of a single index H.D.I. it has three components. The first is the Life Expectancy at birth. The second is a measure of educational attainments of the society. It is itself a composite measure it takes a weighted average of adult literacy (2/3 weight) and a combination of enrollment rates in primary secondary and tertiary education (1/3 weight). The last component is per capita income which is adjusted somewhat with a complex formula after a threshold (usually average of world income) is crossed. Less weight is given to higher incomes after this point on the ground that there is diminishing marginal utility of higher incomes. The HDI is calculated as a simple average of the achievements in these components. Longevity, knowledge and a decent standard of living.

For the construction of the index fixed minimum and maximum values for each of these indicators have been adopted.

Life Expectancy at birth- 25 years and 85 years

Adult Literacy- 0% and 100%

Combined gross enrollment rates- 0% and 100%

Real GDP per capita (PPP): 100 and 40,000

For any component of HDI, individual's indices can be computed according to the general formula

$$\text{Index} = \frac{\text{Actual Xt value} - \text{Minimum Xt value}}{\text{Maxm Xt value- minimum Xt value}}$$

For instance if the actual life expectancy in a country is 65 years then the index of life expectancy in that country would be

$$\frac{65-25}{85-25} = \frac{40}{60} = 0.667$$

The construction of income index is complex-the world average income of 5,835 (1994) is taken as the threshold (y*)-income above this level is discounted based on Atkinsons formula

W(y) = y* for 0<y<y*

= y*+2[y-y*0 ½] for y*=<y<y*

Y = y* +2(y*1/2)…….+n {[1-(n-1)y*]}

The HDI is a simple average of the life expectancy index, educational attainment index and adjusted real GDP (PPP) index.

It is claimed that the process of widening people's choices and the level of well being they achieve are at the core of the notion of human development. Such choices are neither finite nor static. But regardless of the level of development the three essential choices for people are- to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living.

However HDI is one way to combine important development indicators and the rankings according to HDI are of some interest.

**References:**

1. Bonne, A- Studies in Economic Development
2. Lowis, W.A.- Development Planning
3. Higgins, B.- Economic Development Problems, Principle and Policies
4. Tinbergen, J.- Development Planning
5. Roston, W.W.- The Process if Economic Development
6. Rao, V.K.R.V.- Essays in Economic Development
7. Meier, R.L.- Development Planning
8. Das Guptam A.K.- Planning and Economic Growth
9. Kurihara, K.K.- The Keynesin Theery of Economic Development.
10. Ghosh, Alak- New Horizons in Planning
11. Reports-
12. World Development Report (1998)
13. Development Economics (2004)
14. Patterns of Development (2005)
15. World Bank Annual Report (2008