

SUSTAINABLE DEVELOPMENT INDICATORS: HUMAN CAPITAL AND ACCOUNTING

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This paper wants to reveal the importance of Sustainable Development (SD) as a new concept and also the measurement of sustainable development indicators (SDI) on a capital approach. Capital approach is a new concept for SDI measurement so that the research team considered that it is interesting to present this approach. The team's preoccupation was human capital (HC) as a concept and valuation and also some possible contributions that make clear this concept and how organizations must act and how accounting must provide information.

Key words: sustainable development, sustainable development indicators, human capital, accounting.

Introduction

Sustainable Development (SD) was defined by The Brundtland Report of the World Commission on Environment and Development as follows: "Humanity has the ability to make development sustainable – to ensure that it meets the need of the present without compromising the ability of future generations to meet their needs". This definition clearly reveals two fundamental aspects: one is based on present needs or intergenerational equity issues and the other has to do with future generation or development in time.

So that SD may be considered as a temporal concept, a never-ending process where development must be forever in the benefit of the sustainability.

What kind of development may be accepted for a long period of time? Is this in relation with a long-term policy? When is a development good or bad? Why a development is considered as a good or bad one?

These are some questions that were arisen during the period when the research team was studied SD and SDI and also the accounting's position in this context.

Sustainable Development and Sustainable Development Indicators

The concept of development (economic development) was analyzed during a long period of time, on a capital base of societies as an important force behind development. Capital as a base that explains development consists on more than money and assets (produced capital), such as human, natural and social capital. Consequently, development may be explained by produced capital; human, natural and social capital.

Sustainable development is a dynamic concept, is about the development of social welfare over time. Also development over time requires savings that can be invested in various capital types.

SD, as a new concept, was analyzed by a lot of researchers, such as A. Knut, M. Greaker, A. Geir etc. Pears and Atkinson (1993) considered that SD might be a weak or a strong sustainability. Strong or weak sustainability is a concept based on the interrelation between different types of capital, the substitution between the various stocks of capital.

Sustainable development from a capital approach was characterized as follows in the UN handbook and System for Environment and Economic Accounts (SEEA 2003): “Sustainable development is development that ensure non-declining per capital national wealth by replacing or conserving the sources of the wealth: that is stocks of produced, human, social and natural capital”.

Capital approach to measuring SD was often analyzed by different institutions and organizations implied in SD policy but also by a lot of researcher interested by a theoretical outline of the capital approach. Some arguments in the favor of this concept are the following:

- welfare may be considered as a function of how assets are distributed so distributional rules can be viewed as a manifestation of social capital;
- production and consumption can be seen as a function of capital, of how capital was allocated through the working of societies institutions (Dasgupta, 2001).

By contrast Czesnay (2007) considers that capital is not the most appropriate term to be used because of a misleading connotation between different forms of capital.

Total National Wealth (TNW) may be defined as the sum of different types of capital. But to give a value to TNW each form of capital must be valued based on an accounting price or shadow price, which are defined as the welfare effects of a marginal change in the corresponding types of capital.

Human capital (HC) and accounting

Human capital is not a traditional type of capital such as financial assets and physical capital. Human capital in its current meaning is what used to be called human potential or human resources. HC may be defined also as an individual’s collection of human resources including personal abilities, knowledge, skills, time, and energy. Other some definitions of HC are as follows:

- the stock of economically productive human capabilities (Bahrman and Taubman in World Bank, 2006,p89);
- the knowledge, skills, competencies and attributes embodied in individuals that facilitates the creation of personal, social and economic well being (OECD, 2001).

Czesnay (2007) analyzed the relation between HC and the enhancement on the other forms, such as:

	Private benefits	Public benefits
Economic benefits	I	II
Wider social benefits	III	IV

Human capital theory was based on private economic benefits because an better-educated people are economically active and also potential sources of higher earnings. In other way, investment in HC may yield benefits to the economy at large.

A study that was made by OECD shows us that a rise in HC by 10 percent leads to an increase in output per capital between 4 and 7 percent. So that, in the last years, researchers tried to identify the effects of education on economic growth in order to show that HC in general and education in special, have on important impact on national wealth.

In order to calculate SDI, on the capital approach is necessary to establish a measurement frameworks. What does this mean? In this context a measurement framework “is a practical set of data and organizational rules that translate a conceptual framework into policy relevant information in the form of a sustainable development indicators set” (Working Paper, Economic Commission for Europe Conference of European Statisticians, 2007, page 40).

The instruments used for a measurement framework are considered national accounts. In 2003, UN made an extension of the Standards for National Accounts (SNA) to cover natural resources and this was done in the Systems of Environmental and Economic Accounting (SEEA). But, regarding HC and SC such extension does not exist. In this context, a part of HC may be estimated based on national accounts, using some data from those accounts.

Regarding HC, in literature, there are two points of view: the first consider HC composed by three elements: raw labor, education and skills and the second identifies HC with education and skill.

The value of HC was calculated not only to evaluate SD but also for other three reasons:

1. to evaluate education policy;
2. to evaluate what determine employment;
3. to understand economic growth (Stroombergen, Rose and Nana, 2002, Review of Statistical Measurement of Human Capital).

How to calculate the value of HC? This was a challenge for many researchers. An intensity method for HC valuation was conceived by Stroombergen, Rose and Nana. They identified three categories for HC valuation such as:

- a) the cost based method that estimate HC from the input side;
 - b) the revenue generating method that estimates HC from the output side;
 - c) the current stock characteristics method.
- a) On the cost based method from the input side, HC is estimated by all expenses that contribute to HC formation such as education expenses; on job training expenses and employer financed outside job courses. Also some depreciation may be considered due to the period when people leave the work, or stay unemployed, or they begin a new trade.
 - b) The revenue generating method from the output side supposes to estimate the expected wages obtained on a labor market. In this method the economic point of view is important.
 - c) The last method consist in a separate measurement of average years of schooling in the population, unemployment rates, the health status of the population and to translate them in monetary units to the stock of HC.

Because a lot of investments in HC are made, HC may be valued at the discounted sum of expected returns. Pearce and Atkinson (1993) discussed for the first time about an indicator called Genuine savings for SD. After this moment a lot of researchers developed this indicators. In 2005 World Bank, in a book presented a model of how to calculate genuine savings (GS) as follows:

$$GS = NIPC + EE - RR - DE$$

where: NIPC – net investment in physical capital

EE – expenses for education; wages paid to teacher, but excluding investment in buildings

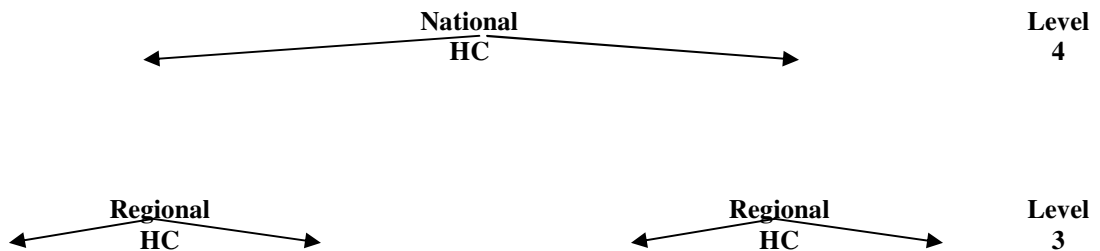
RR – resource rents in non-renewable natural resource sectors

DE – damages to environment from particulate matter and carbon dioxide.

If GS is non-negative that means that consumption is sustainable. This indicator also expressed changes in HC component with expenses to education for a particular period of time.

In the last years the growth literature has tried to ensure HC from the output side, because HC from the input side was largely debates in literature. So that Becker (1975), Jorgenson and Traumeni (1989,1992), Hui Wei (2004), Ervik, holmay and Hargeland (2003), based on the measurement of HC from output side, calculated rates of return to education by looking at wages differentials between workers with different levels of education and also they calculated the HC component.

One important conclusion arises from this presentation: that is not easy to measure HC in order to calculate SDI. In our opinion HC may be analyzed at different levels such as:



**Local
HC**

**Local
HC**

**Local
HC**

**Local
HC**

**Level
2**

Organization's HC

**Level
1**

The measurement of HC at different levels must be something specific based on procedures and methods considered as appropriate for each level and also for the general target that is the calculation of SDI on capital approach.

From the organization's points of view in order to ensure the participation to the preparation of a HC measurement framework is necessary some information to be periodically transmitted to a higher level so that organizations must prepare a few statements where some indicators regarding HC and HC components are to be presented.

Those indicators may be:

- number of employees classified by different level of education and wages received;
- training expenses in order to help employees to gain a particular job skill and techniques that help them contribute to achieve the organization's strategy;
- development expenses involving on-going education to help prepare employees for future jobs;
- on-the-job training expenses for new employees in order to accumulate enough experience to achieve a predetermined performance.

Those indicators may be calculated based on accounting information, especially from managerial accounting where a network of budgets is prepared and HC budget is an important part of the budgeting system. In order to calculate national HC two elements are necessary: (1) information from other levels and (2) own procedures and information (statistical investigation). So, two kinds of accounts are basically used: organizations accounts and national accounts. The research team considers that for organizations the measurement of HC may be ensured from output side and for other levels of HC from both methods.

SDI on the capital approach

In the report from the Joint UNECE/OECD/Eurostat Working Group on Statistics for SS was presented a list of SDI based on capital approach such as:

1. real per capita economic wealth
2. real per capita produced capital
3. real per capita human capital
4. real per capita natural capital
5. real per capita social capital
6. a physical indicator of climate
7. a physical indicator of air quality
8. a physical indicator of water quality, quantity
9. a physical indicator of ecological integrity
10. a physical indicator of biological integrity
11. a physical indicator of soil productivity
12. a physical indicator of educational attainment

13. a physical indicator of health status.

This set of indicators clearly reveals two policies: (1) to optimize the social welfare in relation with a given stock capital and (2) to limit or reverse the depletion/degradation/depreciation of capital stocks through investments of savings.

An important advantage of this set of indicators is the possibility of international comparison (benchmarking) between different countries. On the other hand, another advantage is the opportunity to invest in different types of capital and use these capitals.

SDI calculated on capital approach operates with a long period of time, because the effect of different actions is not immediate.

In our opinion organizations must contribute with a set of specific indicators to the calculation of SDI. So, these indicators are obtained by the contribution of different organizations and areas.

General conclusions

- (1) SD as a new and important concept must be known by people and organizations in order to act consequently;
- (2) SDI ensure the measurement of SD;
- (3) SDI may be calculated on different basis;
- (4) Capital approach is now considered as an appropriate base to measure SD because of some advantages such as:
 - a. Solid theoretical base;
 - b. Harmonized solution across countries;
 - c. Comparability; work in cooperation;
 - d. Reduce political manipulation;
- (5) HC is a specific form of capital difficult to be measured, but some theoretical methods were created and applied in practice;
- (6) HC may be analyzed at different levels in order to calculate the real value;
- (7) Accounting must have an important contribution to the preparation and presentation of appropriate information for HC calculation;
- (8) HC policy, in our opinion, must be a national policy and each region and organization has to ensure the application to the general human resources policy.

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