

ALTERNATIVE ECONOMIC INDICATORS IN FOOD CHAIN ACCORDING TO LIFE QUALITY AND SUSTAINABILITY

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Introduction

There have been attempts and researches for correct measuring the economic performances of the food chain as a part of national economy, for long time. The methodology of the measuring has been changed through the years, newer and newer indicators have been created. In our study we present the major stages of this development process, considering that the need for presenting the economic relationship between sustainable development and the national well-being connected with the main elements of food chain. In our simplified approach the food chain is composed by the raw material production in agriculture, food processing in food industry, distribution and trading and the logistic network between these elements of the whole food chain.

Methods

To reach the aim set, we present the different indicators – primarily based on professional literature and our practical experiences – in time order, detailing their characteristics concerning the content. We were trying to find answer for the question what lacks and problems exist in the case of the indicators concerning the elements of sustainability and life quality.

Results and discussion

1. Share of Gross Domestic Product – GDP

The basics of the often used GDP were worked out by *Kuznets* (1932). GDP has several deficiencies. It does not make difference between costs and benefits. It does not distinguish the results of productive and destructive activities. It does not separate the sustainable and non-sustainable activities etc. This indicator „is able only to add but unable to extract”. The more a country uses up its natural resources, the more its GDP grows; it shows the exhaustion of capital as current income, it does not take into consideration the world of relationships and their economic roles. It treats leisure time as non-valuable, and it also does it with water and air.

2. Share of Measure of Economic Welfare – MEW

Nordhaus and *Tobin* (1972) worked out a modified version of national income which was called the „standard of economic welfare”. The strive of the authors was to complete the national income in a way that it could reflect the **total economic well-being**. They considered the health expenses and education as investments into the human capital; certain expenses were interpreted as „intermediary”, which does not generate well-being itself. Such items were included like services of lasting consumer products, the value of leisure time and some non-market products. Certain costs of urbanization were extracted.

3. Net Economic Welfare – NEW

For its working out and use *Nordhaus* and *Tobin* have given proposal too (1972). They also tried to build the changes of environment into the system. But they have taken into account as an extra: work not socially organized, some activities in the black economy and the increase in free time. They extracted the environmental damages and the elements originated from

damage of the health or urbanization within the GDP, which do not increase well-being). **NEW** strives to measure not just the material growth but the quality of life too. The calculation of factors is quite difficult; it can be only estimated in most cases.

4. Index of Sustainable Economic Welfare – ISEW

It is one of the most comprehensive indicators of well-being. *Daly* and *Cobb* have developed it (1989). It calculates with the value of household work, the annual service of lasting consumer products, the services provided by roads and certain amount from the public expenses for education and health care system as positive factors. The annual amount spent on lasting consumer products, education and health care private expenses that do not influence well-being, the direct cost of commuting, the cost of urbanization, the accident costs of motorized traffic and the costs of harmful actions into the natural processes must be extracted. **It is a comprehensive indicator**, but its calculation is problematic.

5. Human Development Index – HDI

HDI is an indicator developed by United Nations Development Program in 1990. The aim of its development was to make ranks among the countries based on the values not measured by GDP. The composites of HDI are GDP per capita (PPS), the level of attended education and the life expectancy at birth.

6. Integrated System of Economic and Environmental Accounts – SEEA

UN created the system of SEEA in 1993 which strives to increase the environmental sensibility of SNA macro-indicators (**Figure 1.**).

The explanations of abbreviations in the figure:

EDP	Environmental Adjusted	HDI	Human Development Index
NI	National Income	ISEW	Index of Sustainable Economic Welfare
EF	Ecological Footprint	NDP	Net Domestic Product
ENI	Environmental Adjusted	NEW	Net Economic Welfare
EI	Environmental Indicators	NRA	National Resource Accounting
ES	Environmental Statistics	QOL	Quality of Life (indicators)
GS	Green Savings	SI	Social Indicators
CC	Carrying Capacity	GPI	Genuine Progress Indicators

SEEA system leaves unchanged the principles and basics of traditional national accounts. Its elements are the accounts on different natural items which present the changes of that given year and their aim is to follow up the **exhaustion of natural resources and the degradation of environment**.

Measuring the economic sustainability is carried out based on Environmental Adjusted National Income (ENI) and Environmental Adjusted Domestic Product (EDP). Financial instruments measuring sustainability includes the carrying capacity (CC). (Fekete-Farkas M. – Németh F.- Szűcs I. (2004))

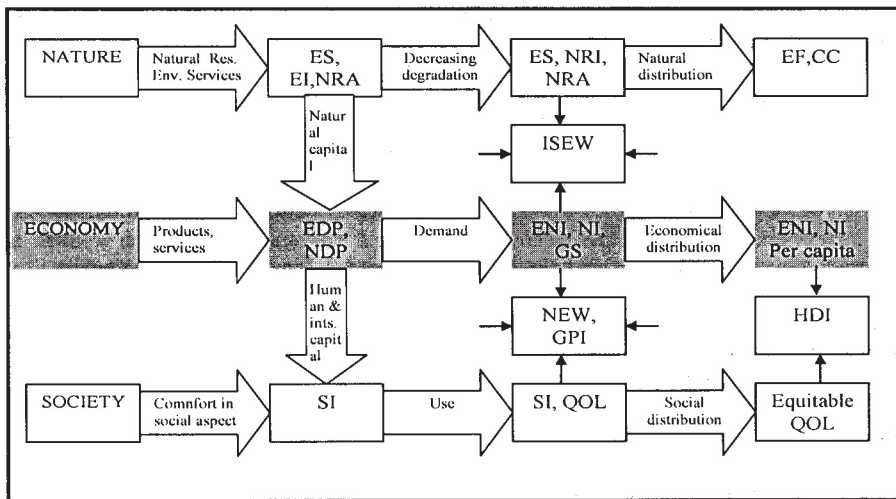


Figure 1.

(Source: UN National Statistical Division, 1997.)

7. Genuin Progress Indicator – GPI

It was developed by *Cobb, Halstead and Rowe* (1995). It is an alternative version of GPI and ISEW. It also calculates with the exhaustion of natural and social capital, so it gives information on the lasting sustainability of actual economic activities. It corrects the total value of personal consumption with the factor of income-distribution and it corrects it further with other social and ecological costs/benefits. In GPI the total value of products and services are added together and three cost-categories connected to consumption are extracted: expenses serving damage mitigation, social costs and depreciation of environmental assets.

8. Environmental Sustainability Index –ESI

ESI indicates the steps made forward environmental sustainability in 142 countries. ESI follows up the relative data of each country with considering the environmental systems, the decrease of stress-effects, decrease of human vulnerability, social and institutional performance and global care. Thus ESI makes it possible to compare the countries in terms of environmental sustainability and life quality.

9. Multidimensional systems of alternative indicators

The theory behind the former indicators was to make corrections to the GDP to reach a more realistic indicator. But there is another theory in discussions on measuring the well-being, saying that if we make any corrections to GDP, due to the monetization of things without original money-value the result will be so distorted that such indicators will become totally useless. The representatives of this approach propose a group of indicators measured by physical units as an alternative instead of GDP. We have not found experiences according to these indicators in food chain.

Conclusions

Several indicators have been developed for measuring economic performances in food chain as a part of national economy. Based on the findings of our study the indicators used meet

only partly the following criteria: being simple, their calculation being cheap, being divided by gender, age, geographical area, economic and social groups, thus expressing the dimensions of the distribution of development. For expressing the sustainability and life quality it is important to use all three kinds of indicators (material-, social-, environmental and resource-indicators). It is more useful to apply the conception of „system of indicators” instead of using „only one indicator”. But we need to pay attention to the fact that it is more difficult to interpret and express such indicators which are the results of complicated mathematical calculations, than those representing „merely facts”. As making international comparisons we need to take into account the differences between the environmental and social institutions. Based on the discovered problems we think that further efforts are necessary to develop indicators that help the more correct assessments in the food chain.

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References

- Fekete-Farkas M.-Németh F.-Szűcs I. (2004): Sustainable development Indicators of European Union and their Hungarian data. Ministry of Environment and Water Budapest and SZIE Gödöllő.
- Kerekes S.-Szlávik J. (1995): A környezeti menedzsment közgazdasági eszközei (The economic tools of environmental management). KJK, Budapest.
- Rennings K.-Wiggerring H. (1997): Steps towards indicators of sustainable development: Linking economic and ecological concepts; Ecological Economics
- Zsoldos F.-Vashegyi A.- Pécsváradi A. et al.(2004): Influence of phosphate supply on aluminium toxicity in cereal species. Cereal Res Commun 32 (4) p: 509-516