

# A Study of GDP And other Indicators to Measure Human Welfare and To Regulate Eco-System Functioning

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**ABSTRACT:** *The assumption that economic development is always synonymous with improved quality of life leads to the misapplication of GDP as a measure of public well-being, ignoring the reality that the economy benefits from natural, social, or human resources. Governments collaborated with scientists to create new measures that go beyond income and material riches to track progress toward sustainability and improved well-being. The Gross Domestic Product may be revised in a number of ways. This study suggested many potential indicators to modify, augment, or replace Gross Domestic Product based on a thorough literature analysis. There are two major methods that have been discovered. The first proposes greening Gross Domestic Product, socializing indices, and integrating it in a more comprehensive index by using it as a basis for building a full index. The second strategy involves attempts to re-define indicators via the use of ecologically and socially focused indicators and metrics. It was recognized that advice for the creation of governance systems intended to shift from short-term decision-making processes to those that enable multidecade planning or implementation processes is critical for guiding the transition to post-fossil-carbon societies was urgently required. This in-depth examination covers a broad variety of subjects, from GDP issues to difficulties and views on indicators. The analysis reveals that if humanity is concerned about the long-term growth of the world as a whole, progress indicators evaluated only in monetary or social terms are confined to the weak or medium sustainability model, and must be supplemented with biophysical indicator. It's past time to shift the global understanding of what progress is, shifting the conversation away from growth and toward sustainable development as well as human well-being.*

**KEYWORDS:** *Environment, Gross Domestic Product, Human Development Index (HDI), Sustainable.*

## 1. INTRODUCTION

Progress indicators may serve as a vital link between the economy and a country's governing apparatus. The most widely accepted indicator of a country's economic success is Gross Domestic Product (GDP), which is the current default benchmark for economic and social development. While its ease of use makes it appealing, there is growing recognition that it is insufficient for monitoring all of the important characteristics for contemporary societies, governance, eco-systems, exo-systems, policymakers, and the general public. The market value of goods and services produced and exchanged in a nation over a particular year is used to calculate GDP, which measures supply and demand. This index is calculated by adding a country's individual consumer spending (payments for goods or services by individuals), governmental operating costs (public expenditures on the supply of goods and services, national debts, and so on), net exports (exports excluding the value of imports), as well as net capital production (an increase in the nation's total stock of capital goods). The GDP is designed to answer how an economy grows, what fraction of production gains is attributable to inflationary trends, but how much of the annual revenue produced is used for consumption, investment, or savings. It reports on the goods and services produced in the country by domestic or foreign companies.

Alternatives or supplements to GDP have been proposed. A growing number of people and teams have created alternatives and supplements to GDP to investigate more complete measurements of societal wellbeing and eco-system health in order to address the limitations of GDP while recognizing its merits. There are two major methods that have been discovered. The first proposes greening GDP, socializing GDP, and integrating GDP in more complete indexes like the Sustainable Wellbeing Indicators as well as the Human Development Index as a basis for a full index (HDI). In the second method, indicators are created independently of GDP, with the notion that development is determined by human well-being and environmental constraints rather than economic growth. Environmentally and socially focused metrics are among the indicators being used to redefine progress measures.

### *1.1. Increasing GDP via Greening:*

Several potential indices and sets of indicators have been suggested as supplements to GDP to address GDP's inadequacies in indicating the state of society and its sectors. In general, most of the suggested indices aim to rectify, adjust, or add components to the array of inputs that are used to calculate GDP. Some ideas start with the national accounts and GDP as a base, then add or remove numbers to solve some of the problems highlighted by numerous academics. Estimates of natural resource depletion and environmental degradation are included into national income calculations in order to arrive at a single figure. To account for various types of natural resource depletion, a depreciation adjustment. Assets are evaluated using the Market Value Approach by multiplying current market values by the number of assets/goods produced or held in stock. The exclusion of resource exhaustion from national accounts, leads in inflated figures for both net output and capital accumulation, and does not address stock depletion or the possibility for ecological resources regeneration. proposes the "user cost" of natural resource use as an amendment to GDP, questioning the use of yearly fluctuations in the market value of natural resource reserves. True income is defined under the user cost approach as the amount that would be maintained for the foreseeable future despite the asset's real limited lifespan by appropriately reinvesting a part of the profits produced to guarantee future income, despite the asset's actual finite lifetime. The creators of the user cost approach highlight that countries that depend on the exploitation of natural resources to boost their GDP growth rates often utilize erroneous values when making choices and enacting public policies. However, there was no agreement on how to properly account for revenue and represent changes in environmental stocks when this approach was used. Several assumptions, such as keeping constant the profit rates, the pace of extraction until the resource is exhausted, and the discount rates, are some of the method's drawbacks[1].

### *1.2. GDP socialization:*

One of the most serious flaws in GDP is that it ignores the welfare consequences of different kinds of social inequality. An economist, addressed the issue of social disparity and its consequences for social welfare, and his vision was used to develop the Human Development Index (HDI). The goal was to see how providing economic growth and human development improves individual prosperity in different country situations. As indicators of people's ability to live long and affluent lives, the index considers "longevity, knowledge, and good living conditions." Other aspects of well-being, such as excellent diet and health, are reflected in male life expectancy. Knowledge is measured using the literacy rate and school time as a proxy for the adult population's level of education, while access to a decent standard of living is measured using a logarithm of real GDP per capita adjusted to reflect purchasing power parity. Despite being seen as a step forward in terms of GDP alone, the HDI has been severely criticized for

failing to account for the environmental costs of growth. The writers also acknowledged the difficulties of calculating the resources required to maintain a decent standard of life, civic liberty, protected human rights, and personal dignity. A number of related problems are also mentioned, including the connection between consumption and well-being, employment and salaries, the effect of technology advancements on employment, and inequality, which are not covered by the HDI[2].

### *1.3.Greening and socializing are two sides of the same coin.*

The Indicators of Long-Term Well-Being MEW (Measure of Economic Welfare), created by Nordhaus and Tobin, was one of the earliest economic welfare metrics (1972). This index evaluates consumption as a proxy for economic wellbeing as an alternative to GDP. The MEW is used to calculate economic wellbeing by adding up the advantages, such as goods and service consumption, and subtracting the costs, such as pollution. Investments in human capital for education and healthcare, as well as expenditures for national security, police, and sanitation, are removed from the calculation, among other changes. According to Nordhaus and Tobin, the findings of MEW are sufficiently close to those of GDP that an independent economic wellbeing metric is unnecessary. Nordhaus and Tobin also offer a SMEW (sustainable measure of economic wellbeing) assessment, which includes the level of MEW that is well-matched with the preservation of natural capital. SMEW values in the United States were compared to GDP growth from 1929 to 1965, and the result was that GDP growth remained a good policy guidance[3].

All of these alternatives as well as supplements to GDP have drawbacks, such as:

- subjectivity in determining which expenses are beneficial & should be decided to add to the total, and which should be subtracted.
- the need for consensus about how to value social or environmental items that are not reported in monetary terms (ecosystem services, natural resources, volunteer labor, or illness).
- The requirement for agreement on how to calculate the costs of natural resource depletion; the subjective nature of choosing and categorizing the most representative variables and/or indicators that serve as the foundation for the indices.

### *1.4.Attempts to rename the indications:*

The disparities between GDP growth as well as green GDPs cast doubt on the idea that greater output equals development. The acknowledgment of a new point of view opens the door to the creation of an alternative framework for evaluating development that uses methods other than those used to calculate GDP. Experiences with modifying or supplementing GDP as a measure of development indicate that excessive use of natural resources does not always imply happiness. and that happiness may be achieved without excessive consumption. Efforts to develop a progress indicator that is compatible with SD may be split into three categories: those that are primarily focused on evaluating environmental determinants of wellbeing, those that are driven by human needs, and those that combine both methods[4].

### *1.5.Indicators that focus on the environment:*

Most environmental indicators were created to track progress toward sustainability rather than to measure social development, and exergy, energy, as well as the environmental cost are three

promising methods that show promise for assessing sustainability at different scales. The use of environmental oriented metrics for SD evaluation is justified, according to because of Herman Daly's first principle of sustainability which states that renewable resources should not be utilized faster than they can be regenerated. To move beyond the GDP's limited limitations, these principles suggest that some suitable measures for material and energy balances should be established.

It is critical to distinguish between weak and strong sustainability at this stage. The indicators mentioned in Section 2 are based on an economic perspective and solely account for the natural environment functions/resources that provide for people and the economic system, while framing the issue in terms of human welfare. These indicators take into consideration the optimum income for progress/well-being and are intended to give information about how much to consume now and how much to invest in building capital in the future. However, no one knows whether this optimum income is sustainable in the sense of ensuring future generations' well-being. On the one hand, the notion of weak sustainability ignores natural resource limitations and restrictions to the substitutability of natural and manufactured capital. Environmental indicators, on the other hand, are based on biophysical factors that should indicate the potential ecological limitations to development. Natural capital cannot be replaced by human or social capital under the notion of strong sustainability[5].

#### *1.6.Measures with a social focus:*

The PQLI (physical quality of life index) is the first composite measure of progress that is not based on money or economic well-being. The PQLI uses a weighted index that ranges from 0 to 100 to assess infant mortality, life expectancy, and basic literacy. The PQLI is founded on the principles that there are many development patterns, that the indicator must assess outcomes rather than inputs, and that it should be able to represent the distribution of social demands. More significantly, it is simple to build and comprehend (Morris, 1979). The score reveals that some nations with relatively high per capita incomes have significantly worse life-quality outcomes, implying that rising disposable personal income does not always imply development.

#### *1.7.Considering both social and environmental issues:*

In acknowledgment of the fact that GDP ignores social and environmental well-being, many methods to measure total development or wellbeing have been proposed, developed, and implemented. Several governments and non-governmental groups have taken the lead and created their own indexes. The majority of them are composite indexes that combine several metrics into a single figure that includes GDP as well as social and environmental issues. The Wellbeing Index (WI) is founded on the idea that a good environment is necessary for human health. It was used to assess the World Summit for Sustainable Development, which took place in Johannesburg in 2002 and included 180 nations. The Human Wellbeing Index (HWI) and the Ecosystem Wellbeing Index (EWI) make up the WI (EWI). EWI combines land, water, and air dimensions, biodiversity problems, and resource use indicators, whereas HWI incorporates population as well as health parameter, community or equity issues, wealth factors, knowledge indicators, and culture. A weighted arithmetic mean of variables is used to aggregate these dimensions, which is then normalized using a proximity-to-target method. When both indicators are integrated into a tool called the Barometer of Sustainability, they are given equal weight[6].

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*1.8. Measurement of development, welfare, and well-being is a difficult task.*

To be useful, the indicator must be consistent, and the underlying data must be accessible at the right time, size, and scope. In addition, an indicator must accurately track progress toward the intended outcomes. Ecological and sustainability research has been too sluggish in this respect, and decision-making has become more data-driven. As a result of the complexity of data sets, especially those related to ecosystem functioning including social data sharing, there are significant information gaps and ambiguities, and choices and regulations are often based on broad observations, expert views, and even green slogans. The major difficulties encountered in developing an index that aims to go beyond GDP, while some of them may be linked to it and are often overlooked by GDP enthusiasts[7].

## 2. LITERATURE REVIEW

Huetting et al studied about all economic activities are oriented to the fulfilment of needs, or in other words: to welfare. Welfare is defined as the fulfilment of needs resulting from our interactions with limited commodities. It is a category of personal experience and not quantifiable in cardinal units. Therefore, we have to make do with measures that are quantifiable in cardinal units and that are presumably affecting wellbeing. Economic growth is usually described as rise in national income (NI) (or GDP) as a measure of output. These goals or ends are frequently in conflict. Therefore, wellbeing may rise with decreased production. The narrow minded, theoretical incorrect concept of economic development is particularly endangering the present and future availability of environmental functions, the most basic scarce and consequently commercial commodities at the disposal of mankind. These lie outside the market or outside of the measurement of NI. Correct information is essential for the coming into being of the preferences of people and institutions and therefore for the decision-making process. The notion of environmental functions is defined as the potential applications of the non-human-made immediate environments on which humankind is completely reliant[8].

D'Acci et al. researched about Well-being is becoming a term which is more and more engaged in any global development consideration. A significant amount of effort is being carried out to investigate measures of well-being, including a more holistic perspective on the growth and welfare of a nation. This article offers a concept of well-being as well as progress being in harmony with each other. This is far from the two extreme positions: impoverished but happy, and wealthy then happy; overly romantic the one, and reductive the second. After a brief explanation on the meaning of Objective and Subjective well-being, we demonstrate some intriguing connections between economic and social factors, and we suggest a new index to evaluate the well-being and development of the countries: the Well-being & Progress Index (WIP). It covers many elements of well-being and development, including human rights, socioeconomic well-being, equality, education, innovation, quality of urban environment, ecological habits, subjective well-being, longevity, and violent crime. The most commonly used indices typically just concentrate on certain areas, like environment, or economics, or policy, or education, maybe happiness, and so on[9].

Zongguo et al. researched about the Gross Domestic Product (GDP) has been extensively used to assess the economic growth of an area or a nation. However, it does not differentiate between economic activities that enhance the well-being and those that harm it. It does not represent the social, financial, or protection of the environment anymore. This article provides a case study utilizing the newly created economic indicator Genuine Progress Indicator (GPI) to assess the economic performance and human well-being in China at an urban level. The research also

demonstrates how the limitations of GDP in evaluating the economic performance and well-being may be addressed by GPI. Important components of GPI for cost and benefit analysis were created to address the depletion of non-renewable resources, cost of environmental contamination, and net capital investment, etc. Based on the GPI findings, suggestions on policy-making and infrastructure development were made for the enhancement of the overall economic wellbeing of the cities[10].

### 3. DISCUSSION

The assumption that economic development is always associated with improved quality of life leads to the misapplication of GDP as a measure of public well-being, ignoring the reality that the economy benefits from natural, social, and human resources. Governments collaborated with scientists to create new measures that go beyond income and material riches to track progress toward sustainability and improved well-being. The Gross Domestic Product may be revised in a number of ways. This study suggested many potential indicators to modify, augment, or replace Gross Domestic Product based on a thorough literature analysis. There are two major methods that have been discovered. The first proposes greening Gross Domestic Product, socializing indices, and integrating it in a more comprehensive index by using it as a basis for building a full index. The vast number of environmental, social, and economic concerns create problems that none of the previously suggested solutions can adequately address on their own. The ideal index(es) should give a detailed account of how the economic system interacts with environmental and social systems. As a result, since no one measure can account for all viewpoints, future study should focus on the use/combination of many methods.

### 4. CONCLUSION

This thorough analysis demonstrates that if humanity is worried about long-term viability, indicators evaluated only in monetary or social terms are severely restricted. Despite being limited to the weak or medium sustainability paradigm, these indices (green or not) provide a significant counterweight to GDP in terms of progress assessment. Biophysical indicators are the only ones that can be linked to a solid sustainability model and must be included/confronted in any progress assessment. Nonetheless, none of the metrics presented in this article seem to be competent to evaluate progress toward management in terms of eco-system functioning and social growth. The vast number of environmental, social, and economic concerns create problems that neither of the previously suggested solutions can adequately address on their own. The ideal index(es) should give a detailed account of how the economic system interacts with environmental and social systems. As a result, since no one measure can account for all viewpoints, future study should focus on the use/combination of many methods.

### REFERENCES

- [1] F. Ježek, "Measuring welfare and poverty in the European countries," 2013, doi: 10.5171/2014.689987.
- [2] G. Thiry, "Alternative Indicators to GDP: Values Behind Numbers. Adjusted Net Savings in Question.," *Appl. Res. Qual. Life*, 2010.
- [3] I. M. Oehler-Şincai, "În căutarea unui indicator veritabil al bunăstării," *Calitatea Vieții*, 2014.
- [4] L. S. Costa, D. F. Pereira, L. G. F. Bueno, and H. Pandorfi, "Some aspects of chicken behavior and welfare," *Revista Brasileira de Ciencia Avicola*. 2012, doi: 10.1590/S1516-635X2012000300001.
- [5] I. M. Oehler-Şincai, "Looking for a genuine indicator welfare | În căutarea unui indicator veritabil al bunăstării," *Calitatea Vieții*, 2014.

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- [6] S. C. Kassenboehmer and C. M. Schmidt, "Beyond GDP and Back: What is the Value-Added by Additional Components of Welfare Measurement?," *SSRN Electron. J.*, 2012, doi: 10.2139/ssrn.1753686.
- [7] C. Brown and E. Lazarus, "Genuine Progress Indicator for California: 2010–2014," *Ecol. Indic.*, 2018, doi: 10.1016/j.ecolind.2018.05.072.
- [8] R. Hueting, "Ekologicznie zrównoważony dochód narodowy i inne sposoby metody poprawy jakości informacji na temat wzrostu gospodarczego," *Probl. Ekorozwoju*, 2011.
- [9] L. D'Acci, "Measuring Well-Being and Progress," *Soc. Indic. Res.*, 2011, doi: 10.1007/s11205-010-9717-1.
- [10] Z. Wen, K. Zhang, B. Du, Y. Li, and W. Li, "Case study on the use of genuine progress indicator to measure urban economic welfare in China," *Ecol. Econ.*, 2007, doi: 10.1016/j.ecolecon.2006.12.004.