ASSESSMENT OF THE OUTCOMES OF SUSTAINABLE DEVELOPMENT GOALS

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Abstract. The main goal of this paper is to concisely investigate the sustainability outcomes registered worldwide and in Romania after the introduction and popularization of the sustainable development principles. The main results prove that since the introducing of the term sustainable development the evolution of the environmental aspects was simply a window dressing. Therefore, the paper outlines several ways of achieving a true smart growth that implies an adaptive growth, new symbiotic entrepreneurial models and also recommends the enrichment of the term of sustainability with a safe and rational behaviour.

1. INTRODUCTION

Sustainable development was primarily used as a term by Bruntland Commission in 1987 and it was defined as a development that satisfies the needs of the present without compromising the future generations' ability to meet their own needs [1], in terms of sound economic, social and environmental progress. However, the environmental issues were considered important after the major oil-shock from the '70s, when the scarcity of fossil fuels accompanied by their environmental footprint were for the first time seriously acknowledged. Important moments of sustainable development followed this "awakening" and in 1972 the Stockholm Conference on the Human Environment put on spotlight the environmental damage and was followed by the introduction of environment departments, agencies and programs around the world. After 20 years, another major environmental event was held in Rio de Janeiro in 1992, when United Nations Conference on Environment and Development issued the Rio Declaration and adopted Agenda 21. The international treaty on United Nations Framework Convention on Climate Change (UNFCC) was opened for signature at the same event, establishing the need to limit average global temperature increases, based on the reduction of the green-house gases (GHG) emissions. In 1997, the Kyoto protocol was signed by numerous states, committing industrialized nations to cut their GHG emissions by a minim 5% over the period 2008-2012, compared with 1990 levels [2]. Romania has signed the protocol on 1999 and ratified it by law no. 3/2001, agreeing to cut the emissions levels by 8% within the period 2008-2012, compared with 1990 levels [3]. In 2002, the Johannesburg World Summit on sustainable development (Rio +10) adopted measures to alleviate poverty and address the environmental problems. In June 2012 the (Rio+20) United Nations Conference on Sustainable Development will take place in Rio de Janeiro and will be mainly focused on the political commitment to sustainability, development of green economy, and the development of the institutional framework for sustainability [4].

The results of these events should be translated into reality and their outcomes should be analyzed in order to identify the advances and gaps that are to be addressed by appropriate measures that correspond to the actual realities and recent evolutions. Therefore, this paper aims to concisely analyze the outcomes of sustainability goals worldwide and in Romania and to identify the correct path towards a better and smarter growth.

2. THE DYNAMICS OF SUSTAINABILITY

Sustainability, sustainable development are terms in fashion today, but they are heavily overused and unfortunately more through rhetoric than action. The three-dimensional sustainability concept, based on three facets, economic growth, social development and environmental protection, produced some progress on the human wellbeing until the present crisis. However, wellbeing is a multidimensional and dynamic concept that comprises an objective factor based on economic, social and environmental criteria together with a subjective factor that is linked with the perception of happiness and fulfilment of each individual. The definition of wellbeing is beyond the scope of this research, therefore a straightforward analysis is performed based solely on gross domestic product (GDP) for economic growth, access to electricity for social progress and CO_2 emissions and renewable energy sources (RES) development for environmental criterion.

The ongoing economic welfare acquired through a continuous world GDP was congested when the financial crisis was set and proved that was built on unhealthy premises. The world GDP/capita growth registered a spectacular increase, from a value of 5,780 USD/capita in 1990, to 7,614 USD/capita in 2010 [5], scoring a total 30% increase during the period, demonstrating an improvement of quality of life of many persons. The economic progress registered in Romania followed the same pattern, from a value of 3,894 USD/capita in 1990, to 5,211 USD/capita in 2010, scoring a 34% increase (see figure 1), but without recuperating the difference from the world mean through the period. In Romania, unfortunately, one may more appropriately speak about poverty and not welfare, as the population below poverty line progressed from a value of 17% in 2000 [6], to 21%, [7] in 2010. It should be noticed that these values are computed considering diverse national thresholds that show different levels of deprivation, therefore the actual percentages are even higher.

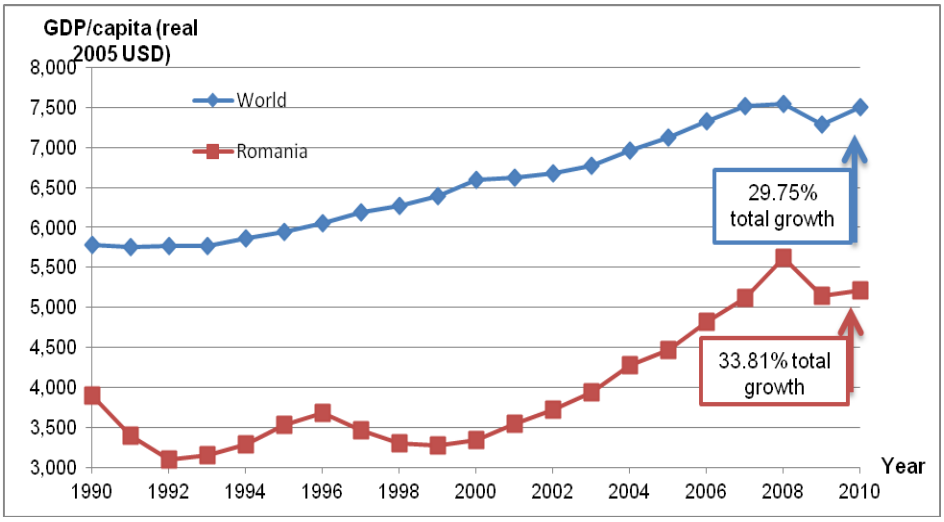

Figure 1. The economic sustainability outcomes in terms of GDP/capita dynamics (1990-2010). Sources: author's own calculations based on [5].

However, the GDP has limits when speaking about social progress, therefore the social development, which is a very complex notion that contains employment opportunities, income, access to various services as electricity, health and education & culture, respect of human rights, reported satisfaction, is represented here by a relevant notion for this research, namely the access to electricity facilities, expressed as electricity consumption/capita (KWh/capita). The XIXth century invention of lightning spurred around

the globe slowly, from a global value of 2 billion without access to electricity in 1990, to 1.5 billion in 2005 and 1.3 billion in 2009 [8]. This spectacular decrease was mostly due to China aggressive commitment to electrify over 95% of its population. The rate of improvement was high enough, from a global 60% electrification rate (number of people with electricity access/total population) in 1990, to 73% in 2000 [9] and 78% in 2008 [10]. In Romania, in 2010, there were 60,584 rural households without access to electricity, situated in 2,100 localities, 96 of them being totally in the dark [11]. Globally, electricity consumption per capita has increased by about one-third since 1990 [12], from 2,066 KWh/capita to 2,650 KWh/capita in 2010, with a great contribution coming from developing countries. Yet, in Romania, electricity consumption decreased from a value of about 3,000 KWh/capita in 1990 [13] to around 2,050 KWh/capita in 2010 [14], mainly due to the drop in consumption from industry, whose production collapsed after 1990. The contribution of industry to GDP decreased from 40.5% in 1990 to 24.5% in 2009 [15], this being largely attributable to the industrial production that in 2010 accounted for only 69% of the value achieved in 1990. It should be noted that this is an unhealthy, unsustainable way of reducing consumption and therefore reducing emissions, as will be further demonstrated.

Nevertheless, the sustainability concept produced no significant results in terms of environmental development. Numerous summits, conferences, workshops were held worldwide over the last 40 years and were focused on the environmental impacts of energy [16, 17]. After thousands of speeches and declarations of intent within the period 1990-2010, fossil fuels global consumption increased with 46%, world CO_2 emissions skyrocketed from 4.1 to 4.7 tons/capita [18] and RES (hydro, solar, wind, biomass and others) still only account for about 8% of the total primary energy mix, scoring about 1.4 % more than 20 years ago [19] (see figure 2 a.). The share of RES also includes unsustainable biomass and large hydropower, so the actual figures are even lower. The share of fossil fuels into the world primary energy consumption decreased from 88% in 1990, to 87% into 2010, recording a small decrease of 1% during the period [19]. However, this modest figure is rather connected with the present economic crisis that translated into smaller energy consumption. Nevertheless, in Romania, the consumption decreased within 1990-2010 period with 43%, due to a significant reduction in industrial activity, as presented above. The fossil fuels consumption decreased substantially, but still maintained at high levels of 79% in 2010 (see figure 2 b).

The CO_2 emissions increased steeply from a value of 354 ppm in 1990, to 390 ppm in 2010 [20], recording an overall increase of 10% in the last 20 years. The CO_2 emissions/capita registered a worldwide increase of 12%, while in Romania, due to the already mentioned industrial collapse, the values decreased by 36% (see figure 2 c). These findings, together with the RES future developing plans (micro hydro, wind, and biomass) prove that Romania is more than capable to achieve the agreed quota of 8% reduction in GHG. However, since the introducing and the popularization of the sustainable development, the evolution of the environmental aspects has been simply a window dressing, even though Romania succeeded to decrease energy consumption and emissions, but at the expense of deindustrialization, population reduction and poverty rise.

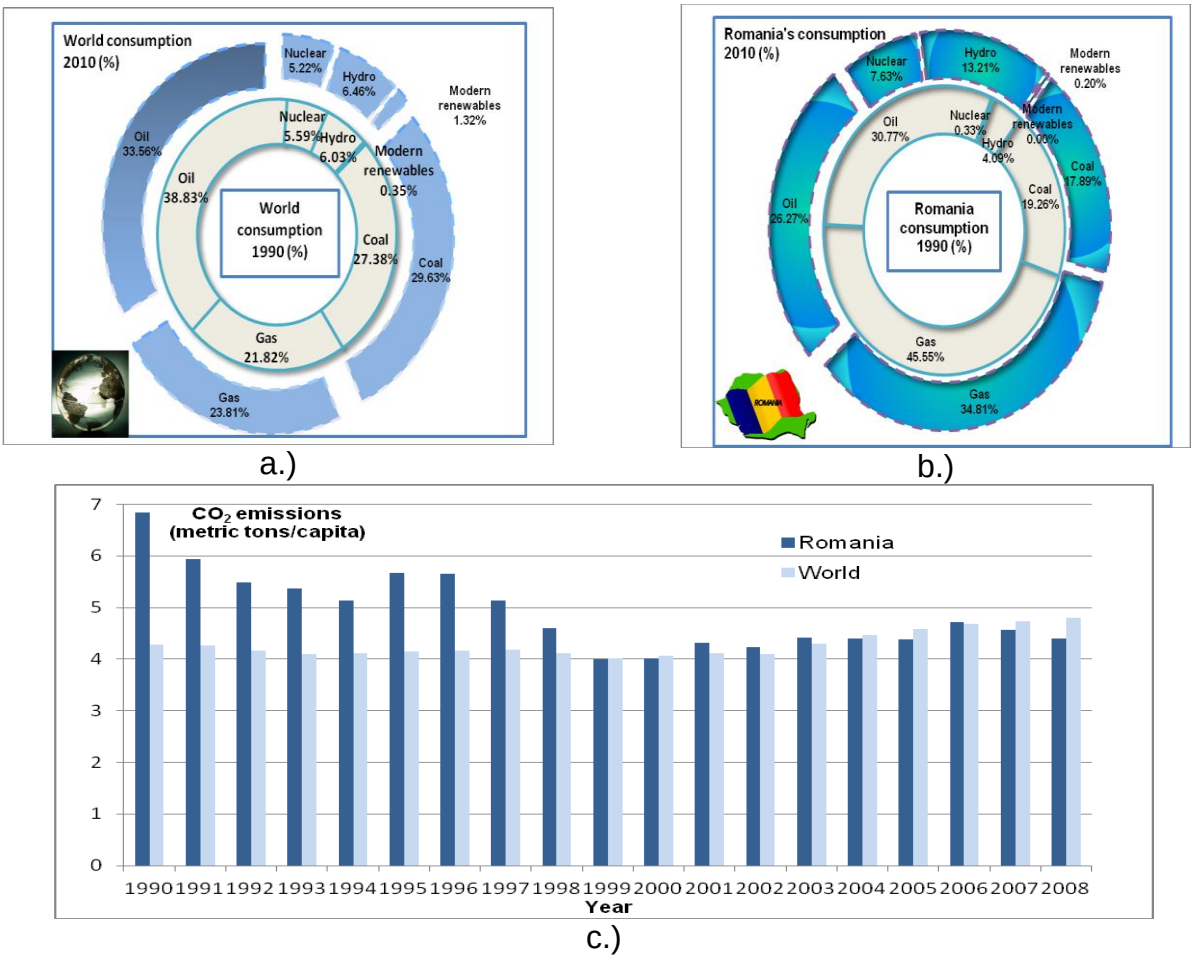

Figure 2. (a.) World primary energy consumption by source in 1990 and 2010 [Mtoe-million tonnes oil equivalent]. (b) Romania's primary energy consumption by source in 1990 and 2010 [Mtoe]. (c.) The evolution of the CO_2 emissions in the world and in Romania [metric tons/capita].
Source: author's own calculations based on [19] and [21].

3. RECOMMENDATIONS TO ACHIEVE AN ADAPTIVE GROWTH

The threefold mission of sustainable development failed to meet its own stakes. Despite the torrent of information and anxiety over the extensive use of fossil fuels and their effects on environment, at present, about 87% of the primary energy use worldwide comes from fossil fuels. It is childish and even irresponsible to consider that this large use could be replaced by RES alone. This is mainly due to the fact that one can control the rate of utilization of fossil fuels, but in the case of RES this is impossible, as they are mostly correlated with variable energy type. Moreover, in the case of the production of secondary energy, the fossil fuels cannot be easily replaced, like oil for transportation and petro-chemistry. Furthermore, fossil fuels are of key importance for economic growth, therefore non-fossil energy type cannot play the same role as fossil fuels in promoting global economic growth [22]. Consequently, this turbulent time of recession might be the window of opportunity needed for the launching of a new set of sustainability goals.

Firstly, a safeguard should be placed and the sustainability concept must be changed and enriched with other dimensions, safety and rational behaviour, consequently becoming a safe and rational development – saferational. The safe dimension has a tremendous importance when speaking about sustainable behaviour and climate change. For instance, the utilization of certain controversial fungicides may be sustainable in terms of economic growth (they produce added value), social wellbeing (in terms of safeguarding

jobs, improvement of agricultural outcomes) and also environment (they have not threats for soil, air and water). However, their utilization is not safe on the long term for humans leading to loss in human health and even human loss [23]. At the same time, the rational dimension should be also considered. The snow removal after a strong snow storm, for instance, seems sustainable, as it provides incomes for the snow removal firms, jobs for the people involved and does not affect the natural environment, possibly creating GDP growth. But it is neither rational nor safe for humans, leading to goods and human loss, as for instance in Romania where 86 deaths were associated with the extreme weather manifestations in the winter of 2012 [24]. Therefore, the saferational approach is the answer, where the climate change and the mechanisms to avoid it become security issues.

Secondly, an adaptive model of growth should be followed that implies a gradual approach of improvements based on what is safe and rational and not for the sake of a declared sustainability and profitability. The economic growth should not be based on deindustrialization, deepening poverty and population reduction as encountered in Romania, but on a synergetic growth that considers the importance of the efficiency of each subsystem for the overall national system. In such a way unethical policies, like of birth control, shall not be mentioned as a sustainable solution and a green option to combat climate change [25].

Another important aspect is represented by poverty and poverty reduction. Many low-income countries, yet rapidly growing in terms of population, have low material consumptions and CO_2 emissions simply because their population is very poor and afford to consume only minimal quantities. Yet, whether the goal of reducing poverty around the globe is a success, the poor population will be getting richer and will afford to consume. The not-so-poor will gain access to electricity, acquire new energy-consumption assets and therefore their energy consumption will increase and so is their environmental fingerprint that will dramatically change. The answer lies in a smart mix of new policies and regulations, new energy sources and technology, energy-efficiency programs and decentralised generation systems for electricity. But above all, it must consist in a behavioural change, where the wastes should be kept to minim levels, both for individuals and companies. The inefficient energy use lead to a waste estimated at 400 billion USD/year in the United States of America [26], while in the European Union an estimated quantity of 6 tonnes of materials/person is wasted annually [27]. Therefore, efficiency programmes and plans for all natural resources (energy, food, water, land, etc) are to be implemented in reach, emerging and poor countries alike. New symbiotic entrepreneurial models must be considered, where an emphasis should be placed on clusters based on wastes, where the residues generated by one firm are included into the industrial process of another.

4. CONCLUSIONS

Energy is a necessary, yet not sufficient, condition for economic growth, poverty alleviation and progress towards wellbeing. The present financial crisis displaced the interest from the environmental protection to the GDP growth. If GDP growth stabilization is based on larger energy consumptions accompanied by larger GHG emissions, this would lead to the exacerbation of climate change. The reciprocal of this affirmation is also true: the diminishing of GHG emissions and lower energy consumption based on deindustrialization and population decline, will lead to job losses and poverty deepening, as those experienced by Romania's population. The green development based on RES, thought as the answer that will generate the economic recovery, may produce results on longer-term being a slow-type process. The answer lies in a mix of solutions, where what

is safe and rational should be considered first, and also on a cultural/behavioural change that will adapt humanity to scarcity of resources and the conditions imposed by an optimum consumption.

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