

Once More about the Limits to Growth

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INTRODUCTION

The problem of depletion in natural resources turned out to be truly inexhaustible topic for discussion in modern society. The forthcoming top-level meeting dedicated to the global climate change, to be held by the United Nations Organization in Copenhagen in 2009, makes us look back in retrospect of 36 years when the first debate on the limits to growth started, initiated by the studies performed by Denis Meadows with colleagues [1]. Those studies were carried out in 1972 and many times became the target of criticism and attacks. Imaginary and real errors were found in the works of D. Meadows. However, even the most furious critics were to agree that the studies performed by D. Meadows and his long-term predictions concerning an increase in population, the use of natural resources, industrial development, environmental pollution turned out to be true in many respects [1–7].

Curiously, even more inaccuracies and errors can be found in the works of the critics of “The Limits to Growth” than in the work criticized by them. Very frequently they substitute the subject under discussion and send the debate to the bottom not understanding or rejecting instinctively the conclusions made by D. Meadows. They simply cannot imagine that the impressive increase in production and consumption in the so-called developed countries

which is observed within the past two centuries can ever come into collision with a limit.

Today the major part of environmentalists are acquainted with the work “The Limits to Growth” which became a turning point in ecological debate in early 1970es, was translated into 30 languages and was spread in thirty million printed copies.

However, many environmentalists are sure that the calculations presented in the works of D. Meadows with colleagues are far from reality and deny the very work as the prophecy of Day of Judgment. Matthew R. Simmons, president of the world’s largest investment company Simmons and Company Int. specializing in the area of power engineering was not engaged in environmental protection. He was also aware of hopeless (according to the critics of D. Meadows’ book) predictions about the depletion of oil resources even before 2000 (for example, see the work by Lomborg [8, p. 121]). As that problem touched the professional activities of M. R. Simmons, at last he had read the book “The Limits to Growth” several years ago. To his enormous surprise, he discovered that all the critical comments widely cited in mass media, generally speaking, bear no relation to the contents of the book: “After having read *“The Limits to Growth”*, I was astonished. Nowhere in the book was it mentioned that any resources were to get depleted by 2000... There

is not a single sentence or even a word written about depletion of oil or other natural resources by 2000" [9, p. 11). He concluded: "...the book gives a correct outlook of the development, and expressed his discontent that the past 30 years were spent in vain for criticizing "The Limits to Growth" but not for taking specific precautions" [9].

DIFFERENT SCENARIOS

What had been actually declared in "The Limits to Growth"? The major conclusion of the book may be formulated in the following manner: "If the modern (1972) trends in the growth of population, industrialization, environmental pollution, food production and depletion of natural resources remain unchanged, then within the next hundred years we will go beyond the limits of our planet's possibilities. As a result, one may expect rather sudden and hardly controllable decrease in population and industrial production" [1, p. 23]. It is this scenario that illustrates how long-term growth trends may lead to collapse; so many people interpreted the book as the prophecy of Day of Judgment. Mass media were happy to report dramatic interpretations of such a scenario, while many readers ceased reading the book after getting acquainted with such sensational conclusions. However, the authors of the work on the limits to growth write about the possible consequences without ecstasy and tragedy, which were so characteristic of mass media, and propose a reasonable way out of the existing situation: "We are sure that the trends of growth and development may be changed and that it will be possible to create conditions for ecological and economical stability for many years. The state of the global equilibrium may be achieved, so that the basic material requirements of every person will be satisfied, and each member of the society will be provided with equal starting possibilities to implement the abilities and satisfy the vital necessities of life. The earlier will mankind start changing development routes, the better will be the chance for success".

Investigations of the future are usually connected with the attempts to predict what is going to happen in reality. Because of this, the methodology of different scenarios of devel-

opment arising under changes of the strategy of human behaviour simply had not been apprehended by many readers caught in an endless loop of the tragic scenario of exponential growth. In the meantime, the basic appeal of the book was exactly the necessity to leave aside the model of unlimited growth for the sake of ensuring more stable future. As concluded by the authors of the book, it is necessary to make this transition before irreversible environmental changes occur and destruction of life support systems for milliards people living on our planet starts. To say nothing of the fact that many critics of "The Limits to Growth" had not read the book to the end, due to a number of reasons it would be incorrect to claim that the researchers of the limits to growth made errors when analyzing the future possibilities for growth.

First, mankind has just entered the century in which the most dramatic scenario is to be displayed according to the theory of the limits to growth. In this situation, it is mentioned in all the possible scenarios that the problems will manifest themselves only after the years 2010–2030.

Second, analyzing different scenarios of "The Limits to Growth", one may conclude that the characteristics of the world development are in good agreement with the "Business as Usual" scenario in which at first no substantial changes are observed in physical, economical or social parameters but finally it leads to collapse [10].

Third, even now we observe crises that have a global character and cruelly remind us of possible consequences that had been foreseen by the authors of "The Limits to Growth". At least one type of pollution connected with an increase in CO₂ concentration in the atmosphere has been recognized as a severe threat to the climate of the Earth [11] as therefore as a menace to food production. Correspondingly, the experts of the energy sector foresee that the production and consumption of oil will reach the maximum within the nearest decade [12]. Of course, the authors of the investigation of the limits to growth warn of an increase in the concentration of CO₂ but generally the used model relies not upon an increase in CO₂ emission or excessive oil consumption but more likely on the general pollution of the biosphere and complete depletion of natural resources. However, the existing trends of CO₂ emission and

depletion of oil resources have been described rather precisely in the book “The Limits to Growth”, similarly to other ecological problems met by mankind today, including an increase in the concentrations of toxic compounds in oceans and ground water, a decrease in oceanic fish resources, disappearance of woodlands *etc.* One of the strongest aspects of the theory of growth limits is that the authors succeeded in demonstrating the interconnection between problems encountered by mankind today. For instance, rapid depletion of fossil fuel resources is directly connected with the problems of climate change, but if we try to solve both these problems through passing to biofuel, this will cause additional load on the nature and especially on the limited areas of plough-land. In turn, this will cause a decrease in the area of agricultural grounds used for growing food, and the necessity to develop irrigation and to increase the consumption of fresh water. The problem of additional fresh water resources can be solved through desalination of seawater but here the circle gets locked because desalination is in its turn connected with the substantial energy consumption and so on and so forth.

WHO IS THE POINTSMAN!

It is known that the conclusions of “The Limits to Growth” had been ignored for a long time; the book itself was prohibited in some countries. What had been the reason of actual derailing of the discussion of this subject, the most important one for the whole mankind?

It is no wonder that a book pointing to the necessity of economical regulation is very annoying to many people, that is why a negative attitude to it was cultivated in the society. Because the theory of the limits to growth throws down a challenge to many commercial interests, a number of economists met it extremely unfriendly. The same attitude was demonstrated by many politicians due to their fear of additional expenses for social needs. Even intellectuals who had built up their scientific and educational system on the basis of the paradigm of unlimited growth met the works of D. Meadows negatively. These public groups did not try to gain an understanding of the prob-

lem, did not argue against the theory of the limits to growth and did not participate in reasonable and fruitful debate. From their opinion, continuing growth of population and industrial production were not the urgent subjects for consideration.

Another reason due to which the theory of the limits to growth had been suppressed for a long time could be a paradox: oil crisis that burst out a year after the publication of the book and seemed to confirm the correctness of the authors was in fact overpassed within several years. This caused a temptation to conclude that no physical limits to growth are likely to exist. The report “The Limits to Growth” was assessed as inadequate and unscientific, though it did not consider such short-term political fluctuations.

EXPONENTIAL GROWTH

Report “The Limits to Growth” warns about pitfalls and unexpected dangers concealed in the exponential growth. The fact that relatively small part of the world has underwent the exponential growth of material production and consumption is often used to state that such a trend may continue infinitely. In reality, this notion ignores the fact that almost zero growth of material production and consumption had been observed during the major part of human history.

The exponential characteristics of the growth themselves make it absurd to suppose that these exponential processes may proceed for a long time on our planet, which is rather small in fact. Annual increase in any value, for example annual consumption, by 3.5 % causes doubling within only 20 years. After 100 years, consumption is going to be 32 times higher than now; after another 100 years it will be approximately 1000 times higher than today, and so on. However, the belief in the possibility of long-term exponential growth is ineradicable in the mind of short-sighted politicians, economists and journalists.

A striking example is demonstrated by the system of energy consumption, for instance, in Denmark. Even after the oil crisis of 1970es, the Danish consumers of electric energy continued increasing the consumption of electricity by approximately 6 % per year. This was

represented as something resembling the laws of nature. Then heated debate concerning the construction of atomic power stations occurred in the country, and the government announced the necessity to consume 100 milliard kW · h of electric power in 2000 [13]. When the year 2000 came to its finish, summing up revealed that the actual consumption of the electric power was 33 milliard kW · h, that is, only one third of the expected need. Since then, predictions of the exponential growth of the consumption of one or another product somewhat changed. However, the dogma of the necessity of exponential growth for economics in general is still alive. A “good economics” even in such a successful country as Denmark is still understood as a growing economics but not a stable one which would not bring hazard to the environment.

DEVELOPMENT WITHOUT GROWTH

Regrettably, mass media do not pay deserved attention to optimistic predictions of “The Limits to Growth” about the possibility to achieve stable global development. From the point of view of terminology, it is clear now that it is useful to distinguish between development and growth, so that it would be possible to speak of development with growth and without growth. One good illustration of this idea is the development of a human being continued during the whole life, while, as a rule, human growth stops at the age of 20 years. Similarly, the society may go on developing after it stops growing: “*Many people in a prosperous society include art, music, scientific research, athletics, studies of religious postulates, improvement of the level of education and social activity into the list of desirable occupations*”. These are the characteristics of stable state economics described in “The Limits to Growth” [1, p. 175]. It is necessary to stress that the society without growth may be as dynamic as our current economics of growth; in this situation, the consumption of some products may decrease and the consumption of other ones may increase within the limits of a definite structure which is always present in valuable economics. In the case of stable economics, decrease in labour consumption is possible, which

means more free time. This is absolutely uncharacteristic of the economics of permanent growth.

What had the western society been doing during thirty years lost in vain and distressing Simmons? Nothing actual for transition to achieving the stable development, except several technological advances. On the other hand, political steps in the area of increase in population, total consumption and production were made in the direction opposite to sustainable development, and in fact those steps reduced all the scientific and technological achievements to zero. As a result, the present anthropogenic press on the environment, for example, expressed in the terms of the ecological footprint [14], is much stronger than 36 years ago when the book “The Limits to Growth” had been published for the first time. Unfortunately, today there are no convincing evidences that the trend has changed or is going to change.

IMPROVEMENT OF GLOBAL DISTRIBUTION

A computer model of the future World 3 on which “The Limits to Growth” is based describes an averaged world in general making no differences between more and less developed countries. Of course, it is the distribution of riches and the level of consumption that play an important part in the real picture of world development. The authors of “The Limits to Growth” clearly pointed to this. Up to now, in spite of the statements of numerous politicians, economists and industrialists, industrial growth had not been leading to any cardinal solution of the problems of poor countries and decrease in the level of injustice. Quite contrary, it promoted conservation or even an increase in the gap between poor and rich countries. Whatever large a pie may be, it cannot be infinitely large, so the necessity arises to divide it into as equal fragments as possible, both on a national scale and on the global one.

At the global level, equal division of a pie implies substantial deceleration or decrease in material consumption in the most developed and economically successful countries, as “The Limits to Growth” recommend. If mankind is going to decrease the ecological press on the plan-

et by a factor of 2 and follow the idea of equal rights of any person living on the Earth to use natural resources, the developed countries are to decrease the effect on the environment by a factor of about 10 [15]. The idea that the rich countries are to conserve their economic growth that will allow them to help poor countries is just idle rhetoric called in popular language the talks in favour of the poor. In reality, everything is quite contrary. Indeed, our planet can provide the ecological space for an increase in the welfare of backward countries, while the developed countries must slow down an increase in their own consumption and production, in order to free the ecological space for the countries that are in sharp need for industrial growth and increase in consumption.

One of the most important steps on the way to constructing stable state society could be the step involving reasonable distribution of the work among the working masses. For example, it seems reasonable to reduce working hours by 20 % instead of dismissal of 20 % of workers. In 1935, philosopher Bertran Russell described dismissal of people as a method to decrease the working masses in the following manner: “*So, leisure time will cause sorrow instead of being the general source of happiness. What can be more nonsensical?*” [cited from 1, p. 176].

DISCUSSION RESUMES

It would be unjust to consider all the economists as implicit supporters of permanent economical growth. Nobel Prize winner in economics Joseph Stiglitz at first rejected the predictions stated in “The Limits to Growth” concerning the lack of natural resources. However, now he admits that if the whole world follows the western style of life, the world economics can hardly be stable and vital [16]. Later on, Nobel Prize winners in economics T. Haavelmoe from Norway and J. Timbergen from Holland declared in even more harsh manner that the economical growth in rich industrially developed countries is to be stopped as soon as possible [17, 18]. It should be noted that it is the professional economists possessing also specialized knowledge about the basic physical principles who must raise the alarm regarding possible

consequences of the permanent growth of production and consumption, similarly to what M. Simmons had done.

Technological changes alone can hardly solve the problems encountered by mankind: very high technological efficiency has a trend to accelerate economic growth [19]. States planning the transition to sustainable development are to attract many economists-ecologists and other interdisciplinary researchers to develop the schedule of measures aimed at the transition from the existing economics based on permanent growth to the vital economics of sustainable development. From our point of view, under the existing political and economic situation, it would be incorrect to ignore the recommendations and proposals formulated in the works of Dennis Meadows and his colleagues [1–7] merely because some people did not accept the title “The Limits to Growth” and unjustly denounced those works.

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