



Mainstream economics toolkit within the ecological economics framework

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ABSTRACT

Development of ecological economics was a response to the environmental crisis born by the economic growth. Ecological economics, in contrast to mainstream economics, is characterized by value pluralism and interdisciplinary approach that makes it hard to achieve methodological unanimity. This paper considers if the mainstream methods could be used to tackle environment problems effectively. To this purpose, the integrated macro model is proposed. It suggests that all environment externalities could be accounted in the existing production-consumption system. So using the new ideology based on ecological economics priorities and applying the toolkit of mainstream economics, we could transform the existing pricing system and provide effective institutional reforms to ensure sustainable development.

1. Introduction

The modern models of development in most countries (in spite of significant differences in the social organization) accept economic growth as a universal way to provide human welfare. At the same time, the methods to provide growth often cause serious damage to the environment, so reducing real quality of life.

The economy, given its constantly increasing size, should be considered not as a self-sufficient isolated system but rather as a subsystem of the finite biosphere that support it (Daly, 2007). With the growing imbalance between ecological processes and human activities it is becoming obvious that the dominant system of economic views has not matched the restrictions imposed by the laws of nature. The recognition of these contradictions, as well as the need to resolve them, not only by environmentalists and biologists but also by economists has resulted in increased attention to ecological aspects of economic sciences. An outcome of such attention was emergence and development (particularly rapid since 1990s) of a new discipline – ecological economics (Spash, 2011).

Ecological economics is seen not as a sub-discipline of economics or ecology but a trans-disciplinary field where different human and natural sciences interact to solve problems of sustainable scale, fair distribution, and efficient allocation (Costanza et al., 1997a, 1997b). It does not mean that ecological economics puts aside the issues of prosperity and well-being. However, interpretation of these concepts also as approaches to measuring is different from the similar in mainstream economics.

Within orthodox economic theories the notion of well-being is identified with the commonly accepted indicators of income or GDP

and the research activity is focused on the problems of growth and efficiency. Ecological economists are treating well-being rather as a complex characteristic of life quality than amount of wealth measured in money. The methodology of ecological economics is based on a multidisciplinary approach. In contrast to mainstream economics, it has such characteristics like value pluralism, acknowledging incommensurability, rejection of mathematical formalism and its claimed rigor, acceptance of strong uncertainty (Spash, 2011). In other words, the ecological economics methodology claims to be more comprehensive than the narrowly utilitarian mainstream one.

Meanwhile, applying a new methodology in economic practice requires developing of an appropriate measurement and valuation system that is needed to provide the proper information for efficient decision-making (MacDonald and Corson, 2012). As ecological economics is focused on “comprehensiveness” it needs complex assessment methods that should embrace different environment effects and ecosystem amenities. But applying multidimensional approaches and complicating valuation methods, as a rule, has a negative influence on reliability and accuracy of results that would be used in decision-making. An appropriate analogy is Heisenberg's uncertainty principle, when improving of one measurement parameter (“comprehensiveness” in this case) leads to deteriorating of another parameter (accuracy or relevance).

As it can be seen “interdisciplinary” methodology has objective limitations. So, ecological economics needs to examine more thoroughly the possibility of applying the mainstream toolkit to solve its problems. This paper considers the issues how ecological economics can apply “orthodox” economic methods for the purposes of valuation, institutionalization and policy making.

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2. The limits of monetary valuation

One of the major causes of the environment degradation is treatment to it as external to the economy. Thus, ecological economists suggest the environmental externalities should be internalized by being evaluated in monetary terms (Dempsey and Robertson, 2012; Farley, 2008). The largely accepted pattern for this task is to consider the environment as a set of ecosystem services.

The concept of ecosystem services plays one of the key roles in ecological economics. It is attracting increased attention to emphasize the dependence of society on ecological life support systems (Gómez-Baggethun et al., 2010). The notion of an ecosystem service is treated in the different ways (Dempsey and Robertson, 2012; Daly, 2007), but the most frequently used definition was proposed by the Millennium Ecosystem Assessment Project. According to this research, ecosystem services have been defined as the benefits humans receive from ecosystems (MEA, 2005).

The issue of valuation of ecosystem services is one of the most important in ecological economics. There are substantial variations and debates about valuation methods that widely represented in different reviews, reports, special publications (Costanza et al., 1997a, 1997b; MEA, 2005; Daily et al., 2000; Gómez-Baggethun et al., 2010; TEEB, 2010; Dempsey and Robertson, 2012). The choice of an appropriate method depends on available information and its quality, economic properties of a specific ecosystem service. The valuation process can be based on subjective preferences analysis or biophysical (ecosystem flows) approaches (TEEB, 2010). Serious discussions concern the relevance of using cost-benefit analysis (CBA), market-based approaches and marginal costs for environment pricing (Dempsey and Robertson, 2012). According to some biologist, the monetary valuation of ecosystem services does not take into account the intrinsic value and holistic nature of ecosystems, and the biosphere as a whole with the complex interdependences of all their elements.

From the point of mainstream economics, the best method to measure the price is a market-based approach that means complying with neoclassical principles. But implementation of the approach is largely limited institutionally and spatially. Many ecosystem services are non-rival public goods and cannot be traded in markets. Besides that a range of environment amenities are not substitutable (the elements of critical natural capital), so marginal values cannot be used for pricing.

Various market failures also as relative nature of market prices are subjected to regular criticism from ecological economists (Pelletier and Tyedmers, 2011). Meanwhile, it has not yet been proposed a valuation method that would have received the unanimous support among them, despite the existence of many alternative approaches. And it seems hardly possible because of the pluralistic nature of ecological economics.

Take as example one of the most frequently cited studies on the problem of the environment valuation. In 1997, R. Costanza and his team presented the total value of the world's ecosystem services as 33 trillion US dollars that was nearly 1.8 times the size of the global GDP (Costanza et al., 1997a, 1997b). These results have been criticized not only by mainstream economists but also by many ecologists. If the latter are noting that the approach simplifies the ecosystem functions and their influence on human well-being, the former are pointing at inconsistency with the neoclassical principles: the estimation based on so-called the index method (multiplying the individual price by quantity (acreage)) does not account marginal costs and values.

In spite of the disputes and criticism, it is needed to notice that valuation methods unlikely can be ideologically neutral (Vatn, 2005). So the considered estimation (1.8 times the size of GDP) could be used to charge the prices of ecosystem services in strict Keynesian style or in compulsory order like it had been done in the former USSR, for example. However, such a policy usually leads to imbalances in the economy. Furthermore, matching the results of the ecosystem services

valuation and GDP it is required to ensure methodological consistency on the macroeconomic level.

GDP as a monetary measure of the value of all final goods and services is the result of interaction between aggregate demand and aggregate supply. The total value of the world's ecosystem services released by R. Costanza and the others (1997) may be considered as an additional part of aggregate supply – ecological aggregate supply. But this supply would be effective only if sufficient effective demand would be ensured. In other words, the total value of the ecosystem services in a proportion of 1.8 times of GDP could be valid if government or society would create equivalent additional demand (by printing money, for example) that would be allocated to the environmental sector. As a result the new GDP (GDP plus the value of ecosystem services or “green” GDP) would be 2.8 times the size of the initial GDP.

Without the assumptions above the approach (Costanza et al., 1997a, 1997b) seems inconsistent like many other approaches to valuation of ecosystem services which are positioned as an alternative to the orthodox methodology. In my opinion, this inconsistency is caused by an intrinsic logical error, and that's why. All attempts to value the non-economic benefits eventually connected with the search for a starting point. In any case, such a point can only be chosen on the basis of the existing (mainstream) pricing framework. And hardly the value of ecosystem services originated from the “mainstream” price can be considered as an adequate alternative to it.

According to the neoclassical economic paradigm market price reflects an exchange (relative) value that is equal to a marginal value. Attempts to measuring a total (comprehensive) value are not only contradicted to mainstream economics; specialists ‘simply plucking monetary numbers from the air to claim importance for ecosystems actually undermine an alternative theoretically grounded research agenda’ (Spash, 2011, p. 355). Moreover, researchers who are trying to provide a comprehensive valuation of non-economic benefits consciously or unconsciously ascribe to the economy force, which it does not possess.

The high prices of ecosystem services are not a sufficient condition for the environment effective reproduction (conservation). A possible threat of applying of the price regulation where the logic of conservation has been based on the ethics or communal values is emerging of an individualistic, utilitarian pattern of behavior (McAfee, 2012). In addition, without appropriate institutions, growth of prices may create incentives for more intensive ecosystems exploitation to maximize profits. Also undesirable consumption might be enhanced because of the so-called Jevons paradox, when rising prices would stimulate gains in efficiency (Gómez-Baggethun et al., 2010), so new technologies would cut costs and increase access to resources for the consumers (as an example, the development of shale gas and oil production). After all, high prices may cut off poor people from ecological amenities (Farley, 2008; Farley and Costanza, 2010) what is not corresponded to the purpose of fair distribution.

Accepting the problem of the ecosystem services undervaluation, we should not overestimate the role of its price for the regulation matters. Given the main problems of ecological economics concern the allocation and distribution, ‘we should not waste further efforts trying to precisely quantify the benefits of action, but rather figure out the most cost-effective way to solve our problems’ (Farley, 2008, p. 1406). So due to lack of a commonly recognized alternative it is worthwhile to examine how the existing pricing approaches could be used in the ecological economics framework. The issues of the ecosystem services valuation in terms of the mainstream methodology will be considered further.

3. Ecosystem services valuation in the neoclassical framework

3.1. The relativity of the ecosystem services price

According to the neoclassical paradigm market prices emerge from

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