

# METHODOLOGICAL APPROACHES TO THE REFLECTION OF ENVIRONMENTAL ASSETS IN SEEA<sup>1</sup> AND NAMEA<sup>2</sup>

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## Abstract

The article deals with possible approaches to the construction of environmental-economic accounting of the national system using a variety of methodological approaches. We consider two systems of environmental-economic accounting: SEEA and NAMEA. Comparative characteristic is given.

**Keywords:** environmental-economic accounting

## 1 Introduction

In modern conditions of managing the exploitation of natural resources should be carried out within the framework of long-term preservation of environment concepts for the needs of the person. Based on this reflection process involving natural resources in economic activity also must undergo a very significant change.

The traditional system of national accounts (SNA) does not have the necessary methodological tools and analytical capabilities for the valuation of the total volume of consumption and stocks of natural assets, environmental protection industries and sectors of the economy. This article describes the basic principles of the national environmental accounting, the advantages and disadvantages of existing systems and proposed approaches to the integration of environmental factors in the statistics. Before you begin to develop a national system of environmental-economic accounting, it is necessary, in our view a detailed analysis of options offered by international organizations, to assess their strengths, weaknesses, labor and cost of implementation. You should start with the simplest options that do not require any additional large-scale statistical observations.

## 2 Approaches to Environmental-Economic Accounting

Between 1970 and 1995 a number of approaches to the accounting involved natural resources and to the evaluation of environmental damage have been developed. In particular it has been proposed two approaches to the construction of environmental accounts to account for the natural assets on the one hand payment of so-called "green

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<sup>1</sup>The System of Environmental-Economic Accounting

<sup>2</sup>National Accounting Matrix including Environmental Accounts

national income” and on the other hand the construction of “physical accounts” for certain types of natural resources.

Dutch economist Roofie Hurting was probably the first to propose the measure “sustainable national income” (SNI), which should be fully taken into account the consumption of natural resources by deducting from the gross national income of the amount of damage to the environment. Proponents of “green national income” offered to give each of its natural resource valuation, monetization damage. Dutch economist Stephen King and his colleague de Haan of Statistics Netherlands (CBS) offered to link economic performance to damage to the environment, but measured in physical units, that is, to develop a hybrid system of accounting, which will be connected to the cost parameters and physical quantities.

Consequently, the development of national statistical methodology in the direction of its greening can go two ways. You can develop a hybrid system of environmental-economic accounting, which along with the traditional accounts of the SNA will be built satellite accounts for each type of natural resources in physical terms. This option is available in the Central bases SEEA, adopted in 2012, the UN Statistical Commission as an international statistical standard [1]. The basis for the development of natural assets in the SEEA are accounts SNA non-financial assets, which also include non-produced and natural assets. SEEA provides the above SNA account in part in aggregate form and partly in a disaggregated form. Disaggregation helps identify environmental protection measures to prevent or attenuate the deterioration of environmental quality or reducing the damage caused by environmental degradation.

As for non-financial assets, it is proposed to further disaggregate data on stocks and changes in the volume of natural assets to improve and extend the registration of consumption of natural resources in the production process, taking into account changes in the value of natural assets under the influence of production and consumption.

On the accounting principles damage builds another hybrid accounting system — National accounting matrix including environmental accounts (NANEA), developed by Dutch researchers [2]. It uses economic indicators, measured in monetary units, and linked to their environmental indicators presented in physical units. According to the developers of the system, to get a clear understanding of the relationship between the natural environment and the economy, it is necessary to use a physical representation of environmental resources in order to avoid the problems of valuation and revaluation.

The basic idea is to expand NANEA traditional national accounting SNA due to two additional accounts. The developers of this system offer to keep records on key environmental areas: the greenhouse effect; depletion of the ozone layer of the earth; Soil oxidation; waste, discharge of polluted wastewater and others.

Second additional expense to the environment by such substances as carbon dioxide or sulfur dioxide, in which these substances should be expressed in physical quantities (kilotons, tons, etc.). We can say that NAMEA create the summary indicators for the environmental issues, which are considered the most relevant at the international level. This system is based on a set of tables that provide an overview of relevant relationships between accounts and data streams on environmental change [2]. The indicators in this table characterize the contribution of each activity in the economic

performance and environmental burden as a percentage. The tables gives an idea about the total rejection of pollution per unit of final demand for specific activities in relation to the average for all industries. Development of this type of table is the complexity of data sources, according to the method of calculation of indicators for individual environmental themes (destruction of the ozone layer, the greenhouse effect, eutrophication).

### **3 Comparative characteristics of the two systems of integrated environmental and economic accounting**

In fact, NAME has much in common with the SEEA. Both systems are similar to the format used by the accounting matrices. However, there are some differences:

1. The SEEA focuses on expanding the standard accounts of assets due account of environmental assets such as water, air and others. In contrast, NAMEA starts with expansion to a full national accounting system to account polluting substances and environmental topics.
2. NAMEA does not involve calculation of environmentally adjusted 'green' GDP, as it makes SEEA.
3. NAMEA links pollutants c environmental themes (for example, the destruction of the ozone layer), and the SEEA system does not contain such an aggregation.
4. NAME system can be used for analytical applications based on Leontief model. It can be used to determine the amount of pollution induced by one unit of final demand for each type of activity. This type of accounting is unfortunately not provided for in the SEEA system.
5. SEEA methodology allows for the degradation of natural resources as consumption of fixed capital in the traditional SNA. This is not provided for in the NAMEA system.

It can be concluded that NAMEA is a multipurpose information system that is able to generate information for the public and governments about the status of environmental assets and environmental pollution. The choice of environmental problems depends on political decisions, rather than on the decisions of scientists. This is the reason why the NAMEA of different countries are different<sup>3</sup>. Without a doubt, it would be useful to standardize sets of pollutants and the list of environmental topics for all countries,

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<sup>3</sup>British NAMEA contains 15 environmental substances and only 3 environmental issues (Vaze 1999), Japan has 16 agents and 6 environmental themes (IKE 1999), the German has 8 pollutants and 2 environmental issues (Tjahjadi, Schaefer, Radermacher & Hoh 1999) and Swedish NAMEA are 5 pollutants (Hellsten, Ribacke & Wickbom 1999).

since environmental problems are global in nature. NAMEA is a tool for the integration of environmental concerns and combines environmental data with the economic data of the main SNA accounts. There is no specific economic constraints to select a specific nationally adapted version NAMEA. Developers are free to decide which environmental themes and some substances that may pollute the environment should be controlled to solve environmental problems. In addition NAMEA provide data in the required format for all kinds of in-depth environmental and economic analysis.

## 4 Findings

Any of the above systems can begin to put into practice the work of statistical bodies of the Republic of Belarus, but first need to select priorities in environmental-economic accounting, identify the most important environmental issues, the integration of all available information on the state of the environment, stocks and consumption of natural assets within unified statistical methodology aimed at the greening of macroeconomic indicators and assessment of sustainable development. It is possible to start with the development of water resources and forests accounts in physical units on the SEEA methodology, parallel to the table to develop a relationship of economic performance and contamination by NAMEA sample.

## References

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