ECOLOGICAL-ECONOMIC SYSTEMS EFFICIENCY

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For efficiency increase in ecological-economic systems synergetic effects must be incorporated. This incorporation increases the systems efficiency. For this we need different assessment criteria. Assessment of production cycles has two main aspect: on the one hand, the integral costs of the whole production and consumption cycle (including environmental protection) should be calculated, on the other hand, aggregate human activities including negative environmental impact should be considered. Eco-efficiency indicators are most useful in this respect. To estimate eco-efficiency two equitable indicators – the ratio *produced goods over environmental impact* and the *environmental impact over the produced goods* can be used. These are called the reverse indicators.

An increase in eco-efficiency refers to an increase of economic value at unchanged (or decreased) environmental impact. As indicated in table 1, four variants of increased eco-efficiency indicators (environmental versus economic result) can be defined.

- *An increase in eco-productivity* (i.e. efficiency of environmental impact);
- *A decrease of nature intensity* (i.e. a decrease of costs of natural factors);
- *An increase in the efficiency of environmental costs* (i.e. better state of the environment per unit of environmental cost);
- *A decrease in environmental specific costs* (i.e. costs per unit of environmental state improvement)

Table 1 – Four types of eco-efficiency

Ratio	Goal	
	Productivity increase	Environmental state improvement
Economic versus environmental indicators	Total production per unit of aggregate environmental impact costs or *environmental productivity*	Sum of costs incurred per unit of environmental state improvement indicator (averted damage)or costs of environmental state improvement
Environmental versus economic indicators	Environmental impact indicators (ecological-economic damage) per unit of production or *environmental intensity*	Improvement of environmental state per unit of costs or *environmental cost-effectiveness*

The increase in efficiency is one of the key success components in business. Enterprises constantly seek ways to improve their efficiency. In modern conditions this can be done within clusters. The growing number of people involved in economic-development activities. The decentralization of decision-making processes to the regional and city levels and the renewed importance of international organizations have left many new policy planners with the need to find new tools to define their policies:

a) use of increasingly frustrating traditional industry policies such as providing subsidies for uncompetitive industries, attempting to build new industries from scratch and trying to attract incompatible foreign investments are unproductive; b) the globalisation of international markets. With the reduction in the number of barriers trade, producers can compete freely in any economy at the global level. Given this, regions realize that they must compete internationally in the industries in which they enjoy an advantage. Globalization is thus leading to a specialization of regional economies. Clusters support this trend by building on local differences, seeking an endogenous growth of regional economies, reinforcing the assets already present in the local economies.

Some authors [3] offer the following scenarios for cluster creation and financing: " top-down", i.e. with prime formation of consultative coordination and monitoring bodies, with definition of cluster strategy as a whole and its resource support; " down-up ", i.e. forming of separate projects and programs which integrate potential cluster participants;. the mixed variant when both approaches are united.

As a rule, clusters are directed at the achievement of the following purposes [3]: competitiveness increase of clusters participants due to introduction of new technologies; decrease (reduction) of expenses and improvement of quality of the appropriate high technology services due to synergy effect and unification of approaches to quality, logistics, engineering, information technologies etc.; maintenance of employment in conditions of reforming of big enterprises and outsourcing; consolidated lobbying of clusters participants interests in different authorities.

Ecological clusters have reliable potential for investment. In our opinion ecological clusters give an opportunity for grouping geographically close ecologically safe productions which have constant interrelations with scientific research institutes, laboratories, and business structures, public institutes, whose strategy and tactics are maintenance and increase of sustainability and efficiency of a region. About 80 % of all economic actives of a region should be concentrated in an ecological cluster, which basic purpose is maintenance of sustainable social, economic and ecological development.

References

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