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## Економічні проблеми сталого розвитку Экономические проблемы устойчивого развития Economical Problems of Sustainable Development



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The complementary information allows doctors to specify the formulation of diagnosis and monitor the changes in skeletal muscles, thus preventing the cumulative trauma disorder. The existence of reference values simplifies the evaluation of the state of the skeletal muscle.

## APICULTURE AS AN INSTRUMENT OF ECOLOGICAL AND ECONOMIC ANALYSIS

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Ecological and Economic Analysis is branch of economic analysis that was founded only in last century. However, nature gave people instruments for EEA much earlier. One of these instruments is apiculture.

By the time, people did come to this world, «the honey-bee had already been around for about 40–50 million years or more» [1]. Humans have taken benefits from bees more than 8 000 years. They use pollen, honey etc.

Apiculture can give one more benefit now – it can help to evaluate environmental conditions (for example, level and measures of pollution). This function of apiculture is especially useful for agricultural business.

So, it was noted, «if we look at bees survival rate, quantity and quality of honey, we can make conclusion about the environmental conditions in place where are bees located». Therefore, it is appropriate to use the bees and their metabolic products in the «monitoring of biosphere pollution by radionuclides, salts of heavy metals, pesticides». Moreover, «with help of one bee family, we can get objective information about the composition of the soil, plants, air on the territory about 3.4 thousand hectares» [2].

It is currently important for our home practice. Ukraine is one of the world leaders in the field of beekeeping, so in such way we can monitor the environment on a national scale. Such monitoring do not need much costs and we can do it in every region. Because apiary are in every Ukrainian region. So using apiculture as tool of ecological and economic analysis is economically feasible for our country.

For example, we can consider the situation in China, «in the southern province of Sichuan in the region Han Yuan are many pear gardens» [3]. About 80% of pears in the province is growing here. This happened not because of Apiary «bees are gone from here long time ago. In the early 1980s, the uncontrolled use of pesticides led to the destruction of bees and death of plants» [3]. And now people pollinate orchards themselves every year in April "First they collect pollen by hand and dried it in two days" [3]. Then they make a device from bamboo and chicken feathers, shake pollen on it and touch this stick every flower.

One family of bees «pollinate three millions flowers every day, the man can pollinate only thirty trees. It's hard and expensive work for people, in compare with the free labor of bees» [3].

Therefore, the extinction of the bees in this Chinese region makes it unsuitable for conducting of agricultural business. Such kind of economic activity (growing orchards) in this territory will require many costs. In this example, we convinced that it is feasible to use bees as a tool for environmental and economic analysis.

According apiculture like ecological and economic indicator in global scale we can observe interesting phenomena nowadays. Scientists called it Colony Collapse Disorder. Today, global degree of bee's mortality is 20 to 40 percent at a normal rate of less than 10%. The problem of extinction of bees could lead to irreversible catastrophic consequences - until the disappearance of humans on our planet. This situation is the signal to people. It mean: we have to change something in our economic activity.

Using natural indicators for economic analysis is one of the ways to sustainability. Especcially if we talk about apiculture: it gives us double benefit. Firstly, beekeeping is very profitable business that almost doesn't need costs. Secondly, it is instrument for ecological and economic analysis. Therefore, in such way we have synergetic effect from apiculture. It can help human in achieving some sustainable development goals. David Cramp in his book "A Practical Manual of Beekeeping" said: «if all humans were to be wiped out, the world would probably revert to the rich, ecologically balanced state that existed some 10,000 years ago. On the other hand, if bees and other pollinating insects were to be wiped out, humans and other animals would not last for long» [1]. Nature give us signals (for example: Colony Collapse Disorder) that world is in dangerous. And we have to choose: listen to the bees as to the natural ecological indicator or ignore them and continue to destroy our planet.

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## ENVIRONMENTAL SAFETY OF UKRAINE

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The environmental situation in the world and especially in Ukraine is becoming more threatening. Ukraine is an industrial state which holds a significant place in the global economy that directly causes significant pollution.

Today, the ecological situation in the country is characterized by a deep ecological crisis and is extremely tense since the Chernobyl disaster, due to the influence of the command economy of the Union of Soviet Socialist Republics, depreciation of fixed assets of industrial and transport infrastructure, insufficient