

# **THE DEVELOPMENT OF SUSTAINABLE LAND USING AS A STRATEGIC PRIORITY OF MODERN AGRICULTURE**

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Agriculture is still a sector of the economy in which the outcome of economic activity has a probabilistic nature and can't be accurately predicted. Besides economic processes, the uncertainty of the operating systems in the industry is connected with the specific land use as a production factor. The productive part of land (soil) forms a crop yield under the influence of simultaneous multiple, sometimes differently directed, factors group interaction. Factors group includes genetic characteristics of crops, weather and climatic conditions of the environment (humidity, temperature, pressure, etc.), the activity of living organisms. Therefore, the impact of humans on the labor subject is not decisive in this case.

However, in recent years, namely the human impact is a major threat to the natural resources of agriculture in Ukraine. Failure science-based crop rotation, no systematic reproduction of soil fertility leads to the agrosocioecological systems destruction. Intra-industrial destabilizing factors currently gained national importance and defined as major risks of present and future economic stability in the industry.

Nature elements, which are directly or indirectly used in the production at the agricultural enterprise, a group of companies within the same administrative unit, region or a whole country, make natural resource potential of appropriate localization level. The rationality level of land using should be viewed through the prism of land use efficiency ability that are in use in agricultural enterprises (associations, industry). Also it should provide a long term sustainable yields from existing internal and external constraints due to the dynamics of their reproduction.

The strategic priority is to build an industrial model of agriculture, which would be supported by the ecological balance and benefit balance between financial and social interests. In this aspect, rational system of land using must be tempered by such directions: "input resources" – "output production" – "compensatory influence".

Soil as a natural formation is changed by biotic influence physical, chemical composition, etc. during the production operations implementation. They aren't traced even within one field. However, the total index of land use systems balance (namely resources balance) should be a subject to continuous monitoring of the enterprise's strategic management.

Land use equilibrium of the "persistent" type (position A in Fig. 1) provides a way of production organizing, in which the parameters balancing costs and benefits are obtained by self-regulation. The average impact  $F_i$  on the system productivity

of the  $i^{\text{th}}$  factor (natural, anthropogenic influence) has a direction for productive land properties saving ( $\sum \bar{F}_i = 0$ ).

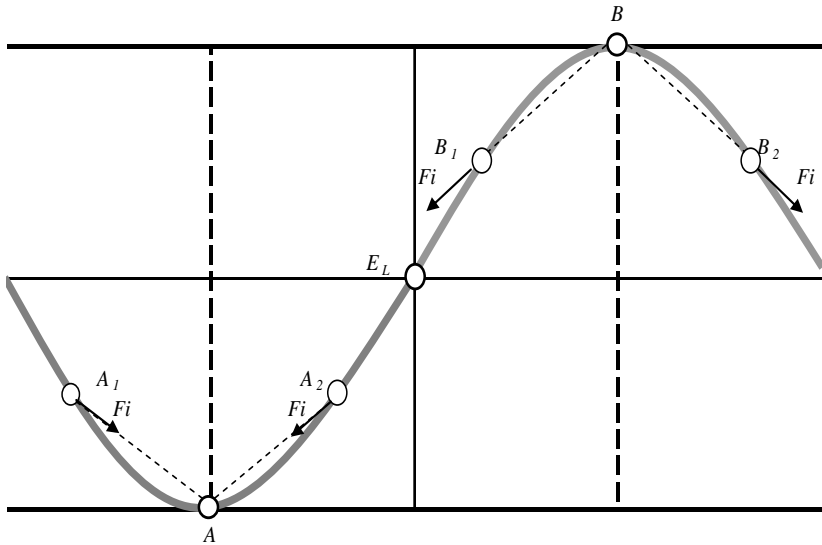


Figure 1. The level of land use systems balance

At the equilibrium of "unstable" type (position  $B$ ) and rejecting the system parameters from the values that provide yield indexes reproduction (positions  $B_1, B_2$ ) at the beginning of operations, forces  $F_i$  are acting, seeking to increase this deviation. Change in direction and character of productivity factors oscillations depends on the equilibrium  $E_L$  threshold. It is determined firstly by the degree of environmental safety (for example, values of erosion hazard) of the current system of land use. This causes irreversible changes in the configuration of the productive mutual influence factors. The equilibrium deprivation in at least one direction leads to imbalance in the system "resources" – "results" – "compensation" in general.

So, it is necessary to ensure a balanced land use systems and timely prevention of risk of soil fertility losses in order to prevent reduction of natural resources, particularly the land and resource potential in the industry. The identifying of these risks is a strategic prerequisite for the successful development of agriculture in Ukraine.

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