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ISSUES OF ECONOMIC INCENTIVES FOR INCREASING SOIL FERTILITY OF IRRIGATED LANDS

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Abstract
The article examines the problem of increasing the fertility of irrigated lands through economic methods. It considers factors such as subsidies, tax benefits, and financial allocations used in foreign countries to maintain and increase soil fertility. Additionally, it outlines directions for enhancing soil fertility using modern methods, particularly digital technologies, investment incentives, subsidy systems, and agrotechnical measures.

Keywords: Irrigated land, soil fertility, economic incentives, subsidies, investment benefits

Introduction

Relevance and importance of the topic. The agricultural economy of Uzbekistan is largely dependent on irrigated lands. For example, irrigation directly contributes to 25-28% of agricultural production, as well as up to an average of a quarter of the production value [3-4]. However, as a result of the unregulated use of agricultural land, problems of soil erosion, salinization, and waterlogging have emerged. Currently, about half of Uzbekistan's irrigated land area is heavily salinized [5]. For instance, according to FAO data, an average of 40-60% of agricultural land in Central Asia is saline or waterlogged, and in Uzbekistan, this figure is around 51% [5]. This situation, in turn, significantly reduces crop yields. Additionally, due to climate change, water conservation and preservation of soil fertility are becoming pressing issues [3]. Therefore, the matters of protecting land resources and increasing their fertility are under strict control and are aimed at addressing them through economic incentives.

Global experience (examples from developed and developing countries) Various countries employ economic methods for effective soil resource management. For instance, the EU has introduced restrictions based on "green components" of agricultural policy, along with additional payments for poultry farming and other environmental measures. In the USA, programs like the Environmental Quality Incentives Program (EQIP) provide financial assistance to farmers for implementing soil protection methods, such as cover crops and organic matter amendments. In some developing countries, necessary support typically comes in the form of subsidies for fertilizers and energy. For example, a few years ago, China began offering land subsidies for cotton, wheat, and grain production under the guise of "protecting soil fertility." However, these payments are being implemented without effectively linking them to measures that actually increase soil fertility [6]. Countries at all levels primarily focus on improving technology and knowledge. FAO projects in Central Asia have conducted

training on mapping saline soils and implementing advanced methods for restoring fertility [3]. It is worth noting that developed countries have well-established systems of environmental legislation and mechanisms for directing subsidies towards environmental protection.

Today, several new structural methods are also being applied to increase soil fertility:

Digitalization and monitoring: Drones, satellite observations, and GIS technologies serve to improve agronomics. Such methods provide the ability to determine soil conditions and effectively propose solutions. For example, in the industrialized agricultural sector, farmers can electronically maintain land area and productivity data through geolocated land input information systems.

Investment incentives and loans: The government is introducing preferential loans, investment programs, and public-private partnership mechanisms for investment in agriculture. Additionally, if farmers increase soil fertility, they will receive land and tax benefits for up to three years [8].

Subsidies and preferential programs: The government is allocating subsidies to support agrotechnical measures on agricultural lands. As such, quantitative subsidies and land tax benefits have been established for land areas with improved soil conditions [8].

Innovation centers and extension services: It is planned to establish information and service centers in each region, which will offer farmers services such as soil condition improvement diagnostics and application of organic substances [6]. Such centers are important for enhancing farmers' knowledge and widely implementing modern agrotechnical practices.

Currently, the government of Uzbekistan is actively implementing measures aimed at increasing soil fertility. For example, based on Presidential decrees and Government resolutions, a system of demonstration events and subsidies for cotton fields has been established. According to the PQ-179 resolution of March 2022, measures were introduced to reduce land tax by 25-50% for three years for farmers who studied their land area and increased its fertility by 3 points, and a subsidy of 1 million soums per hectare was implemented [1]. Subsequently, based on Government Resolution No. 97 adopted in February 2024, subsidies will be paid to improve soil fertility in selected districts on a trial basis for 2024-2025, and a program to increase the levels of phosphorus, nitrogen, and humus in the soil will be approved [1]. Thus, there are currently well-defined incentive systems (subsidies and benefits) and monitoring mechanisms in place for land productivity.

To improve soil fertility in the future, it is necessary to address the following tasks:

- Legislative frameworks should be incorporated into soil and land resource protection issues. The law should include provisions such as linking soil land tax and rent payments to the preservation of soil quality.
- It is necessary to strengthen the activities of Agroservice centers being established in all regions. In addition to providing farmers with subsidies and bank loans, these centers should conduct training on soil diagnostics and technologies that restore only organic fertility (such as compost and organic fertilizers) [6]. It is advisable for the centers to inform citizens about soil conditions, rights, and obligations related to land use in a "one-stop shop" manner.

-Technical measures should be expanded to reduce hazardous soil conditions. For example, the use of biotechnologies and biochemical substances for the restoration of saline lands should be gradually implemented. Additionally, there are plans to expand the use of devices (such as solar-powered pumps) to improve water and energy efficiency.

- It is necessary to further strengthen the system of subsidies and digital products aimed at soil protection and increasing fertility within the framework of state budget expenditures. For instance, it is essential to fundamentally differentiate preferential rates for agricultural loans or introduce a system for adjusting land tax rates according to soil quality. The expansion of subsidies should be studied based on an assessment of the results of subsidy practices implemented in various pilot districts [9].

- It is important to attract necessary investments to increase the productivity of both farmers and the cluster itself. Conditions should be created to facilitate agreements that encourage private sector participation in many projects.

- A unified database must be created for regular monitoring of soil conditions. In cooperation with state agrochemical laboratories and geodetic services, data on soil composition (amounts of nitrogen, phosphorus, potassium, and humus) should be recorded and an open information service organized for land users.

In Uzbekistan's conditions, many aspects of the soil fertility problem should not be overlooked. The next strategic goal is to increase agricultural potential through creating an effective irrigation system and sustainable land development. Reforms must be implemented involving all market mechanisms and external means, guaranteeing soil protection and optimal utilization.

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