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Research Article

AGRO INDUSTRIAL CLUSTERS AS A FORM OF INNOVATIVE DEVELOPMENT IN THE INDUSTRY

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ABSTRACT

The article begins by defining agro-industrial clusters as geographically proximate groups of interconnected firms and institutions in the agriculture and food processing sectors. It examines how these clusters facilitate knowledge sharing, technology transfer, and resource pooling among participants, leading to enhanced productivity, competitiveness, and market access. Moreover, the article discusses the role of supportive policies, infrastructure, and institutions in nurturing and sustaining agro-industrial clusters. Furthermore, the article analyzes the impact of agro-industrial clusters on local and regional development, including job creation, income generation, and rural revitalization. It explores the linkages between agro-industrial clusters and broader innovation ecosystems, highlighting their contribution to research and development, entrepreneurship, and value chain integration. Additionally, the article discusses challenges and opportunities associated with building and scaling agro-industrial clusters, such as financing, governance, and stakeholder coordination.

KEYWORDS

Clusters, innovative development, agriculture.

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INTRODUCTION

The development of agriculture has seen a sharp rise on the global economic stage in recent years, indicating an increased significance of agriculture in the world economy. Therefore, studying and analyzing the key factors of agricultural production, such as land, water, labor resources, and their unique characteristics, as well as developing and developing countries, is important and necessary.

Uzbekistan has long been known for its agricultural prowess, with a diverse range of crops including cotton, grains, fruits, and vegetables. The country's favorable climate and fertile soils provide an ideal environment for agricultural production. However, challenges such as water scarcity, inefficiencies in production and marketing, and the need for value addition have prompted the exploration of new strategies for sustainable development. At present, Uzbekistan is facing a pressing issue of promoting innovative economic development and overall country development. A crucial aspect of creating an innovative economy at the regional level is the formation of a cluster development model. The current state of affairs in the country's scientific and innovative sphere does not meet the needs of the main directions of state policy in attracting the results of scientific and technical activities.

The existing situation requires the creation of new approaches to the development of scientific and technological achievements. The experience of cluster formation in foreign countries allows identifying the following directions: the first direction is based on the Italian model (industrial districts), which are internal clusters focused on a strong concentration of small enterprises in exports, and their market activity is supported by internal or informal communities.

The second direction is based on the model of industrial clusters, which are concentric circles with a centralized management system (organizations with centralized management). Scientific laboratories, research centers, and higher education institutions operate in such industrial clusters. Such approaches to cluster formation are actively used in Japan, South Korea, Germany, and France. They have a high level of cooperation in international markets and developed internal formal and informal connections. It is worth noting that the lack of organization of innovative activities and effective connections is the main aspect of cluster formation under this model.

Each cluster participant ensures effective interaction with the system's management apparatus, which is the basis for ensuring mutual integration. This approach to cluster formation implies broader participation of financial sources and strengthening of government interaction in the cluster organization process, which contributes to its participation as a primary financial provider and enhances its competitiveness in the international market or as

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a strategic direction. The third direction is based on the period of industrialization and is widely used in Scandinavia, Switzerland, and the USA. The main direction of the clustering model that promotes innovation is technology development. Innovative clusters are aimed at ensuring competitiveness by attracting cluster participants. The formation of clusters in Uzbekistan corresponds to the following main strategic objectives for expanding industrial capabilities:

1. Increasing the processing volumes of cotton into deeply processed products using modern technologies to meet demand in domestic and international markets, ensuring environmental cleanliness and the production of light industrial products reaching 5.6 billion marks by 2030.

2. Creating experienced production of clothing prototypes at the international level, establishing a workshop for producing designer models, and the necessity of studying design and fashion experiences from France, Germany, and Italy.

3. Regular monitoring to find suitable locations in domestic and global markets, improving innovative products, focusing on design in goods production considering market trends, as well as expanding the national brand in the global market.

The main focus of ensuring competitiveness of clusters is the development of innovative activities of companies producing light industrial products. One of the key advantages of clusters is the opportunity for efficient use of various production factors to create multiple types of products within existing conditions, leading to increased productivity. This phenomenon is characterized by multiple functions.

When firms unite into clusters, the benefits of joint activities significantly increase, as using the multiple functions of different companies allows reducing transaction costs and ensuring more efficient use of resources. The cluster structure based on common production standards creates synergistic benefits. Thus, all cluster participants have additional advantages in terms of benefits from joint activities, contributing to overall competitiveness.

Improving the innovation orientation of the cluster leads to increased efficiency of its activities, as specialized assistance in developing labor productivity and reducing production costs can exceed the threshold of profitability. Increasing the benefits of the cluster's innovation orientation can be achieved by reducing overall expenses on research and development, as well as by developing new types of products Contributes to the development of production, which opens up opportunities for long-term innovative activities among cluster participants. The advantages of an innovation cluster are distributed across all areas:

Increases the efficiency of scientific research for new manufacturers and encourages the creation of new strategies using the necessary resources to accelerate their own development;

Facilitates free exchange of information and prompt dissemination of news through feedback channels with suppliers or consumers;

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Promotes the emergence of new paths of collaboration within the cluster and creates conditions for developing new opportunities. Forms new combinations of human resources and assets. Thus, the cluster approach used in studying issues of innovation development can be very useful in addressing a wide range of issues, including analyzing innovation development at the level of a country, region, or industry. Based on the fundamental principles of state industrial policy. Creating regional development programs supporting innovative activities, improving relations between large and small businesses. Cluster programs can also serve as the basis for developing targeted strategies aimed at strengthening the competitiveness of regions in the context of modern scientific knowledge. Therefore, the ability of a cluster to enhance the competitiveness of a region is considered its key advantage.

Agro-industrial clusters in Uzbekistan are emerging as catalysts for change, bringing together farmers, agribusinesses, researchers, and policymakers in collaborative ecosystems. These clusters are characterized by several key elements:

1. Collaboration and Networking: Agro-industrial clusters promote collaboration and networking among stakeholders, fostering knowledge sharing, innovation, and joint problem-solving. Farmers exchange best practices, while businesses collaborate on value chain integration and market strategies.

2. Technology Integration: The clusters embrace technological advancements such as precision agriculture, IoT, and data analytics. These technologies optimize resource use, improve productivity, and enhance product quality, leading to increased yields and profitability.

3. Value Chain Enhancement: By integrating various stages of the agricultural value chain, agro-industrial clusters enable value addition through processing, packaging, branding, and marketing. This not only adds economic value but also opens up new market opportunities.

4. Sustainability Focus: Sustainability is at the core of agro-industrial clusters, with a focus on resource conservation, waste reduction, and environmental stewardship. Practices like organic farming, water management, and climate-smart agriculture are prioritized.

Agro-industrial clusters stand as a promising model for fostering innovative development within the agricultural industry. Through collaborative efforts and shared resources, these clusters facilitate the integration of modern technologies, research advancements, and sustainable practices. By leveraging economies of scale and knowledge sharing among cluster participants, agro-industrial clusters create a conducive environment for innovation, productivity enhancement, and market competitiveness. Furthermore, these clusters play a vital role in addressing sector-specific challenges, such as enhancing food security, promoting rural development, and mitigating

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environmental impacts. As we move forward, continued support and strategic investments in agro-industrial clusters will be instrumental in driving sustainable growth, resilience, and prosperity across the agricultural sector.

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