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Institutional Drivers of Agrohub Development: Evidence from a Transition Economy

Rab Nawaz Lodhi [1]*

[1]Hailey College of Commerce, University of the Punjab, Lahore, Pakistan.

Correspondence
*Rab Nawaz Lodhi – PhD, Associate Professor, Hailey College of Commerce, University of the Punjab, Lahore, Pakistan. Email: rabnawazlodhi.hcc@pu.edu.pk

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Abstract
Despite the implementation of various government programs to support the agricultural sector, the institutional foundations for the formation of agrotechnological hubs remain insufficiently systematized and require a comprehensive analysis. The purpose of the study is to systematise the institutional conditions that influence the formation of agrohubs as key elements of the modernisation of Kazakhstan's agro-industrial complex. The research methods are based on an institutional approach and qualitative content analysis of government programs, strategic documents, and analytical reports on the development of the agro-industrial complex. The initial data include state strategic documents, analytical reports, and statistical indicators on agricultural development in Kazakhstan. The results of the study showed deviations between the planned and actual indicators of industry development. Investments in agricultural fixed assets amounted to 1672.7 billion tenge, against the planned level of 1800.7 billion tenge (–128 billion tenge), and labour productivity grew by 112.8 p.p., against the target of 122 p.p. (–9.2 p.p.). At the same time, gross agricultural output reached 9.8 trillion tenge, grain production amounted to 19.3 million tons, and industry implemented 286 investment projects totalling 279.6 billion tenge, reflecting positive dynamics in the sector's development. The findings suggest that Kazakhstan has developed a relatively comprehensive institutional framework for agricultural modernisation. The prospects for further research include a quantitative assessment of the effectiveness of agricultural policy instruments, spatial modelling of agrohub locations, and an analysis of the role of digital and innovative technologies in the development of agro-industrial clusters.

KEYWORDS
Agriculture, Agricultural Economy, Agribusiness, Agrohub, Economic Growth, Government Support, Modernisation

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1 | INTRODUCTION

The agricultural sector is one of the fundamental drivers of Kazakhstan's economic development. This is because it is a key factor in ensuring food security, employment, income, and exports. Kazakhstan has agricultural potential, given its large land area, diverse climatic conditions, and existing production capacity in grain, livestock, and oilseed sectors. However, the agricultural sector is also characterised by inefficiencies, including low productivity, limited processing facilities, technology gaps, and limited integration into global value chains. These inefficiencies affect the agricultural sector's potential to develop value-added products and its competitiveness in both local and international markets. To address existing inefficiencies in the agricultural sector, there is growing interest in developing agro-technological hubs, also known as "agrohubs". Agrohub development is a new approach to agricultural modernisation, shifting from a traditional production-oriented system to a value chain-oriented one. An agrohub can be defined as an institutional and organisational system that includes agricultural production, agro-processing industries, logistics, financial systems, and innovation systems.

The importance of developing agrohubs has increased substantially over the past few years, given global changes in agricultural production and trade. First, the complexity of global value chains requires agricultural producers to look for opportunities beyond the production of raw agricultural commodities. Second, the development of technology, particularly digital technologies in agriculture, requires a supportive environment for agricultural producers. Finally, the challenges of a sustainable environment demand more efficient use of resources and the development of agricultural production systems that can help balance the environment. Thus, the concept of agrohubs can provide a platform for integrating production efficiency, technology, and sustainability into a single framework. The development of agrohubs is particularly important for Kazakhstan, given the country's high regional disparities, fragmented agricultural production, and a high level of state support. Despite the country having formulated a wide range of agriculture-related policies and government initiatives in crop farming, livestock development, input subsidies, credit availability, and infrastructure development, these policies and initiatives have not been formulated in a coordinated and integrated manner.

Therefore, although the overall contribution of these policies and initiatives to the sector's growth is significant, their impact on the development of an integrated agro-industrial ecosystem is relatively limited. Theoretically, the development of agrohub is related to different conceptual approaches. These approaches include cluster theory, value chain analysis, institutional economics, and regional development theory. Cluster theory relates to the concept of geographical concentration and to the interactions among different agents in the economy. This concept is related to increasing overall productivity and the diffusion of innovation in the economy. Value chain analysis involves linking different sectors of the economy to increase overall value added. Institutional economics is concerned with the overall role of different governance structures in the economy.

Despite the increasing policy significance of agrohub development, there is a noticeable lack of scientific research addressing the institutional aspects of agrohub system formation in Kazakhstan. Existing studies have largely focused on issues related to agricultural productivity, rural development, or the effectiveness of specific policy tools, while paying little attention to the relationships between policy tools and the structural components of agro-industrial ecosystems. Specifically, there is a noticeable lack of research addressing the institutional aspects of the relationship between government support tools, value chains, and agrohub system formation. This is a considerable gap, especially considering that agro-

hub system formation depends not only on available resources but also on the institutional framework.

Considering these aspects, this study focuses on systematising the institutional aspects of agro-technological hub system formation in Kazakhstan. The study is grounded in a qualitative institutional approach, in which content analysis is used to analyse available data on agro-industrial complex policies, government programs, and analytical studies. The main focus of the study is to identify the key policy instruments, institutional priorities, and structural mechanisms that play a significant role in the development of agrohub ecosystems. Emphasis is placed on the five interrelated aspects of support for agricultural production, input provision and technological modernisation, the development of agro-processing industries, financial and investment mechanisms, and institutional governance and infrastructure development. The contribution of the study is the comprehensive institutional analysis of the development of agrohub ecosystems, bridging the gap between policy analysis and value chain integration. The aim of the study is to systematise the institutional conditions and mechanisms for the development of agro-technological hubs in Kazakhstan through qualitative content analysis of existing agricultural policies and government support.

2 | LITERATURE REVIEW

The theory of agro-industrial development and agro-technological hubs formation has undergone several stages in its conceptualization. This is in line with the transition in the nature of agricultural development from production-oriented approaches to an integrated and institutionally coordinated system. The first conceptual framework for understanding agglomeration concentration and clustering effects was developed by Fujita et al. (1999). This team demonstrated the role of agglomeration economies in spatial concentration in enhancing productivity and the diffusion of innovation in the context of regional competitiveness.

In the early 2000s, studies in agricultural development focused on the institutional and policy aspects of the field. Dorward et al. (2004) pointed out that agricultural growth is driven not only by factor endowments but also by an appropriate institutional framework and high-quality governance. Further development of this institutional view was provided by Swinnen (2007), who examined the evolution of agri-food systems and demonstrated the significance of integration into global supply chains, as reflected in adherence to standards and the presence of institutional support. At the same time, Reardon and Timmer (2007) demonstrated the importance of structural changes in the food system, driven by urbanisation, market integration, and the emergence of modern supply chains.

The systemic view of agricultural development was promoted by the World Bank (2008), which highlighted the importance of integrating production, processing, infrastructure, and market access into a unified framework. This view was also promoted by FAO (2010), which highlighted the importance of developing the value chain as a tool to increase value added and support improved market participation, especially in developing and transition countries. Barrett et al. (2012) also highlighted the importance of the value chain for integrating small-scale producers into the market and improving livelihoods. However, in the 2010s, there has been a growing trend towards agro-industrial clustering as a tool for regional development and agricultural modernisation. Empirical studies have shown that agro-industrial clustering positively impacts employment creation, income growth, and competitiveness (Balcha et al., 2014; Trishin, 2020). This has further supported the earlier argument that a cluster of agricultural producers, processing enterprises, and service

providers positively impacts agricultural systems.

The evolution of agricultural systems in transition countries has also been analyzed in terms of their transformation (Buchenrieder et al., 2009), which has shown that institutional reforms, private sector development, and market-oriented restructuring in post-socialist agricultural systems are essential tools for development in transition countries. This has also shown that effective institutional systems are essential tools for large-scale agricultural development. However, in recent years (2020–2025), there has been a growing trend towards incorporating new dimensions, such as technology, innovation, and sustainability, into the agro-industrial development literature. For instance, studies have shown that digital agriculture positively impacts agricultural productivity (Muraru-Ionel et al., 2019; D'Oronzio & Sica, 2021; Gromenkova, 2022; Kniazieva et al., 2025). Moreover, biotechnology has also been identified as an essential tool for agricultural development (Najork, 2022).

Moreover, recent research underscores the significance of cluster-based and value-chain approaches in agricultural development. In this regard, Nikolaienko (2022) and Nikoliuk et al. (2022) demonstrate that agro-industrial clusters positively impact the coordination of value chain actors and the competitiveness of agricultural enterprises. Moreover, Mashrabovich and Toxtasinovna (2024) reveal that agro-industrial clusters operate as a unified system that integrates production and institutional support in a unified economic space. Other studies have also shown that cross-sectoral and innovation clusters positively impact cooperation between the agricultural sector and other sectors, which in turn leads to value chain integration (Muraru-Ionel et al., 2019). In this regard, it is worth mentioning that the formation of unified agro-industrial structures is also associated with cluster-based agricultural policies and institutional coordination mechanisms (Makhmadizoda & Mukhsinova, 2025). In this respect, Otsuka and Ali (2020) have underlined that agro-based clusters have a significant impact on structural and rural development.

The significance of policy support and institutional frameworks for agro-industrial development has been discussed in recent studies. According to various research studies, investments in infrastructure, research institutions, and extension services have played a significant role in creating a conducive environment for agro-industrial clustering (Salih, 2021; Yang & Li, 2021). In addition, smart specialisation strategies, regional policy coordination, and institutional frameworks have contributed to agro-industrial development, particularly by fostering innovation systems (Shvets et al., 2023). Recently, various studies have highlighted the importance of sustainability factors in agro-industrial development. Specifically, green clusters integrate environmental regulation, sustainability, and technological innovation (Voronkova et al., 2023). Furthermore, agro-industrial parks, aggregation centres, and their contributions to rural industrialisation have been discussed in recent studies (Kahuthia & Karanja, 2025; Zhang et al., 2023).

Despite recent studies on agricultural development, value chains, agro-industrial clustering, and related issues, certain limitations remain. First, various studies have discussed agro-industrial clustering, value chains, and institutional frameworks separately. On the one hand, while cluster theory is concerned with spatial concentration, value chain analysis with market linkages, and institutional studies with governance structures, there is a general lack of integrated approaches that account for all these aspects within a single framework.

Second, while recent studies increasingly recognise technological innovation and digitalisation, there is a general lack of attention to how these aspects are integrated into institutional systems that support agrohub development.

Third, there is a general lack of empirical studies on the institutional foundation of agro-technological hub formation in transition economies, such as Kazakhstan. Existing

studies on Kazakhstan's agricultural sector have mainly focused on productivity, investment, or policy measures, while there is a general lack of studies examining the link between policy instruments and the structural components of agro-industrial ecosystems.

It is, therefore, the institutional link between the government's policy instruments, the value chain, and the development of the agrohub ecosystem that forms the main gap in the research, which needs to be filled in order to fully comprehend the role that coordinated policy frameworks can have in the development of agro-technological hubs in the country's agricultural sector.

3 | METHODOLOGY

The research is grounded in a qualitative institutional research design, focusing on content analysis of policy, strategic, and analytical documents on the development of the agro-industrial complex in Kazakhstan. This approach is intended to reveal the institutional, governance, and policy conditions for the emergence of agro-technological hubs as an integral component of agricultural modernisation. In the context of the research, an agrohub is not only understood as a territorial concentration of agricultural activities but also as an institutional and organisational environment that encompasses agricultural production, agro-processing, logistics, infrastructure, finance, and innovation support under a single umbrella. The empirical base of the research comprises 28 official documents adopted between 2017 and 2025, reflecting the current state of agricultural policy development in Kazakhstan.

The document corpus includes the State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017–2021, the National Project for the Development of the Agro-Industrial Complex for 2021–2025, the Concept for the Development of the Agro-Industrial Complex until 2030, strategic plans of the Ministry of Agriculture of the Republic of Kazakhstan, annual reports on the implementation of state programs, analytical reports on the development of the agro-industrial complex prepared by government bodies and the National Chamber of Entrepreneurs "Atameken," as well as statistical data from the Bureau of National Statistics. These documents provide comprehensive information on policy priorities, support mechanisms, and implementation outcomes in agriculture.

The selection of the documents is based on their institutional relevance, contribution to the development of the agro-industrial complex, and the presence of a well-defined set of policy instruments, objectives, and mechanisms of implementation. The documents related to agriculture, the agro-industrial complex, investment support, infrastructure development, and institutional governance were included in the analysis. Documents not related to the field of agriculture and the agro-industrial complex, and those with low policy content, were not included in the analysis. The rationale for choosing the qualitative content analysis method is grounded in the complexity of the research problem. The development of the agrohub is not only dependent on the results of the relevant economic indicators but also on the consistency of the policy instruments. The unit of analysis is either a policy statement or a fragment of the document that has a well-defined institutional meaning. This may include the provisions related to the subsidies, mechanisms of investments, infrastructure development, and modernisation of technologies.

The framework was built upon the conceptual understanding of what an agrohub is, as a system that integrates production, processing, infrastructure, finance, and innovation. Therefore, five analytical categories were used: support to agricultural production, provision of inputs and technological modernisation, agro-processing development, financial and

investment mechanisms, and institutional governance and infrastructure development. Each policy instrument was classified according to its contribution to these structural components.

The methodological framework used in this study is shown in Figure 1.

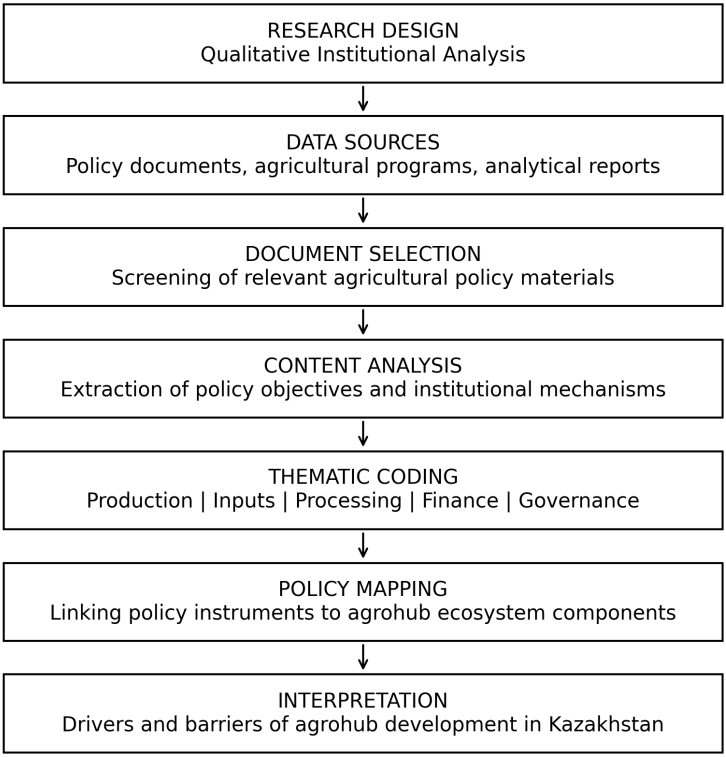


Figure 1 Research methodological framework

The analytical method involved a series of steps: identifying relevant documents, identifying key policy elements, coding, and, finally, policy mapping. The mapping process enabled the identification of relevant policy instruments and their structural components in relation to agrohub ecosystems. This enabled the assessment of the balance and coherence of institutional support. Moreover, the analytical method involved comparing sectoral indicators against plans and actual implementation, as presented in official documents. This enabled the assessment of the gap in policy implementation.

The paper also highlights institutional challenges to the effective implementation of agricultural policies. These challenges include inadequate financing for agrohub ecosystems, administrative challenges in allocating subsidies to farmers, inadequate credit for farmers, inadequate rural infrastructure, and poor coordination among state institutions. These challenges are considered critical to the formation of agro-technological hubs. Overall, the methodological framework provides an analytical framework for assessing agrohub ecosystems in Kazakhstan as an integrated system. This enables the identification of key

elements in agrohub ecosystems in Kazakhstan.

4 | RESULTS

The results of the content analysis reflect the main institutional mechanisms and policy instruments that determine the formation of agro-technological hubs in Kazakhstan. Analysing policy documents, analytical reports, and agricultural development programs helps identify key policy priorities, investment trends, and sectoral results that shape the formation of agro-industrial clusters. The analysis demonstrates that government policy focuses primarily on increasing productivity in the agricultural sector, promoting investment in agriculture, and enhancing agricultural processing and institutional governance. At the same time, it is shown that certain structural limitations lead to financing gaps and delays in program implementation.

The first stage of the analysis involves examining strategic indicators of agricultural development. These indicators reflect the implementation of government policies to develop and modernise the agricultural sector. It is necessary to compare planned and actual values to demonstrate that, although the agricultural sector shows positive growth dynamics, it is not achieving strategic targets. In particular, significant deviations are observed in investment levels, labour productivity growth, and the development of domestic seed supply systems. As shown in Table 1, these indicators reflect the implementation of government policies aimed at developing and modernising the agricultural sector.

Table 1 Implementation of key strategic indicators of agricultural development in Kazakhstan

Indicator	Planned value	Actual value	Deviation	Interpretation for agrohub development
Investment in fixed capital in agriculture	1,800.7 billion KZT	1,672.7 billion KZT	–128.0 billion KZT	Lower investment slows the modernisation of agricultural infrastructure
Labour productivity in agriculture	122 p.p.	112.8 p.p.	–9.2 p.p.	Technological modernisation progresses more slowly than expected
Share of domestic seeds in agricultural production	62.2 p.p.	No implementation	–62.2 p.p.	Weak seed production base for agrohub systems
Share of breeding livestock in the total herd	36 p.p.	28.2 p.p.	–7.8 p.p.	Slower development of livestock clusters
Certified organic producers	3 producers	12 producers	+9 producers	Emerging niche markets within agrohub ecosystems

Note: compiled by the author

The results show that the most significant gap was recorded in the development of domestic seed production systems, which is vital to the sustainability of agricultural productivity. The results also show that investment levels are too low to modernise the agricultural sector's production infrastructure, which negatively affects the development of agro-industrial clusters. However, a positive trend was observed in the certification of organic producers in the agricultural sector, indicating greater diversification of production systems.

According to the presented data, there are deviations between planned and actual values. Thus, investments in agricultural fixed assets amounted to 1,672.7 billion KZT, against the

planned level of 1,800.7 billion KZT, indicating insufficient investment support for industry modernisation. Labour productivity growth reached 112.8 p.p., with a target of 122 p.p., indicating a slower pace of technological renewal in agricultural production. There is also a significant lag in the development of the seed production system, although the planned share of 62.2 p.p. of domestic seeds was not achieved. At the same time, the number of certified organic producers has increased from 3 to 12, which indicates the emergence of new areas of agricultural business development. The results obtained make it possible to identify institutional constraints and conditions that influence the formation of agrotechnological hubs and the modernisation of the agro-industrial complex in Kazakhstan.

The second stage of the content analysis examines production outcomes and investment dynamics in the agricultural sector. These results indicate structural changes in Kazakhstan's agro-industrial complex. As shown in Table 2, agricultural production in Kazakhstan demonstrates positive growth trends.

Table 2 Agricultural production and investment dynamics in Kazakhstan

Indicator	Value	Analytical interpretation
Gross agricultural output (Jan–Sep 2025)	9.8 trillion KZT	Indicates stable growth of agricultural production
Growth of crop production	+7.8 p.p.	Driven by expansion of cultivated areas and increased productivity
Growth of livestock production	+3.3 p.p.	Moderate growth in the livestock sector
Grain harvest (after processing)	19.3 million tons	Reflects strong grain production capacity
Oilseed production	2.9 million tons	Expansion of export-oriented agricultural crops
Potato production	3.9 million tons	Stable domestic production levels
Vegetable production	4.9 million tons	Growth of horticultural production
Agricultural investment projects implemented	286 projects	Total value of 279.6 billion KZT

Note: compiled by the author

The results obtained indicate that the dynamics of the agricultural sector of Kazakhstan is generally positive in terms of production and investment. However, the results of the analysis also indicate that the dynamics of the sector is institutionally uneven and does not yet lead to the formation of integrated agro-technological hubs. The implementation of 286 investment projects totalling 279.6 billion KZT indicates that the state has created a significant platform for capital renewal in the agricultural production and processing sector. At the same time, the results of the analysis of the dynamics of grain, oilseed, vegetable, and livestock production should not be understood as evidence of sectoral growth. The results are important for the formation of the agrohub. The sector has several material preconditions for the development of the agrohub. However, the preconditions require a more consistent institutional background to be transformed into an agro-industrial ecosystem.

The next step of the analysis concerned the policy framework's thematic content, as reflected in the 28 documents. The content analysis highlighted that the institutional architecture of Kazakhstan's agricultural policy is built around five major thematic blocks, which correspond to the main structural dimensions of agrohub development: support to agricultural production, inputs and technological modernisation, support to agro-processing,

financial/investment mechanisms, and institutional governance/infrastructure. Nevertheless, there is a rather uneven spread of policy attention between these thematic blocks. The main focus remains on direct support for primary agricultural production, as well as on financial instruments to sustain activity levels, while innovation, digitalisation, inter-sectoral coordination, and the institutional integration of value chains receive limited attention. This is a critical aspect, as agrohub development not only requires the coexistence of different policy instruments, but their interaction, especially across the entire range of production, processing, finance, innovation, etc.

As illustrated in Table 3, the institutional architecture of agricultural policy is structured around five key thematic categories.

Table 3 Thematic structure of policy instruments identified in the corpus of 28 agricultural policy documents

Thematic category	Core content of identified policy instruments	Institutional function in agrohub formation	Dominant orientation of state support	Analytical interpretation
Agricultural production support	Crop support measures, livestock development instruments, productivity growth targets	Strengthening the raw-material base of agrohub ecosystems	Output expansion and stabilisation of primary production	Forms the quantitative production basis for agrohub development
Input provision and technological modernisation	Subsidies for seeds, fertilisers, pesticides, machinery renewal, breeding systems	Reducing production constraints and improving technological capacity	Cost reduction and partial technological renewal	Improves the operational capacity of farms
Agro-processing development	Support for food-processing enterprises, storage capacity, processing facilities	Moving the sector toward higher value-added production	Strengthening processing capacity and marketability	Critical for agrohub development
Financial and investment mechanisms	Investment subsidies, concessional lending, agricultural credit, capital support measures	Mobilising capital for agricultural expansion and modernisation	Maintaining investment activity and stimulating private participation	Financial instruments are visible but access is constrained
Institutional governance and infrastructure	Regulatory reforms, digitalisation of agricultural services, logistics support	Creating the institutional and physical environment for integrated agrohub ecosystems	Improving implementation conditions and administrative support	Strategic significance but less developed in practice

Note: compiled by the author

The results of thematic coding indicate that the basic institutional framework for Kazakhstan's agricultural policy is already in place to support the formation of an agrohub. However, it is also clear that the basic institutional content is not equally developed or balanced. The highest concentration of agricultural policy is observed in areas directly related to supporting agricultural output and providing financial instruments. This may indicate that agricultural policy remains primarily focused on maintaining and expanding agricultural production. On the other hand, the greater presence of agro-processing policy measures in the analysed corpus may signal a gradual change in agricultural policy from a simple production approach to a more complex one. This is an important change, as the feasibility of agrohubs is directly linked to the availability of processing capacity to transform agricultural output into new agro-industrial chains.

It was precisely the process of policy mapping that allowed us to transcend the level of thematic classification and evaluate the correspondence of the identified instruments with the structural components of agrohub ecosystems. It was established that policy support in Kazakhstan is allocated across the main components necessary for the development of agrohub ecosystems, with certain asymmetry in intensity and functional consistency. Table 4 illustrates the policy mapping of government support instruments to the structural components of agrohub ecosystems.

Table 4 Policy mapping of government support instruments onto structural components of agrohub ecosystems

Agrohub ecosystem component	Main policy instruments	Functional role within the agrohub model	Degree of institutional coverage	Key limitation identified
Agricultural production systems	Crop support programmes, livestock development initiatives, productivity targets	Formation of stable primary output and supply concentration	High	Strong support does not automatically translate into integrated downstream development
Agro-processing industries	Support for food-processing enterprises, processing investment projects	Creation of value-added links and industrial deepening	Medium to high	Coordination with raw-material supply systems and logistics remains incomplete
Agricultural infrastructure	Logistics development, storage facilities, transport-related support	Reducing transaction costs and improving supply-chain continuity	Medium	Infrastructure development remains uneven across regions
Financial ecosystem	Credit programmes, subsidised loans, investment subsidies	Providing liquidity and long-term capital for modernisation	High	Administrative barriers and delayed disbursement reduce effectiveness
Innovation and knowledge ecosystem	Digitalisation initiatives, selected research and technological modernisation	Supporting technological upgrading and long-term competitiveness	Low to medium	Innovation measures are fragmented and less institutionally embedded
Institutional coordination environment	Regulatory reforms, digital public services, inter-agency governance	Ensuring coherence of support instruments	Medium	Coordination remains fragmented across agencies

Note: compiled by the author

As shown by policy mapping results, Kazakhstan's agricultural policy institutional architecture includes almost all essential components needed to support the creation of agro-technological hubs. Nevertheless, one should not equate coverage with system integration. As shown by the results, the system is more extensive in scope than integrated, meaning that different tools exist, though not always functioning as complementary mechanisms. Figure 2 illustrates the policy-agrohub ecosystem relationship, as derived from content analysis.

Another aspect of the content analysis was the search for institutional barriers that affect the practical effectiveness of the existing support system. From the documents, it is evident that the major constraints are not only sectoral but also institutional and organisational. Issues such as financial constraints, policy implementation delays, inadequate access to credit, and poor infrastructure in rural areas are cited as major constraints. Table 5 shows institutional barriers constraining agrohub development in Kazakhstan.

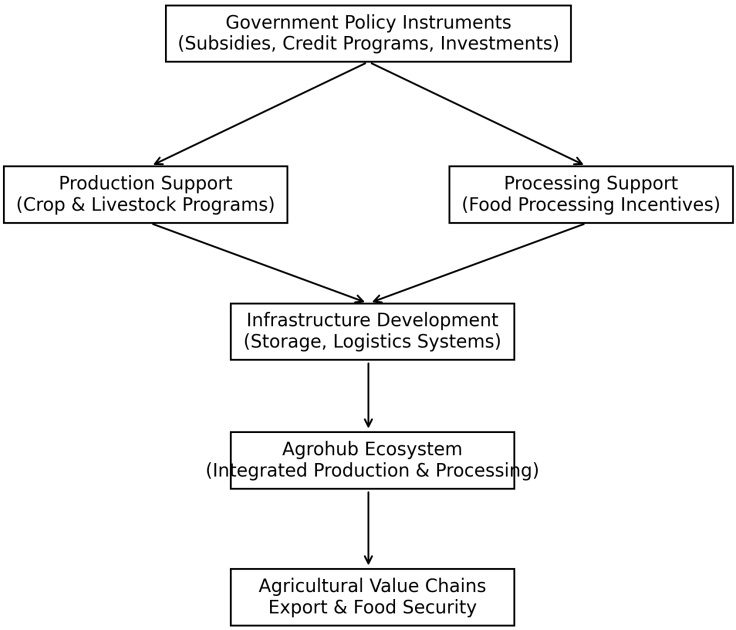


Figure 2 Policy–agrohub ecosystem relationship identified in the content analysis

The analysis of the institutional barriers revealed that the key limitation to agrohub development in Kazakhstan is not a lack of support tools but a low level of maturity in the institutional environment. Thus, the support for production, subsidies, and investment incentives is represented fairly well. At the same time, the tools for integrating these tools into a single ecosystem have not been sufficiently developed. This primarily applies to the domains of policy coordination, financing continuity, infrastructure completeness, and ecosystem innovation. Thus, the existing policy environment is viewed as a system that supports sectors rather than one that builds ecosystems.

The results of content analysis show that Kazakhstan has managed to create a certain, though not wide, institutional base for the development of an agro-technological hub. The results of the policy corpus content analysis confirm the presence of support measures in all major structural areas of the agrohub ecosystem. At the same time, the results are clear: the configuration of the institutional base of the support measures is asymmetrical. Thus, the highest level of support is observed in primary production and financial stimulation, while innovation, digital technologies, logistics connectivity, and inter-institutional coordination are less well articulated. Therefore, the main result of the research is that Kazakhstan's agricultural policy already possesses the formal preconditions for creating an agrohub, though developing an agro-industrial ecosystem from it requires greater vertical and horizontal integration of policy instruments. Thus, the main institutional task is not only to expand the range of support measures but also to integrate them more fully and align them with the value chain.

Table 5 Institutional barriers constraining agrohub development in Kazakhstan

Institutional barrier	Manifestation in the analysed documents	Mechanism of negative influence on agrohub development	Structural consequence
Insufficient financing of programmes	Underfinancing, delayed implementation of planned measures	Reduces the scale and continuity of infrastructure support	Slower formation of integrated agrohub infrastructure
Administrative delays in subsidy allocation	Time lags in disbursement, procedural complexity	Weakens the responsiveness of support instruments	Lower investment attractiveness and reduced policy efficiency
Limited access to agricultural credit	Unequal access to concessional finance, financing gaps	Restricts farm expansion, technological renewal	Uneven participation of producers in agrohub ecosystems
Infrastructure deficits in rural areas	Insufficient storage, logistics, transport connectivity	Increases transaction costs and limits territorial integration	Weak linkage between local production systems and value chains
Fragmented institutional coordination	Multiplicity of implementing bodies, incomplete alignment	Prevents the formation of a unified ecosystem approach	Institutional fragmentation of agrohub development policy
Weak innovation embedding	Innovation and digitalisation measures are less prominent	Limits the transition from extensive growth to knowledge-based development	Reduced long-term competitiveness of agrohub models

Note: compiled by the author

5 | CONCLUSION

The purpose of this study was to systematise the institutional conditions and policy mechanisms for the development of agro-technological hubs in Kazakhstan in the context of agricultural modernisation. The study examines the institutional foundations for the development of agro-technological hubs in Kazakhstan using qualitative content analysis of policy documents and strategic and analytical materials related to the agro-industrial complex. The study is based on the idea that the development of an agrohub should be understood not only as the concentration of agricultural production but also as the development of an integrated institutional environment. From this standpoint, the study allows for the assessment of the conditions for the development of agriculture not just as the aggregate of supporting measures but also as a system of interrelated tools.

From this analysis, it can be seen that a wide policy and institutional foundation has been developed in Kazakhstan, which can serve as a foundation for agrohub development. This foundation includes support for primary production, investment stimulation, agro-processing development, as well as certain elements of infrastructure development and institutional arrangements. This means that a shift has already occurred from a purely production-based model of agricultural development to one that also includes elements of value-added development and structural modernisation. In this regard, the institutional context of the agro-industrial complex includes a foundation necessary for the development of regionally embedded agrohub ecosystems.

At the same time, the study finds that the current policy mix is more supportive than integrative. From an institutional point of view, the main limitation is not the availability of policy instruments, but rather their incomplete coordination. To develop agro-technological hubs, it is necessary to enhance functional linkages among production systems, processing, logistics, finance, and innovation. However, according to the documents, these aspects are

still not developed uniformly, with a tendency to treat them as parallel directions of state support rather than parts of a single ecosystem strategy. Therefore, the current policy model is more supportive than integrative, meaning it is more effective at maintaining activity than at creating coordinated agro-industrial hubs.

The study also confirms that the quality of implementation is a key factor in determining the operational impact of the institutional framework. Thus, despite the existence of support instruments in theory, the impact of development is limited by financing volatility, administrative delays, underdeveloped infrastructure, and fragmented governance. Therefore, in order to tackle the issue of agrohub development in Kazakhstan, it is necessary not only to expand support programmes but also to strengthen implementation coherence and institutional complementarity. In this regard, it is necessary to underline that a key policy issue is how to move from a fragmented support system to a more cohesive development model.

Possible ways for further research include the extension of the current analysis in the following ways: extension of the current analysis by using quantitative assessments of the effectiveness of specific policy instruments based on the institutional patterns identified in this research; spatial analysis for identifying regional areas with the greatest potential for agrohub concentration and specialisation; further research may also focus on the role of digital agriculture, innovation ecosystems, and inter-organisational networks in the context of the long-term sustainability of agro-industrial hubs in Kazakhstan. The current research confirms that the transition to agrohub-based agricultural development is institutionally feasible in Kazakhstan, but it also depends on the extent to which specific policy instruments are integrated into a coherent system.

AUTHOR CONTRIBUTION

Writing – original draft: Rab Nawaz Lodhi.
Conceptualization: Rab Nawaz Lodhi.
Formal analysis and investigation: Rab Nawaz Lodhi.
Development of research methodology: Rab Nawaz Lodhi.
Software and supervisions: Rab Nawaz Lodhi.
Data collection, analysis and interpretation: Rab Nawaz Lodhi.
Visualization: Rab Nawaz Lodhi.
Writing review and editing research: Rab Nawaz Lodhi.

CONFLICT OF INTEREST

No conflict of interest/competing interest is reported by the author.

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AUTHOR BIOGRAPHIES

***Rab Nawaz Lodhi** – PhD, Associate Professor, Hailey College of Commerce, University of the Punjab, Lahore, Pakistan. Email: rabnawazlodhi.hcc@pu.edu.pk, ORCID ID: https://orcid.org/0000-0001-5330-4962

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