

Azerbaijan's Food-Grade Wheat Sector: SWOT Analysis and Institutional Development Prospects

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Abstract

Food-grade wheat production is one of the strategic indicators characterizing Azerbaijan's food security. Milling wheat production reflects the quality of agrarian land relations and the effectiveness of state support in agriculture. The self-sufficiency level has remained at around 55% for a long time, suggesting that the limitations are not only associated with the size of arable land and natural resources. Land fragmentation, small farm sizes, water losses, inequality in access to quality seeds and agronomic services, limited coverage of agricultural insurance, and weak integration between production, processing, and logistics limit the expansion of domestic production. The aim of this study is to assess the sector using SWOT analysis, reconsider the results of the 1990s reforms in terms of modern development requirements, and propose an institutional model for the new stage. Voluntary land use consolidation, the Agricultural Land Bank, regional agricultural combines, a result-based subsidy model, risk-based agricultural insurance, the National Food-grade Wheat Council, double statistical accounting of wheat, the Agricultural Science Transfer Agency, and the application of the farmer income indicator are justified. The study proposes a sustainable self-sufficiency target of 70–75%, without making import substitution a goal in itself as a strategic direction.

Keywords: Milling wheat, Food security, Land consolidation, SWOT analysis, Agricultural Land Bank, Agricultural insurance, Result-based subsidy, Farmer income indicator

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1. Introduction

The issue of food-grade wheat should not be regarded merely as a sector-specific problem related to crop production. In countries where bread and flour products constitute staple foods, the stability of wheat supply directly affects food prices, foreign exchange expenditures, rural incomes, and national security. The volume of production, product quality, supply geography, strategic reserves, risk insurance, and the entire value-added chain should all be included within the scope of state policy.

According to the information presented at the meeting held on May 25, 2026, wheat production in the country was 1.573 million tons, imports were 1.267 million tons, and the self-sufficiency level was approximately 55% (Aliyev, 2026). The long-term stagnation observed despite subsidies, concessional financing, agroparks, leasing, agricultural insurance, and infrastructure investments suggests that the causes lie in the structure of the agricultural system, including land use, irrigation, seed production, risk management, agricultural science, procurement mechanisms, and public administration.

The reforms of the 1990s abolished the administrative model based on collective and state farms, strengthened the institution of private property, and created the legal framework for market relations. While the first phase of reforms addressed who owns the land, the modern phase must address what productivity, income, and social benefits the land generates. The new economic impetus to be given to the agricultural sector should be expressed not in the redistribution of property, but in the voluntary consolidation of land use, long-

term leasing, cooperation, contract production, and the integration of smallholders into large value-added chains.

As the author emphasized in his interview on the relationship between grain wheat and land, the modern problem is not so much about the physical volume of production, but about the efficiency of land use, technology, productivity, and competitiveness (Guliyev, 2026). In a previous interview on the topic of drought and water supply, it was noted that food security cannot be explained solely by climatic events, and that planning, land reclamation, and a lack of specialists also have a serious impact on the results (Guliyev, 2021a).

The State Program for 2026–2030 involves the transmission to an intensive production model, the development of irrigation, land consolidation, digitalization, and the modernization of agricultural science, including goals such as increasing productivity in specialized regions to approximately 50 quintals/hectare, expanding the areas covered by modern irrigation systems to 300,000 hectares, and implementing a pilot consolidation model on 20,000 hectares (State Program, 2026). Based on the research hypothesis, the main obstacle is not restricted to a complete shortage of resources, but also their organizational fragmentation and the incomplete transition from promoting general production to a thorough agrarian policy.

2. Literature Review and Theoretical-Methodological Approach

The relationship between farm size and productivity is not unambiguous. While small farms can more efficiently use family labor and local knowledge, large farms benefit from economies of scale in mechanization, financing, laboratory control, storage, insurance, and marketing. In grain production, the separate organization of combines, sowing equipment, irrigation equipment, insurance valuation, and elevator services for each farm increases average costs. Existing econometric estimates suggest a direct relationship between consolidation, access to technology, and productivity (Aliyev, 2025).

Protecting property rights and stimulating efficient land use are not contradictory goals. Institutional management should take into account the quality, fertility, intended purpose, and effectiveness of land use (Valiyev, 2020). The water problem is also determined not only by physical shortages, but also by accounting, tariffs, the condition of intra-farm networks, and the quality of management of water user associations (Fikratzade & Aliyev, 2022a; Rzayev, 2020).

The cluster approach shows that the integration of production, processing, service, and sales increases added value and reduces transaction costs (Guliyeva, 2022). An agro-industrial complex can be considered as a territorial-production model that combines seed production, technical support, laboratories, elevators, processing, credit, insurance, and sales into a single system. In an interview on the development of agroparks, the impact of modern irrigation, technological equipment, and diversified production on the sustainable development of regions was particularly emphasized (Guliyev, 2021b).

Agricultural insurance is one of the main institutions that allows separating the producer's individual risk from the state's budget risk and the bank's credit risk. In the face of climate change, drought, hail, floods, frost, disease, and price volatility, the uninsured subsidy system does not fully protect the producer from risk; on the contrary, it may reinforce the expectation that losses will always be compensated from the budget. Although the availability of agricultural insurance is considered a factor of stability for farmers, its coverage, risk mapping by product and region, digital confirmation of damage, and speed of insurance payment are of crucial importance (Guliyev, 2024b).

In addition to production volume, financial accessibility should also be considered while analyzing food security policies. The interview on the price of social breadth and its role in mass consumption suggests that the food grain policy is not only a question of farmers and producers, but also a social policy issue regarding real population income and their ability to access basic food commodities (Guliyev, 2024a). In this regard, it is important to measure farmer income and consumer accessibility in terms of the same policy framework.

The study introduces the SWOT methodology not as a simple list of factors, but as an analytical means which strategically connects strengths and weaknesses with opportunities and threats. Regulatory documents, scientific articles, reports of international organizations, official speeches, and interviews given by the author in various years are included in the research base of the article. The bibliography is developed only based on resources cited in the text.

3. The Real Economic Picture of the Sector

The total pool of resources, measured as the sum of domestic production and imports, accounts for approximately 2.84 million tons, indicating the share of domestic production is 55.4%, while imports are 44.6%. Because of the opportunity cost of land and water, 100% self-sufficiency may not be cost-effective in all situations. Nevertheless, the long-term stagnation of the share of domestic production exacerbates the country's risks to logistical, price, and geopolitical shocks. A self-sufficiency target of 70–75% would achieve a balance between domestic resilience and efficient resource use.

To reach the 70% level, assuming the total resource volume remains unchanged, domestic production would need to increase to approximately 1.988 million tons, 415,000 tons more than the current figure. At a productivity of 5 tons/hectare, the increase is equivalent to 83,000 hectares of highly productive area. A more rational way is to increase productivity on existing lands. Increasing productivity from 3.2 tons to 5 tons/hectare creates an additional 180,000 tons of product for every 100,000 hectares. The yield of approximately 5.8 tons/hectare on farms covered by the modern irrigation and food-grade wheat program is 8 tons higher than the national average (Mammadov, 2026).

Increasing the volume of wheat does not guarantee a reduction in import dependence if the product does not meet the requirements of the baking industry in terms of protein, vitreousness, moisture, and nature. State statistics should distinguish the total wheat harvest from the volume of certified grain wheat. The double-entry accounting system will allow us to assess not only production measured in tons, but also the real import substitution ability of domestic products in terms of quality.

Financial constraints hamper small and medium farmers' timely access to seeds, fertilizer, irrigation, and machinery. In the interview on simplifying access to agricultural finance, transparency of financial markets, risk reduction, digital technologies, and alignment with international standards were also assessed as conditions for agricultural competitiveness (Guliyev, 2025). When credit and insurance mechanisms are set up separately, the bank does not finance the risky farmer, and the farmer perceives the insurance premium as an additional cost. Combining credit, insurance, subsidy, and sales contract into a single project package can increase financial accessibility.

4. SWOT Analysis of the Sector and Strategic Interpretation of SWOT Results

SWOT analysis of the milling wheat sector in Azerbaijan is described in Table 1.

Table 1. SWOT analysis of the milling wheat sector in Azerbaijan.

Direction	Main elements
Strengths (S)	Grain-growing traditions; diversity of natural zones; state support; agroparks; storage capacity of approximately 1.9 million tons; digital platforms; subsidy and agrarian insurance infrastructure; potential of Karabakh and East Zangezur
Weaknesses (W)	Land fragmentation; dominance of small farms; water losses; unequal access to seeds, machinery, insurance and advisory services; weak linkages between production and processing; support mainly provided on a per-hectare basis; mixing of common and bread wheat in statistics
Opportunities (O)	State Program for 2026–2030; voluntary consolidation; Agricultural Land Bank; modern irrigation; regional agro-combinations; subsidies based on results and quality; index-based insurance; digital monitoring; new production zones
Threats (T)	Climate change; water scarcity; external price and logistics shocks; land degradation; rural-urban migration; monopolization; mispricing of insurance risks; violation of smallholder rights (FAO, 2021)

Source: Compiled by the authors.

Existing strengths create a solid foundation for scaling up successful technologies. Agroparks should become open service platforms for surrounding farmers, elevators should become independent quality classification centers, and the insurance system should become an institution for preventive risk management. The integration of land, crop, water, subsidy, insurance, and productivity data enables a shift to government support based on measurable results.

The sector's main weakness is the fragmentation of land. The fragmentation of fields makes the use of machinery, irrigation, laboratory analysis, insurance, and sales sharply more expensive. The lack of sufficient differentiation of purchase prices based on quality reduces interest in high-protein wheat production. The

disconnect between science, breeding, and production prevents a new variety from going all the way from zoning and reproduction to advisory support to the farmer.

Key opportunities relate to consolidation pilots, modern irrigation, outcome-based subsidies, and risk-based insurance. The value of pilot projects should be measured not only by the area covered, but also by testing contracts, revenue sharing formulas, insurance claim approvals, and dispute resolution mechanisms. Institutional safeguards require the establishment of protective institutions such as antitrust limits, transparent contracts, independent laboratories, fertility control, an insurance ombudsman, and the owner's right to withdraw from the contract.

5. Concept of Institutional Reforms

5.1. Single Coordination Center of Agrarian Policy

The functional transformation of the Ministry of Agriculture into the Ministry of Agrarian Policy and Food Security, or in a more concise form, the Ministry of Agrarian Policy, may be discussed. The reform aims not only to change the name, but also to consolidate responsibility for land, water, food balances, rural areas, processing, science, insurance, and farmer incomes into a unified policy center. The ministry's main success indicators should cover value added per hectare, yield per cubic meter of water, farmers' net income, share of insured acreage, share of quality wheat in total production, consolidated land use area, and additional output per manat of financial assistance

5.2. Agricultural Land Bank

The Agricultural Land Bank should be founded not as a classic credit institution, but as an intermediary, registrar, and guarantee institution for land use planning. Long-term leasehold should be registered by the bank; it should also ensure the voluntary transfer and consolidation of lands, formation of production groups, and provide for owners' option of either fixed rents, rents in kind, or participating in the capital of the undertaking. The process of consolidation should expand use rights rather than ownership rights.

The Land Bank's digital platform can integrate land boundaries, fertility indicators, water supply, lease term, insurance history, financial assistance, and production outcomes. Initial and last soil fertility analysis, including an accelerated mediation mechanism for land-related conflicts, are important factors for reform. If bank operations fail to comply with transparency and self-determination, consolidation can become a cause of new concentration and social dissatisfaction.

5.3. Regional Agricultural Combines

The establishment of regional agro-combinations built on public-private-farmer partnerships can combine fragmented supply chains into a single value chain. Infrastructure and legal security are secured by the state, while the investor provides capital and management, and the farmers supply land, labor, and contractual obligations. The agro-industrial complex should contain a seed center, laboratories, a common equipment park, data-driven monitoring, an elevator, flour production, waste treatment, logistics, lending, and insurance.

Farmer's property rights should be protected by legislation; it should also ensure transparent pricing, independent quality evaluation, revenue distribution mechanisms, and the right to withdraw from the contract. The agricultural cooperative should not be responsible for product purchase, quality assessment, and insurance compensation. To prevent conflicts of interest, independent accredited institutions should conduct laboratory and damage assessment processes.

5.4. Results-Based Subsidy Model

The current subsidy system should gradually transition to a results-based model. In the pilot phase, distribution should be conducted as follows: 30% of the support can be determined as a base portion, 50% as payment for productivity and quality indicators, while 20% is a bonus for water conservation, soil fertility protection, insurance, and digital accounting. Following pilot evaluation, the process of distribution ratios should be finalized (Fikratzade & Aliyev, 2022b).

Performance should not be measured solely in tons harvested per hectare. Quality class, use of certified seeds, access to official sales channels, yield per cubic meter of water, soil organic matter balance, availability

of insurance contracts, and increase in the farmer's net income should be evaluated together. Given the low initial capabilities of small farmers, they should be provided with non-monetary support, including access to machinery, discounted seeds, agronomic guidance, and training.

The budget burden in vulnerable territories can be eased by establishing a direct connection between subsidies and insurance. A minimum insurance requirement may be demanded to access a base subsidy, and protective measures, certified seeds, commitment to agrotechnical rules, irrigation schedules, and digital field logs can be taken into account for a further bonus. Insurance should not be seen as a pressure, but as a means to strengthen the link between state support and risk responsibility.

5.5. The New Role of Agricultural Insurance

Agricultural insurance should become an integral part of production decision-making, not an independent support mechanism in wheat policy. Division of croplands, uneven distribution of weather stations, and delays in damage assessment can threaten confidence in insurance. The reforms mainly involve the preparation of risk maps according to region and product, the application of satellite and drone data, electronic damage confirmation, standardization of payment terms, including the establishment of an independent complaint mechanism.

Furthermore, traditional non-life insurance, index-based products related to weather conditions, such as drought, temperature, or precipitation indicators, could be assessed. Even though the index model decreases administrative expenses, it poses the risk of an inconsistency between the farmer's real loss and the index result. The model will only be effective if there is a dense meteorological data network, a clear calculation methodology, and payment rules are explained to the farmer in advance. The relevant authorities should separately regulate reinsurance and public guarantee of catastrophe risks.

5.6. National Milling Wheat Council

The National Milling Wheat Council should unify government agencies, farmer associations, seed companies, mills, bread producers, the insurance sector, banks, and scientific organizations on a single platform. The Council must annually issue information on the wheat balance, need by quality class, regional production plan, import and reserve scenarios, price mechanism for public procurement, and insurance risks.

Double-entry statistical evaluation should contain data envisaging total harvested wheat and certified grain wheat separately. The first indicator will represent the physical output of agriculture, and the second indicator will represent the real food resource that meets the requirements of the flour and bakery industry. The statistical system must also record the product's quality class, moisture content, protein content, storage location, insurance status, and sales channel. Such a database will increase the objectivity of subsidy, procurement, reserve, and import decisions.

5.7. Agricultural Science Transfer Agency

The Agricultural Science Transfer Agency should coordinate production trials of varieties and technologies, demonstration farms, certification of advisory services, and projects in the “university-research institute-agro-industrial complex-farmer” model. The effectiveness of scientific activity should be assessed not by the number of publications, but by direct application, productivity, quality, water conservation, risk reduction, and revenue growth.

The agency's regional offices should provide farmers with a package of advice on soil analysis, seeding rates, plant protection, irrigation, insurance, and sales contracts. The results of state-funded research should be posted in an open electronic database, and the licensing of new varieties and technologies should be simplified. The transfer agency should accept the farmer's production results as the main final indicator, not the report of the scientific organization.

5.8. Farm Income Indicator

To measure the social impact of agricultural policy, a “farmer income indicator” should be calculated based on the ratio of the average net income of a farm to the average wage in the economy. The indicator should take into account the labor time, depreciation, loan interest, insurance premiums, and subsidy income

of family members working on the farm, not just one person. Calculating sales revenue alone can overstate a farmer's real well-being (FAO, 2023).

Publishing the farmer income indicator by region, farm size, and product will allow us to assess the economic causes of rural migration, the social impact of the subsidy model, and the fairness of income distribution among agro-combined enterprises. If farmer income does not grow against the backdrop of productivity increase, it is evident that added value is focused on other links in the chain. The steady income of rural families should also be seen as the success of agricultural policy along with tons of production.

6. Implementation Stages and Risk Management

The reforms are recommended to be conducted in stages. In 2026–2027, a regulatory and legal framework, a pilot model of the Agricultural Land Bank, an experiment on double-entry accounting of wheat, a result-based subsidy, and index-based insurance should be created. Risk maps should be developed for three major climatic zones during the same period, and the methodology of the farmer income indicator should be tested.

In 2028–2029, it is envisaged to launch at least three regional agro-combinations, expand consolidation areas, establish a regional network of the Agricultural Science Transfer Agency, and introduce KPIs for water productivity. After 2030, the country may establish a nationwide network of agro-combinations, economic passporting of lands, a shift to a superior position of result-based subsidies, and the annual balance sheets of the National Milling Wheat Council gaining legal status.

The risk of excessive land concentration should be limited by regional antitrust thresholds, disclosure of beneficiaries, and the farmer's right to withdraw from the contract. An insurance company, an agricultural enterprise, and a credit institution operating under the same beneficial control can cause conflicting interests. On the contrary, independent laboratories, insurance adjusters, and ombudsmen, as well as open contract standards, are preconditions for institutional trust.

Climate- and water-related risks should play a central role in crop allocation decisions, while strategic reserves should be managed and evaluated through digital systems that monitor stock quality, rotation, and the number of months of domestic demand they can cover. Agricultural insurance should not be viewed as a comprehensive solution for all potential losses. Instead, effective risk management should begin with preventive measures such as efficient water use, sound agronomic practices, high-quality seeds, production diversification, and contract-based marketing arrangements. Insurance should serve primarily as a mechanism for distributing the remaining risk that cannot be mitigated through these measures.

7. Conclusion

Wheat self-sufficiency has remained at approximately 55% over a long period, indicating that the problem is not only resource-driven, but more institutional in nature. Private property, resulting from the reforms during the 1990s, must acquire a new qualitative character, becoming the basis for highly productive, coverable, and profitable land use. Voluntary integration, long-term leases, cooperation, and agro-combinations facilitate economies of scale without the risk of land expropriation.

According to the SWOT analysis, essential state support, infrastructure, digital systems, and an agrarian insurance system co-occur with land fragmentation, water shortage, insufficient quality incentives, limited insurance coverage, and fragmented management. The 2026–2030 State Program offers new possibilities for the sector, but climate change, water shortage, land degradation, migration, and market concentration require social, environmental, insurance, and antitrust safeguards.

The proposed institutional model integrates the Ministry of Agrarian Policy and Food Security, the Agricultural Land Bank, regional agro-combinations, the results-based subsidy system, risk-based agricultural insurance, the National Milling Wheat Council, double-entry statistical accounting, the Agricultural Science Transfer Agency, and the farmer income indicator into a unified policy framework. All institutions should be aligned with their databases, performance indicators, and lines of responsibility.

It is possible to create an optimal balance between complete import substitution and uncontrolled foreign dependence. Extending cultivated areas while simultaneously increasing productivity, quality, water efficiency, insurance coverage, and farmers' income can help achieve the intended goal. The new phase of

agrarian reform should focus on restructuring land-use relations to ensure more efficient utilization of agricultural land while balancing private property rights, higher farmer incomes, and national food security, rather than merely redistributing land.

Author Contributions

All authors approved the final manuscript.

Conflict of Interest

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