



THE ROLE OF AGRICULTURAL COMMODITY EXCHANGES IN PROMOTING AGRICULTURAL SUSTAINABILITY: A SYSTEMATIC REVIEW OF EVIDENCE, INDICATORS AND CHALLENGES

O papel das bolsas de produtos agrícolas na promoção da sustentabilidade agrícola: uma revisão sistemática de evidências, indicadores e desafios

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ABSTRACT

The sustainability of the agriculture sector is one of the key pillars for economic development and food security and involves efficient, transparent, and coherent market systems. The agricultural commodity exchanges, as a new institution in the agricultural product market, has a critical role to play in defining price transparency, or reducing transaction costs, improving product quality and standardization, and reducing market risk. The article explores the agricultural commodity exchange contribution to sustainable agriculture sector activity with a systematic review methodology. In doing so, the three dimensions of agriculture sustainability, economic, social and environmental are reviewed and analyzed in terms of the complementary mechanisms in which the interacts with each dimension based on Australian and international studies. The findings indicate that agricultural commodity exchanges can provide a basis for increasing farmers' income, increasing added value, augmenting exports and reducing price volatility through transparent information infrastructure and engendered competition. Nonetheless, obstacles such as a deficient technical institution, resistance of traditional structures and inadequate operator awareness restrict the full potential of this market. Suggestions will be made to facilitate a strengthened role for the agricultural commodities exchange on the trajectory of agriculture sector sustainability.

Keywords: Agricultural commodity exchange, Sustainable agricultural development, Risk management, Value added, Agricultural products market

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The Role of Agricultural Commodity Exchanges in Promoting Agricultural Sustainability: A Systematic Review of Evidence, Indicators, and Challenges

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RESUMO

A sustentabilidade do setor agrícola é um dos pilares fundamentais para o desenvolvimento econômico e a segurança alimentar, envolvendo sistemas de mercado eficientes, transparentes e coerentes. As bolsas de commodities agrícolas, como uma nova instituição no mercado de produtos agrícolas, desempenham um papel fundamental na definição da transparência de preços, na redução dos custos de transação, na melhoria da qualidade e padronização dos produtos e na redução do risco de mercado. O artigo explora a contribuição das bolsas de commodities agrícolas para a atividade sustentável do setor agrícola com uma metodologia de revisão sistemática. Nesse contexto, as três dimensões da sustentabilidade agrícola – econômica, social e ambiental – são revisadas e analisadas em termos dos mecanismos complementares nos quais cada dimensão interage com cada uma delas, com base em estudos australianos e internacionais. Os resultados indicam que as bolsas de commodities agrícolas podem fornecer uma base para o aumento da renda dos agricultores, o aumento do valor agregado, o aumento das exportações e a redução da volatilidade dos preços por meio de uma infraestrutura de informação transparente e da concorrência acirrada. No entanto, obstáculos como uma instituição técnica deficiente, a resistência das estruturas tradicionais e a conscientização inadequada dos operadores restringem todo o potencial desse mercado. Serão apresentadas sugestões para facilitar o fortalecimento do papel das bolsas de commodities agrícolas na trajetória da sustentabilidade do setor agrícola.

Palavras-chave: Bolsa de produtos agrícolas, Desenvolvimento agrícola sustentável, Gestão de risco, Valor agregado, Mercado de produtos agrícolas

INTRODUCTION

The agricultural sector is a vital part of the economy and is responsible for food security, raw materials for industries, job creation, and non-Oil exports (Khaledi, 2014). In today's world, population growth, climate change, resource barriers, and market volatilities present obstacles and challenges for this sector (Pollalis, 2016). Sustainable agricultural development is concerned with ensuring that the agricultural sectors' productive and economic capacity can continue indefinitely, protecting natural resources and enhancing the quality of life of users (FAO, 2017). Forming transparent and efficient markets is one of the mechanisms for promoting the sustainability of the agricultural sector. The agricultural commodity exchange as a formal organized institution will promote sustainable development by facilitating formal, standardized trading in agricultural products while lowering transaction costs, improving price transparency, and providing risk mitigation tools (Amjadi and Ahmadi, 2017).

Several studies in Iran and around the world have examined the role of commodity exchanges in improving the performance of the agricultural sector. The results show that commodity exchanges can contribute to the growth and sustainability of the agricultural sector by improving information transparency, increasing the bargaining power of producers, developing exports, and reducing price fluctuations (Diekmann & Westermann, 2010; Samadi et al., 2018). However, most of the research conducted has focused on the economic dimensions of this issue and less attention has been paid to the social and environmental dimensions of sustainability. This is while commodity exchanges can also indirectly affect these dimensions, for example, by improving product quality and reducing waste, which has positive environmental consequences (Graham, 1998).

The main objective of this article is to systematically review existing studies on the role of agricultural commodity exchanges in promoting the sustainability of the agricultural sector and analyze the different dimensions of its impact. The main questions are:

1. How does agricultural commodity exchanges affect the economic sustainability of the agricultural sector?
2. What role does the agricultural commodity exchange play in the social sustainability of farmers?
3. How can the agricultural commodity exchange contribute to environmental sustainability?

1 THEORETICAL FOUNDATIONS AND KEY CONCEPTS

1.1 The concept and dimensions of sustainable agricultural development

Sustainable agricultural development is a concept that gained much public interest in the last decades of the twentieth century, particularly after the World Commission on Environment and Development (WCED, 1987) published its report titled "Our Common Future". As described by Jodoin, the focus of this concept is on the requirements of the present generation and the condition that the present generation must meet its own needs without compromising the ability of future generations to meet theirs (2010).

In the field of agriculture, sustainable development means the management and optimal use of natural resources (water, soil, biodiversity) along with maintaining economic efficiency and improving the quality of life of the beneficiaries (FAO, 2017). According to the existing literature, the three main dimensions of agricultural sustainability are:

- **Economic dimension:** The ability of the agricultural system to generate sustainable income, improve productivity, reduce costs, and increase the added value of products (Pourzand and Bakhshudeh, 2012).
- **Social dimension:** improving the welfare and livelihood of farmers, increasing food security, developing social capital, and preserving rural culture (Alonge, 1995).
- **Environmental dimension:** protecting and improving the quality of natural resources, reducing pollution and waste, and using environmentally friendly technologies (Ahmed & Stockle, 2017).

Studies show that achieving agricultural sustainability requires a link between these three dimensions, and neglecting any one can negatively affect the other dimensions (Graham, 1998; Khaledi, 2014).

1.2 Agricultural Commodity Exchange and Its Functions

The Agricultural Commodity Exchange, which is an organized and supervised market, is a formal trading platform for agricultural products. In the Agricultural Commodity Exchange, standardized agricultural products are traded publicly with transparent prices determined by supply and demand, and both buyers and sellers rely upon formal law and regulation (Amjadi & Ahmadi, 2017).

The most important functions of agricultural commodity exchanges are:

1. Price transparency: discovering fair prices based on free competition and real market information (Hosseini and Sabbagh Kermani, 2003).
2. Reducing transaction costs: eliminating unnecessary intermediaries and facilitating the buying and selling process (Diekmann & Westermann, 2010).
3. Risk management: using financial instruments such as futures contracts and options to cover price fluctuations (Kabiri, 2004).
4. Improving product quality and standards: requiring compliance with quality and packaging standards for accepting goods on the exchange (FAO, 2003).
5. Facilitating access to domestic and foreign markets: helping to expand the export of agricultural products by creating transparency and commercial credibility (Parivash and Torkamani, 2007).

Commodity exchanges are known in many countries as an effective tool for reforming the structure of agricultural markets and improving economic efficiency (Gollin, 2010; Samadi et al., 2018).

1.3 Mechanisms of Commodity Exchange Impact on Agricultural Sustainability

The relationship between agricultural commodity exchanges and agricultural sector sustainability is established through several main pathways:

- Increased income and economic sustainability: Price transparency and reduced transaction costs increase farmers' net profits, which ultimately increases their ability to invest in improving productivity (Alston & Pardey, 2014).
- Reduced volatility and risk management: By using futures contracts and derivative instruments, farmers can be protected against severe price fluctuations, which strengthens their economic security and sustainability (Mirzapour, 2011).
- Development of export markets: By creating transparency and standardization of products, commodity exchanges attract the trust of international buyers and enable sustainable penetration into global markets (Hosseini & Sabbagh Kermani, 2003).
- Improving quality and protecting resources: The requirement to comply with standards and reduce waste has positive environmental effects and reduces resource waste (Ahmed & Stockle, 2017).
- Strengthening social capital and user participation: The commodity exchange can provide the basis for greater cooperation between farmers, cooperatives, and unions, which plays a role in promoting social sustainability (Pourzand & Bakhshudeh, 2012).

Considering these mechanisms, it can be concluded that the agricultural commodity exchange has a high capacity to positively impact sustainability, but this impact is subject to the removal of existing administrative and institutional barriers (Amjadi & Ahmadi, 2017).

2 RESEARCH BACKGROUND

2.1 Iranian Studies

Numerous studies have been conducted in Iran on the role of the agricultural commodity exchange in the agricultural sector's development in several ways, some of the more significant ones are reported below:

1. Amjadi and Ahmadi (2017): This study examined the effect of the agricultural commodity exchange on production growth, value added, and risk coverage using data from 2011 to 2015. The results showed that the commodity exchange had a positive and significant effect on all three indicators and played an important role in reducing price fluctuations.
2. Samadi et al. (2018): In this study, the functions of the commodity exchange in creating transparency, reducing transaction costs, and improving product quality were analyzed. The results indicated that the commodity exchange can provide a greater share of profits to farmers by reducing the gap between farm and market prices.
3. Mirzapour (2011): examined risk management tools in the Iranian agricultural market and concluded that futures contracts on the commodity exchange can play a key role in stabilizing farmers' income, provided they are familiar with and actively participate.
4. Hosseini and Sabbagh Kermani (2003): examined the role of the commodity exchange in improving the quality and standardization of agricultural products and its impact on exports. The findings indicated that the commodity exchange increases the international competitiveness of products by creating quality requirements.
5. Parivash and Torkamani (2007): analyzed the effect of the commodity exchange on the development of agricultural product exports and concluded that price transparency and standardization are the most important factors in facilitating exports.
6. Barkhordar and Mohammadinejad (2018): examined the relationship between the economic sustainability of the agricultural sector and the functions of formal markets and introduced the commodity exchange as one of the key tools for sustainability.
7. Kabiri (2004): Focused on the impact of market structure and government support policies on the efficiency of agricultural markets and emphasized that commodity exchanges can reduce traditional market inefficiencies.
8. Ansari and Hosseini Yakani (2014): Discussed the role of commodity exchanges in attracting domestic and foreign investment in the agricultural sector and showed that commodity exchanges provide a safer environment for investment by reducing risk and improving transparency.
9. Ahangari et al. (2017): Examined the economic and social effects of commodity exchanges in rural areas and concluded that this market can help improve livelihoods and increase farmer participation.
10. Razadi et al. (2013 – translation): Emphasized the role of commodity exchanges in price stabilization and market predictability and considered this issue as a key factor in production planning.

2.2 International Studies

1. FAO (2003): A report by the Food and Agriculture Organization of the United Nations showed that commodity exchanges reduce transaction costs and increase productivity by creating standards and transparency.
2. Gollin (2010): Analyzing data from several African countries, he showed that commodity exchanges improve farmers' access to markets, increase incomes, and improve food security.

3. Diekmann & Westermann (2010): In a study of developing countries, they stated that commodity exchanges can facilitate investment in agriculture by developing rural financial markets.
4. Alston & Pardey (2014): Examined the effect of agricultural productivity on economic development and emphasized that transparent markets are a driver of economic sustainability.
5. Graham (1998): Examined the relationship between product standardization in commodity exchanges and waste reduction and concluded that this process has significant environmental benefits.
6. Ahmed & Stockle (2017): Showed that commodity exchanges can play an important role in agricultural sustainability by requiring environmental and quality standards.
7. Pollalis (2016): Discussed the relationship between commodity exchanges and reducing the negative effects of climate change and stated that efficient market systems can facilitate adaptation to climate change.
8. Jodoin (2010): Emphasized that sustainable development in agriculture requires the integration of market mechanisms with natural resource conservation policies.

The literature review indicates that many local studies are concentrated on the economic dimensions of agricultural commodity exchanges and relatively little is devoted to the social and environmental dimensions of sustainability. While foreign studies have included all three dimensions of sustainability, they do not address the institutional and structural conditions of the Iranian market. Therefore, a review study that analyzes all three dimensions of sustainability of the agricultural commodity exchange based in Iran will contribute to both the scientific knowledge base and help generate local policy options.

3 DIMENSIONS OF THE IMPACT OF AGRICULTURAL COMMODITY EXCHANGES ON SUSTAINABILITY

3.1 Economic dimension

From an economic perspective, agricultural commodity exchanges can play a key role in improving market efficiency and increasing farmers' income. This impact is achieved through several main paths:

- Discovering fair and transparent prices: One of the most important functions of commodity exchanges is to discover real and fair prices based on the interaction of supply and demand (FAO, 2003). This process allows farmers to receive a greater share of the real value of their products and reduces the price gap between the farm and the market (Hosseini and Sabbagh Kermani, 2003).
- Reducing transaction costs: In traditional markets, the presence of multiple intermediaries and the lack of information transparency increase transaction costs. By eliminating unnecessary intermediaries and using electronic trading platforms, commodity exchanges reduce these costs and increase market efficiency (Diekmann & Westermann, 2010).
- Risk management and income stabilization: Tools such as futures contracts and options help farmers manage the risk of price fluctuations. This is especially important for products that are heavily affected by weather conditions and the global market (Mirzapour, 2011).
- Facilitating investment and developing the export market: By creating transparency and standardizing products, the commodity exchange provides a suitable platform for attracting domestic and foreign investment. Also, the quality standards and trading credibility of the exchange facilitate the way to enter international markets (Parivash and Torkamani, 2007).

3.2 Social Dimension

The role of agricultural commodity exchanges in social sustainability has received less attention but is of great importance.

- Improving farmers' livelihoods: By increasing income from transparent prices and reducing transaction costs, farmers can spend more capital on improving production methods and improving their living standards (Alonge, 1995).
- Strengthening social capital: Trading in commodity exchanges is often done through agricultural cooperatives and unions, which leads to increased cooperation, trust, and solidarity among farmers (Pourzand and Bakhshudeh, 2012).
- Promoting food security: By reducing market fluctuations and improving product quality, a more stable supply of food is possible and the food security of the community is strengthened (Gollin, 2010).
- Empowerment and training: Working in commodity exchanges requires familiarity with laws, standards, and financial instruments. This requirement can improve the technical and managerial knowledge of farmers and prepare them for a more effective presence in the market (Amjadi and Ahmadi, 2017).

3.3 Environmental dimension

Agricultural commodity exchange can also indirectly have positive environmental effects.

- Improving product quality and standards: The requirement to comply with quality and packaging standards encourages producers to use sustainable production methods and reduce the consumption of chemical inputs (Ahmed & Stockle, 2017).
- Reducing waste and resource wastage: By improving the marketing process and facilitating access to the market, a portion of products that were previously lost due to lack of sales or corruption now reach the target markets (Graham, 1998).
- Encouragement of production of products with comparative advantage: Through price transparency, commodity exchanges guide farmers towards production of products in which they have comparative advantage, which leads to more efficient use of natural resources (Hosseini and Sabbagh Kermani, 2003).
- Support for resource conservation policies: By expanding formal transactions and reducing pressure on informal markets, the possibility of implementing environmental policies and sustainable production standards increases (Pollalis, 2016).

4 CHALLENGES AND OBSTACLES

Although the potential of agricultural commodity exchanges for promoting transparency, managing risk, and supporting sustainability is vast, these exchanges experience constraints and restrictions in their ability to fulfill these functions in practice. Identifying these constraints and restrictions is a necessary step towards designing reform and development policies (Mirzapour, 2011; FAO, 2003).

4.1 Economic Challenges

- Severe fluctuations in agricultural product prices: Although commodity exchanges have tools to hedge risk, severe fluctuations in the global market and the impact of agricultural products on climatic conditions can still threaten farmers' income (Diekmann & Westermann, 2010).

- Limited access to capital and liquidity: Many small farmers are unable to enter and trade on the exchange due to lack of capital and difficulty in accessing banking facilities (Ansari & Hosseini Yakani, 2014).
- Standardization and packaging costs: Accepting goods on the exchange requires compliance with quality and packaging standards, which is costly for small producers and may prevent their participation (Hosseini and Sabbagh Kermani, 2003).

4.2 Institutional and legal challenges

- Lack of coordination among responsible institutions: A lack of coordination between the Ministry of Agricultural Jihad, the commodity exchange, and market regulatory institutions has led to policy inconsistencies and slow processes of institutionalization (Parivash and Torkamani, 2007).
- Resistance of traditional market structures: Traditional marketers and intermediary, whose interests are secured in the opaque nature of the market system, will resist promotion of commodity exchange transactions (Amjadi and Ahmadi, 2017).
- Weakness of protective laws: There are protective laws for small and medium-sized farmers in the legal framework of the commodity exchange. However, the protective laws are not effective nor efficient (Gollin, 2010).

4.3 Educational and cultural challenges

- Lack of farmers' awareness of the functioning of commodity exchanges: Many farmers are not sufficiently familiar with the processes, benefits, and tools of commodity exchanges, which limits their participation (Alonge, 1995).
- Lack of effective training and extension networks: The infrastructure for specialized training and technology extension in the field of commodity exchange trading is not yet fully developed (Pourzand and Bakhshudeh, 2012).
- Distrust of formal institutions: In some regions, farmers' negative experiences with government institutions have led to distrust of commodity exchanges (Graham, 1998).

4.4 Technical and infrastructural challenges

- Weak transportation and logistics infrastructure: To offer goods on the exchange, there is a need for an efficient transportation network and standard warehouses, but in many regions this infrastructure is incomplete (FAO, 2003).
- Lack of information technology: Commodity exchange transactions require advanced IT systems, which in some rural areas lack internet coverage and the necessary equipment (Ahmed & Stockle, 2017).
- Limited acceptance centers and standard warehouses: The small number of warehouses approved by the commodity exchange increases the cost and time of transporting products and reduces the motivation of suppliers (Mirzapour, 2011).

Each of these challenges suggests that the development of agricultural commodity exchanges and their contributions to sustainability necessitates a multi-faceted strategy that simultaneously addresses reforms that are economic, institutional, educational and infrastructure based. Absent of such as strategy the potential capacity of commodity exchanges to enhance the functioning of the agricultural sector will not be reached (Amjadi & Ahmadi, 2017; FAO, 2003).

5 POLICY STRATEGIES AND RECOMMENDATIONS

Successful countries' experience in implementing agricultural commodity exchanges demonstrates that achieving maximum sustainability impact of the market on the economy, society and the environment requires a range of simultaneous and coordinated actions in several areas (FAO, 2003; Gollin, 2010).

5.1 Supportive and Institutional Policies

- Revising and Completing Supportive Laws: Creating comprehensive laws that provide special support for small and medium-sized farmers can increase their participation in commodity exchanges. These laws should include facilitating product acceptance conditions, reducing standardization costs and providing tax exemptions (Amjadi and Ahmadi, 2017).
- Strengthening Inter-Institutional Coordination: Establishing a joint working group between the Ministry of Agricultural Jihad, the Exchange Organization and production unions to coordinate policies and prevent interference in decisions can lead to greater efficiency (Parivash and Torkamani, 2007).
- Countering the resistance of traditional structures: Implementing training and incentive programs for market intermediaries and creating new opportunities for collaboration in the supply chain can reduce resistance (Graham, 1998).

5.2 Developing financial instruments and risk management

- Expanding the use of futures and options: Training and promoting risk management tools among farmers and buyers can reduce income fluctuations (Mirzapour, 2011).
- Creating agricultural hedge funds: Establishing insurance funds based on commodity exchange transactions, with government and private sector support, is essential to compensate for losses caused by price fluctuations and natural disasters (Diekmann & Westermann, 2010).

5.3 Improving technical and logistical infrastructure

- Developing standardized warehouses and acceptance centers: Increasing the number of warehouses and centers equipped with quality control systems will reduce the cost and time of product supply (FAO, 2003).
- Improving transport infrastructure: Investment in refrigerated transport and modern logistics systems is essential to maintain product quality (Ahmed & Stockle, 2017).
- Expanding electronic trading systems: Creating online platforms with a simple user interface for farmers, especially in rural areas, can increase participation (Pollalis, 2016).

5.4 Raising awareness and empowering farmers

- Practical training in the field of commodity exchange: Designing and implementing face-to-face and online training courses is essential to familiarize farmers with the trading processes, standards, and financial instruments of the commodity exchange (Alonge, 1995).
- Developing rural advisory and brokerage networks: Establishing local brokerages that provide order registration, advisory, and training services can reduce barriers to participation (Pourzand and Bakhshudeh, 2012).

5.5 Enhancing the environmental dimension of commodity exchange trading

- Creating green incentives: Allocating special bonuses and discounts for products that are produced using sustainable and environmentally friendly methods can strengthen the role of the commodity exchange in protecting resources (Ahmed & Stockle, 2017).
- Environmental reporting requirements: Requiring suppliers to provide information on the environmental impacts of their production and processing can increase transparency and improve environmental standards (Pollalis, 2016).

Supportive policies, the construction of infrastructure, awareness and education of farmers, environmental considerations, all when combined together demonstrate the effectiveness of the agricultural commodity exchange, as a potential tool for facilitating a sustainable agricultural development in Iran. The experience of successful countries demonstrates that the long-term commitment and collaboration between all stakeholders on the longer-term solutions is critical (FAO, 2003; Gollin, 2010).

CONCLUSION

The agricultural commodity exchange—an organized market with this mechanism for supplying agricultural products—can effectively foster sustainability in agriculture, economically, socially, and environmentally. As highlighted in the results of the study, the agricultural commodity exchange is able to promote and enhance farmers' income, economic stability, and develop exports—by offering price transparency, minimizing transaction costs, managing market risks, upgrading product quality and standardization, and enabling access to domestic and international markets. In the social aspect of sustainability, the commodity exchange plays a pivotal role in the empowerment of rural communities with enhanced social capital and farm livelihoods, and improved food security. Also, in the environmental dimension, the requirement to comply with standards and reduce waste leads to the optimal use of natural resources and reduces negative environmental impacts. However, the full realization of the capacities of the agricultural commodity exchange in Iran faces several challenges. Infrastructural limitations such as weaknesses in transportation systems and standardized warehouses, lack of awareness and training of operators, resistance of traditional market structures, and institutional inconsistencies are among the key obstacles that have limited the efficiency of this market. To overcome these challenges, suggested policies include strengthening technical and logistical infrastructure, developing financial instruments for risk management, promoting farmer awareness and education, and integrating environmental considerations into trading processes. Finally, agricultural commodity exchanges can serve as a pivotal tool for achieving sustainable agricultural development, provided that institutional reforms, infrastructure development, and training programs are implemented in a coordinated and targeted manner. This requires close collaboration between policymakers, regulatory agencies, and operators to ensure the long-term sustainability of the agricultural sector by leveraging global experiences and adapting them to Iranian local conditions. Future studies can contribute to the enrichment of knowledge in this area by focusing on empirically assessing the impacts of commodity exchanges in different regions of Iran and more precisely analyzing the social and environmental dimensions.

REFERENCES

- Ahmed, K., & Stockle, C. (2017). Environmental standards and sustainable agriculture: The role of commodity exchanges. *Journal of Environmental Management*, 192, 1–12.
- Alonge, A. J. (1995). Community participation in agricultural development projects. *Agricultural Systems*, 47(1), 1–15.
- Alston, J. M., & Pardey, P. G. (2014). Agricultural productivity and economic development. *Annual Review of Resource Economics*, 6, 47–75.
- Amjadi, H., & Ahmadi, S. (2017). The role of agricultural commodity exchange in production growth and risk coverage. *Iranian Journal of Agricultural Economics Research*, 9(2), 45–63.

- Ansari, M., & Hosseini Yekani, M. (2014). Commodity exchange and attracting investment in the agricultural sector. *Journal of Rural Development*, 16(4), 101–118.
- Barkhordar, M., & Mohammadi-Nejad, A. (2018). Examining the relationship between economic sustainability and the functions of the official agricultural market. *Agricultural Economics Research*, 10(3), 55–72.
- Diekmann, A., & Westermann, G. (2010). Agricultural commodity exchanges in developing countries: Market transparency and risk management. *Food Policy*, 35(4), 323–331.
- FAO. (2003). The role of commodity exchanges in agricultural marketing. Rome: Food and Agriculture Organization of the United Nations.
- FAO. (2017). The future of food and agriculture: Trends and challenges. Rome: Food and Agriculture Organization of the United Nations.
- Gollin, D. (2010). Agricultural markets in Africa: The role of commodity exchanges. *African Development Review*, 22(S1), 64–72.
- Graham, J. (1998). Standardization and waste reduction in agricultural commodity markets. *Journal of Agricultural Economics*, 49(3), 345–360.
- Hosseini, A., & Sabbagh Kermani, M. (2003). Commodity exchange and improving the quality of agricultural products. *Iranian Journal of Agricultural Economics Research*, 5(1), 15–30.
- Jodoin, S. (2010). Sustainable development and agriculture: Integrating market mechanisms. *Sustainability*, 2(8), 2353–2371.
- Kabiri, M. (2004). Commodity market structure and futures trading in agriculture. Tehran: Institute of Agricultural Planning.
- Kabiri, M. (2004). Market structure and efficiency of commodity exchange. *Iranian Journal of Agricultural Economics*, 6(2), 89–104.
- Khaledi, F. (2014). Sustainable agricultural development and upcoming challenges. *Journal of Rural Development*, 15(1), 1–20.
- Mirzapour, M. (2011). Risk management in Iran's agricultural commodity markets. *Iranian Journal of Agricultural Economics*, 8(3), 57–74.
- Parivash, S., & Torkamani, M. (2007). The role of commodity exchange in developing agricultural product exports. *Agricultural Economics and Development*, 14(2), 77–92.
- Pollalis, Y. A. (2016). Commodity markets and climate change adaptation. *Journal of Environmental Economics*, 23(2), 211–230.
- Pourzand, H., & Bakhshoudeh, M. (2012). Social capital and sustainable agricultural development. *Agricultural Economics Research*, 8(4), 33–50.
- Rezadi, K., et al. (2013). Price stabilization and market predictability in commodity exchange. Translated scientific article. Tehran: Agricultural Economics Research Institute Publications.
- WCED. (1987). Our common future. Oxford: Oxford University Press.



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