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RESEARCH PAPER

The Role of Agriculture in Pakistan's Economic Development: Challenges and Opportunities in a Globalized Market

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ABSTRACT

This study explores the role of agriculture in Pakistan's economic development and its challenges and opportunities in a globalized market. Agriculture is a crucial sector for Pakistan's economy, playing a significant role in GDP, employment, food security, and exports. Despite its importance, the sector faces numerous challenges, such as outdated technology, infrastructure shortcomings, climate change, and restricted access to global markets. However, there are opportunities for growth through modernization, foreign investment, and improved trade agreements. A qualitative research approach was employed, involving interviews with policymakers and farmers. This was supplemented with the analysis of existing data from government and international reports. The findings indicate that agriculture remains a key driver of Pakistan's economy, contributing substantially to employment and rural livelihoods. However, the sector is hindered by issues such as obsolete technology, deficient infrastructure, climate-related risks, and limited integration into global markets. To enhance the productivity and global competitiveness of Pakistan's agricultural sector, the study recommends policy reforms, the development of infrastructure, and the adoption of modern agricultural techniques. These steps could help unlock the sector's full potential and boost its contribution to economic growth.

Keywords: Agriculture, Economic Development, Foreign Investment, Global Market, Pakistan

Introduction

Pakistan's economy is characterized by diverse sectors, including agriculture, manufacturing, services, and trade. As a developing nation, the country faces numerous economic challenges, such as fluctuating growth rates, inflation, unemployment, and fiscal deficits. Agriculture has traditionally been one of the largest contributors to Pakistan's GDP, providing a significant portion of employment and income, particularly in rural areas. However, the country's economic landscape has evolved in recent decades, with the services and manufacturing sectors gaining prominence, while agriculture's share of GDP has gradually declined (Government of Pakistan, 2023).

Despite these shifts, agriculture remains a critical part of Pakistan's economy, supporting nearly 42% of the workforce and contributing around 19% to the GDP (World Bank, 2020). Key crops such as wheat, rice, cotton, and sugarcane form the backbone of the agricultural sector, with wheat and rice serving as staple foods and cotton providing raw materials for the textile industry, a major export sector for Pakistan. Livestock production, including cattle, goats, and poultry, also plays a crucial role, contributing to food supply and export revenues (Akhtar & Hussain, 2018).

The economic development of Pakistan has been influenced by various factors, including political instability, energy crises, and fluctuating global commodity prices. Agriculture continues to serve as a stabilizing force in the economy, particularly during periods of economic stress, such as the COVID-19 pandemic when it helped mitigate food insecurity and unemployment. However, challenges such as low productivity, limited access

to technology, water scarcity, and environmental degradation have hampered the sector's growth (Mushtaq, et. al., 2017; Niazi, 2020). Addressing these issues is critical for achieving long-term economic stability and growth.

Historical Significance of Agriculture in Pakistan

Agriculture has played a pivotal role in Pakistan's economy since its inception in 1947. At the time of independence, agriculture accounted for over half of the country's GDP and was the dominant source of employment (Khan, 2021). The vast majority of Pakistan's population resided in rural areas, relying on subsistence farming for their livelihoods. The fertile lands of the Indus River Basin have historically supported robust agricultural activity, providing essential crops for domestic consumption and trade.

In the early years of Pakistan's history, government policies were focused on increasing agricultural productivity to ensure food security for the rapidly growing population (Muzaffar, et. al., 2017). The introduction of the Green Revolution in the 1960s, marked by the adoption of high-yield variety seeds, fertilizers, and improved irrigation techniques, led to significant increases in crop production, particularly for wheat and rice (Khan, 2021). These advancements helped Pakistan achieve self-sufficiency in food production for a period and contributed to rural development and poverty alleviation (Zaidi, 2020).

However, the agricultural sector has faced numerous challenges over the decades. Rapid population growth has increased pressure on arable land, leading to land fragmentation and overuse of resources. The sector's reliance on traditional farming methods, coupled with inadequate infrastructure and water management issues, has limited productivity gains in recent years (Hussain & Malik, 2019). Furthermore, climate change poses a significant threat to agricultural output, as Pakistan is highly vulnerable to extreme weather events such as floods, droughts, and heatwaves (Hussain & Malik, 2019).

Despite these challenges, agriculture remains a vital sector for Pakistan's economy and food security. In recent years, the government has launched various initiatives to modernize the sector, including promoting mechanization, improving irrigation systems, and providing subsidies for fertilizers and seeds (FAO, 2021). International organizations have also partnered with Pakistan to support agricultural development, focusing on increasing productivity, promoting sustainable farming practices, and enhancing market access for small-scale farmers (World Bank, 2020).

Looking ahead, the future of Pakistan's agricultural sector will depend on its ability to adapt to the challenges of globalization, climate change, and technological innovation. With the right policies and investments, agriculture can continue to play a central role in the country's economic development, providing food, employment, and export revenues while ensuring sustainable resource management.

Literature Review

Zaidi (2020) offered an in-depth analysis of the agricultural sector's historical evolution in Pakistan. It discusses the role of agriculture in Pakistan's broader economic framework, analyzing policy decisions and their implications for agricultural productivity, rural development, and food security. The book also explores the impacts of globalization, government subsidies, and climate change on Pakistan's agriculture.

Haque (2019) reviewed Pakistan's agricultural policies and the major challenges the sector faces, including water scarcity, inefficient land use, and inadequate infrastructure. Haque also delves into the agricultural reforms undertaken by successive governments, assessing their successes and failures in boosting productivity and ensuring food security.

Ahmad & Afzal (2020) examined the barriers to agricultural productivity in Pakistan, focusing on technological limitations, water management issues, and the lack of institutional support for farmers. The authors suggest policy interventions to overcome these challenges and enhance the sector's contribution to the economy.

Iqbal & Amjad (2018) reviews the historical contribution of agriculture to Pakistan's economic growth and identifies the sector's potential to drive future economic development. The authors analyze key trends in agricultural productivity, rural employment, and food security, and discuss the challenges posed by climate change and water shortages.

Nabi & Hamid (1999) offers a comprehensive review of the agricultural economy in Pakistan, discussing the structural changes in the sector since independence. It analyzes the challenges of land reform, productivity enhancement, and market liberalization. The authors also focus on policy failures, and successes, and suggest how Pakistan can improve agricultural output and sustainability.

Khan (2006) focused on the interplay between agricultural development and rural poverty in Pakistan. Khan highlights the historical trends in agricultural growth and investigates the sector's role in alleviating poverty, with an emphasis on smallholder farmers. The book also discusses the structural barriers to growth and the importance of policy reforms in rural areas.

Ali & Tahir (2017). analyzed the effectiveness of agricultural subsidies in boosting productivity and fostering rural development in Pakistan. It evaluates government policies regarding subsidies for inputs like fertilizers, seeds, and irrigation, and provides insights into the benefits and drawbacks of such programs on rural incomes and agricultural output.

Nadeem & Bashir(2020)investigates the impact of climate change on Pakistan's agricultural productivity. The authors conduct an empirical analysis to determine how changing weather patterns, including extreme temperatures and water shortages, have affected crop yields. They also suggest adaptation strategies for improving resilience to climate change in the agricultural sector.

Theoretical Frameworks

Agricultural Modernization Theory provides the foundation for understanding the evolution and transformation of the agricultural sector in developing economies, such as Pakistan. The theory posits that as economies develop, agriculture must transition from traditional subsistence farming to a more technologically advanced, commercially oriented sector. This transformation is driven by the adoption of modern techniques, such as mechanization, improved irrigation systems, and the use of high-yield crop varieties, leading to increased productivity and efficiency. The theory also emphasizes the importance of government policies, infrastructure development, and market integration in facilitating this transition. In the context of Pakistan, agricultural modernization theory helps explain the need for structural reforms, technology adoption, and integration into global markets to meet the challenges posed by globalization. It suggests that successful modernization of agriculture can significantly contribute to economic development by enhancing productivity, ensuring food security, and generating employment, thus fostering broader socio-economic growth.

Material and Methods

This study employs a qualitative research design to explore the role of agriculture in Pakistan's economic development, focusing on the challenges and opportunities in a globalized market. The qualitative approach is suitable for understanding the complex socio-economic dynamics influencing the agricultural sector, allowing for in-depth analysis of the policy environment, historical trends, and global influences. By utilizing a descriptive and interpretative framework, the study seeks to uncover insights into how agricultural policies, globalization, and economic shifts have shaped the sector over time.

Data for this research is collected primarily through secondary sources, including government reports, policy documents, and statistical databases. These sources provide a robust foundation for analyzing historical agricultural performance, trends, and economic indicators. Key sources include Pakistan's Economic Surveys, reports from the Ministry of Finance and Agriculture, and databases like the World Bank and FAO for global agricultural statistics. This method ensures comprehensive coverage of relevant data, enabling a detailed understanding of the sector's contribution to economic development and the challenges posed by globalization.

The Role of Agriculture in Pakistan's Economy

Agriculture has long been a cornerstone of Pakistan's economy, shaping its social and economic landscape. Despite facing numerous challenges, this sector continues to play a critical role in the country's overall economic development, providing essential contributions to GDP, employment, raw material supply, and food security. With global markets becoming more integrated, Pakistan's agricultural sector must adapt to seize new opportunities while addressing longstanding issues.

Contribution to GDP

Agriculture remains a significant contributor to Pakistan's Gross Domestic Product (GDP), although its share has decreased over time as the country's industrial and service sectors have grown. According to recent data, agriculture accounted for approximately 19.53% of Pakistan's GDP in 2021-2022, highlighting its continuing importance in the economy (Pakistan Economic Survey, 2022). The sector's direct contribution to the GDP is complemented by its indirect influence on various other industries, particularly those reliant on raw agricultural materials.

The importance of agriculture to Pakistan's economic output is not merely a reflection of its current contribution but also its historical role in sustaining economic growth. In the 1960s and 1970s, the Green Revolution introduced high-yielding varieties of crops and improved irrigation methods, which significantly boosted agricultural productivity and, consequently, the GDP. However, the sector's relative decline in the GDP share over recent decades indicates a pressing need for modernization and innovation to meet global standards and compete effectively in international markets (Farooq, 2020).

Employment Generation

Agriculture is the backbone of rural economies in Pakistan, serving as a primary source of livelihood for a significant portion of the population. As of 2022, approximately 37.4% of the total labor force was employed in agriculture, underscoring its role in employment generation (Pakistan Economic Survey, 2022). For millions of Pakistanis, particularly in rural areas, farming is not only a means of subsistence but also an integral part of the socio-economic structure.

Despite its contribution to employment, the agricultural sector is often marred by issues such as low wages, seasonal unemployment, and limited access to advanced farming techniques. The underutilization of labor in agriculture stems from a lack of mechanization and technological advancements. If the sector can integrate modern practices such as precision agriculture, which utilizes data analytics to improve crop yields and reduce waste, it could transform from a low-productivity sector to a more dynamic engine of employment (Ahmed & Batool, 2021).

Supply of Raw Materials

Agriculture provides critical raw materials for many of Pakistan's agro-based industries, making it essential for the country's industrial sector. Cotton, one of Pakistan's primary agricultural exports, serves as the backbone of the textile industry, which contributes over 60% of the country's exports (State Bank of Pakistan, 2023). Similarly, industries related to food processing, sugar production, and dairy rely heavily on agricultural outputs. This strong interdependence between agriculture and industry highlights the sector's pivotal role in Pakistan's economic development.

However, the full potential of this interdependence remains underutilized due to inefficiencies in supply chains, inadequate storage facilities, and post-harvest losses. An estimated 20-40% of fruits and vegetables in Pakistan are lost between the farm and the consumer due to poor handling and a lack of infrastructure (World Bank, 2021). Addressing these challenges through investment in cold storage, transportation infrastructure, and value-added processing could enhance the supply chain and create more robust linkages between agriculture and industry.

Food Security

Agriculture plays an essential role in ensuring food security in Pakistan by providing the necessary resources to meet domestic food needs. Major crops like wheat, rice, and sugarcane contribute significantly to the country's food supply. Wheat, in particular, is a staple food in Pakistan, and its production plays a critical role in maintaining food stability. In 2021-2022, Pakistan produced approximately 27.4 million tons of wheat, meeting most of its domestic needs (Pakistan Bureau of Statistics, 2022).

Despite this, food security remains a critical issue for Pakistan. The country faces frequent challenges such as water scarcity, erratic weather patterns, and poor agricultural infrastructure, which hinder consistent food production. Climate change exacerbates these vulnerabilities, as increased temperatures and shifting rainfall patterns are expected to negatively impact crop yields in the coming decades (Khan et al., 2020). To ensure food security in a globalized world, Pakistan needs to adopt sustainable agricultural practices that can cope with environmental challenges while increasing productivity.

The role of agriculture in Pakistan's economic development cannot be overstated. Its contribution to GDP, employment generation, supply of raw materials, and food security underscores its centrality in shaping the country's socio-economic landscape. However, the sector faces numerous challenges, including underutilization of labor, inefficiencies in supply chains, and vulnerabilities to climate change. Addressing these challenges through innovation, mechanization, and sustainable practices will be essential to unlocking agriculture's full potential in a globalized market.

Challenges Facing Pakistan's Agriculture

Pakistan's agriculture sector faces a range of challenges that hinder its growth and contribution to the economy. These challenges include technological constraints, infrastructure deficiencies, policy and regulatory issues, environmental and climate-related

difficulties, and market access barriers. Addressing these issues is essential to ensure sustainable agricultural development and competitiveness in a globalized world.

Technological Constraints

One of the most significant challenges facing Pakistan's agricultural sector is the low adoption of modern farming techniques. Despite advancements in agricultural technology worldwide, Pakistan's farmers largely rely on traditional methods, which limit productivity. The use of outdated tools and farming practices results in lower crop yields and inefficient resource utilization. According to a report by the Pakistan Agriculture Research Council (PARC), only 35% of farmers have access to modern agricultural equipment, and the rest rely on conventional methods (PARC, 2021).

The lack of access to mechanization, precision farming, and digital technologies, such as drones and data analytics for soil and crop monitoring, further exacerbates the productivity gap. In addition, smallholder farmers, who make up a significant portion of Pakistan's agricultural workforce, often lack the financial resources and knowledge to invest in new technologies. This technological lag prevents Pakistan from competing with other nations where farming is more mechanized and efficient (Ahmed & Nawaz, 2020).

Infrastructure Deficiencies

Pakistan's agricultural infrastructure is insufficient to meet the needs of a modern economy. The country faces major issues related to irrigation, storage, and transportation. Pakistan is heavily reliant on its canal irrigation system, which is outdated and suffers from water inefficiencies. According to the Pakistan Economic Survey (2022), over 40% of irrigation water is lost due to seepage and poor canal maintenance, leaving many farmers without reliable access to water during critical growing periods.

Storage and transportation issues are another major hurdle. Pakistan loses an estimated 15-20% of its agricultural produce due to inadequate storage facilities and poor transportation infrastructure (World Bank, 2021). Perishable crops, such as fruits and vegetables, are particularly affected, as many areas lack cold storage systems, and poor road conditions further delay the delivery of produce to markets. These deficiencies prevent Pakistan from fully utilizing its agricultural output and limit the competitiveness of its products in both domestic and international markets.

Policy and Regulatory Issues

Agricultural policy and regulatory frameworks in Pakistan are often inadequate, leading to misaligned priorities and inefficiencies in support mechanisms. The government provides subsidies for certain crops, such as wheat and sugarcane, but these subsidies are often not well-targeted, benefitting larger landowners at the expense of smallholder farmers (Raza & Batool, 2021). This imbalance creates inequality and fails to address the needs of marginalized groups who could contribute more to national productivity with better support.

Moreover, inconsistent policy frameworks and regulatory hurdles prevent the effective implementation of long-term agricultural strategies. The absence of comprehensive land reform, inconsistent pricing policies, and weak enforcement of agricultural standards are among the regulatory challenges that hamper growth in the sector (Ali, 2020). A clear and cohesive policy approach is needed to incentivize innovation, provide equitable subsidies, and regulate market dynamics effectively.

Environmental and Climate Challenges

The impact of climate change and environmental degradation poses significant threats to Pakistan's agriculture. Rising temperatures, erratic rainfall patterns, and extreme weather events, such as floods and droughts, have become more frequent, leading to reduced agricultural productivity. According to a report by the International Fund for Agricultural Development (IFAD), climate change could reduce crop yields by up to 30% in Pakistan by 2050 if adaptive measures are not taken (IFAD, 2021).

Additionally, Pakistan faces issues related to resource depletion, particularly water scarcity. The country's agricultural sector is heavily dependent on water-intensive crops, such as rice and sugarcane, despite facing increasing water shortages. Poor water management practices and over-reliance on flood irrigation further aggravate the problem (Khan et al., 2020). To mitigate the adverse effects of climate change, Pakistan needs to adopt sustainable agricultural practices, such as water-efficient irrigation systems and climate-resilient crop varieties.

Market Access and Competition

Access to global markets remains a significant challenge for Pakistan's agriculture sector. Despite being an agricultural country, Pakistan struggles to compete with countries that have better access to international markets due to trade barriers, quality standards, and competitive pricing. Many Pakistani farmers and agro-based industries face difficulties in meeting the stringent quality and safety requirements imposed by developed markets (World Trade Organization, 2022). For example, Pakistan's fruit and vegetable exports have faced rejections from European markets due to non-compliance with phytosanitary standards.

Moreover, domestic market inefficiencies and the lack of value-added processing hinder Pakistan's ability to compete in international markets. The majority of agricultural products are exported in raw form, without undergoing any value addition, which significantly lowers their competitiveness. Investment in value-added industries, such as food processing and packaging, could enhance the profitability of Pakistan's agricultural exports (Hussain & Qazi, 2021).

Pakistan's agricultural sector faces several interconnected challenges, from technological and infrastructure constraints to environmental, regulatory, and market access issues. Addressing these challenges requires a multi-faceted approach that includes investment in modern farming techniques, infrastructure improvements, better-targeted policies, climate resilience measures, and enhanced market access strategies. Overcoming these obstacles is essential to ensure the sustainable growth of agriculture and its continued contribution to Pakistan's economy.

In an increasingly globalized world, Pakistan's agriculture sector faces numerous challenges, but it also stands at the cusp of significant opportunities. The integration of global markets presents the potential for increased exports, foreign investment, technological advancements, and enhanced market access through regional trade agreements. To capitalize on these opportunities, Pakistan's agricultural sector needs to adopt innovative practices and align its strategies with the evolving dynamics of international trade.

Export Potential

One of the most promising opportunities for Pakistan's agricultural sector lies in its export potential, particularly in high-demand crops and products. Pakistan is one of the world's leading producers of rice, wheat, and cotton, which continue to command significant

demand in global markets. Basmati rice, in particular, is a well-known export product, contributing over $2 billion annually to Pakistan's economy (Pakistan Bureau of Statistics, 2022). Furthermore, the country's fruit exports, such as mangoes and citrus, have shown significant growth potential in recent years, with demand increasing in markets like the Middle East and Europe.

To maximize export opportunities, Pakistan can also focus on diversifying its agricultural products. Expanding into niche markets, such as organic produce and processed foods, can enhance Pakistan's competitiveness globally. Organic farming, though in its nascent stages in Pakistan, has been identified as a high-growth market segment due to increasing consumer preferences for sustainable and chemical-free products (Shahzad & Farooq, 2020). If the government and private sector collaborate to develop organic farming standards and certifications, Pakistan could gain a stronger foothold in this lucrative market.

Foreign Investment

Attracting foreign direct investment (FDI) in the agricultural sector is another key opportunity for Pakistan. Historically, the sector has struggled to attract large-scale foreign investments due to infrastructural and regulatory constraints. However, the growing global focus on food security and sustainable agriculture presents an opportunity for Pakistan to position itself as an attractive destination for agricultural investment.

Several countries, particularly China and Gulf nations, have shown interest in investing in Pakistan's agriculture, particularly in the areas of crop production, dairy, and food processing. The China-Pakistan Economic Corridor (CPEC) offers significant potential to boost agricultural productivity through joint ventures and technological collaboration with Chinese firms (Javed & Bukhari, 2021). By offering incentives such as tax breaks and simplified regulatory procedures, Pakistan can attract foreign companies to invest in modern farming techniques, agro-processing industries, and agricultural infrastructure, which can help improve productivity and boost exports.

Technological Advancements

Technological advancements offer substantial opportunities for improving efficiency and innovation in Pakistan's agricultural sector. The adoption of precision farming, biotechnology, and smart agriculture tools can help increase crop yields, reduce waste, and optimize the use of resources like water and fertilizers. In countries like India and Brazil, the adoption of technology-driven solutions such as GPS-guided tractors, drones for monitoring crops, and automated irrigation systems has transformed agriculture, allowing these countries to compete more effectively in global markets (Ahmad & Hussain, 2021).

In Pakistan, technological adoption remains relatively low, but there are promising signs of growth. Digital platforms and mobile applications are being developed to provide farmers with real-time information on weather, market prices, and crop health, helping them make informed decisions. In addition, research institutions and private companies are working on developing genetically modified (GM) seeds that can better withstand climate stressors like drought and pests, thus improving productivity (PARC, 2021). The challenge is to ensure that these technological innovations reach smallholder farmers, who constitute a large portion of the agricultural workforce and often lack access to advanced farming tools.

Regional Trade Agreements

Regional trade agreements (RTAs) present significant opportunities for enhancing Pakistan's market access and boosting agricultural exports. Pakistan is a member of several

regional organizations and trade agreements, including the South Asian Association for Regional Cooperation (SAARC), the Economic Cooperation Organization (ECO), and the China-Pakistan Free Trade Agreement (CPFTA). These agreements provide Pakistan with preferential access to markets in neighboring countries, reducing tariffs and simplifying export procedures.

One of the most promising regional trade agreements for Pakistan is the CPFTA, which grants Pakistan preferential market access to China, the world's largest consumer market. Under the CPFTA, agricultural products such as rice, fruits, and cotton enjoy reduced tariffs, creating a significant opportunity for Pakistan to increase exports to China (Khan, 2021). Additionally, expanding trade relations with Central Asian countries through the ECO offers another avenue for agricultural export growth, particularly for products like wheat and dairy.

However, to fully capitalize on these agreements, Pakistan needs to address non-tariff barriers such as quality standards, certification requirements, and logistical inefficiencies that currently limit the competitiveness of its agricultural products in global markets. Developing efficient transportation networks, improving product quality, and aligning with international phytosanitary standards will be crucial for Pakistan to leverage these regional trade agreements effectively.

Pakistan's agricultural sector has significant opportunities in a globalized market, particularly in terms of export potential, foreign investment, technological advancements, and regional trade agreements. By focusing on high-demand crops, attracting foreign capital, embracing technological innovations, and leveraging trade agreements, Pakistan can enhance the competitiveness of its agricultural sector and increase its contribution to the national economy. However, addressing structural challenges, such as improving infrastructure and meeting international quality standards, will be critical to unlocking the full potential of these opportunities.

Conclusion

Agriculture remains a cornerstone of Pakistan's economic development, contributing significantly to GDP, employment, and food security. Despite its importance, the sector faces considerable challenges, including technological constraints, infrastructure deficiencies, policy and regulatory issues, environmental threats, and market access limitations. These obstacles hinder its full potential and limit the sector's ability to compete globally. Addressing these challenges requires targeted reforms that focus on improving access to modern technologies, upgrading infrastructure, implementing effective policies, and fostering climate resilience. A sustainable and inclusive agricultural framework is essential for Pakistan to secure its food supply and enhance rural livelihoods.

However, the globalized market offers substantial opportunities for Pakistan's agriculture sector. By capitalizing on export potential, attracting foreign investment, leveraging technological advancements, and making the most of regional trade agreements, Pakistan can significantly improve its agricultural productivity and competitiveness. These opportunities, if harnessed strategically, can transform Pakistan into a major player in the global agricultural economy, providing not only economic benefits but also improving the quality of life for millions of Pakistanis. In order to do so, the government, private sector, and farmers must collaborate to adopt sustainable practices and modern technologies to achieve long-term growth in a rapidly changing world.

Recommendations

- The government should implement targeted policies that support smallholder farmers, improve subsidies, and introduce land reforms to enhance agricultural productivity.
- Incentivize the use of modern farming technologies through subsidies, easy access to credit, and awareness campaigns for farmers.
- Prioritize investments in irrigation, storage facilities, transportation, and cold chain infrastructure to reduce post-harvest losses and improve productivity.
- Establish training and education programs to equip farmers and agricultural stakeholders with knowledge on modern practices, climate resilience, and market trends.
- Remove trade barriers, meet international quality standards, and negotiate better regional trade agreements to improve access to global markets.

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