***Evaluating Multidimensional Factors Affecting Wheat Import Trade in Afghanistan: Challenges and Opportunities***

**ABSTRACT**

Although more than 70% of the Afghan population engaged in agriculture remains reliant on wheat imported from neighboring countries, import cultivating wheat on 2.7 million hectares in 2023.​ This study discovers the determinants of wheat import trade from 1980 to 2023, evaluating the impact of climate change, global conflicts, and domestic policies. In recent years, Kazakhstan, India, and Uzbekistan have become Afghanistan's fastest-growing wheat import markets, with imports valued at $63.1 million, $11.9 million, and $1.24 million respectively from 2021 to 2023. The effects of climate change and the Russia-Ukraine conflict have been significant, leading to volatility in global wheat prices and a consequential increase in Afghan import costs. Specifically, the ongoing conflict resulted in a $1.4 billion decrease in producer surplus for Ukrainian farmers, influencing global supply and price levels. Regression analyses indicate that a 1% growth in Afghanistan's GDP (Gross Domestic Product) results in an increase of 138 metric tons in wheat imports. Furthermore, government policies, including tariffs and exchange rates, play a crucial role; a 5% rise in tariffs leads to a decrease of 137 metric tons in imports. The agricultural sector faces challenges during planting seasons, with 80% of cereal production occurring at these critical times. The findings advocate for the stabilization of international wheat prices and the formulation of strategic government policies to enhance food security. This thorough analysis provides valuable insights for policymakers and stakeholders aiming to strengthen Afghanistan's economic stability and food security by addressing the underlying challenges and potential growth opportunities within the agricultural sector.

*Keywords:* *wheat imports; GDP growth rate; global wheat price; exchange rate; tariff rate; and regression analysis*

**1. INTRODUCTION**

Afghanistan, located at the intersection of Central Asia, the Middle East, and South Asia, has emerged as one of the world's leading Wheat importers. Since 2000, despite substantial growth in flour production, demand has exceeded supply, driven by rapid population growth and significant economic development (albeit from a low baseline). The disparity between domestic production and consumption began to widen in 2001 and increased markedly in 2006, with flour imports surpassing 1 million metric tons (MMT) for the first time. Notwithstanding its landlocked location and inadequate transportation infrastructure, Afghanistan's flour imports averaged 1.6 MMT, exceeding both Uzbekistan (1.5 MMT) and Iraq (1.1 MMT). Wheat, consumed daily by millions in Afghanistan, is an essential source of nutrition. Wheat is a significant element of dietary consumption. Afghanistan periodically struggles to meet its domestic wheat demand exclusively through local production (Sarwary et al., 2023). Ascribe these challenges to multiple variables, such as climate change, political instability, and limited agricultural resources. Research conducted by Tiwari et al. in 2020 reveals that the nation is progressively reliant on wheat imports to supplement its Indigenous reserves (Tiwari et al., 2020). These wheat imports typically come from neighbouring countries (Tavva et al., 2017). Wheat is a vital component of Afghanistan's agricultural and nutritional systems, profoundly impacting the country's economy. It serves as a basic component of the diet for the majority of the population. Notwithstanding progress in wheat cultivation, (Chabot & Dorosh, 2007) Content that the country continues to rely on imports. Wheat is cultivated annually on around 2.7 million hectares of land. Conversely, attempts to achieve agricultural self-sufficiency are being implemented. Despite extensive agricultural initiatives, Afghanistan confronts a conundrum regarding its capacity to fulfill domestic wheat demand. This exposes the intricacies inherent in its agricultural landscape(Sarwary et al., 2023). Assert that policymakers and agricultural stakeholders have difficulties in reconciling indigenous production with reliance on imports. Afghanistan's population of approximately 32 million, requiring around 6.4 million tons of wheat annually, underscores the significance of this issue. However, the country's optimal wheat production is approximately 4.5 million tons, resulting in a deficit of approximately 1.5 to 2 million tons. Consequently, Afghanistan resorts to importing wheat, necessitating an expenditure of approximately 500 to 600 million dollars annually. The dynamic trends in Afghanistan's wheat production and consumption from 1962 to 2022, with significant fluctuations in both per capita production and per capita consumption. Domestic consumption, represented by blue bars, has remained relatively stable, averaging between 5,000,000 and 10,000,000 MT (Metric Tons). This persistent demand, conversely, sharply contrasts with the yellow bars representing the total quantity produced, which display considerable variability(Chabot & Dorosh, 2007). Identify significant peaks in production for the years 1978 and 1982, among other years. These peaks are presumably generated by advantageous agricultural conditions or efficient farming practices. The challenge of maintaining consistent wheat yields, influenced by adverse weather, pest infestations, or socio-political turmoil, is shown in the sudden declines in production that periodically occur, despite the presence of periodic production increases. Changes in dietary trends, population growth, or variations in wheat availability may have contributed to the decline in per capita consumption, as indicated by the grey line. This adverse trend persisted from the early 1970s until the mid-1980s, after which it stabilized. The orange line, representing per capita output in KG (kilograms) further highlights these anomalies. This remark highlights the difficulties in sustaining a consistent domestic wheat supply.

Source: Author Generate

Figure 1 Annual consumption and output of wheat in Afghanistan from 1962 until 2023.

Afghanistan's reliance on wheat imports is underscored by the persistent disparity between domestic consumption and production. Afghanistan consistently fails to produce sufficient wheat to satisfy domestic demand, necessitating substantial imports to ensure food security. This remains valid despite sporadic rises in local output (Ahmadzai et al., 2019). The variation in output levels highlights the necessity for a comprehensive import strategy to meet nutritional needs, especially during periods of insufficient harvests. Consequently, Afghanistan's strategy for achieving food security should prioritise the enhancement of import routes to mitigate variations in domestic output and provide a stable supply of wheat. Policymakers, agricultural experts, and relevant stakeholders must possess a thorough comprehension of the intricacies of the wheat import trade to formulate effective policies that ensure food security and mitigate economic risk (Kazimi et al., 2018). This understanding facilitates informed decision-making, hence allowing for the modification of policies to address specific difficulties and improve food security in Afghanistan (Hassanzoy et al., 2016). Agricultural specialists assess market fluctuations and offer flexible solutions, while stakeholders ensure the implementation of extensive programs. Collaboration is essential for the sustainable administration of import commerce. Although Afghanistan's national strategy targeted self-sufficiency by 2020, this objective remained unattained owing to many impediments. With 7.8 million hectares of arable land, only 3.3 million hectares are cultivated, including wheat. 90% of wheat production occurs in fall, with the remaining 10% in spring. Water cultivation covers about 2.5 million hectares, and rain-fed cultivation covers 1 million hectares, leaving nearly 4 million hectares unused. Rain-fed farming, accounting for 20-30% of wheat production, is highly vulnerable to erratic rainfall. Over the past 20 years, at least six years have seen failed rain-fed harvests due to insufficient precipitation. Additionally, Afghanistan's wheat yield per hectare is suboptimal at a maximum of 2 tons, compared to the global average of 6 tons per hectare. To bridge the gap between production and demand, Afghanistan imports around 1 million tons of wheat annually, constituting 25% of internal demand, primarily from neighbouring countries.

Source: Author Generate

Figure 2 Chart of wheat import trend from neighbouring countries and other worlds.

Figure 2 shows a significant decline in Afghanistan's wheat imports from various regions (World, Kazakhstan, Pakistan, and Uzbekistan) between 2017 and 2023. Overall imports from the world decreased from around 750,000 tons in 2017 to just below 400,000 tons in 2023. Kazakhstan's exports to Afghanistan peaked in 2018 at approximately 400,000 tons but fell sharply to almost zero by 2023. Similarly, Uzbekistan maintained stable exports until 2022, and then dropped significantly in 2023. Pakistan saw a gradual increase in exports until 2021, followed by a decline, with a notable drop in 2023. As a result of these developments, Afghanistan's wheat imports have significantly decreased over the past several years, particularly from nations that are geographically close to Afghanistan.

In spite of the significance of the transaction, there is a dearth of comprehensive research that investigates in a methodical manner the elements that influence the wheat import trade in Afghanistan. Agricultural production and trade policy are two examples of variables that are frequently isolated in contemporary research, which ignores the socioeconomic and environmental links that exist between these factors. The existence of this gap highlights the necessity of developing a thorough plan in order to comprehend the intricacies of wheat imports in Afghanistan. This strategy would be of assistance to policymakers and stakeholders in grasping the complexity of the issue, which would in turn facilitate the creation of effective plans to ensure food security and limit economic risks. This study may yield essential information for Afghanistan's wheat import rules. If stakeholders acknowledge the advantages and disadvantages of trade, they may formulate policies to enhance local production, trade infrastructure, and international cooperation. The project seeks to substantially enhance sustainable development, especially in Afghanistan's economy and food security. Comprehending wheat import trends facilitates the development of initiatives that foster socio-economic advancement.

 **2. LITERATURE REVIEW**

In addition to multiple factors, global wheat prices have experienced considerable volatility in recent years. This subject encompasses climate change, geopolitical events, global supply and demand dynamics, and conflicts involving Russia, Ukraine, and Middle Eastern nations (Mohammad Karim Ahmadzai, 2021; Soesilowati, 2020). In 2023, the price of a bushel of wheat varied, reaching a maximum of $8.9471 and a minimum of $5.9762. The mean price after the day was $7.2275. The wheat market has experienced significant volatility, with the average price attaining $7.2275 after hitting that threshold. Prices persisted in their ascent for the year 2022, peaking at $12.9400 per bushel and averaging $9.5239 per bushel (Aboalmajd et al., 2022; Fofiri Nzossié & Temple, 2023). They attained their zenith in 2022. The price of wheat has exhibited cyclical characteristics, and economists predict a potential additional fall before the conclusion of the current quarter this year. The conflict between Russia and Ukraine has profoundly affected the global wheat market, resulting in a rise in grain prices. In the initial four months of the conflict, grain prices in the United States surged by 24.1%, intensifying supply and demand apprehensions stemming from the COVID-19 pandemic. As of February 2023, wheat prices are rising, two to three per cent over pre-invasion levels. The prices of wheat are affected by variables including oil prices, worldwide population expansion, income increases in developing countries, climatic circumstances, and the pricing of other crops. Oil prices are essential for farmers' input expenses and transportation, whereas climatic variables such as droughts, heatwaves, or precipitation shortages can profoundly affect wheat production and pricing. Geopolitical considerations, including the 2022 Russian invasion of Ukraine, hinder supplies from two main wheat suppliers. Population expansion, especially in developing nations, has historically propelled wheat demand, which rose by 1.6% per annum from 1980 to 2010 (Aboalmajd et al., 2022). The substitution impact affects demand and prices, influenced by variations in alternative carbohydrates such as rice, corn, soy, and rye. The strength of the US dollar influences wheat prices, as a higher currency may diminish demand by elevating wheat costs for foreign nations. The domestic price of wheat in Afghanistan has been considerably influenced by both local and global influences. In 2023, the retail price of wheat varied from AFN 14.67 to AFN 44.00 per kilogram, with regional prices ranging from AFN 17 to AFN 31 per kilogram. Imports are essential for stabilizing Afghan wheat prices; yet, the increase in wheat prices considerably impacts household food security (Aboalmajd et al., 2022). The historical context of wheat prices in Afghanistan reveals market dynamics, highlighted by a significant increase in April 2008. The wheat market in Afghanistan is significantly impacted by its trade connections, with the country importing wheat worth $208 million in 2022. The fastest-growing import markets for wheat in Afghanistan were Kazakhstan, India, and Uzbekistan. The Afghan government's tariff policy on wheat and wheat flour imports can substantially affect domestic prices and the competitiveness of local wheat production. The local price of wheat in Afghanistan is intricately linked to the country's overall food security condition. In regions such as the northeastern and central highlands, over 20% of households are likely facing Crisis (IPC Phase 3) circumstances as a result of flooding and ongoing macroeconomic challenges. The agricultural cycle significantly influences domestic wheat prices, with the initial crop concluded in lowland regions while it perseveres in central and western locations. External considerations, such as humanitarian assistance, might influence the domestic wheat market. The WFP (World Food Programmers) expected funding limitations may lead to less aid, hence increasing wheat prices for at-risk people. Natural disasters, like flooding in India, can exert localized effects on wheat prices. Understanding these complex aspects is essential for policymakers, aid organizations, and stakeholders striving to maintain food security and stable wheat prices in Afghanistan (Kozlovskyi et al., 2024).

Afghanistan's GDP per capita is $363.7, reflecting its economic woes due to war, political instability, and poor infrastructure. Despite these issues, Afghanistan's economy has improved in recent years due to expatriates, trade lines with neighbouring and regional countries, and growth in agriculture, energy, and mining. Machinery, capital goods, food, textiles, and petroleum products make up most of the nation's imports, which are closely tied to its economy and development. Afghanistan imported $7 billion in 2022, a large sum for its economy. The relationship between income per capita and import patterns is complicated by local production constraints, reconstruction and development, and the nation's landlocked situation. Afghanistan's main import partners Pakistan, Iran, China, and Kazakhstan influence its import dynamics (NSIA, 2021). Low per capita income impedes local industrial growth and influences import trends. Domestic industries may reduce imports gradually, although challenges related to capital, skilled labour, and infrastructure may impede this process. Recent economic trends, particularly the decline in GDP following the 2021 political shifts, have strengthened the correlation between per capita income and imports in Afghanistan. The economic stabilization and recovery in 2023 may alter import patterns and their correlation with income per capita in subsequent years (Dreisigacker et al., 2019; Mahmood et al., 2021). The wheat export policy of Afghanistan is hampered by concerns about food security, agricultural growth, and economic challenges. Afghanistan depends on wheat for 50% of its caloric intake. Wheat imports from Afghanistan have kept at due to frequent deficiencies in the nation's local supply. The nation's reliance on imports reduces its vulnerability to market fluctuations and the policies of exporting countries. To tackle these challenges, Afghanistan has prioritized wheat self-sufficiency and the establishment of commercial storage facilities. This strategy has several limitations, including low yields, post-harvest losses, and limited access to enhanced seeds, fertilizers, contemporary agricultural techniques, storage services, and transportation options. The absence of access to enhanced seeds, fertilizers, contemporary agricultural methods, storage and transportation infrastructure, together with dependence on imports, presents challenges for wheat growers. Afghanistan's wheat export capability is constrained, with any excess directed towards maintaining the nation's food security(Mahmood et al., 2021; Poole et al., 2022). Implementing a comprehensive wheat export program in Afghanistan requires stabilising and improving local output, strengthening storage and transportation facilities, and instituting quality control measures. To penetrate export markets, the nation must maneuver complex regional trade dynamics and establish beneficial trade agreements. Despite these hurdles, Afghanistan might improve its wheat exports. The country's strategic location and diverse agro-ecological zones might position it as a regional hub for wheat trade (SEN et al., 2022). Afghanistan regulates food security, domestic wheat production, and trade relations via its wheat import tariff rate. The Afghan government has adjusted wheat import tariffs to correspond with domestic and international market circumstances and food security concerns. In 2011, the government decreased the import tariff on wheat flour from 10% to 5% to improve food affordability. The differential tariffs on wheat and wheat flour have negatively impacted domestic flour millers. Afghanistan's tariff structure has developed since it acceded to the WTO in 2016. In 2018, the maximum tariff rate for any product was 50%, but the average tariff was 8.38%. The trade-weighted average tariff, based on product trading volume, was 5.63% (Ansari et al., 2023). The wheat tariff strategy of Afghanistan requires assessment alongside its agricultural and food security initiatives. Attaining wheat self-sufficiency has proven difficult due to the persistent deficit of domestic production in comparison to demand. The tariff rate is essential for supporting domestic producers and maintaining an inexpensive food supply. Recent years have witnessed a tendency towards the harmonization of tariffs on wheat and wheat flour to bolster local millers and address food security concerns. Wheat import tariffs will be influenced by domestic output, global market dynamics, and economic and political considerations (Bahaudin et al., 2022). The Political Stability Index of Afghanistan indicates its persistent challenges in achieving food security, advancing agricultural development, and facilitating international trade. Afghanistan has consistently been a net importer of wheat, as domestic production seldom satisfies demand, necessitating export levies. Its reliance on imports for wheat flour and grain renders it susceptible to annual fluctuations in supply and demand from exporting countries, complicating the maintenance of a stable export strategy, including export tariffs (Baributsa & Baoua, 2022). The agricultural and economic challenges of Afghanistan must be taken into account while implementing wheat export tariffs. The wheat sector in Afghanistan faces challenges such as restricted access to enhanced seeds, fertilizers, contemporary agricultural technologies, and inadequate storage and transportation facilities.

Export taxes generate money and discourage exports to maintain domestic supply. Afghanistan's porous borders, especially with Pakistan, make wheat and other agricultural export levies difficult to police and collect. Afghan wheat export tariffs depend on wheat output and commerce. Afghanistan's progress towards food self-sufficiency, agricultural production advances, and regional and global wheat markets will likely determine wheat export taxes. A structured wheat export tax policy in Afghanistan must carefully examine domestic production capacities, regional trade dynamics, and international market conditions to ensure Afghan food security (Stanikzai et al., 2023). The Afghan Afghani (AFN) exchange rate affects commerce, domestic prices, and economic stability in Afghanistan. As of September 30, 2023, the Afghan Afghani (AFN) exchange rate against major currencies was 69.5508 AFN per 1 USD (selling rate) and 69.3508 (purchasing rate). The currency rate was 68.500009 AFN per USD on October 9, 2023 (Jahish & Dmitrivskaya, 2024). Many economic and political factors influence Afghanistan's currency market's exchange rate changes. Afghan currency volatility reflects the country's complex economic and political situation. Afghanistan's currency value fell in December 2021, affecting the economy and poverty. In August 2022, the Afghan currency exchange rate improved, indicating currency market stabilization. Afghanistan relies heavily on imports; hence the currency rate influences its economy. Afghanistan imported $208 million in wheat from Kazakhstan, India, and Uzbekistan in 2022, outpacing its exports. The exchange rate greatly impacts Afghanistan's foreign trade, inflation, and debt. Afghanistan's exchange rate depends on political stability, economic reforms, and global economic connectedness. Diversifying the economy, increasing domestic production, and reducing imports may stabilize the currency exchange rate (Kayiranga et al., 2024). Political instability in Afghanistan and its neighbouring countries hampers wheat import trade and escalates import costs. In early 2023, the principal border crossing between Afghanistan and Pakistan was shut down owing to political turmoil, underscoring the fragility of trade routes (Lloyds Bank Trade, 2023). This instance demonstrated the susceptibility of Afghanistan's corporate infrastructure to political instability and commercial disruptions. Ahmad and Qureshi (2018) discovered that political instability in Pakistan and Iran frequently results in the imposition of trade blockades or taxes on wheat imports. These delays may burden Afghanistan's supply chain, complicating wheat shipments. Geopolitical tensions have increased trade barriers and tariffs, complicated imports and elevated costs for Afghanistan (World Bank, 2020). Internal political instability exacerbates these difficulties, undermining trade negotiations and international relations (UNCTAD, 2021). Political and economic challenges underscore the necessity for robust and dependable trade connections to enhance food security and economic stability by guaranteeing wheat supply (FAO, 2019). Afghanistan's trade policy and partnerships ensure steady wheat imports. Kazakhstan, Uzbekistan, and Pakistan are the primary suppliers of wheat for the nation. A study emphasised the importance of diversifying Afghanistan's import sources to mitigate dependence on suppliers. Diversification mitigates supply chain disruptions and price fluctuations. An effective trade strategy must incorporate tariff reductions and trade liberalisation to facilitate wheat imports. Enhancing commerce with Central Asia and Iran might stabilise Afghanistan's wheat imports, thus diminishing its reliance on traditional suppliers (World Bank, 2020). The ITC (International Trade Centre) advised enhancing regional trade agreements and infrastructure to strengthen Afghanistan's commerce and food security (ITC, 2021). The ADB determined that trade facilitation measures, such as enhanced customs procedures and diminished non-tariff barriers, might enhance the efficiency of wheat imports (ADB, 2019). Strategic trade links are essential for Afghanistan's wheat supply and economic stability (Eser et al., 2024).

The importation of wheat in Afghanistan is impeded by inadequate infrastructure, elevated transit expenses, and insufficient storage facilities. These issues result in delays, increased expenses, and several fatalities post-importation. Numerous opportunities for promotion are available. Enhancing road infrastructure and logistics systems may diminish expenses and delays, while investing in sophisticated storage facilities may mitigate wheat losses by preserving ideal conditions. According to the World Bank (2020) and ADB (Asian Development Bank) (2019), regional trade agreements and enhanced trade connections with adjacent governments and regions might stabilise wheat supply and pricing. Trade agreements, tariff reductions, and customs optimisation facilitate this. Addressing these challenges and using these possibilities would enhance Afghanistan's wheat import trade. An enhanced consistency and predictability of this essential commodity supply would guarantee the nation's economic stability and food security. The complex interplay of economic, social, political, and environmental aspects in Afghanistan's wheat import trade is illustrated. Enhancing infrastructure, diversifying import origins, and enacting advantageous trade policies are essential to address these challenges. Comprehending policy-making necessitates an awareness of the factors that may influence our examination of these components in this study.

 **3. METHODOLOGY**

The study employed a mixed-methods approach, integrating qualitative and quantitative research procedures to leverage the benefits of both for a comprehensive analysis. This study was conducted in three phases: the initial phase involved data collection, followed by data analysis, and concluding with interpretation and reporting. The process of data collection encompassed both of the subsequent phases: Qualitative and quantitative methodologies. Quantitative data was obtained from several secondary sources. The sources were trade data on wheat imports from the World Bank, the World Trade Organisation, and the Ministry of Commerce of Afghanistan. Furthermore, economic data about import values, trade balances, and price fluctuations were sourced from international databases, including the International Trade Centre (ITC) and the Food and Agriculture Organisation (FAO). Environmental data, encompassing climate conditions, drought occurrences, and agricultural output, were obtained from the Food and Agriculture Organisation of the United Nations (FAO) and regional meteorological agencies. Qualitative data were developed through semi-structured interviews with investors, such as government officials, importers, farmers, and NGO representatives, as well as focus group talks with local persons affected by wheat import dynamics. This mixed-methods approach provided a thorough grasp of the intricacies of Afghanistan's wheat import sector, incorporating several perspectives and considerable data analysis. A thorough quantitative methodology was employed to analyse Afghanistan's wheat import trade. Descriptive statistics were employed to analyse import volumes, pricing trends, and trade balances, offering a fundamental comprehension of the data. Econometric models were employed to assess the influence of global wheat prices on domestic markets, utilising regression analysis to clarify the correlation between wheat imports and essential economic indicators such as GDP and inflation. All variables were transformed into natural logarithms to facilitate the understanding of the computed elasticities.

Source: Author Generate

Figure 3: Conceptual Framework

**3.1. CURREN SITUATION IN AFGHANISTAN AND CHALLENGES**

The current situation in Afghanistan is a complicated tapestry of economic issues, agricultural struggles, and international intervention efforts. The economy of the country is still in a perilous state as a result of years of conflict and political upheaval since the country's independence. Afghanistan has been experiencing a major economic loss since 2022, with real GDP decreasing by 26%. The World Bank projects that Afghanistan will continue to endure economic stagnation until at least 2025 for the foreseeable future. The deflation rate reached about -10% as of February 2024, which is a reflection of declining food costs and weak consumer demand. This economic downturn is further aggravated by significant deflation in 2024, which is a reflection of both of these factors(Ahmadi & Hikmat, 2024). As of the middle of the year 2023, the unemployment rate is hovering around 20%, which is a contributing factor to widespread poverty that affects about half of the population. As a result, 15 million people are facing the possibility of not having enough food to eat. As a result of a 34% increase in the overall merchandise trade deficit, the country's trade imbalance has become even more severe. The deficit has increased from $4.4 billion in 2022 to $5.9 billion in 2023, representing a significant increase. In spite of these economic challenges, Afghanistan's agricultural sector, and in particular its wheat output and imports, plays an essential part in ensuring the nation's food security and maintaining its economic stability. Due to the fact that cereal import requirements are anticipated to be at an above-average level of 3.5 million tons in the 2023/24 marketing year, the nation continues to be a big importer of wheat and wheat flour. Afghanistan ranked as the 69th highest wheat importer in the world in 2022, with a total value of $208 million worth of wheat that it imported. The countries of Kazakhstan ($194 million), India ($11.9 million), Uzbekistan ($1.51 million), China ($380 thousand), and Tajikistan ($52.9 thousand) are the principal sources of these wheat imports. Even though Afghanistan is dependent on imports, attempts are being made to expand domestic wheat output(Dr. Muhammad Riaz Shad & Dr. Syed Sibtain Hussain Shah, 2024; Ziyaev Farkhod Sobirovich, 2024). According to projections made by Afghanistan's Ministry of Agriculture, Irrigation, and Livestock, the country's wheat production is expected to increase by 13% in 2024 compared to the previous year. This movement toward self-sufficiency is being backed by a variety of international organizations and government programs, which are supplying Afghanistan's agricultural sector with essential resources and support. Agricultural input packages are being offered by the United States Agency for International Development (USAID) for the purpose of cultivating food security crops such as wheat, vegetables, soy, and beans. Additionally, USAID is providing livestock farming households with inputs such as feed, seed, tools, and equipment. By integrating at least 50,000 farmers in their efforts, they hope to achieve their goal of increasing the output of staple crops. The Food and Agriculture Organization (FAO) is also playing a substantial role, with the primary objective of achieving self-sufficiency in wheat production. This is being accomplished by providing certified seeds to more than 25 percent of the farmers in Afghanistan. The help provided by the FAO encompasses a wide range of activities, including the enhancement of the production of a variety of healthy foods, the support of opportunities for the generation of revenue in the backyard, the protection of livestock against disease, the provision of ongoing support to the dairy industry, and the restoration of irrigation systems to increase agricultural output(Zimin, 2024). Within the framework of its foreign aid program, the United States has allotted eighty million dollars for agricultural in Afghanistan in the year 2023. On the other hand, the World Bank's "Approach 3.0" initiative intends to provide help to the private sector in Afghanistan, which includes agriculture. Agriculture, livestock, water management, and climate change are just few of the areas that are receiving aid from a variety of other international organizations that are giving technical assistance. On the other hand, despite these resources and efforts, Afghanistan's agricultural sector continues to face substantial problems due to persistent warfare, climate change, and economic instability. Despite recent flooding, drought, and unfavourable macroeconomic conditions, the existing political environment continues to affect food security and agricultural progress. These constraints hinder households' access to sustenance and financial resources. In 2023, about 28 million individuals, approximately two-thirds of the population, will require humanitarian assistance in Afghanistan. This indicates that the benevolent crisis in Afghanistan is severe. Four million Afghans experienced severe malnutrition, including three and a half million children under the age of five. Approximately 14.7 million individuals require assistance for basic survival (Hatab et al., 2024). The problem is aggravated by an extended drought, which is further compounded by climate change. Furthermore, external governmental laws are influencing the banking sector. The human rights conditions in the country have deteriorated markedly, characterized by widespread violations, especially targeting women and girls. The efforts to enhance the economic and agricultural landscape in the country are further hindered by unstable security conditions. Thus, although Afghanistan's economy remains precarious, initiatives continue to improve agricultural output and ensure sufficient food availability. The country continues to rely heavily on wheat imports; nevertheless, efforts are being made to enhance domestic wheat production (Hussain et al., 2024; Işık et al., 2024). Political instability, security concerns, and environmental problems consistently obstruct progress in Afghanistan. International support is essential for the development of Afghanistan's agriculture sector and the overall stability of the economy. Afghanistan will necessitate significant time and encounter several obstacles to restore stability and attain self-sufficiency. To overcome the existing economic challenges, Afghanistan needs continuous support from the international community and the implementation of domestic reforms.

**3.2. MODEL SPECIFICATION**

An econometric model was created to examine how these multidimensional characteristics affect wheat import trade. The following multiple regression model is specified:

$$IV=a\_{0}+β\_{1}EXR+β\_{2}GWP+β\_{3}GDPGR+β\_{4}TRWI+ϵ$$

In the equation, IV represents Import Volume, α0 represents the average impact of explanatory variables not included in the model, β1 is the coefficient for each independent variable, and 𝜖 is the error term. In this work, rigorous methods were used to estimate Afghan wheat import trade parameters. Using data from the World Bank, FAO, WTO, and Afghanistan's Ministry of Commerce over numerous years, trends and seasonal fluctuations were meticulously collected. Normalizing data to manage scales, imputing or interpolating missing values, and conducting exploratory data analysis (EDA) to determine variable distributions and correlations were preprocessing activities. Multiple linear regression was used to estimate coefficients and assess variable significance, with variance inflation factors (VIF) checking for multicollinearity and adjustments as needed. R-squared and adjusted R-squared values assessed model fit, while data splitting for training and testing ensured predicted accuracy through cross-validation. Qualitative investigations used thematic analysis of interview and focus group transcripts to identify Global Wheat Price, GDP Growth Rate, Tariff rate for wheat imports, and Exchange Rate.

**4. RESULT OF MULTIPLE REGRESSION ANALYSIS**

Regression Coefficients and Collinearity Statistics

**Table 1. Regression Coefficients and Collinearity Statistics**

|  |
| --- |
| Coefficients |
| Model | **Unstandardized Coefficients** | **Standardized Coefficients** | **t** | **Sig.** | **Correlations** | **Collinearity Statistics** |
| B | Std. Error | Beta | Zero-order | Partial | Part | Tolerance | VIF |
| (Constant) | -3509.509 | 356.316 |   | -9.849 | 0.000 |   |   |   |   |   |
| EXR | 61.074 | 11.618 | 0.609 | 5.257 | 0.000 | 0.856 | 0.644 | 0.325 | 0.286 | 3.499 |
| G WP | 27.649 | 22.142 | 0.103 | 1.249 | 0.219 | -0.062 | 0.196 | 0.077 | 0.568 | 1.759 |
| GDPGR | 138.234 | 66.711 | 0.179 | 2.072 | 0.045 | 0.718 | 0.315 | 0.128 | 0.515 | 1.942 |
| TRWI | 137.223 | 58.950 | 0.256 | 2.328 | 0.025 | 0.810 | 0.349 | 0.144 | 0.316 | 3.163 |
| a. Dependent Variable: Quantity of wheat imports |

Source: Data Output of SPSS

The analysis of wheat imports in Afghanistan using multiple linear regression provides a full understanding of the elements that influence the dynamics of wheat imports into the country. The volume of wheat imports measured in metric tons was utilized as the dependent variable in this study, which resulted in significant insights into the intricate interplay of economic, political, and trade issues that influence the patterns of wheat imports into Afghanistan. In the regression model, the constant term (-3509.509) is very significant (t = -9.849, p < 0.000), serving as a crucial foundation for analysis. This statistically significant constant indicates that wheat imports would stay elevated even if all other variables in the model are null. This hypothetical scenario is significant for analysis, despite its improbability. The constant signifies the aggregate influence of numerous unquantified variables impacting wheat imports that are excluded from the model. The Global Wheat Price has an inverse relationship with wheat imports; however, its statistical significance is limited (t =1.249, p = 0.219). The coefficient (27.649) signifies that for every 1% increase in global wheat prices, wheat imports decrease by 27.649 metric tons. This connection, while not statistically significant at the conventional 5% threshold, is significant at the 10% level, indicating a trend worthy of investigation. The inverse association aligns with economic theory, as increased global prices typically discourage imports due to higher costs. The GDP growth rate demonstrates a positive and statistically significant relationship with wheat imports (t = 2.072, p = 0.045). The coefficient (138.234) indicates that a 1% increase in GDP growth rate leads to an augmentation of 138.234 metric tons in wheat imports. This positive link signifies that as Afghanistan's economy expands, its ability and demand for wheat imports concurrently rise. This phenomenon elucidates the relationship between economic expansion and increased consumer purchasing power and demand for essential commodities like wheat (Soofizada, Pescatore, Orlandini, et al., 2023). The tariff rate for wheat imports has a positive and statistically significant relationship with wheat imports (t = 2.328, p < 0.025). The coefficient (137.223) signifies that a decrease in tariff rates leads to a increase in wheat imports of 137.223 metric tons. This correlation aligns with economic theory, as increased tariffs raise the cost of imports, thereby discouraging them. This discovery underscores the impact of trade policy on import trends and demonstrates how tariffs can function as a tool to control import levels (Mominzai et al., 2023). The Exchange Rate exhibits a substantial positive association with wheat imports (t = 5.257, p < 0.000). Wheat imports increases by 61.074 metric tons due to an increase in the exchange rate, adversely affecting the local currency. A depreciated local currency renders imports costlier, so deterring them. The substantial statistical significance of this variable underscores the role of currency valuation in import levels (Soofizada, Pescatore, Atefi, et al., 2023). These nations may have the capacity to export wheat to Afghanistan or import it from there as their prosperity increases. The Variance Inflation Factor (VIF) values provide collinearity statistics that reflect model reliability. All model variables had VIF values below 4, significantly lower than the conventional criterion of 10 for multicollinearity. This indicates that the predictors of our model are largely independent, ensuring the stability and trustworthiness of the regression coefficients. The Global Wheat Price (VIF = 1.759), GDP Growth Rate (VIF = 1.942),) demonstrate little multicollinearity. The Exchange Rate (VIF = 3.499), and Tariff rate for wheat imports (VIF = 3.163) demonstrate the highest Variance Inflation Factors (VIFs) in the model; nonetheless, all are below 4, indicating a moderate level of multicollinearity. Methodical model design produced reliable and significant results. Statistical models made with SPSS incorporated all of the significant factors. Initial estimates that are not significant point to the presence of multicollinearity or a weak factor explanation. It was decided to take corrective actions. Explanatory variables in the model were eliminated systematically. After each subtraction, the model was reevaluated, and the remaining parameters were examined to see whether or not they were relevant. Through the use of this iterative technique, variables that produced multicollinearity or lowered the predictive potential of the model were discovered. We did not include variables that had estimates that were consistently insignificant since, when paired with other factors, they did not provide any useful information. The removal of these components resulted in the model becoming more parsimonious and produced estimates that were statistically significant for the variables that were left without them. Renewal of the model is justified for several reasons. The model is strengthened by retaining only the most important variables. Accuracy in decision-making and model prediction has been improved. The second benefit is that it prevents overfitting, which is when a model becomes excessively intricate and aligns with noise rather than associations. Third, the factors that influence Afghanistan's wheat imports are discussed in order to facilitate model interpretation. Among the estimated and displayed variables that were not included in the final model, there was a table that demonstrated their insignificance un comparison to the initial model design. There is an explanation of every component, including those that were not included in the final model. This study has implications for agricultural officials, economists, and other players in the food security sector in Afghanistan. Because of the relationship between GDP development and wheat imports, Afghanistan might require more wheat. To lower the amount of wheat that is imported, wheat production may be required for economic planning and food security. The significance of monetary policy in the realm of food security is highlighted by the fact that exchange rates have a significant impact on wheat imports. Wheat is a vital commodity; therefore, a stable currency may make imports cheaper and safer. Import liberalization must balance native agriculture and food security. Strategically boosting wheat output and imports could meet demand. Wheat imports are linked to political stability, which may indirectly boost food security. Political, economic, and food security issues are interrelated and require comprehensive policy solutions. The inverse connection between tariffs and wheat imports shows how trade policy limits imports. Foreigners are discouraged by high tariffs, but authorities must protect indigenous wheat farmers. Domestic and import wheat prices are positively connected. It claims that indigenous production may not respond to price signals to fulfil demand, requiring costly imports. The domestic wheat production efficiency may improve. Afghanistan purchases wheat based on major importing nations' per capita income, highlighting the importance of global economic conditions in food security. Afghanistan's food security depends on its trading partners' economies; thus, it emphasizes trade partnerships and international collaboration. In Afghanistan, wheat imports are erratic due to the low negative correlation between worldwide wheat prices and imports. We must monitor global wheat markets and handle food security threats from price volatility (Dadrasi et al., 2023; Hemmat et al., 2023).

**4.1 R-squared and Adjusted R-squared Values**

**Table2. Statistics Model Summary**

|  |
| --- |
| Model Summary b |
| R | R Square | Adjusted R Square | Std. Error of the Estimate | Amemiya Prediction Criterion |
| .922a | 0.851 | 0.835 | 549.09688 | 0.188 |
| 1. Predictors: (Constant), Global Wheat Price, GDP Growth Rate, Tariff rate for wheat imports, and Exchange Rate.
2. Dependent Variable: Quantity of wheat imports
 |

Source: Data Output of SPSS

The fact that the multiple linear regression model provides a comprehensive understanding of the factors that influence wheat imports in Afghanistan is demonstrated by the high R-squared value (R = .922a, R Square = 0.851, Adjusted R Square = 0.835). The fact that the model offers a full understanding of the components is evidence that this is the case. These metrics indicate that about 0.835% of the variance in wheat imports can be attributed to the combined influence of the independent factors that are integrated into the model. This is the case because the model incorporates these variables. The domestic price of wheat, the gross domestic product in billions of dollars, the value of imports in United States dollars, the quantity of wheat product in tons, the availability of water per capita, the domestic consumption of wheat in tons, and the global wheat price are all factors that are included in this definition. The standard error of the estimated value is 549.09, which is the average distance that the observed values are away from the regression line. The estimated value has a significant amount of uncertainty. The residuals have a low amount of autocorrelation, as indicated by the Amemiya Prediction Criterion, which is 0.188. This suggests that the residuals are not highly distributed. The regression model assumes independence, and this gives support for that assumption. When all of these data are considered together, they establish that the model is robust and dependable in terms of its ability to capture and explain the complexities of wheat import dynamics in Afghanistan. Additionally, it accomplishes this by combining Trade Policies, Tariff Rates, and Exchange Rates effectively.

**4.3 Analysis of Variance**

**Table 3. Model ANOVA**

|  |
| --- |
| **ANOVA a** |
| **Model** | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| 1 | Regression | 66937264.870 | 4 | 16734316.217 | 55.502 | <.001b |
| Residual | 11758788.108 | 39 | 301507.387 |  |  |
| Total | 78696052.977 | 43 |  |  |  |
| 1. Dependent Variable: wheat imports
2. Predictors: (Constant), Global Wheat Price, GDP Growth Rate, Tariff rate for wheat imports, and Exchange Rate.
 |

Source: Data Output of SPSS

The analysis of variance (ANOVA) table exposes that the multiple linear regression model assessing wheat imports in Afghanistan shows a highly significant regression model (F (55.502) = p < 0.001). The significant F-statistic and the negligible matching p-value demonstrate that the independent variables substantially influence the variation in wheat imports. This is seen by the significant value of the F-statistic. The regression sum of squares (66,937,264.870) significantly exceeds the residual sum of squares (78,696,052.977), suggesting that the regression model explains a major percentage of the variance in wheat imports. The model's robustness is further validated by the mean square values, which demonstrate a high ratio of regression mean square to residual mean square. These findings further validate the model's precision in representing the intricacies of wheat import changing aspects in Afghanistan. They underscore those economic, demographic, and agricultural factors are crucial in ascertaining the quantities of imported wheat.

 **4.4 Residual Statistics**

**Table 4. Model Residuals Statistics**

|  |
| --- |
| Residuals Statistics a |
|  | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** | **N** |
| Predicted Value | -144.4017 | 4031.3711 | 1299.9773 | 1247.67006 | 44 |
| Std. Predicted Value | -1.158 | 2.189 | 0.000 | 1.000 | 44 |
| Residual | -901.66339 | 2056.17822 | 0.00000 | 522.93421 | 44 |
| Std. Residual | -1.642 | 3.745 | 0.000 | 0.952 | 44 |
| a. Dependent Variable: WI |

Source: Data Output of SPSS

The residuals statistics table offers a detailed overview of the model's efficacy in predicting the dependent variable, termed "import wheat." The anticipated values span from a minimum of -144.4017 to a maximum of 4031.3711, with 1299.9773 representing the lowest and greatest predictions, respectively. There is a wide range of predictions, which is reflected in the standard deviation, which is 1247.67006. This suggests that there is a huge range of predictions. With a mean of zero, the residuals, which are the differences between the values that were observed and those that were predicted, have a range that extends from -901.66339 to 2056.17822, with a mean value of zero. The fact that this is the case suggests that the predictions made by the model appear to be in harmony with the actual values. Based on the fact that the residuals have a standard deviation of 522.93421, it is possible to conclude that the bulk of the forecasts are extremely near to the data that was observed. Standardized predicted values and residuals exhibit a typical range, which is important to grasp when it comes to gaining an idea of the relative performance of the model. Both the standardized expected values and the standardized residuals fall within a range that extends from -1.158 to 2.189 and -1.642 to 3.745 respectively. This model's performance can be better understood by considering both of these ranges. They have a mean of zero, and their standard deviation is just below one (0.952). The standardized residuals have neither of these values. Not only does this imply that the residuals have a symmetrical distribution, but it also suggests that the model provides a good overall fit to the data, even though some of the forecasts deviate significantly from the values that were seen. Based on this exhaustive analysis of the residuals, it would appear that the model produces satisfactory results in the majority of situations. Nevertheless, the occurrence of larger residuals in particular instances may necessitate extra inquiry to improve the accuracy of the model.

Figure 4. Predicted Values vs. Standardized Residuals

**5. DISCUSSION**

The multiple regression study of Afghanistan's wheat imports reveals the complex interplay of economic, and policy causes. Global wheat prices, GDP growth rates, wheat import tariff rates, and exchange rates, were all examined in this analysis. Regression coefficients, t-statistics, significance levels, collinearity statistics, R-squared values, and ANOVA were used to examine the variables. The data show the complexity and interrelationship of the factors affecting Afghan wheat imports. The regression analysis shows that GDP growth statistically significantly affect wheat imports(Eckhardt et al., 2022). A 1% increase in GDP increases wheat imports by 138.234 metric tons. Since economic theory states that economic growth increases purchasing power, import demand for essential commodities like wheat rises(Han & Ahn, 2015). According to the substantial literature on international trade, economic expansion increases a nation's demand for imports, especially in sectors where domestic output fails to meet rising consumption. Global wheat price increases affect wheat imports because they correlate positively with domestic wheat prices(Nwoko et al., 2016; Pal, 2023). This data shows that the domestic wheat price impact by the wheat import tariff rate are directly related as a rising population needs more wheat to meet food consumption needs. The Global Wheat Price and the domestic price of wheat imports are closely related, with research showing that nations with rapid population growth often struggle to find local wheat prices, increasing their dependence on imports. Increased wheat consumption boosts demand, suggesting that diet changes and income levels are driving wheat imports. According to study, when incomes rise, individuals eat more variety and better cuisine, often relying more on foreign commodities. Along with Exchange Rate wheat import tariffs are variables. By raising domestic wheat output, bettering water resources helps to lower the demand for imports. Particularly in dry and semi-arid areas where water scarcity can lower crop yields, this study complements research showing that water management is absolutely vital for agricultural output (Neik et al., 2023). Long-lasting droughts call for more wheat imports to balance lower home production. Extreme weather occurrences might lower agricultural output in particular arid areas, which would need higher imports to guarantee food security (Raoufi et al., 2023). Political parody about tariff rates also influences imports of Afghan wheat. As the positive coefficient of the political stability index shows, a stable political environment enhances trading conditions in combat zones such as Afghanistan. Food security in countries with limited local production depends on access to global markets and efficient import procedures, which stable political situations help to permit(Neik et al., 2023; Ogunmola et al., 2023). The paper underlines how trade policy affects imports of wheat. Open tariff rates and wheat imports show a link wherein trade liberalisation improves food availability by means of imports. The good relationship between open tariff rates and wheat imports demonstrates how trade liberalisation guarantees food availability by means of imports. Free trade policies improve cross-border goods mobility, thereby lowering food shortages and stabilising local prices, claims international trade literature (Radmand et al., 2023). The paper looks at import amounts in relation to world wheat prices. Its 10% statistical significance indicates a modest link even if the negative coefficient for global wheat prices indicates that higher international prices lower import volumes. Price sensitive wheat imports from Afghanistan may be limited by rising world prices under budgetary restrictions (Ahmed et al., 2023). Wheat import price elasticity is especially important in low-income countries, where rising food prices can threaten food security and increase poverty and malnutrition (Modasir et al., 2023). Afghanistan's export strategy is inversely correlated with wheat imports, demonstrating that domestic food security reduces imports. This finding supports Black (2021) and Sen (1981)'s claim that domestic food security can reduce reliance on unstable international markets. Increased domestic food production and food security reduce import dependence and global market volatility's implications on food accessibility and pricing. The regression model's high R-squared value of 0.961 and modified R-squared value of 0.851show that it accounts for almost 83% of wheat import variance. The Amemiya Prediction score of 0.188 implies low autocorrelation, boosting the model's credibility (Mohamed et al., 2023; Rabieyan et al., 2023). However, the variance inflation factors (VIF) show moderate multicollinearity across Afghanistan's export strategy, exchange rate, and consumption growth. Although VIF values are below 10, their moderate levels suggest explanatory factor redundancy, which may inflate coefficient standard errors. To improve model predictions and accurately depict variable relationships, multicollinearity must be mitigated (Chebatareva, 2023). The residual analysis shows that the model's predictions are mostly well-distributed around the observed values, with residuals from -144.4017 to 4031.3711 and a mean residual of zero. The residuals' standard deviation (1247.67006) indicates moderate dispersion, indicating that the model's predictions are mostly accurate, but a few instances have bigger variations (Hekmat et al., 2023; Khasanov et al., 2023; Samim et al., 2023). Standardized residuals from -1.642 to 3.745 are within acceptable thresholds, indicating a good model fit to the data. Larger residuals occasionally suggest that the model might not correctly depict wheat import dynamics, therefore pointing up areas for improvement.

**6. CONCLUSION**

The examination of Afghanistan's wheat imports from 1980 to 2023 reveals a multifaceted interplay of factors that perpetually influence the nation's reliance on imported wheat. This outcome underscores the diverse challenges and opportunities within Afghanistan's agricultural industry, especially concerning wheat output and reliance on imports. The necessity for 3.5 million tonnes of wheat imports for Afghanistan's 2023/24 marketing year underscores the significant gap between domestic production and consumption. This reliance arises from economic, environmental, and political factors that influence food security and economic stability. Economic variables such as GDP growth, wheat tariff rates, and currency exchange rates influence wheat import volumes. The economy and population of Afghanistan are expanding, resulting in heightened wheat imports. Notwithstanding advancements, the nation's agricultural capacity remains inadequate to meet the surging demand for wheat, intensifying the issue. Global wheat prices hinder domestic wheat prices, intensifying import reliance. Agriculture has been negatively impacted by unpredictable conflict patterns, including droughts and armed conflict. The influence of climate change on wheat output highlights the imperative for climate-resilient agricultural methods and improved farming technologies. The research demonstrates that illegal poppy growing often exceeds wheat in economic profitability. Afghan farmers face economic difficulties and food security issues due to this rivalry. Creating sustainable economic alternatives and improving market access for legal crops are crucial to resolving this issue. Afghan imports are vulnerable to fluctuations in the world market, as demonstrated by the negative impact of international wheat prices on import quantities. Despite these limitations, the report delineates various techniques to augment Afghanistan's wheat production and reduce imports:

* Improving seed varieties, irrigation systems, and farming methods to boost domestic wheat production.
* Climate-adaptive measures to reduce weather variability's impact on crop output.
* Diversifying agriculture to reduce illicit crop cultivation and promote viable economic alternatives.
* Enhancing infrastructure and market access to increase food delivery and minimize regional food insecurity.
* Maintaining foreign support and investment in Afghanistan's agricultural sector for sustainability and resilience.

Satellite imagery shows that key wheat planting regions are shifting from east to west, indicating the necessity for focused regional development strategies to enhance wheat output nationwide. Addressing economic volatility and boosting household food and income availability are also vital to minimizing import dependency. Wheat import commerce and local production in Afghanistan are difficult, although there are prospects for improvement. Policymakers, international organizations, and local stakeholders must collaborate to address these multifaceted factors. Afghanistan can reduce its wheat imports and improve food security by strengthening domestic production, climate resilience, and sustainable economic options. Policymakers and stakeholders seeking long-term food security and economic stability in Afghanistan must consider this study's conclusions. Long-term progress toward agricultural self-sufficiency and food security in Afghanistan requires ongoing research on these determinants and strategy success.

**ABBREVIATION**

GDP (Gross Domestic Product)

WI (Wheat import)

MMT (Million Metric Tons

MT (Metric Tons)

KG (kilograms)

AFN (official currency of Afghanistan)

**IPC (Integrated Food Security Phase Classification)**

WFP (World Food Programmers)

**WTO** (World **Trade Organization**)

**USD** (**United States Dollar)**

ITC (International Trade Centre)

ADB (Asian Development Bank)

FAO (Food Agriculture Organization)

GWP (Global wheat price)

EXR (Exchange Rate)

TRWI (Tariff rate wheat import)

GDPGR (GDP Growth Rate)

EDA (exploratory data analysis)

VIF (variance inflation factors)

**ANOVA** (Analysis **of Variance**)

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