

## Impacts of Economic Policies on Agricultural Commodity Development in Afghanistan

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**ABSTRACT:** To achieve strategic growth, a nation's agricultural production and distribution systems must be managed in careful consideration of broader economic dynamics. It is therefore essential that government policies are formulated to harmonize with these critical components of the national economy. Within Afghanistan, the agricultural sector stands as a foundational pillar of the economy, contributing 28% to the gross domestic product. Consequently, stimulating agricultural expansion is a central priority for national economic development strategies. While predicting outcomes is inherently complex, this objective can be realized through systematic planning informed by reliable data. This research evaluates the effects of economic policies on the cultivation of agricultural commodities in Afghanistan over the fiscal period from 2010-11 to 2019-20. Analytical methods, including the Compound Annual Growth Rate (CAGR) and the Cuddy-Della Valle Index, were employed to assess growth patterns in the

area, production, and productivity of principal commodities. The findings indicate a statistically significant and positive CAGR for the cultivated area (21.65%) and total production (19.91%) of the selected crops. Furthermore, productivity demonstrated a positive growth rate of 1.77%. The analysis highlights that fluctuations in cultivated area are a primary driver of production instability. This underscores the necessity of implementing fair pricing structures for farmers and minimizing the influence of intermediaries. Afghanistan possesses substantial potential to become a significant participant in the global agricultural marketplace and is on a trajectory to establish itself as a prominent exporter. Effective economic development policies can create the necessary framework for the commercialization and international export of Afghanistan's agricultural goods.

**Keywords:** *Afghan Agriculture, Economic Policy Impact, Commodity Growth Analysis, Export Performance, Production Stability.*

## **Introduction**

In the contemporary global landscape, nations are deeply interconnected, meaning that a major event in one region inevitably produces effects, whether minor or substantial, across the world. International trade is a cornerstone of economic advancement and is vital for enhancing the quality of life for a nation's citizens. Over the past decade, Afghanistan has experienced profound and fundamental transformations, making economic isolation and existence without trade virtually impossible. The global financial crisis has exerted considerable pressure on economies and export markets worldwide. During this period, Afghanistan's export sector has navigated unprecedented changes, compounded by political instability within the nation and neighboring countries, which has created numerous obstacles.

Despite these challenges, Afghanistan's merchandise exports have shown an upward trend over the last ten years, establishing a clear need for a rapidly expanding export trade. In the current economic environment, Afghanistan's strategy for export growth must prioritize high-potential sectors such as agricultural products, engineering goods, chemicals, and textiles over machinery and armaments. The global trade in agrifood products has expanded robustly, growing at an annual real-term rate of

nearly 7% between 2001 and 2019. Trade remains one of the most critical drivers of a country's economic development.

Economic strategies designed to foster the growth of agricultural goods can serve as a catalyst for the advancement of Afghanistan's entire agriculture sector. A primary goal of these policies is to attract private sector investment to convert traditional agriculture into a high-value, commercialized industry that serves as a source of economic growth and provides widespread livelihood opportunities. This approach is structured around two central objectives: (1) the alleviation of poverty and (2) the provision of alternative livelihoods through a comprehensive agricultural and development policy framework. The overarching vision is to create a developmental path for the expansion of agricultural commerce, with a specific emphasis on supporting the most impoverished and vulnerable segments of the agrarian population. Through intensified efforts to refine and implement agricultural policy, a rapid expansion of agriculturally-based economic activities is expected to become highly influential.

## **1.1 Agriculture in Afghanistan**

Afghanistan spans a total landmass of 652,864 square kilometers and was home to an estimated 34.16 million people as of 2022. The country is characterized by three distinct geographical regions: the northern plains, which represent the primary agricultural heartland; the central highlands; and the southwestern plateau, a landscape composed of desert and semi-arid terrain. In 2022, the population density was approximately 52.3 persons per square kilometer. Literacy rates were recorded at 52% for males and 23% for females, while life expectancy at birth was 63.8 years for males and 66.7 years for females.

The agricultural sector is the dominant industry in Afghanistan, employing nearly 80% of the nation's workforce. In 2019, this sector contributed 23% to the country's GDP, compared to 21.10% from the industrial sector and 55.90% from the service sector. Afghanistan is a landlocked nation positioned at the center of Asia and is recognized as one of the world's richest countries in terms of untapped mineral reserves. The Ministry of Mines and Petroleum has placed the estimated value of

these resources at approximately \$3 trillion. The country currently yields about 1.5 million tonnes of fresh fruit each year, a figure with significant potential for growth. It is renowned for producing premium-quality fruits, notably pomegranates, apples, apricots, cherries, melons, sweet mulberries, and peaches.

The traditional mainstays of Afghan agriculture are wheat and other cereal crops, and the nation is approaching self-sufficiency in grain production. The total arable land is estimated at 8 million hectares. In the 2019-20 period, wheat production reached approximately 5 million tonnes. Nurseries occupied 119,000 hectares, while grape production stood at 61,500 tonnes and almond production at around 56,000 tonnes.

## **1.2 Agriculture Commodities Trade in Afghanistan**

The principal crops cultivated in Afghanistan include wheat, corn, rice, barley, along with a variety of vegetables, fruits, and nuts. The nation's industry has historically been linked to agricultural and pastoral raw materials. Key industrial crops are cotton, tobacco, castor beans, and sugar beets. Exports constitute approximately 20% of the GDP.

Afghanistan's primary exports consist of carpets and rugs (45% of total exports), dried fruits (31%), and medicinal plants (12%). The main destinations for these exports are India (48%), Pakistan (19%), and Russia (9%). In 2019, the leading sources of imports were the Islamic Republic of Iran, China, Pakistan, the United States, and Turkmenistan, with others including Iraq and Turkey. In that same year, agricultural raw materials accounted for 21.04% of exports. This is achieved despite the fact that only 12% of the country's land is arable, with only about half of that area actively cultivated.

The Kunduz and Helmand provinces, located in the north and south respectively, are the primary agricultural zones. The majority of farms are small-scale operations; approximately 69% are under five hectares. Only 16% of farms exceed 10 hectares of arable land (irrigated or rain-fed), and a mere 6.5% are larger than 20 hectares, though this small fraction covers about 33% of irrigated land and 50% of rain-fed land. Water for agriculture is typically supplied by spring rains and the melting of winter snow. The livestock sector includes cattle, Karakul sheep, and poultry.

### 1.3 Afghanistan Economy

The estimation by the Afghanistan Ministry of Mines and Petroleum that the nation's mineral reserves are worth \$3 trillion presents the most significant opportunity for long-term economic growth and independence. The Afghan government designated the 2014-2024 period as a "transformation decade," with a strategic goal to leverage the country's mineral wealth to replace reliance on foreign aid. Afghanistan possesses a vast array of natural resources, including natural gas, petroleum, coal, copper, gold, iron, lithium, cobalt, and precious stones like lapis lazuli and emeralds. The effective mining of these deposits could position Afghanistan as one of the world's leading mineral-exporting nations.

The country's industries currently include small-scale production of textiles, soap, furniture, footwear, fertilizer, and cement, alongside hand-woven carpets and wool. The GDP growth rate experienced a sharp decline from 20.6% in 2009 to just 1% in 2018, with an average growth of 6.79% from 2003 to 2018. Afghanistan's GDP reached \$19.88 billion in 2018, accounting for 0.03% of the world economy. The GDP value peaked at \$20.62 billion in 2017 after hitting a record low of \$4.55 billion in 2003. Concurrently, the share of agriculture in the GDP fell from 37.42% in 2003 to 19.88% in 2018. Although the economy has shown signs of recovery, a population growth rate of 2.14% in 2018 implies a decrease in per capita income. It is important to note that these figures do not account for the illegal poppy industry, which represents 90% of global production and generates an estimated \$2 billion in annual revenue.

Inflation decreased to 3% in 2018, below the 5% forecast, but was expected to climb to 4% in 2019 and 5% in 2020. The highest inflation level recorded was 26.42% in 2008, while the lowest was -0.66% in 2015.

The use of greenhouses is a rapidly expanding industry. Northern Afghan provinces are well-known for pistachio cultivation, a practice now being adopted by farmers in southern and western provinces. Eastern provinces are famous for pine nuts, while northern and central regions are known for almonds and walnuts. Bamyan province is renowned for its superior-quality potatoes, and Nangarhar province for oranges,

olives, peanuts, and dates, with cultivation of these crops spreading to other southern provinces.

Livestock, primarily cattle, sheep, and goats, are central to the economy. Modern poultry farming is also a fast-growing industry. The availability of natural pastures, covering approximately 7,500,000 acres, has traditionally made animal husbandry a vital economic activity practiced by both sedentary farmers and nomadic herders known as Kochis. However, these pastures are currently subject to overgrazing. In the late 1990s, the northern regions near Mazar-i-Sharif and Maymana were home to about six million Karakul sheep.

#### **1.4 Afghanistan Export**

Afghanistan's traditional exports are items with relatively low value, including fresh and dried fruits, pulses, cereals, medicinal herbs, non-alcoholic beverages, hand-woven textiles, wool, cotton, and precious stones. According to official data, national exports grew dramatically from \$137.3 million in 2000 to \$885 million in 2018. Projections anticipated a further increase to \$1.5 billion in 2019 and \$2.0 billion in 2020. Between 2000 and 2018, exports averaged \$411 million annually, reaching an all-time high of \$885 million in 2018 and a record low of \$68 million in 2001.

#### **Objective of the Investigation**

This investigation aims to analyze the growth and stability of the area, production, and productivity of key agricultural commodities within Afghanistan. A further objective is to examine the corresponding trends in the export trade of these selected products.

#### **Methodology**

This section outlines the methodological framework of the research. The study focuses on analyzing agricultural development policy by utilizing data spanning from 2010 to 2019. Key analytical instruments such as the Compound Annual Growth Rate (CAGR) and the Cuddy-Della Valle Index were applied. The research also includes an updated assessment of the trade status of significant agricultural commodities from Afghanistan.

## 1.2 Growth Rate and Instability Analysis

The growth rates for area, production, yield, and exports of major Afghan agricultural commodities were calculated for the 10-year period from 2010-11 to 2019-20. While various functional forms exist for studying growth rates, such as linear and quadratic functions, the exponential function ( $Y_t = ab^t$ ) was determined to be the most appropriate and is frequently used in such analyses.

In this study, the compound growth rates for the area, production, and productivity of major commodities were estimated using the exponential growth function, presented as:

$$Y_t = ab^t U_t \quad (1)$$

where:

- $Y_t$  = represents the dependent variable (e.g., production) in time period  $t$ .
- $a$  = is the intercept.
- $b$  = is the regression coefficient.
- $t$  = denotes the time variable.
- $U_t$  is the disturbance term for year  $t$ .

To facilitate estimation, this equation was transformed into a log-linear form:

$$\ln(Y_t) = \ln(a) + t \ln(b) + u_t \quad (2)$$

The coefficients were estimated using the Ordinary Least Squares (OLS) method. The percentage compound growth rate ( $g$ ) was then computed using the formula:

$$g = [\text{antilog}(b) - 1] \times 100 \quad (3)$$

The statistical significance of the regression coefficient was evaluated using the Student's  $t$ -test.

### 1.3 Instability Analysis

To analyze the instability in area, production, productivity, and exports of the selected commodities, the Cuddy-Della Valle Index was utilized. This index adjusts the standard coefficient of variation (CV) to account for trends in the data. The instability was calculated using the formula:

$$\text{Instability Index} = CV \times \sqrt{1 - r^2} \quad (4)$$

where  $CV$  is the coefficient of variation  $((\sigma/\mu) \times 100)$ , and  $r^2$  is the coefficient of determination from the time-trend regression.

### Results and Discussion

This section presents a detailed discussion of the research findings. The analysis elucidates the primary factors contributing to the outcomes and impacts of agricultural and trade policies in Afghanistan, based on the quantitative data collected.

As detailed in Table 1, the major crops selected for this study demonstrated substantial growth. The cultivated area expanded at a significant Compound Annual Growth Rate (CAGR) of 21.65%, with a Cuddy-Della Valle (CDV) instability index of 4.06%. Production grew at a significant CAGR of 19.91%, with a low CDV index of 1.85%, indicating relatively stable growth. Concurrently, productivity showed a positive and significant growth rate of 1.77%, with a CDV index of 4.03%.

Table 1: Growth Metrics for Major Agricultural Crops in Afghanistan (2010-11 to 2019-20)

Fiscal Year	Area (Thousand Ha)	Production (Thousand MT)	Productivity (MT/Ha)
2010-11	92,697.89	530,446.96	5.72
2011-12	97,126.59	634,955.42	6.54
2012-13	99,620.59	742,882.93	7.46
2013-14	106,127.84	755,139.04	7.12

Fiscal Year	Area (Thousand Ha)	Production (Thousand MT)	Productivity (MT/Ha)
2014-15	127,700.84	879,872.70	6.89
2015-16	134,046.84	930,171.91	6.94
2016-17	158,236.84	1,059,630.97	6.70
2017-18	190,021.84	1,102,840.48	5.80
2018-19	218,839.14	1,258,805.85	5.75
2019-20	260,925.51	1,392,090.79	5.34
<b>CAGR (%)</b>	<b>21.65*</b>	<b>19.91**</b>	<b>1.77**</b>
<b>CDV Index (%)</b>	<b>4.06</b>	<b>1.85</b>	<b>4.03</b>

*Note: \* denotes significance at the 1% level; \*\* denotes significance at the 5% level. Source: Compiled from Afghanistan Statistical Yearbooks (2009-2020) and data from the Ministry of Agriculture, Irrigation and Livestock of Afghanistan.*

Table 2 details the export performance of six major agricultural commodities from Afghanistan.

- **Asafoetida:** An examination of asafoetida exports reveals a substantial increase over the decade. From a baseline of 393 tonnes (valued at \$12.23 million) in 2010-11, the export volume expanded nearly fivefold to 1,918 tonnes (valued at \$131.96 million) by 2019-20. This expansion corresponds to a significant CAGR of 19.29% in quantity and 26.74% in value, with a low instability index of 7.60%.
- **Fig:** The export volume of figs grew from 3,344 tonnes in 2010-11 to 16,133 tonnes in 2019-20, representing a significant CAGR of 20.18%. The export value grew even more rapidly, from \$13.46 million to \$102.01 million, with a CAGR of 27.95%.

- **Grapes:** Grape exports increased from 3,535 tonnes in 2010-11 to 15,753 tonnes in 2019-20, a more than fourfold increase. This reflects a significant CAGR of 11.95% in quantity and 11.74% in value. However, the trade showed higher instability, with a CDV index of 18.02% for quantity and 17.46% for value.
- **Almond:** The quantity of almond exports rose from 43,649 tonnes to 66,845 tonnes over the decade, showing a modest but significant CAGR of 1.37%. In contrast, the value of these exports exhibited a negative growth rate of -0.70%. The trade in almonds was highly unstable, particularly in value, which had a CDV index of 36.08%.
- **Walnut:** Walnut exports demonstrated strong and stable growth. The quantity increased from 1,663 tonnes to 7,342 tonnes, while the value rose from \$6.12 million to \$26.03 million. This reflects a significant CAGR of 15.96% in quantity and 15.61% in value, with low instability indices (6.76% and 7.11%, respectively).
- **Apple:** Apple exports experienced remarkable growth. The volume surged from 13,028 tonnes to 103,794 tonnes, and the value increased from \$3.89 million to \$31.33 million between 2010-11 and 2019-20. This represents a very high and significant CAGR of 26.54% for quantity and 27.63% for value, with moderate instability.

Table 2: Export Volume and Value of Selected Afghan Agricultural Commodities (2010-11 to 2019-20)

Commodity	Metric	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	CAGR (%)	CDV Index (%)
<b>Asafoetida</b>	Qty (T)	393	576	519	695	567	1,012	1,174	1,234	1,899	1,918	<b>19.29**</b>	<b>7.60</b>
	Val (\$M)	12.23	28.39	25.47	38.57	43.31	57.20	71.00	80.98	115.28	131.96	<b>26.74*</b>	<b>6.90</b>
<b>Fig</b>	Qty (T)	3,344	4,016	5,185	9,053	9,964	8,827	10,679	22,365	13,484	16,133	<b>20.18**</b>	<b>11.23</b>
	Val (\$M)	13.46	13.50	18.74	27.29	36.18	35.50	44.79	97.18	83.39	102.01	<b>27.95*</b>	<b>7.77</b>
<b>Grapes</b>	Qty (T)	3,535	17,581	4,508	5,882	8,361	9,667	10,138	12,486	13,791	15,753	<b>11.95**</b>	<b>18.02</b>
	Val (\$M)	29.77	142.00	36.87	49.11	72.37	80.93	82.90	103.90	115.23	125.03	<b>11.74*</b>	<b>17.46</b>
<b>Almond</b>	Qty (T)	43,649	41,941	80,433	37,108	32,689	35,980	43,618	43,272	47,926	66,845	<b>1.37**</b>	<b>15.56</b>
	Val (\$M)	5.56	4.79	12.09	3.59	1.72	1.99	3.62	3.08	3.89	12.08	<b>-0.70</b>	<b>36.08</b>
<b>Walnut</b>	Qty (T)	1,663	2,246	3,575	4,098	4,488	4,618	6,321	5,796	6,395	7,342	<b>15.96*</b>	<b>6.76</b>
	Val (\$M)	6.12	8.24	11.79	16.73	17.34	16.69	22.16	20.97	23.14	26.03	<b>15.61**</b>	<b>7.11</b>
<b>Apple</b>	Qty (T)	13,028	18,763	27,599	41,084	72,039	61,986	85,852	92,612	104,882	103,794	<b>26.54*</b>	<b>9.05</b>
	Val (\$M)	3.89	5.60	8.30	13.59	21.69	19.35	27.35	29.31	36.91	31.33	<b>27.63*</b>	<b>9.49</b>

Note: Qty = Quantity in Tonnes; Val = Value in Million USD; \*Significance at 1% level; \*\*Significance at 5% level. Source: Compiled from data provided by the Afghanistan Ministry of Commerce & Industries (2010-2020).



(i) Asafoetida (*Ferula assafoetida*)



(ii) Figs (*Ficus carica*)



(iii) Grapes (*Vitis vinifera*)



(iv) Almonds (*Prunus dulcis*)



(v) Walnuts (*Juglans regia*)



(vi) Apple (*Malus pamila*)

Plate 1. Afghanistan farm products

## Conclusion

Despite significant progress in recent years, Afghanistan's infrastructure continues to be a major impediment to development, lagging considerably behind that of its neighbors. Deficiencies in the road network and the absence of a reliable power supply are critical bottlenecks that hinder the expansion of agribusiness and related industries. Government policy must prioritize investments in the agriculture sector and supporting infrastructure. Such strategic focus is essential to stimulate private investment, boost domestic production, create employment, generate income, and alleviate poverty. Furthermore, the nation's agricultural trade policies must be carefully calibrated to serve the interests of domestic producers and enhance their access to both national and international markets.

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