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Growth and instability of export and import in the trade of selected agricultural commodities: India vis-à-vis Afghanistan

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Abstract
Asafoetida, Fig, Grapes, Almond, Walnut and Apple are the major commodities traded from Afghan's country, are having the major share in terms of quantity commodités are major exportable agricultural commodités of Afghanistan which has many other benefits on the economy and national income. The présent study evaluates in the Trade of agricultural commodités and also the export performance of commodités. The analysis was made using compound annual growth rate analysis and descriptive statistics of growth rate analysis. The results revealed that export to India was stable importer of asafoetida grew and positive and significant growth rate of 19.15 per cent, Fig growth rate of 17.17 per cent, Almond growth rate of 20,92 per cent, Grapes 112.19 per cent, Walnut growth rate of 16.24 per cent and Apple growth rate of 51.62 per cent and entire the total of six crops export from Afghanistan to India the grow rate of 29.55 per cent are positive and significant. And also, India is the best exportér of agricultural products to Afghanistan, Products have been exported to Afghanistan such as Sugar, Groundnut, Coconut, Rice, Cumin and Cashew. The results revealed that export to Afghanistan was stable of Sugar positive and significant the growth rate of 14.93 per cent, Groundnut was growth rate of 51.70 per cent, Coconut was growth rate of 50.30 per cent, Rice was growth rate of 1.56 per cent, Cumin was growth rate of 28.90 per cent and Cashew was positive and significant 23.88 per cent and all India was export positive and significant growth rate of 20.40 per cent with instability of 24.34 percent respectively.
India and Afghanistan with continued to be proved as a stable importer of agricultural commodities.

Keywords: compound annual growth rate, India, Afghanistan, agricultural commodités, Afghanistan are, asafoetida, fig, Grapes, Almond, walnut and Apple, India are, sugar, groundnut, coconut, rice, cumin and cashew

Introduction
The country Afghanistan is blessed with hills, mountains, deserts and plains. The climate in the country is very much particular in different season, as the people of the country evidence with the extreme in dry cold winters, hot summer and snow falls at the places of higher altitude and having the dust storms in some of the dry areas. There will be significant variations in the temperature of day and night is evidenced. The country's economy largely depends on the agricultural sector as it signifies a notable share in the growth of the economy which is in spite of only 12 per cent of the country land is arable and half of its cultivated.
Agriculture is the foundational basis of Afghan society. Approximately 80 per cent of the population is engaged in agriculture directly or in secondary or tertiary activities. It is in this sector that the future of Afghanistan's wealth and potential for capital accumulation resides. While some of Afghanistan's former agricultural infrastructure has been restored, considerably more, remains to be done. As new possibilities in the development of infrastructure and technologies emerge, agricultural producers, processors and traders are demanding increased assistance in identifying new markets for their products. Agricultural practices in Afghanistan represent an evolving narrative – while some farmers continue to engage in subsistence farming, many are discovering that intensive farming is profitable, but only if Government invests in creating a range of services and enabling structures for agricultural commodities.
Afghanistan is a landlocked country located in the center of Asia, forming part of South Asia, Central Asia, and Greater Middle East.

It is bordered by Pakistan in the south and the east, Iran in the west, Turkmenistan, Uzbekistan and Tajikistan in the north, and China in the far northeast. In conducting agricultural activities in Afghanistan, one needs to be fully prepared for water shortage in summer.

Agriculture is contributing a major portion to our national income. In 1950-51, agriculture and allied activities contributed about 59 per cent of the total national income. Although the share of agriculture has been declining gradually with the growth of other sectors but the share still remained very high as compared to that of the developed countries of the world. Over two-thirds of our working population are engaged directly on agriculture and also similarly depend for their livelihood. According to an estimate, about 66 per cent of our working population is engaged in agriculture. Agriculture is the only major source of food supply as it is providing regular supply of food to such a huge size of population of our country. It has been estimated that about 60 per cent of household consumption is met by agricultural products. Agriculture in India has been the major source of supply of raw materials to various important industries of our country. Cotton and jute textiles, sugar, vanaspati, edible oil plantation industries (*viz*. tea, coffee, rubber) and agro-based cottage industries are also regularly collecting their raw materials directly from agriculture. About 50 per cent of income generated in the manufacturing sector comes from all these agro-based industries in India. Moreover, agriculture can provide a market for industrial products as increase in the level of agricultural income may lead to expansion of market for industrial products. Indian Agriculture is playing a very important role both in the internal and external trade of the country. Agricultural products like tea, coffee, sugar, tobacco, spices, cashew-nuts etc. are the main items of our exports and constitute about 50 per cent of our total exports. Besides manufactured jute, cotton textiles and sugar also contribute another 20 per cent of the total exports of the country. Thus nearly 70 per cent of India's exports are originated from agricultural sector. Further, agriculture is helping the country in earning precious foreign exchange to meet the required import bill of the country.

India and Afghan have a strong relationship based on historical and cultural links, history indicates link to the both countries during Mahabharata period. India has played a significant role in the reconstruction and rehabilitation of Afghanistan. The strategic partnership agreement was signed during 2011 October by Afghan president Hamid Karzai and India Abdul Kalam. It is considered the best field for marketing agricultural and commercial products for both countries. Also, Afghanistan's trade in agricultural products has historical roots with India.

Methodology

The data on required for the study of growth rate and instability were collected from sources like Customs Offices, Ministry of Finance, Ministry of Commerce & Industries (MOCI) and Central Statistics Organization of Afghanistan for the year 2010-11 to 2019-20. The data collected were analysed through CAGR, instability and presented through tabular presentation technique for easy comparisons. The Study area: India and Afghanistan are selected for the study of major six Agricultural Commodities.

* Selected agricultural commodities in India are:

Sugarcane, Rice, Groundnut, Coconut, Cumin, Cashew

*** Selected agricultural commodities in Afghanistan are Asafoetida, Fig, Grapes, Almond, Walnut, Apple**

The data were summarised with the aid of statistical tools like averages, percentages. Growth rate and instability analysis were calculated through compound growth rates using the following model.

$$Y_t = ab^t e^u$$

Where,

Yt = dependent variable (export/ import agricultural commodities)

a = intercept

b = (1+r)

r = (b - 1)

'r' is the compound annual growth rate per cent per annum,

t = time period

u = error term

The above model in the Logarithmic form is expressed as,

Log Y= log a + t log b+ log u

We can, thus, calculate the compound growth rates (r) as under:

CAGR in per cent (r) = (Antilog of log b-1) x 100

The coefficient of variation (CV) was calculated by using the equation given below:

$$CV(\%) = \frac{Standard\ deviation\ (sd)}{Mean} \times 100$$

Pattern of growth rate over the years was identified using the 'b' coefficient.

Instability analysis

In order to analyse instability in area, production, productivity and export of selected major agricultural commodities from Afghanistan and India. Cuddy-Della Valle Index was used. The coefficient of variation (CV) was calculated

And Instability was estimated from coefficient of variation (CV) using the formula.

$CV = ((\sigma / \mu)*100)*\sqrt{1–r2}$

Where,

σ = Standard deviation

μ = Mean.

Results and Discussion

Agricultural commodities are important commercial crops in Afghan Economy. Table 1. Revealed that growth rate and instability for the period 2010-11 to 2019-20 were worked out for separately for Asafoetida, Fig, Grapes, Almonds, Walnut and Apple. The variation in export was measured using Coefficient of variation. It is evident from Table 1. that, coefficient of variation of Asafoetida was 59.57 per cent, the coefficient of multiple determination(R^2) indicated

that 84 per cent of the variations in export of Asafetida were explained by the variables included in the function. Overall growth rate of Asafoetida was 19.15 per cent in terms of quantity which was found significant, whereas cuddy Della valley index was 12.00.

Coefficient of variation of Fig was 71.78 per cent; the R^2 indicated that 81 per cent of the variations in export of fig were explained by the variables included in the function. Overall growth rate of Fig was 27.17 per cent in terms of quantity which was found to be significant, where as cuddy della valley index was 15.61.

Coefficient of variation of Almond was 62.11 per cent, the R^2 indicated that only 36 per cent of the variations in export of grapes were explained by the variables included in the function. Overall growth rate of grapes was 20.92 per cent in terms of quantity which was found to be non-significant, whereas cuddy Della valley index was 24.75.

Coefficient of variation of Grapes was 171.58 per cent, the coefficient of multiple determination indicated that 56 per cent of the variations in export of almonds were explained by the variables included in the function. Overall growth rate of Grapes was 112.19 per centin terms of quantity which was found to be significant, where as cuddy Della valley index was 56.78.

Coefficient of variation of walnut was 122.80 per cent, the coefficient of multiple determination indicated that 30 per cent of the variations in export of walnut were explained by the variables included in the function. Overall growth rate of walnut was 16.24 per cent in terms of quantity which was found to be non-significant, where as cuddy Della valley index was 60.33.

Coefficient of variation of Apple was 114.79 per cent, the coefficient of multiple determination indicated that 35 per cent of the variations in export of apple were explained by the variables included in the function. Overall growth rate of apple was 51.62 per cent in terms of quantity which was found to be significant, where as cuddy Della valley index was 46.14.

Coefficient of variation of selected agricultural commodity was 69.76 per cent, the coefficient of multiple determination indicated that 83 per cent of the variations in export of all commodities were explained by the variables included in the function. Overall growth rate of selected commodities quantity was 29.55 per cent in terms of quantity which was found to be highly significant, where as cuddy Della valley index was 14.25.

The Coefficient of variation, coefficient of multiple determination, Compound annual growth rate and Cuddy-Della-valley index in selected agricultural commodities export in terms of value from Afghanistan were clearly showed in the Table 2. The growth rate and instability for the period 2010-11 to 2019-20 were worked out for separately for Asafetida, Fig, Grapes, Almonds, Walnut and Apple. The variation in export was measured using Coefficient of variation. It is evident from Table 2. that, coefficient of variation of Asafoetida was 70.86 per cent, The coefficient of multiple determination indicated that 95 per cent of the variations in export of Asafetida were explained by the variables included in the function. Overall growth rate of Asafoetida was 28.17 per cent in terms of value which was found to be significant, where as Cuddy Della valley index was 7.78.

Coefficient of variation of Fig was 90.52 per cent, the coefficient of multiple determination indicated that 94 per cent of the variations in export of fig were explained by the variables included in the function. Overall growth rate of Fig was 39.45 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 10.92.

Coefficient of variation of almonds was 61.18 per cent, the coefficient of multiple determination indicated that 88 per cent of the variations in export of almonds were explained by the variables included in the function. Overall growth rate of grapes was 20.85 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 25.89.

Coefficient of variation of Grapes was 175.95 per cent, the coefficient of multiple determination indicated that 67 per cent of the variations in export of almonds were explained by the variables included in the function. Overall growth rate of Grapes was 121.15 per cent in terms of value which was found to be non significant, where as cuddy Della valley index was 50.52.

Coefficient of variation of walnut was 137.41 per cent, the coefficient of multiple determination indicated that 10 per cent of the variations in export of walnut were explained by the variables included in the function. Overall growth rate of walnut was 25.51 per cent in terms of value which was found to be non significant, where as cuddy Della valley index was 65.00.

Coefficient of variation of Apple was 133.23 per cent, the coefficient of multiple determination indicated that 46 per cent of the variations in export of apple were explained by the variables included in the function. Overall growth rate of apple was 71.44 per cent in terms of quantity which was found to be non significant, where as Cuddy Della valley index was 48.90.

Coefficient of variation of selected agricultural commodity was 73.48 per cent, the coefficient of multiple determination indicated that 96 per cent of the variations in export of all commodities were explained by the variables included in the function. Overall growth rate of selected commodities value was 29.04 per cent in terms of value which was found to be significant, where as Cuddy Della valley index was 7.35 per cent.

The Coefficient of variation, coefficient of multiple determination, Compound annual growth rate and cuddy-Della valley index in selected agricultural commodities export in terms of quantity from India were clearly showed in the Table 3. The growth rate and instability for the period 2010-11 to 2019-20 were worked out for separately for Sugar, groundnut, coconut, Rice cumin and cashew The variation in export was measured using Coefficient of variation. It is evident from Table 3. That, coefficient of variation of Sugar was 86.65 per cent, the coefficient of multiple determination indicated that 36 per cent of the variations in export of sugar were explained by the variables included in the function. Overall growth rate of sugar was 14.93 per cent in terms of quantity which was found to be highly significant, where as cuddy della valley index was 34.79.

Coefficient of variation of groundnut was 139.37 per cent, the coefficient of multiple determination indicated that 91 per cent of the variations in export of groundnut were explained by the variables included in the function. Overall growth rate of groundnut was 51.70 per cent in terms of quantity which was found to be significant, where as cuddy Della valley index was 20.97.

Coefficient of variation of coconut was 121.75 per cent, the

coefficient of multiple determination indicated that 98 per cent of the variations in export of coconut were explained by the variables included in the function. Overall growth rate of coconut was 50.30 per cent in terms of quantity which was found to be non-significant, where as cuddy Della valley index was 7.49.

Coefficient of variation of Rice was 57.67 per cent, the coefficient of multiple determination indicated that 77 per cent of the variations in export of Rice were explained by the variables included in the function. Overall growth rate of Rice was 1.56 per cent in terms of quantity which was found to be non-significant, where as cuddy Della valley index was 13.75.

Coefficient of variation of cumin was 94.44 per cent, the coefficient of multiple determination indicated that 89 per cent of the variations in export of cumin were explained by the variables included in the function. Overall growth rate of cumin was 28.90 per cent in terms of quantity which was found to be significant, whereas cuddy Della valley index was 15.55.

Coefficient of variation of Cashew nut was 65.29 per cent, the coefficient of multiple determination indicated that 97 per cent of the variations in export of cashew were explained by the variables included in the function. Overall growth rate of cashew was 23.88 per cent in terms of quantity which was found to be significant, where as cuddy della valley index was 5.37.

Coefficient of variation of selected agricultural commodity was 85.47 per cent, the coefficient of multiple determination indicated that 68 per cent of the variations in export of all commodities were explained by the variables included in the function. Overall growth rate of selected commodities quantity was 20.40 per cent in terms of quantity which was found to be highly significant, where as Cuddy Della valley index was 24.34.

The Coefficient of variation, coefficient of multiple determination, Compound annual growth rate and Cuddy-Della-valley index in selected agricultural commodities export in terms of value from India were clearly showed in the Table 4. The growth rate and instability for the period 2010-11 to 2019-20 were worked out for separately for Sugar, groundnut, coconut, Rice cumin and cashew The variation in export was measured using Coefficient of variation. It is evident from Table 4. that, coefficient of variation of Sugar was 83.90 per cent, The coefficient of multiple determination indicated that 86 per cent of the variations in export of sugar were explained by the variables included in the function. Overall growth rate of sugar was 24.90 per cent in terms of value which was found to be highly significant, where as cuddy Della valley index was 15.90.

Coefficient of variation of groundnut was 148.95 per cent, The coefficient of multiple determination indicated that 90 per cent of the variations in export of groundnut were explained by the variables included in the function. Overall growth rate of groundnut was 50.22 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 24.10.

Coefficient of variation of coconut was 123.67 per cent, the coefficient of multiple determination indicated that 98 per cent of the variations in export of coconut were explained by the variables included in the function. Overall growth rate of coconut was 50.56 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 7.82.

Coefficient of variation of Rice was 58.09 per cent, the coefficient of multiple determination indicated that 75 per cent of the variations in export of Rice were explained by the variables included in the function. Overall growth rate of Rice was 3.43 per cent in terms of value which was found to be non significant, where as cuddy Della valley index was 28.78.

Coefficient of variation of cumin was 95.37 per cent, the coefficient of multiple determination indicated that 90 per cent of the variations in export of cumin were explained by the variables included in the function. Overall growth rate of cumin was 29.57 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 15.24.

Coefficient of variation of Cashew was 118.09 per cent, the coefficient of multiple determination indicated that 92 per cent of the variations in export of cashew were explained by the variables included in the function. Overall growth rate of cashew was 37.19 per cent in terms of value which was found to be highly significant, where as cuddy Della valley index was 17.13.

Coefficient of variation of selected agricultural commodity was 91.02 per cent, the coefficient of multiple determination indicated that 89 per cent of the variations in export of all commodities were explained by the variables included in the function. Overall growth rate of selected commodities quantity was 28.58 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 14.99.

The Coefficient of variation, coefficient of multiple determination, Compound annual growth rate and cuddy-Della-valley index in selected agricultural commodities export in terms of quantity and value from India and Afghanistan were clearly showed in the Table 5. The growth rate and instability for the period 2010-11 to 2019-20 were worked out for separately for India and Afghanistan. The variation in export was measured using Coefficient of variation. It is evident from Table 5. that, coefficient of variation of India in terms of quantity was 85.47 per cent, The coefficient of multiple determination indicated that 68 per cent of the variations in export of India in terms quantity were explained by the variables included in the function. Overall growth rate of India was 20.40 per cent in terms of quantity which was found to be highly significant, where as cuddy Della valley index was 24.34. Similarly in case value coefficient of variation of India in terms of value was 91.02 per cent, the coefficient of multiple determinations indicated that 89 per cent of the variations in export of India in terms value were explained by the variables included in the function. Overall growth rate of India was 28.58 per cent in terms of value which was found to be significant, where as cuddy Della valley index was 14.99.

Coefficient of variation of Afghanistan in terms of quantity was 69.76 per cent, The coefficient of multiple determination indicated that 83 per cent of the variations in export of Afghanistan in terms quantity were explained by the variables included in the function. Overall growth rate of Afghanistan was 29.55 per cent in terms of quantity which was found to be significant, where as cuddy Della valley index was 14.25. Similarly in case value coefficient of variation of Afghanistan in terms of value was 73.48 per cent, the coefficient of multiple determinations indicated that 96 per cent of the variations in export of Afghanistan in

terms value were explained by the variables included in the function. Overall growth rate of Afghanistan was 29.04 per cent in terms of value which was found to be highly significant, where as cuddy Della valley index was 7.35.

Conclusion

The best quality of crops is being produced in Afghan region and wide range of opportunities are available for Afghan to increase the production and export to various countries India is a stable importer of agricultural commodities since it is widely accepted in India. Increased the agricultural commodities production not only pave the way for the strengthening the economy but also increases the farmers income and foreign exchange reserves of the country by utilising potential natural reserves for optimising the benefits. We strongly recommend that the Government of Afghanistan, especially Ministry of Agriculture, needs consider agricultural commodities for its crop development plan and provide incentives for farmers to increase their production of Asafoetida, Fig, Almond, Grapes, Walnut and Apple. The government of Afghanistan promotes agricultural commodities production as a means to achieve economic development while reducing the widely spread crops cultivation in the country by providing necessary support to its farmers via crops farmer service centres'.

India, with its large population and increasing urban and rural incomes, increases demand. Foreign demand causes exports from the agricultural sector. India has been the best trading partner of Afghanistan in the past decades, India's trade with Afghanistan increased rapidly in 2010-2019.

India's export items to Afghanistan such as: Sugar, Groundnut, Coconut, Rice, Cumin and Cashew. Agricultural commodity is the largest commercial product in India; with great efforts it was able to get the second rank in the world. India and Afghan have a strong relationship based on historical and cultural links, history indicates link to the both countries during Mahabharata period. India has played a significant role in the reconstruction and rehabilitation of Afghanistan.

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