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Mohammad Akbar Nadeerpoor
Ph.D. Scholar, Department of
Agricultural Economics, College
of Agriculture, University of
Agricultural Sciences, Dharwad,
Karnataka, India

Dr. BL Patil
Professor, Department of
Agricultural Economics, College
of Agriculture, University of
Agricultural Sciences, Dharwad,
Karnataka, India

Dr. SS Guledagudda
Professor and Head of the
Department of Agricultural
Economics, College of
Agriculture, UAS, Dharwad.
University of Agricultural
Sciences, Dharwad, Karnataka,
India

Dr. JS Sonnad
Professor, Department of
Agribusiness Management,
College of Agriculture,
University of Agricultural
Sciences, Dharwad, Karnataka,
India

Dr. RM Hosamani
Professor, Department of
Horticulture, College of
Agriculture, University of
Agricultural Sciences, Dharwad,
Karnataka, India

Corresponding Author

Mohammad Akbar Nadeerpoor
Ph.D. Scholar, Department of
Agricultural Economics, College
of Agriculture, University of
Agricultural Sciences, Dharwad,
Karnataka, India

Production trend and exports performance of asafoetida in Afghanistan

**Mohammad Akbar Nadeerpoor, Dr. BL Patil, Dr. SS Guledagudda,
Dr. JS Sonnad and Dr. RM Hosamani**

Abstract

Asafoetida is a major exportable agricultural commodity of Afghanistan which has numerous and other health benefits. The present study evaluate the area production and productivity and also the export performance of asafoetida. The analysis was made using compound annual growth rate analysis and descriptive statistics of growth rate analysis. The results revealed that area, production and productivity grew at a positive and significant growth rate of 7.39, 3.47 and 28.85 per cent perineum with an instability of 93.21, 74.49 and 38.06 per cent respectively. Samangan province was a major producer of asafoetida in Afghanistan with a share of 70 and 73 per cent in area and production respectively in 2019-20. Whereas Urozgan is another province with least production which occupied a minimum share of 6 and 1 per cent respectively. India imports about 1441 MT of asafoetida worth of Rs. 11 crores which constitute 66 per cent share of total export of asafoetida from Afghanistan. Iran appears to be an unstable importer of asafoetida. Export in terms of quantity increased with an instability rate at 59.6 per cent whereas exports in terms of value increased at compound annual growth rate of 28.17 with an instability of 68.9 per cent. India continued to be proved as a stable importer of asafoetida.

Keywords: Compound annual growth rate, India, Afghanistan, asafoetida, Samangan

Introduction

Asafoetida is the dried latex (gum oleoresin) exuded from the rhizome or tap root of several species of *Ferula*, a perennial herb. The species are native to the deserts of Iran and mountains of Afghanistan. It has a pungent smell and has trivial name known as stinking gum. The odour dissipates upon cooking and spreads a smooth flavour. It is also known as devils dung in English. Asafoetida contains about 40–64 per cent resin, 25 per cent endogenous gum, 10 to 17 per cent volatile oil, and 1.5 to 10 per cent ash. The volatile oil is rich in organ sulphide compounds which are primarily responsible for the odour and flavour. This was brought to Europe by the Alexander the Great. The white and red asafoetida varieties are demanded across the globe and the demand is more vibrant in India. The white asafoetida particularly which is a water soluble while red asafoetida oil soluble. Afghanistan is climatologically best suited for asafoetida production and is grown in area of 1, 08,956 ha with 23021 thousand tonnes of production with an average productivity of 5200 Kgs/ha in 2019.20.

Methodology

The data on area, production, productivity and export of asafoetida 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 and presented through tabular presentation technique for easy comparisons. The data were summarised with the aid of statistical tools like averages, percentages. Growth in area, production and productivity were calculated through compound growth rates using the following model.

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

Where,

Y_t = dependent variable (area / yield / production of Asafoetida)

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:

$$\text{CAGR in per cent (r)} = (\text{Antilog of log b} - 1) \times 100$$

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

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

Results and Discussion

Asafoetida is an important commercial crop in Afghan Economy. Table 1. reveals that the area was hardly 8052 ha in 2010-11 which has grown in a decade up to 1, 08,956 ha in 2019-20. The growth was significant with 7.39 per cent per annum with instability of 93.21 per cent. The growth was consistent revealing its demand over the decade.

The production of this spice has also registered significant growth at 3.47 per cent which was only 799 metric tonnes in 2010-11 rose to 23,021 tonnes in 2019-20 almost more than twenty times increase in a decade and instability of production was around 75 per cent. The productivity was observed consistently rising and sharply risen in 2019-20 almost 3 times more than the base year 2010-11 which was due to sharp increase in area.

The province wise analysis reveals (Table 2.) that the area and production is comparatively more in Samangan province with a share of 68 and 73 per cent in total country's production in 2018-19 which rose to 70 and 73 percent respectively in 2019-20 indicating Samangan province is better suited for cultivation of Asafoetida, with favourable climate and soil conditions. While Urozgan province revealed least production with meagre share of 4 and 0.4 percent in 2018-19 respectively. And 6 and 1 percent in 2019-20 due to the less area because of non-suitability of crop in the region.

The other provinces like Jozjan, Sarpul, Balkh, Takhar, Badakhshan revealed marginal or near to average area and production in Afghan Economy.

Afghan Asafoetida has a wide spread demand across the globe Around \$ 17.05Crores worth of the spice is expected to various neighbour countries like India, Iran, Pakistan, Uzbekistan, Germany, China etc. Among these wide spread demand is from India worth of 11.33Crore \$ was imported in 2019-20 constituting 66 per cent of the global share.

Table 3 indicates that India is one of the major import destination for Afghanistan for export of asafoetida followed by Pakistan and Iran. India imports about 1441 MT of asafoetida worth of Rs. 11 crores which forms 66 per cent of total export of asafoetida. Iran is very unstable importer of asafoetida from Afghanistan. This results were in line with research conducted by Mohammad and Metin, 2021 wherein major share of asafoetida export from Afghanistan reached India.

Table 4 also reveals that Afghans Asafoetida export both in terms of quantity and value increased at the rate of 19.15 and 28.17 per cent respectively while instability index revealed that 59.6 and 68.90 per cent respectively indicating stability in Asafoetida import by India from Afghanistan.

Table 1: Growth and Instability of Asafoetida in Afghanistan

Sl. No.	Year	Area(hectare)	Production (MT)	Productivity (tonne/ha)
1	2010-11	8052	799	1.5
2	2011-12	9452	1843	1.5
3	2012-13	11642	4648	2.6
4	2013-14	15782	9035	2.7
5	2014-15	20214	7376.5	2.7
6	2015-16	24529	8225	3
7	2016-17	32980	8078	2.7
8	2017-18	50886	8164	3.9
9	2018-19	77088	14343	4
10	2019-20	108956	23021	5.2
CAGR %		7.39***	3.47***	28.85***
Mean		35958	8553	2.98
SD		33517	6371	1.13
Instability (%)		93.21	74.49	38.06

***significant at 1% level of significance

Source: Afghanistan Ministry of Agriculture, Irrigation & Livestock (2010-2020) and Afghanistan Statistical Yearbook (2009 to 2020)

Table 2: Province-wise, Area, Production & Productivity of Asafoetida in Afghanistan

SL No.	Provinces	2018-19				2019-2020			
		Area (ha)	Percent share	Production (MT)	Percent share	Area (ha)	Percent share	Production (MT)	Percent share
1	Jozjan	395	1	198	1	450	0	270	1
2	Sarpul	1821	2	911	6	2000	2	1000	4
3	Balkh	21100	27	1266	9	25000	23	5000	22
4	Samangan	52400	68	10480	73	80000	73	16000	70
5	Takhar	477	1	954	7	500	0	150	1
6	Badakhshan	891	1	535	4	1000	1	600	3
7	Urozgan	4	0.005	0.4	0.002	6	0.005	1	0.002
Total		77088	100	14343	100	108956	100	23021	100

Source: Afghanistan Ministry of Agriculture, Irrigation & Livestock (2010-2020) and Afghanistan Statistical Yearbook (2009 to 2020).

Table 3: Asafoetida export to major Countries 2019-20

Sl. No.	Countries	Quantity (MT)	% share	Value (US \$)	% share
1	India	1,441	66	11,33,57,828	66
2	Pakistan	261	12	20535359	12.04
3	Iran	5	0.1	393397.68	0.23
4	Uzbekistan	102	5	8025212.749	4.71
5	Tajikistan	216	9.97	16994780	9.97
6	Germany	11	0.51	865474.904	0.51
7	United Arab Emirates	9.5	0.44	747455.5991	0.44
8	China	2.3	0.11	180962.9	0.11
9	Australia	1.9	0.09	149491.1199	0.09
10	other Countries	118	5.44	9284185.342	5.44
	Total	2,167	100	17,05,34,147	100

Source: Afghanistan Statistical Yearbook (2009 to 2020) and Afghanistan Chamber of Commerce & Industries Department (2010-2020), (ACCI).

Table 4: Asafoetida Export to India

SL. No.	Years	Asafoetida (Quantity in MT)	Asafoetida (Value in Million \$)
1	2010-11	323	94,67,089
2	2011-12	442	2,33,37,811
3	2012-13	356	1,91,99,268
4	2013-14	493	3,08,10,626
5	2014-15	331	3,41,99,525
6	2015-16	734	4,63,03,023
7	2016-17	856	5,85,78,869
8	2017-18	875	6,69,81,958
9	2018-19	1,487	9,91,58,203
10	2019-20	1,441	11,33,57,828
	CAGR (%)	19.15	28.17
	C.V (%)	59.60	68.90

Source: Afghanistan Statistical Yearbook (2009 to 2020) and Afghanistan Chamber of Commerce & Industries Department (2010-2020), (ACCI).

Conclusion

The best quality of asafoetida 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 asafoetida since it is widely accepted in India. Increased asafoetida 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.

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