



## Growth Performance in Area, Production, Productivity and Export of Spices in India

Ganga Devi\* and KS Jadav

Department of Agricultural Economics, BACA, Anand Agriculture University, Anand, Gujarat, India

\*Corresponding Author: Ganga Devi, Department of Agricultural Economics, BACA, Anand Agriculture University, Anand, Gujarat, India.

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### Abstract

The compound growth rate and instability index in area, production and productivity over last ten years were analyzed based on secondary data collected from the website [www.indiastats.com](http://www.indiastats.com) [1]. India has achieved positive growth rate in production (1.79%) and productivity (3.04%) over the years. It also indicates that increasing trend in productivity leads to increase in production. In case of area the negative growth rate was found over the years due to diversification of agricultural field crops. Furthermore, the study showed low variability index in productivity. The spices crops recorded positive higher growth in export and a very less growth in import over last years in terms of value earned. The high growth and low instability index indicates sustainability in production which is the prerequisite and reflects positive indication for the export potential from India.

**Keywords:** Spices; Growth; Instability; Area; Production; Productivity; Export and Import

### Introduction

India is the land of spices. It has been an integral part of the Indian diet. No Indian meal is considered complete without the tangy and delectable flavor of Indian spices, locally known as "masala". Indian spices are famous in the world wide for their gastronomic value, are also known to possess high medicinal values [2]. India produces a wide range of spices due to varying agro-climatic conditions from arid to temperate. Almost all spices grow splendidly in India. In almost all the states and union territories of India, at least one spice is grown in abundance. Under the act of Parliament, a total of 52 spices are brought under the purview of Spices Board. However, 109 spices are notified in the ISO list [3]. Spice products are essentially products derived from the whole spices. They are in the form of powders, extracts (oil, oleoresin, colors), preserved for like freeze dried, dehydrated frozen, in brine, in sugar syrup, etc. Spices are defined as strongly flavored or aromatic substance of vegetable origin, obtained from tropical plants, commonly used as a condiment [4]. In ancient times, spices were as precious as gold and significant as medicines, preservatives and perfumes. India is the land of spices plays a significant role in the global spices market. None of the country in the world produces as many kinds of spices as India, with quality spices coming from the state of Kerala. The

most popular spice products are extracts which are widely used in food, pharmaceutical and toiletry industries. India enjoys a near monopoly in the field of spice extract [4].

India is not only the largest producer but also the largest consumer and exporter of spices in the world. Indian spices flavour foods in over 134 countries. Spice exports touched 7,26,613 tonnes valued 12,112.76 crore (US\$ 2212.13 Million) in 2012-13 [5]. The shift in preferences of domestic consumers for food items, increasing urbanization and rising incomes, altered demographic and social factors and the changes in productivity of spices have brought about changes in the pattern of their consumption and demand. India has certain natural comparative advantages with respect to production and utilization of spices; these include diverse agro-climatic production environments, availability of innumerable varieties and cultivars of each spice suitable for different climatic conditions, cheap labour, large domestic market and a strong tradition of using spices and their products in food, medicine and cosmetics. As India is known for the land of spices and has the great potential to meet the global demand. Looking to all these aspect there is a need to study the growth and instability in area, production and export of spices from India. The high growth and low instability index indicates sustainability in production which is the prerequisite and reflects positive indication for the

export potential of the country. Keeping this in view the present study was planned.

**Material and Methods**

To achieve the objectives of the study, time series data on area, production and productivity of major spices in the country were collected from the website [www.indiastats.com](http://www.indiastats.com) for last ten years (2004-05 to 2013-14). The data related to export and import was collected for the year 2011-12 and 2012-13. The data were compiled and analyzed using standard statistical tools. The CGR and Instability Index were calculated by using the following methods.

The CGR was calculated by fitting the exponential function given below:

$$Y = a bt \dots\dots\dots (1)$$

Where, Y= area/production/productivity

a = constant

b= regression co-efficient

t= time variable

Thus, natural log on both the sides of eq (1) was taken to convert it in to linear form.

$$\text{Log } Y = \text{log } a + t \text{ log } b \dots\dots\dots (2)$$

and,

CGR (%) was work out using following formula:

$$\text{CGR } (\%) = (\text{antilog of } b-1) \times 100$$

The simple co-efficient of variation (CV) often contains the trend component and thus over estimates the level of instability in time series data characterized by long-term trends. To overcome this problem, the Cuddy Della Valle Index was used to correct the CV.

$$\text{Instability Index (II)} = \text{CV} \times \sqrt{1-R^2}$$

Where, CV = co-efficient of variation and

R<sup>2</sup> = co-efficient of determination from a time trend regression adjusted by the number of degrees of freedom.

The significant CGRs were classified in two groups i.e. negative and positive CGR.

The high growth and low instability are prerequisites for sustainable agricultural performance. Since the magnitude of growth and instability in crop production has serious implications for policy makers.

**Result and Discussion**

Table 1 represents the results of compound growth rates (CGRs) and Instability Index (II) for area, production and productivity of spices crops. Production of spices in India has achieved positive and statistically non-significant growth (1.79%) and productivity has positive and significant growth rate (3.04%) over the last ten years (2004-05 to 2013-14). It indicates that, increasing trend in productivity leads to increase production. In case of area the negative (-1.28%) growth rate was found over the years, this is mainly due to diversification of agricultural field crops. The result of the instability index for area was found higher (34.76) in comparison to production (27.40) and productivity (10.43). The high growth and low instability index indicates sustainability in production which is the prerequisite and reflects positive indication for the export potential from India. Similarly, high growth and low instability was reported by Jyoti., *et al.* [6] in Onion and potato and Kaur., *et al.* [7] in turmeric.

Year	Area (000' ha)	Production (000' Mt)	Productivity (Mt/ha)
2004-05	5909	8051	1.4
2005-06	2366	3705	1.6
2006-07	2448	3953	1.6
2007-08	2617	4357	1.7
2008-09	2629	4145	1.6
2009-10	2464	4016	1.6
2010-11	2940	5351	1.8
2011-12	3212.5	5951.5	1.9
2012-13	3076	5744	1.9
2013-14	3163	5908	1.9
CGR	-1.28 NS	1.79 NS	3.04**
Instability index	34.76	27.40	10.43

**Table 1:** Compound growth rate and instability index of area, production and productivity of spices in India.

\*\* Significant at 1 per cent level

Source: [www.indiastats.com](http://www.indiastats.com)

**Export and Import Prospects of Spices from India**

India's exports of spices in terms of value in 2012-13 registered a growth of 23.81 per cent over the previous year i.e. 2011-12, when the same reached a level of Rs 1211275.80 lakh as against Rs 978342.48 lakh in the previous year (Table 2). A further perusal of the table revealed that in the year of 2012-13, Mint products

emerged as the topmost item of exports and had registered a steep growth of 77.20 per cent over the previous year (2011-12) by reaching a level of Rs 394050 lakh as against Rs 222372 lakhs in 2011-12. Other spices showing a significant growth during the period comprised as Garlic (385.14%), Other seeds (90.07%), Cumin (78.93%), Fennel (45.18%), Fenugreek (44.16%), Celery (27.23%), Coriander (23.05%), Spice Oils and Oleoresins (19.51%), Chili (11.03%) and Curry Powder/Paste (9.15%). Thumar, *et al.* [2] also reported similar trend in major spices. During this period, the achievement in export earning is high and mainly due to the rigorous focus and initiatives taken by the Board for value addition and higher end processing of Spices. The better unit price of most of the Spices during the year also helped for achieving the record in the export earnings. On the other hand, spices going a steep fall during the period viz., Cardamom small (41.59%), Pepper (27.33%), Turmeric (24.44%), Cardamom large (8.42%), Ginger (8.30%) and Other spices (5.69%).

Item	Year		
	2011-12	2012-13	Growth (%)
Pepper	87813.45	63810.29	-27.33
Cardamom (Small)	36322.28	21215.04	-41.59
Cardamom (Large)	6830.00	6254.59	-8.42
Chilli	214408.00	238060.90	11.03
Ginger	20420.02	18725.14	-8.30
Turmeric	73434.40	55487.70	-24.44
Coriander	16401.85	20182.59	23.05
Cumin	64442.05	115306.61	78.93
Celery	2340.05	2977.26	27.23
Fennel	7209.20	10466.12	45.18
Fenugreek	7275.20	10488.12	44.16
Other Seeds (1)	5881.25	11178.60	90.07
Garlic	1415.70	6868.14	385.14
Nutmeg and Mace	24097.51	22591.87	-6.25
Other Spices (2)	32033.00	30209.03	-5.69
Curry Powder/Paste	25208.25	27515.66	9.15
Mint Products (3)	222372.00	394049.95	77.20
Spice Oils and Oleoresins	130438.28	155888.19	19.51
Total	978342.48	1211275.80	23.81

**Table 2:** Item-wise export of spices from India in 2012-13 (Value in Rs. Lakhs).

**Note:** (1) Include bishops weed (ajwan seed), dill seed, poppy seed, aniseed, mustard etc.

(2) Include asafoetida, cinnamon, cassia, cambodge, saffron, spices etc.

(3) Include menthol, menthol crystals and mint oils.

Source: www.indiastats.com

Country wise analysis revealed that USA and China continue to be the largest market for Indian spices (Table 3). In 2012-13, the country (USA) registered a growth of 31.78 per cent when the exports to this market reached a level of Rs 211572.30 lakh as against Rs 160543 lakh in the year 2011-12. The countries showing a significant growth during the period comprised as Nepal (501.84%), China (132.46%), Vietnam (129.48%), Thailand (108.31%), Mexico (84.07%), France (66.93%) and UK (16.32%).

Major Country	Year		
	2011-12	2012-13	Growth (%)
U.S.A	160543.54	211572.30	31.78
China	86806.23	201791.56	132.46
Vietnam	27712.34	63595.26	129.48
Malaysia	54327.91	49387.73	-9.09
U.A.E	58822.55	47713.42	-18.89
U.K	40106.38	46650.93	16.32
Germany	36795.46	39575.25	7.55
Singapore	35615.31	36673.94	2.97
Saudi Arabia	42708.93	35594.83	-16.66
Thailand	15299.43	31870.42	108.31
Netherlands	26073.27	29694.38	13.89
Sri Lanka	35598.98	28743.88	-19.26
Mexico	12075.38	22226.93	84.07
Bangladesh	25171.38	21381.62	-15.06
Nepal	3123.61	18799.07	501.84
Brazil	15767.53	18470.33	17.14
Indonesia	22231.87	18331.33	-17.54
Pakistan	30616.61	18008.88	-41.18
Japan	23873.08	17772.70	-25.55
France	10524.19	17568.66	66.93
Total	978342.48	1211275.80	23.81

**Table 3:** Major country wise export of spices from India in years 2011-12 and 2012-13 (Value in Rs lakhs).

Source: www.indiastats.com

India's import of spices in terms of value in 2012-13 registered a growth of 0.37 per cent over the previous year (2011-12) when the same reached a level of Rs 210231.86 lakh as against Rs 209447.75 lakh in the same year (Table 4). The further perusal of the study showed that the spices in terms of export achieved highly significant higher growth (23.81%) in comparison to import (0.37%), which is the prerequisite and reflects positive indication for the export potential from India. Growth was also reported by Anonymous [8].

Item	Year		
	2011-12	2012-13	Growth (%)
Pepper (1)	53339.88	56944.18	6.76
Cardamom (Small)	361.71	1612.44	345.78
Cardamom (Large)	10390.00	14558.80	40.12
Chilli/Paprika	2133.93	940.22	-55.94
Ginger Fresh/Dry	4739.26	10409.89	119.65
Turmeric	3060.52	2173.89	-28.97
Coriander	2722.76	3526.04	29.50
Cumin Black/White	839.31	165.36	-80.30
Mustard Seed	92.38	12.84	-86.10
Poppy Seed	26847.93	23221.50	-13.51
Garlic	220.05	105.30	-52.15
Clove	44081.58	45188.27	2.51
Nutmeg	3173.17	3575.04	12.66
Mace	3466.66	4937.27	42.42
Cassia	9169.33	8225.59	-10.29
Star Anise	4725.10	7482.40	58.35
Other Spices (2)	15604.24	7848.88	-49.70
Oils and Oleoresins (3)	24479.94	19303.95	-21.14
Total	209447.75	210231.86	0.37

**Table 4:** Item-wise import of spices from India in 2012-13  
(Value in Rs lakhs).

**Note:** (1) Include white pepper, light pepper and black pepper

(2) Include aniseed, asafoetida, cinnamon, pepper long, cambodge, herbal spices and spices.

(3) Include spices oils and oleoresins and mint products.

Source: www.indiastats.com

## Conclusion

From the above discussion it was concluded that the positive and significant growth rate of productivity (3.04%) of spices in India was observed during the study period whereas, the positive and statistically non-significant growth rate in production (1.79%) was found over the years. It also indicates that increasing trend in productivity leads to increase in production. In case of area the negative but non-significant growth rate was found over the years this may be due to diversification of agricultural field crops. Further it was observed that the spices crops recorded positive higher growth in export as compared to import over last years in terms of value earned. The high growth and low instability index indicates sustainability in production which is the prerequisite and reflects positive indication for the export potential from India [9,10].

## Policy Implications

The findings of present study would be of practical significance for the researchers, extension personnel, policy makers, planners, administrators and farmers to take rational decisions for the benefit of Indian farmer. The study in nutshell indicated that the major seed spices as well as total seed spices crops recorded positive and significant high growth and low instability in production and productivity are prerequisites for sustainable agricultural performance. Since the magnitude of growth and instability in crop production has serious implications for policy makers. The export performance of spices in terms of value earned also found the positive growth rate. Hence efforts should be made to adopt advanced processing technology to improve the quality production of spices crops to boost the export. Indian seed spices fairly enjoy the export competitiveness. Further, Spice Park will improve the quality of processed spices which can further enhance the competitiveness of Indian seed spices in the international market.

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