Multifactor analysis of productivity in oilseeds – a principal component analysis approach

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Abstract

Oils and fats constitute an essential ingredient of human diet. Oilseeds are main source of edible fats which are rich in protein. India is the largest producer of oilseed in the world. The area under oilseeds is declining which has resulted in production reduction. Presently the supply of oilseed is lagging far behind the actual requirement. The per capita intake of edible oils is 7.8 kg against the world average of 15 kg. The widening demand – supply gap has constraint to the country. It has resulted to examine the performance and stability in production. The present study aims to examine the performance, extent of stability in production and classify the years as poor productivity, moderate productivity and good productivity years. The study is based on the twenty years data for the period 1990-91 to 2010-11. The results of principal component indicate that the productivity performance of summer groundnut is poor in most of the districts while, the Kh. Groundnut and safflower perform well in Amravati, Wardha, Nagpur and Chandrapur district.
Key words: Principal component, Oilseed, multifactor analysis and productivity

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Access this article online	
Quick Response Code:	Website: www.statperson.com
	DOI: 02 January 2015

INTRODUCTION

Oils and fats constitute an essential ingredient of human diet. Oilseeds are main source of edible fats which are rich in protein. India is the largest producer of oilseed in the world. The area under oilseeds is declining which has resulted in production reduction. Presently the supply of oilseed is lagging far behind the actual requirement. The per capita intake of edible oils is 7.8 kg against the world average of 15 kg. The widening demand – supply gap has constraint to the country. It has resulted to examine the performance and stability in production. The present study aims to examine the performance, extent of stability in production and classify the years as poor productivity, moderate productivity and good productivity years.

MATERIAL AND METHODS

The study is based on the twenty years data for the period 1990-91 to 2010-11. The results of principal component indicate that the productivity performance of summer groundnut is poor in most of the districts while, the Kh. Groundnut and safflower perform well in Amravati, Wardha, Nagpur and Chandrapur district. (Barber and Copper, 1996)

RESULT AND DISCUSSION

Principal component method is used to classify the years and districts in to poor, moderate and good productivity for oil seed production. Considering the availability of data, in the presents eights districts and four oilseed crops are selected

for estimating the composite productivity indices. The crops and districts classified on the base of productivity indices is given in table 1.

Table1: Classification of districts and crops on the basis of composite indices

Sr. No.	Composite indices	Crops	Districts
1.	Poor Productivity (0.16 – 0.30)	i) Summer groundnut	Akola, Buldhana, Wardha, Nagpur,
		ii) Safflower	Bhandara and Chandrapur
2.	Moderate productivity (0.30– 0.70)	i) Kharif groundnut	Akola, Buldhana and Yavatmal
		ii)Summer groundnut	Amaravati, Yavatmal
			Wardha, ,Buldhana
		iii)Sunflower	Nagpur, Bhandara, Chandrapur
			Nagpur,
		iv) Safflower	Buldhana Amaravati, Wardha,
3.	Good Productivity (0.70– 1.09)	i) Kharif groundnut	Amaravati, Wardha, , Nagpur, Bhandara, Chandrapur
		ii) Safflower	Akola, Amaravati, Yavatmal
			Buldhana, Chandrapur

It can be seen from table 1 that the composite indices of productions ranged between 0.01 to 0.30 are considered as poor productivity crops in the districts. The districts like Akola, Buldhana, Nagpur, Bhandara, Wardha and Chandrapur are grounded in to poor productions districts of summer groundnut while Akola, Yavatmal and Nagpur are identified as poor performing districts in safflower, The composite indices in the range of 0.30 to 0.70 are classified as moderate productivity for oilseed production. The districts like Akola, Buldhana and Yavatmal are classified as moderate productivity districts in respects of Kh. Groundnut while Amravati and Yavatmal for summer groundnut and Buldhana, Wardha, Nagpur Bhandara, Chandrapur for sunflower. The districts Buldhana, Amravati and Wardha are considered as moderate productive district for safflower. The district and crops having composite indices of productivity between 0.70 to 1.00 are called as good productivity crops and districts. Amaravati, Wardha, Nagpur Bhandara and Chandrapur for Kh. Groundnut and Akola, Amravati, Yavatmal Bhandara and Chandrapur for Safflower are grouped as good productivity districts.

Classification of years

The different years of oil seed production are classified in to poor, moderate and good productivity years on the basis of composite indices are given in table 2.

Sr. No	Composite Index	Years
1.	Poor productivity (0.01 – 0.50)	1996-97,2000-2001, 2001-2002
2.	Moderate productivity (0.50 – 0.75)	1998-99, 2005-06, 2006-07, 2007-08
3.	Good productivity (0.75 – 1.00)	1990-91 to 1995-96, 1997-98, 1999-2000, 2004-05, 2010-11

The composite productivity indices are worked out using principal component technique for classifying years into poor, moderate and good productivity years for oilseed production. As seen from table 2. That years like 1996-97, 2000-2001 and 2001-2002 are grouped as poor productivity years for oilseed crops and year 1998-99 to 2005-06,2006-07 and 2007-08 are considered as moderate. The Productivity years having composite indices in the range of (0.50 - 0.75). The productivity performance of oilseed crop productions observed good in the years except poor and moderate productivity years.

CONCLUSIONS

The study concluded that the area under Kh. Groundnut decreased over the year, while the area under Soybean and Sunflower exhibited increasing trend. Further it is observed that Soybean is emerging as one of the important oilseed crop of Vidarbha as its area is increasing significantly.

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