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Variability in Area, Production, Productivity and Export of Mango

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A B S T R A C T

The study was conducted to know the variability of area, production, productivity and export of mango from India during the period 1991- 1992 to 2015-2016. Further this whole study period was divided into three sub periods - 1991-92 to 2000-2001, 2001- 2002 to 2010-2011 and 2011-2012 to 2015- 2016. For obtaining the results of the following objectives: (1) To examine the variability in area, production, productivity and export of mango from India. To fulfil the above objective, The coefficient of variation was measured to estimate the instability in area, production, productivity and export of mango during different periods. Coefficient of variation as a measure of instability and it is advantageous over other methods because it directly gives the value of instability of the characters under study. Results reveal that the coefficient of variation of area varied from 1.3 to 26 percent. Production from 0.68 to 24.55 percent. Productivity and export from 9.52 to 13 per cent and 23 to 43.96 percent respectively.

Introduction

India ranks first among world's mango producing countries accounting for about 50% of the world's mango production. Other major mango producing countries include China, Thailand, Mexico, Pakistan, Philippines, Indonesia, Brazil, Nigeria and Egypt.An increasing trend has been observed in world mango production averaging 22 million metric tonnes per year. Worldwide production is mostly concentrated in Asia, accounting for 75% followed by South and Northern America with about 10% share (NHB).

The mango fruit is very popular with the masses due to its wide variety and of adaptability, high nutritive value, richness in variety, delicious taste and excellent flavour. It is a rich source of vitamin A and C. The fruit is consumed raw or ripe. Good mango varieties contain 20% of total soluble sugars. The acid content of ripe desert fruit

varies from 0.2 to 0.5 % and protein content is about 1 %.In India, about 1,500 varieties of mango are grown including 1,000 commercial varieties. Each of the main varieties of mango has an unique taste and flavour.

Raw fruits of local varieties of mango trees are used for preparing various products like raw slices in brine, amchur, pickle, murabba, jam, jelly, chutney, panhe etc. Presently, the raw fruit of local varieties of mango are used for preparing pickle and raw slices in brine on commercial scale while fruits of Alphonso variety are used for squash in coastal western zone.

The wood is used as timber, and dried twigs are used for religious purposes. The kernel of mango contains about 8-10% good quality fat which can be used for saponification. Its starch is used in confectionery industry. Mango also has medicinal uses. The ripe fruit has fattening, diuretic and laxative properties. It helps to increase digestive capacity.

Among internationally traded tropical fruits, mango ranks only second to pineapple in quantity and value. Major markets for fresh and dried mangoes are : Malaysia, Japan, Singapore, Hong Kong and the Netherlands, while for canned mango are : Netherlands, Australia, United Kingdom, Germany, France and USA. Among west Asian market India and Pakistan are the most predominant suppliers. Southeast Asian countries get most of their supplies from the Philippines and Thailand.

Materials and Methods

This chapter is adopted for the fulfilment of objectives of the study different sources and nature of data for the study and the analytical tools employed in the study. It involves following methods:

1. Description of the study area and data collection.
2. Analytical tools and techniques employed.

Description of the study area and data collection

The whole study is conducted for the country, India for the period 1991-1992 to 2015-16. The area under consideration for analysing the objective variability in area, production, productivity and export of mango whole India is taken into consideration at aggregate level so as to facilitate data compilation from different sources like: Agricultural Processed Food Products Export and Development Authority (APEDA),Food and Agriculture Organisation (FAO) and IndiaAgristat. The publications of National Horticulture Board, "Indian Horticulture Databas", Agmarknet and Department of Commerce were also used for obtaining relevant data. Mango is grown almost in all the states of India but Lucknow district of state Uttar Pradesh tops the list of mango producing states. The domestic prices are taken since 1991-1992 to 2015-2016 from the LUCKNOW market of Uttar Pradesh state.

The present study is based on secondary data. The secondary data on area, production and productivity was compiled from National Horticulture Board (NHB) for a period of 25 years (1991-92 to 2015-16). Further the whole period is divided into three sub periods- first sub period from 1991-92 to 2000-2001, second sub period from 2001- 2002 to 2010-2011 and third sub period from 2011-2012 to 2015-2016.

Analytical tools and techniques employed

According to the objective the following analytical tools and techniques were adopted.

Measurement of instability

The degree of instability in area, production, productivity and export quantity of mango was measured by using coefficient of variation (CV).

$$CV\ (\%) = (\sigma / \bar{X}) \times 100$$

Where,
CV= Co-efficient of variation
σ = Standard deviation
$\bar{X}$= mean of the variable

Results and Discussion

In this chapter the results of the whole study are presented according to the objectives of the study. The data pertinent to the present study was collected and elicited from various sources and analysed using appropriate techniques. The results of the present study are presented as below keeping in view the objectives of the study. Instability in area, production, productivity and export of man.

Variability in area, production, productivity and export of mango

The variability with respect to area, production, productivity and export of mango during different period was determined through coefficient of variation. The study was taken from the period 1991-1992 to 2015-2016.

Further the whole study period was divided into three sub periods. First sub- period from 1991-1992 to 2000-2001 second sub-period from 2001-2002 to 2010-2011, third sub-period from 2011-2012 to 2015-2016.The result of whole study period and different sub-periods has been presented in table.1, 2, 3 and 4 respectively.

Table.1 Variability in area of mango in different Periods in India

ITEM (Area) (in ha)	STUDY PERIOD 1991-1992 to 2015-2016	PERIOD-I 1991-1992 to 2000-2001	PERIOD-II 2001-2002 to 2010-2011	PERIOD-III 2011-2012 to 2015-2016
Mean	18.14	1308.04	20430.3	2369.62
Standard Deviation	4.81	145.36	271.76	140.87
CV %	26%	11 %	1.3 %	5.9 %

Table.2 Variability in production of mango in different Periods in India

ITEMS (Production) (in mt)	STUDY PERIOD 1991-1992 to 2015-2016	PERIOD-I 1991-1992 to 2000-2001	PERIOD-II 2001-2002 to 2010-2011	PERIOD-III 2011-2012 to 2015-2016
Mean	12.72	10041.39	12925.13	17687
Standard Deviation	3.12	687.37	1608.01	1683.78
CV %	24.55%	0.68%	1.24%	9.5%

Table.1 reveals that the coefficient of variation of area varied from 1.3 to 26 percent during the whole study period. The highest (26 per cent) coefficient of variation was observed during whole period followed by first sub-period (11 per cent) and third (5.9 per cent) sub period. The lowest (1.3 per cent) variability was observed in second sub-period.

From table.2 it was observed that the coefficient of variation in production of mango varied from 0.68 to 24.55 percent during the whole study period. The coefficient of variation of whole study period registered relatively higher variability (24.55 per cent) in mango production followed by third sub-period (9.5 per cent) and second sub period (1.24 per cent). The lowest variability was observed in first sub-period (0.68 per cent).

From table.3 it was observed that the coefficient of variation in productivity of mango varied from 9.52 to 13 percent during the whole study period. The coefficient of variation of whole study period registered relatively higher variability (13 per cent) in mango productivity followed by third sub-period (11.09 per cent) and first sub period (9.71 per cent). The lowest variability was observed in second sub-period (9.52 per cent).

Table.4 indicates that the coefficient of variation in export of mango varied from 23 to 43.96 percent during whole study period. The coefficient of variation of whole period registered relatively higher variability (43.96 per cent) in mango export followed by first sub-period (42.09 per cent) and second sub period (24.38 per cent). The lowest variability (23%) was observed in third sub period.

Table.3 Variability in productivity of mango in different Periods in India

ITEMS (Production) (in mt)	STUDY PERIOD 1991-1992 to 2015-2016	PERIOD-I 1991-1992 to 2000-2001	PERIOD-II 2001-2002 to 2010-2011	PERIOD-III 2011-2012 to 2015-2016
Mean	7.18	7.74	6.36	7.7
Standard Deviation	0.96	0.75	0.60	0.85
CV %	13%	9.71 %	9.52%	11.09%

Table.4 Variability in export of mango in different Periods in India

ITEMS (Production) (in mt)	STUDY PERIOD 1991-1992 to 2015-2016	PERIOD-I 1991-1992 to 2000-2001	PERIOD-II 2001-2002 to 2010-2011	PERIOD-III 2011-2012 to 2015-2016
Mean	45	27.708	61.51	47.92
Standard Deviation	19.90	11.66	15.00	11.20
CV %	43.96%	42.09%	24.38%	23%

The coefficient of variation was done in area, production, productivity and export of mango during the period 1991-1992 to 2015 -2016. The coefficient of variation in area during the whole study period varied from 1.3 to 26 percent. The coefficient of variation of whole period registered relatively higher in area of mango followed by first and third sub period and lowest in second sub-period.

The coefficient of variation in production varied from 0.68 to 24.55 percent during the whole study period. The coefficient of variation of whole study period registered relatively higher variability in mango production followed by third sub-period and second sub period and lowest variability was observed in first sub-period.

The coefficient of variation in productivity of mango varied from 9.52 to 13 percent during the whole study period. The coefficient of variation of whole study period registered relatively higher variability in mango productivity followed by third sub-period and first sub period .The lowest variability was observed in second sub-period. In export the coefficient of variation variedfrom23 to 43.96 percent during whole study period. The coefficient of variation of whole study period registered relatively higher variability in mango export followed by first and second sub period. The lowest variability was observed in third sub period.

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