AGRICULTURAL PRODUCTIVITY AND RURAL SUSTAINABILITY

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Abstract: Mango cultivation is best suit for a tropical climate it is known as 'King of Fruits'. India is a leading producer of mangoes. Though production is high, productivity is low. A well nurtured plant yields fruit for about 40-60 years producing anything between 5 tons/ha to 10 tons/ha. Indian mangoes are grown for local consumption and export. A diversified direction of exports can be seen. India has great potential to extend the market as well as increase production. It is not just the fruit and raw mangoes are consumed but various processed products of mangoes are exported. Indian mangoes are priced better in the international market. The lean season is compensated by inter-cropping. Break even is achieved in three years.

Keywords: tropical fruit, production, productivity, export, inter-cropping and break even.

INTRODUCTION

Sustainable development intends not just maintaining resources but also going for development for the present generation without compromising the needs of the future generation. The focus of this paper is mango cultivation in India because it is a predominantly tropical and sub-tropical fruit which is grown extensively in many states. The farmers of these areas have gone in for extensive cultivation of mangoes both for local consumption and export. They grow multiple varieties which survive the hardest climatic conditions. This is due to the fact that the majority of farmers are dependent on monsoon which can either make or break them.

IMPORTANCE OF THE STUDY

The study is important in that the mango trees give yield not for just one generation but for a few. Therefore, it is important to maintain the tree population by providing the necessary ingredients for them to be healthy and retain their reproductive capacity. Generally mango trees are maintained over a few generations as they are nurtured by the farmers. It is seen the total production does vary from year to year and at times the crop is bountiful that there is glut in the market.

OBJECTIVE

The objective is to assess the various factors that affect annual output of mangoes over a period of time and how output has influenced life changes in farmers.

HYPOTHESIS

Horticultural productivity mainly mango has brought about rural sustainability in India.

NEED FOR SUSTAINABLE DEVELOPMENT

It is important for rural development and in turn sustainability. Agriculture is seen as a way of life and is yet to be commercialized. Mango growers need to diversify and maintain quality to improve their income, increase export and foreign exchange.

METHODOLOGY

Primary and secondary data has been collected. Cost and revenue analysis is based on primary data. Secondary data has been analyzed with the help of time series.

REVIEW OF LITERATURE

(a) Mango or Mangifera indica L belong to the family Anacardiaceae. It is an important commercially grown fruit crop in India and is called 'King of Fruits'. (b) Climatic Requirements: Mangoes grow in places which receive rainfall in the range oh 75-375mm/annum. Dry weather is conducive for flowering whereas a few light showers of rain during fruit development is ideal. It cannot be grown at altitudes above 600mts and a soil pH of 5.5 to 7.5 is essential for mango cultivation. (c) Economic Importance: Mango is popular because of its nutritive value, rich variety, delicious taste and flavour. It is a rich source of vitamin A and C and has lot of fibre. It is used for making amchur, pickle, murabba, chutney, squash etc. Mango also has medicinal value and is used for religious purposes. (d) The area, production and productivity in India during the period 2006-07 to 2010-11 has remained almost constant, total area remaining around a little more than 2000 hectares, production of at least 12000 tons and productivity 6 tons/ha. (e) State wise Area Production and Productivity: In the period 2008-09 to 2010-11 four major states- Uttar Pradesh, Andhra Pradesh, Karnataka and Bihar show the highest production. Area and productivity varies for different states. (f) Major Mango Producing Countries of the World: These are India, China, Thailand and Pakistan. Their percentage share in world market is maximum contributing more than 60% of the total production. (g) Country wise Exports: Indian mangoes are mainly exported to the UAE, Bangladesh, UK and Saudi Arabia. These four countries are the major importers. (h) Agriculture and its allied activities yield income. In the mango growing areas farmers are dependent on the quantum of mango production which is the source of their livelihood and employment.

ANALYSIS

Primary Data

Estimate of One Acre Model for Mango Cultivation-Pre-Harvest Approximate Expenditure

Cultivation expenses (a) Cost of planting: Rs 3000 (b) Manure and Fertilizers: Rs 6000 (c) Insecticides and pesticides: Rs 2000 (d) Cost of labour: Rs 7000 (e) power: Rs 2000 Irrigation (a) Tube well: Rs 50000 (b) Cost of pipeline : Rs 10000 Infra structure (a) Agricultural equipment: Rs 50000 Store and Pump house: Rs 20000 Land development (a) Soil leveling: Rs 2000 (b) Fencing: Rs 30000 Post-Harvest (a) Labour: Rs 10000 (b) Transport: Rs 7000
TOTAL of Pre and Post Harvest Expenditure: Rs 199000
Revenue (a) Inter-cropping: Rs 25000 (b) 5 tons of mangoes @ Rs 10000/ton: Rs 50000
TOTAL: Rs 75000

The initial cost is around two lakhs and the average earning is about is Rs 75000/year. The earning increases beyond the third year as production improves. Therefore returns are greater with the consequence break even is achieved by the third year.

Secondary Data

It has been collected from Indian Horticulture Database, Food and Agriculture Organization (FAO) and DGCIS.

Table 1 shows area, production and productivity of mango in India from 2006-2011. There has been steady increase in the total area cultivated and production also increased steadily. There has been variation in productivity. There was a drop during 2008-09 but the other years have shown an increase.

Table 2 shows state wise area, production and productivity in India. It can be seen that there is either a marginal increase or decrease in the area of mango cultivation. The fore most states are Uttar Pradesh, Andhra Pradesh, Bihar, Orissa and Maharastra. The higest production is in Andhra Pradesh followed by Uttar Pradesh, Bihar and Karnataka. The highest productivity during the three years is seen in Uttar Pradesh followed by Karnataka, Bihar and Andhra Pradesh.

Table 3 shows the major mango producing countries of the world. The top three in the world as far as area and production is concerned are India, China and Thailand, whereas when productivity is taken into consideration the highest is Mexico(19.33tons/ha) followed by Brazil(15.83), Pakistan (10.62) and China (9.36). The major contributor to world production is India followed by China, Thailand and Pakistan.

Table 4 shows country wise exports of mangoes from India. Export to UAE, Bangladesh, UK and Saudi Arabia has been maintained at a more or less steady level. Quantities exported to these countries show a marginal increase or decrease from 2009-2012.

FINDINGS

(a) Mangoes are more suited to be grown in tropical and sub-tropical climate which is mainly found in South East Asian countries. (b) The life span of a mango tree is generally around 40-60 years. (c) The trees start yielding fruit from the age of three. (d) Since the mango tree has an yielding capacity of over 40years the break even point is reached when the trees are about three years old. (e) If nurtured well using insecticide and pesticides and sufficient manure being added the yield tends to increase. (f) A few light showers in the month of April help in increasing the yield. (g) Since mangoes are exclusively summer fruits the rest of the year the farmer compensates by inter-cropping mainly with ragi, horticultural and floricultural yields.

Table 1: Area, Production and Productivity of mangoes in India

YEAR	AREA ('000ha)	PRODUCTION ('000 tons)	PRODUCTIVITY (tons/ha)
2006-07	2153.87	13733.97	6.38
2007-08	2201.38	13996.78	6.36
2008-09	2308.98	1249.77	5.52
2009-10	2312.3	15026.69	6.5
2010-11	2296.8	15188.38	6.61
Source: Indian Horticulture Database, 2010-11			

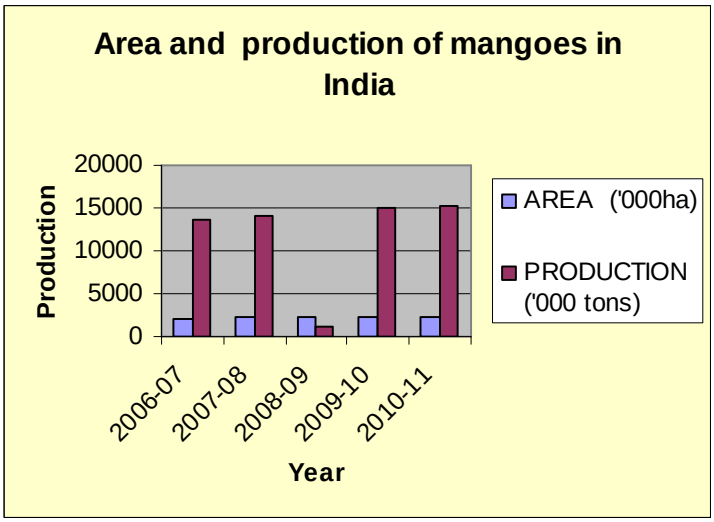

Figure 1: Area, Production of mangoes in India

Table 2: State wise Area, Production and Productivity in India

STATE	AREA ('000 ha)			PRODUCTION ('000 tons)			PRODUCTIVITY (tons/ha)		
	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11
Uttarpradesh	271.2	276.42	267.2	3466	3588	3623.2	12.78	12.98	13.56
Andhrapradesh	497.7	480.41	391.1	2522	4058.4	3363.4	5.07	8.45	8.6
Karnataka	141.29	153.8	161.6	1284.4	1694	1778.8	9.09	11.01	11.01
Bihar	144.07	146.03	147	1329.8	995.94	1334.9	9.23	6.82	9.08
Gujarat	115.69	121.52	130.1	229.82	856.74	911.3	2.59	7.05	7
Tamil Nadu	148.84	132.68	148	821.41	636.29	823.74	5.52	4.8	5.56
Orissa	164.25	177.63	190.1	449.71	577.48	642.01	2.74	3.25	3.38
West Bengal	85.97	188.14	89.53	548.92	578	620.17	6.38	6.56	6.93
Jharkhand	31.84	15.1	38.9	91.52	254.3	427.94	2.87	16.84	11
Kerala	76.7	63.75	62.2	445.4	373.17	380.86	5.81	5.85	6.12
Maharashtra	45.7	474.5	47.7	712.8	597	331	1.56	1.26	0.7
Others	585.72	182.32	6623	778.02	817.42	951.12	1.33	4.48	0.14
Total	2309	2312.3	2297	12750	15027	15188	5.52	6.5	6.61
Source : Indian Horticulture Database, 2010 -11									

Table 3: Major Mango Producing Countries of the World

COUNTRY	AREA ('000ha)	PRODUCTION ('000 tons)	PRODUCTIVITY (tons/ha)	%age Share in World Total Production
India	2312.3	15026.7	6.5	40.48
China	465.38	4351.29	9.36	11.72
Thailand	311.05	2550.6	8.2	6.87
Pakistan	173.7	1845.5	10.62	4.97
Mexico	174.97	1632.65	19.33	4.4
Indonesia	131.67	1287.29	9.78	3.47
Brazil	75.11	188.91	15.83	3.2
Bangladesh	170.8	1047.85	6.13	2.82
Philippines	189.44	825.68	4.36	2.22
Nigeria	114.9	790.2	6.88	2.13
Others	827.04	6578.07	7.95	17.72
World	4946.31	37124.74	7.51	
Source: FAO (2010)				

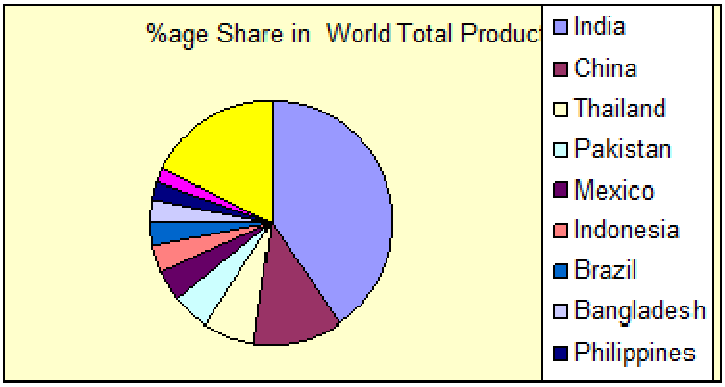

Figure 2: Percentage share in world total production

Table 4: Country wise Export of Mango for last 3 years: India Export of Mango to top 10 Countries.

Country	2009-10		2010-11		2011-12		%growth in Qty	% share in
	Qty	Value	Qty	Value	Qty	Value	on previous year	2011-12
UAE	25,608	10,383	25,725	10,067	22,014	10,737	-14.43	51.19
Bangladesh	33,550	3,296	23,050	1,859	27,599	4,059	19.74	19.35
United Kingdom	2,959	1,747	2,724	1,454	2,532	1,642	-7.02	7.83
Saudi Arabia	3,147	1,345	1,592	618	2,389	1,170	50.02	5.58
Nepal	4,058	379	1,991	210	3,926	671	97.15	3.2
Kuwait	804	520	580	378	731	540	26.01	2.57
Singapore	368	190	388	206	599	358	54.53	1.71
Qatar	659	513	374	199	816	329	117.64	1.57
Bahrain	1,238	402	981	355	624	290	-36.4	1.38
United States	175	257	137	194	353	221	158.36	1.06
Total Mango Export	74,461	20,054	59,221	16,292	63,441	20,974	7.13	100.00
Source: DGCIS								

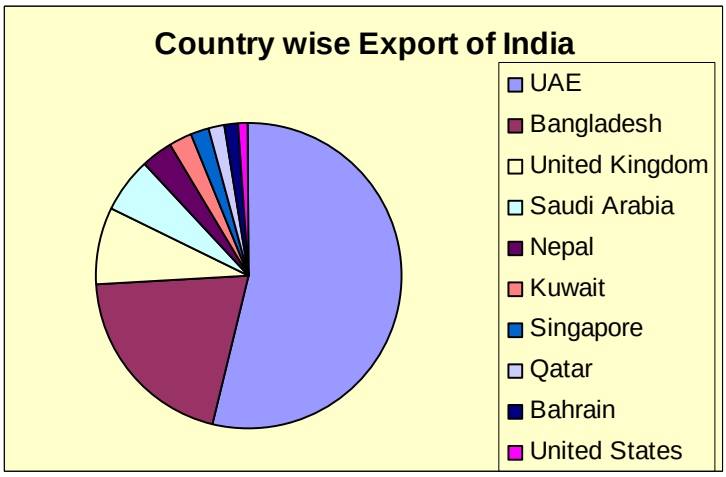

Figure 3: Country wise export of India

(h) India is a leading producer in mangoes and contributes almost 50% of the world's mango production. (i) Production in India is more but productivity per hectare is less compared to other countries. High production is attributed to the fact that the are under mango cultivation is extensive. (j) India exports mangoes which is restricted to the Middle East and South East Asian countries and at the most to United Kingdom. Very little is exported to the US market because of prohibitive transport cost. (k) Indian mangoes are better priced than those of other countries. (l) The mangoes are not only eaten as a fruit but are also converted into other forms. The Asian immigrants have been demanding mangoes from where ever they are available. (m) Raw mangoes and its processed products are sent to various parts of the country as well as being exported. This also yields income which ensures improvement in quality of life of the rural population.

SUGGESTIONS

(a) Creation of essential infrastructure like that of Special Economic Zone (SEZ), exclusively mangoes and its various other products. The SEZ can have a number of small scale industries which would process mangoes to produce various other products which are equally in demand. The SEZ can be provided with infrastructure such as preservation, cold storage, grading, processing, packaging and quality control units as well as refrigerated transportation. (b) To establish mango preservation factories in the co-operative sector. 'MAHAMANGO', a co-operative society has been established with the help of Maharastra state Agricultural and Marketing Board. Similarly 'MANGROW' has been formed for the export of kesar variety of mangoes from Aurangabad district of Maharastra. Along the same lines the other state can form associations or co-operatives to export mango and its products. (c) Capital subsidy can be given to farmers to encourage mango production and increase productivity per hectare. (d) Phytosanitary restrictions are less on mango and its products. India should utilize this to promote more exports. (e) Agricultural production and proper marketing brings rural sustainability. Infrastructure such as roads, railways, electricity, banking, and educational institutions would appear with increased income of a farmer which in turn ensures economic progress and better quality of life.

CONCLUSION

India has great potential for improving export of mango and its products. It should explore the possibility of exporting mangoes to the US market after ensuring its viability. Presently mangoes are supplied to US market by small countries close to it. Increase in export would get better returns to the farmers further improving their economic status and standard of living.

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