

Status and Performance of Pineapple Cultivation in West Bengal: A Geographical Analysis

Parvej Alam¹ Dr. Tariq Mahmood Usmani² Asefa Khatun³

^{1,2,3}Department of Geography

^{1,2,3}Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Abstract — Pineapple (*Ananas Comosus*) is very important tropical and sub-tropical fruit and is commercially cultivated in worldwide. The fruit has the capacity to fertilize the national as well as state economy if cultivate judicious manner. October-November is the growing season of pineapple in northern part of West Bengal. India produced 1861 thousand metric tonnes in 2017 contributing more than 7 per cent of the whole world (27402). West Bengal is the emerging state for pineapple cultivation. In terms of pineapple production West Bengal alone produced 336.11 thousand metric tonnes which is near about 17 per cent of country's total production. The study is mainly based on secondary sources of data obtained from Food and Agriculture Organisation (FAO), District Statistical Handbook, National Horticulture Board, indianstat.com. Etc. The study reveals that, pineapple is produced mainly in four districts of West Bengal which are Darjeeling, Uttar Dinajpur, Jalpaiguri and Coochbehar, shares more than 90 per cent of states total production. West Bengal is the leading producer of pineapple in India though it has low share of land than Assam and Manipur. In terms of productivity or yield, West Bengal (30 MT/Hectare) stand in a good position after Karnataka (62.67 MT/Hectare) and Tamil Nadu (34.05 MT/Hectare). There are many problems (inadequate farm management technique, less extension source, less scientific knowledge etc.) lies in pineapple cultivation of farmers which led to variation of yield among different states of India and West Bengal is not exception of that.

Keywords: Pineapple, Growth Status, Production, Productivity, AAGR

I. INTRODUCTION

Pineapple (*Ananas Comosus*) belongs from Bromeliaceous family is very important tropical fruit of grown almost whole tropical world lies between 10-30° north and south latitudes. Like banana and citrus it is also the most important commercial fruit in India as well as in West Bengal. Pineapple is very important for fresh fruit consumption and canned food. It contains vitamin A, B, and C considerable amount of calcium, potassium and fibre. Due to its delicious nature it has excellent flavour and nutritive value. It is low in fat and Cholesterol (Alam, 2019). It contains a special enzyme called 'Bromelin' which helps digestion of protein (Afzal, 2019). Although it contains vitamin A, B and C but is very rich in vitamin C. It is also used for preparation of alcoholic beverages by Native Americans. Besides these it

has very importance in production of fibre and medicinal use. A number of value added products like canned juice, jelly, jam, mixed jam etc. are produced which provides lucrative price to the fibre. Pineapple have different regional name in different states i.e. Ananus (Marathi), Anasipazham (Tamil), Keehom (Manipur), Kaitachchakka (Malayalam) etc. but almost all parts of India it is popularly known as Ananas. Pineapple is the most important commercial fruits which shares almost 1/5 of total horticulture GDP comes from all horticultural fruits in India. As far as economic importance of this fruit is concerned, Government of India has sanctioned one out of ten Agriculture Export Zone (AEZ) for all round development of the pineapple producing areas.

A. Pineapple Cultivation Scenario in India

Pineapple cultivation performs very well in Indian horticulture fruits production, its stand in 9th rank in terms of production among all the fruits grown in India. According to National Horticulture Board (Horticulture Statistic Division) mainly 10 states in India produced almost 95 per cent of country's total production. Among top 10 states in production, West Bengal placed in first position (330.07 thousand tonnes) almost 18 per cent of country's total production, followed by Kerala, Assam, Tripura, Karnataka, Manipur, Nagaland, Meghalaya, Bihar and Andhra Pradesh.

Sl. No	States	Production (000 Metric Tonnes)	% of Total Production
1	West Bengal	330.07	17.15
2	Kerala	305.67	15.89
3	Assam	285.17	14.82
4	Tripura	180.26	9.37
5	Karnataka	155.41	8.08
6	Manipur	128.51	6.68
7	Nagaland	127.81	6.64
8	Meghalaya	123.13	6.40
9	Bihar	116.30	6.04
10	Andhra Pradesh	55.38	2.88
Top 10 total		1807.71	93.95
Others		116.51	6.05
India		1924.22	100

Table 1: Top 10 States of India in Pineapple Production (2015-2016)

Source: Computed by researcher, data obtained from indianstat.com

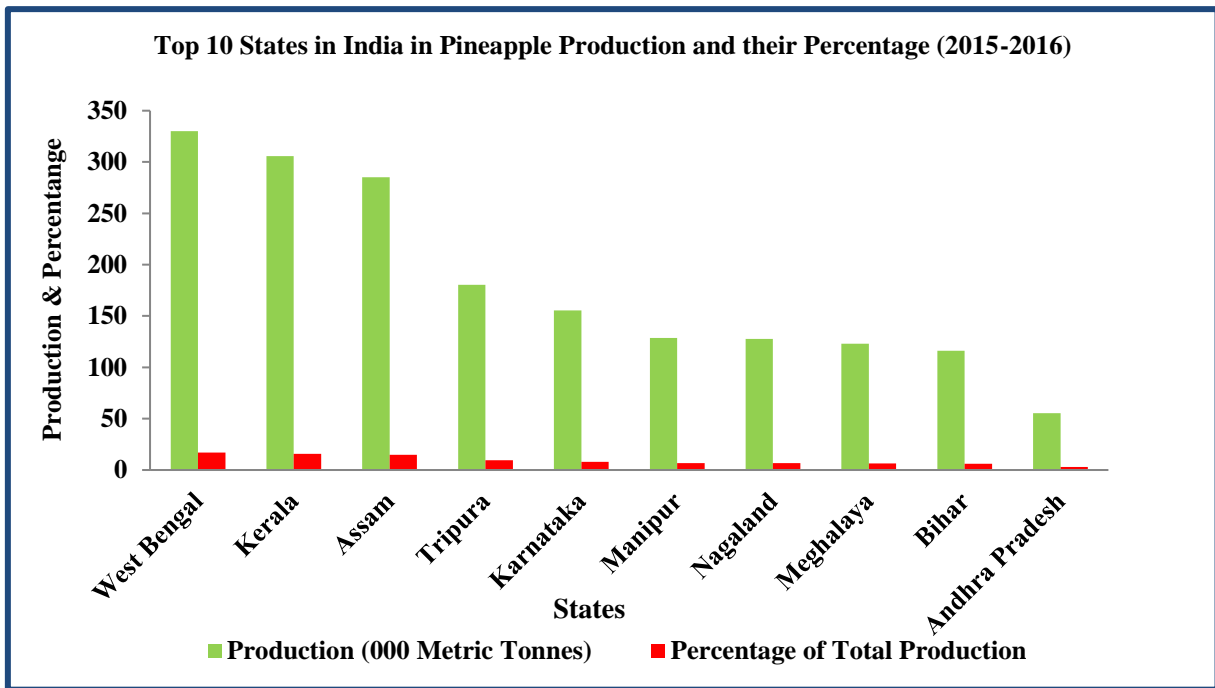


Fig. 1:

II. STUDY AREA

The state of West Bengal lies the eastern bottleneck between $22^{\circ} 58' - 43^{\circ} 04' 64''$ Northern Latitudes and $87^{\circ} 44' - 52^{\circ} 09' 08''$ Eastern Longitudes. It has borders with five Indian states i.e. Assam in the east, Sikkim in north, Bihar in west, Jharkhand in west and Odisha in south west and also share borders with international country like Bangladesh in east and south east, Bhutan in north east and Nepal in north and north west. The physiography of the state is mountain and hills in the north and Indo-Gang etic plain in the middle portion and plateau in the south west. Due to the physiography the climate of the state is also varies from humid sub-tropical in the north to tropical savana in the south. The major rivers which flow in

the state are Ganga, Mahananda, Teesta, Torsa, Bhagirathi and Hoogly. The state has been divided in 23 districts for smooth administrative purpose. The total geographical area of the state is $88,752 \text{ km}^2$. In terms of demography, it is India's fourth most populous state with total population of 9.13 crores and the growth rate is 13.84 per cent, the literacy rate is 76.26 per cent which is above the national average. The economy of the state is primarily depend agriculture and medium-sized industry. Agriculture alone share 21 per cent of state GDP. Jute, Mango, Silk, Tea, Pineapple and Orange is commercially grown which contributed major agriculture economy of the state. Kolkata is the capital of the state, located in the eastern bank of the Hoogly River which is the commercial, cultural and educational centre of East India.

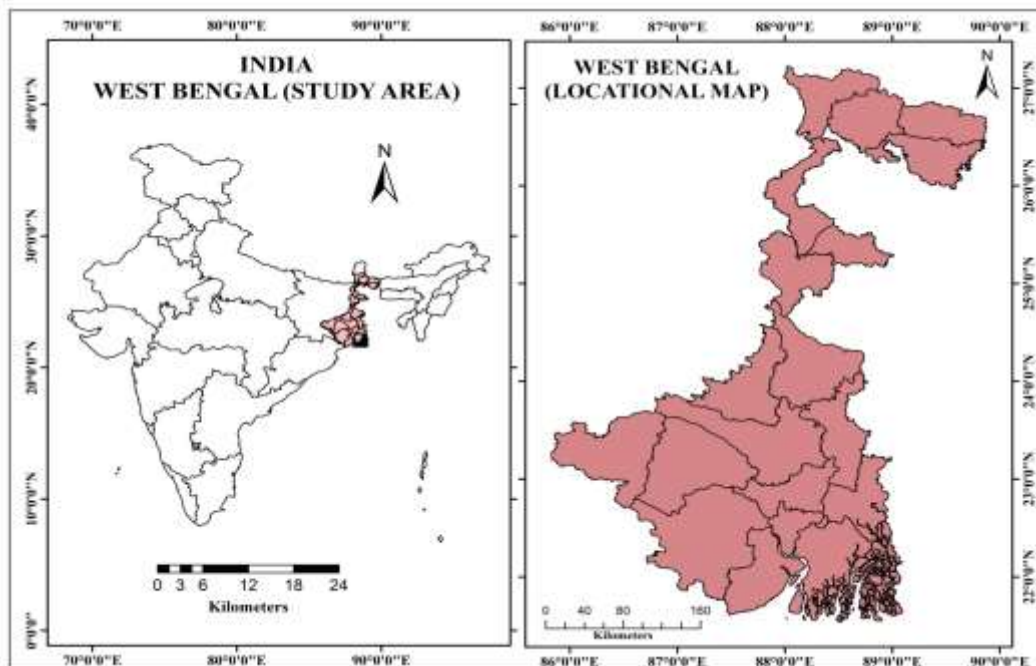


Fig. 2:

A. Objectives of the Study

The main objectives of the paper is undertaken

- To study the status and growth performance of Pineapple cultivation in West Bengal.
- To examine the inter-district growth analysis in area and production of pineapple farming.
- To find out the problems in pineapple farming.

III. METHODOLOGY

In this section a brief account of the methodology which was used for the present study. It includes description of data used, method of data processing and calculation of the data.

A. Data Used

The present paper is primarily based on the secondary sources of data and the time period for the area, production, and productivity undertaken from 1995-96 to 2015-16 i.e. 20 consecutive years in West Bengal. Due to inefficient district-wise data only 10 years have been undertaken. The secondary sources of data were mainly obtained from the Horticultural Statistics Division, Department of Agriculture, Cooperation & Farmers Welfare, Food and Agricultural Organization (FAO), National Horticulture Board of India (NHB), Statistical fact book, Agriculture and Processed Food Products Export Development Authority (APEDA), District Statistical Handbook, State Statistical Book, etc. and retrieved from indiastat.com, westbengalstat.com, fao.org. Besides these to get adequate information related to the topic, descriptive and numerical information was obtained from various national and international journals, Ph.D. thesis, articles, projects, and reports.

B. Methods and Techniques

The collected secondary data have been analysed, tabulation has been done manually, and diagrams and maps of the study area are prepared with the help of Arc GIS software 10.2. Results have been represented with the help of MS word and

MS Excel 2010. For the sake of analysis of collected secondary data, suitable statistical techniques have been used. To show the growth rate of area, production, and productivity of pineapple in West Bengal, statistical tools like the share of percentage and average annual growth rate are used.

$$AAGR = \frac{\left[\frac{\text{End value} - \text{Starting value}}{\text{Starting value}} \right] \times 100}{N}$$

Where, AAGR = Average Annual Growth Rate, N = Number of Years / Time Period

IV. RESULT AND DISCUSSION

Pineapple is one of the most commercial fruits of West Bengal and the state is the leading producer in India followed by Kerala and Assam. According to 2015-16 data, West Bengal alone produces 330.07 thousand metric tonnes which is near about 17.15 per cent of the country's total production. The study reveals that the production of pineapple in West Bengal tremendously increased from 232.6 to 330.07 (000 MT) (table 2) in the last two decades from 1995-96 to 2015-16. The total growth of production in the last twenty years is 41.93 per cent and the average annual growth rate is 2.10 per cent. Likewise, the total area and productivity of pineapple have increased from 9.1 to 11 (000 hectares) and 25.06 to 30.01 (000 MT) per hectare respectively from 1995-96 to 2015-16. The total growth of area and productivity are 27.38 and 15.79 per cent respectively. The average annual growth rate of area, production, and productivity are 1.37, 2.10, and 0.79 per cent respectively. The area and productivity of pineapple are shown slow growth as compared to its production. Three parameters show steady growth over the last two decades. The highest positive growth in terms of production (15.21 %) has shown in the year 2001-02 and the highest negative growth (23.89%) has shown in the year 2007-08. All data relating to the area, production, and productivity status of the state replicate very well performance.

Year	Area (000 Hect.)	Growth (%)	Production (000 MT)	Growth (%)	Productivity (MT/Hect.)	Growth (%)
1995-96	9.1	-	232.6	-	25.6	-
1996-97	9.1	0.0	236.6	1.72	26.0	1.56
1997-98	9.2	1.09	246.8	4.31	26.80	3.08
1998-99	10.3	11.96	283.9	15.03	29.60	10.45
1999-2000	9.3	-9.71	280.0	-1.37	27.20	-8.11
2000-01	10.4	11.83	279.5	-0.17	26.90	-1.10
2001-02	11.5	10.58	322.0	15.21	28.0	4.09
2002-03	11.8	2.61	340.7	5.81	28.80	2.86
2003-04	11.7	-0.85	320.7	-5.90	27.40	-4.86
2004-05	12.9	10.26	349.8	9.11	27.20	-0.73
2005-06	13.4	3.88	379.2	8.40	28.30	4.04
2006-07	13.4	0.0	372.1	-1.87	27.80	-1.76
2007-08	9.5	-29.10	283.2	-23.89	29.70	6.83
2008-09	9.6	1.05	283.9	0.25	29.70	0.0
2009-10	9.6	0.0	293.8	3.49	30.50	2.69
2010-11	9.9	3.12	303.7	3.37	30.60	0.33
2011-12	10.1	2.02	310.0	2.07	30.70	0.33
2012-13	10.5	3.96	310.0	0.0	29.50	-3.91
2013-14	10.7	1.90	316.0	1.94	29.50	0.0
2014-15	10.8	0.93	320.07	1.27	29.50	0.0

2015-16	11.0	1.85	330.07	3.15	30.01	0.0
Total		106.7	-	108.33	-	56.73
Overall Growth Rate		20.88		41.90		17.23
Average Annual Growth Rate (AAGR)		5.33		5.42		2.84

Table 2: Growth Status of Area, Production and Productivity of Pineapple in West Bengal (1995-96 to 2015-16)
Source: Computed by researcher, data obtained from indiastat.com

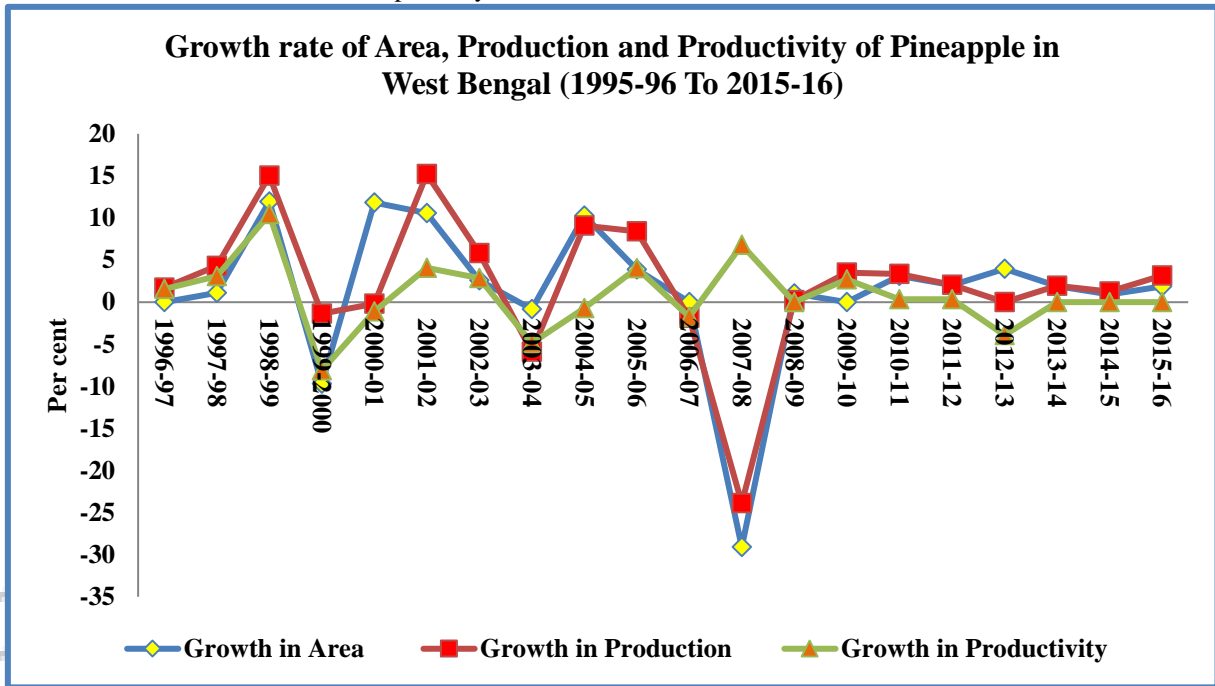


Fig. 3:

A. Area and Production of Pineapple in West Bengal (Inter-District Growth Analysis)

Pineapple is one of the important commercial fruit in North Bengal and major production comes from Phansidewa block, Darjeeling district. Production performance of Darjeeling and North Dinajpur districts from 2002-03 to 2012-13 shows positive growth. In terms of area and production of pineapple, the Darjeeling district has increased by 26.21 per cent and 37.65 per cent respectively (table 3). North Dinajpur also registered positive growth in the last ten years (2002-03 to 2012-13) accounted 39.81 and 51.38 per cent respectively. Pineapple production has decreased mainly in two districts namely Jalpaiguri and Coochbehar. The growth of the area in these two districts shows negative which constituted 40.13 and 10.82 per cent. Similarly, the production also shows negative i.e. 41.34 and 4.35 per cent respectively. The negative growth performance is mainly due to the selling

price of the fruit being much lower than the desirable market price. The inadequate infrastructures of storage, cold storage facilities, and less processing units push the farmers into the dark. At the farmer's level though the cry for reasonable pricing is too loud in reality they are not getting reasonable market prices.

Pineapple production decreased also due to hit by lack of rainfall and wicked weather condition during the flowering season. The pineapple fruits' average wholesale price is around 15-18 rupees per 1.5 kg and it's around 10-12 rupees per kg, much lower than the average price of last year says farmers. As pineapple is commercial fruit, neither they can consume it locally nor could they store it. Owing to that the farmers depend on the middleman of upcountry markets and the middleman dictating the market price. All these are the reason which led the farmers to less production in the last ten years of some districts.

Sl. No	Districts	Area (000 Hectare)		Growth (%)	Production (000 MT)		Growth (%)
		2002-03	2012-13		2002-03	2012-13	
1	Darjeeling	3.51	4.43	26.21	98.8	136	37.65
2	Uttar Dinajpur	2.11	2.95	39.81	56.2	85.08	51.38
3	Jalpaiguri	2.99	1.79	-40.13	100.59	59	-41.34
4	Coochbehar	0.37	0.33	-10.82	10.57	10.11	-4.35
5	Others	2.85	1.29	-54.74	74.53	19.81	-73.42
Total		11.83	10.5	-11.24	340.69	310	-9

Table 3: District Wise Growth of Area and Production of Pineapple in West Bengal (2002-03 to 2012-13)
Source: Computed by researcher, data obtained from westbengalstat.com

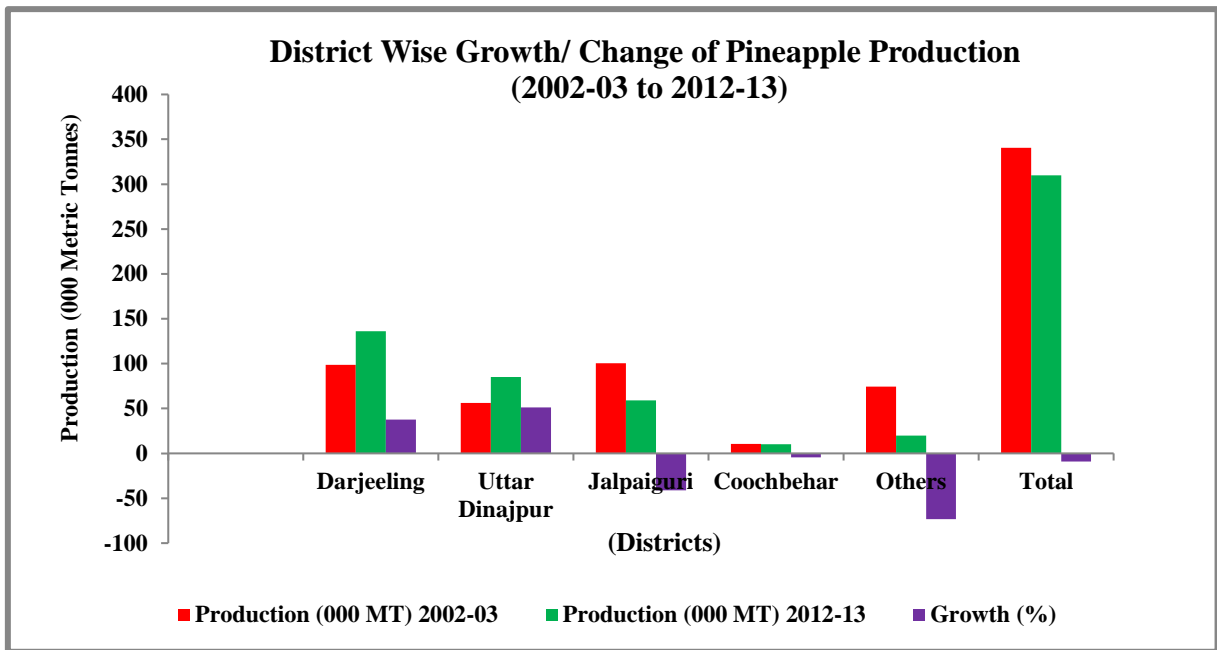


Fig. 4:

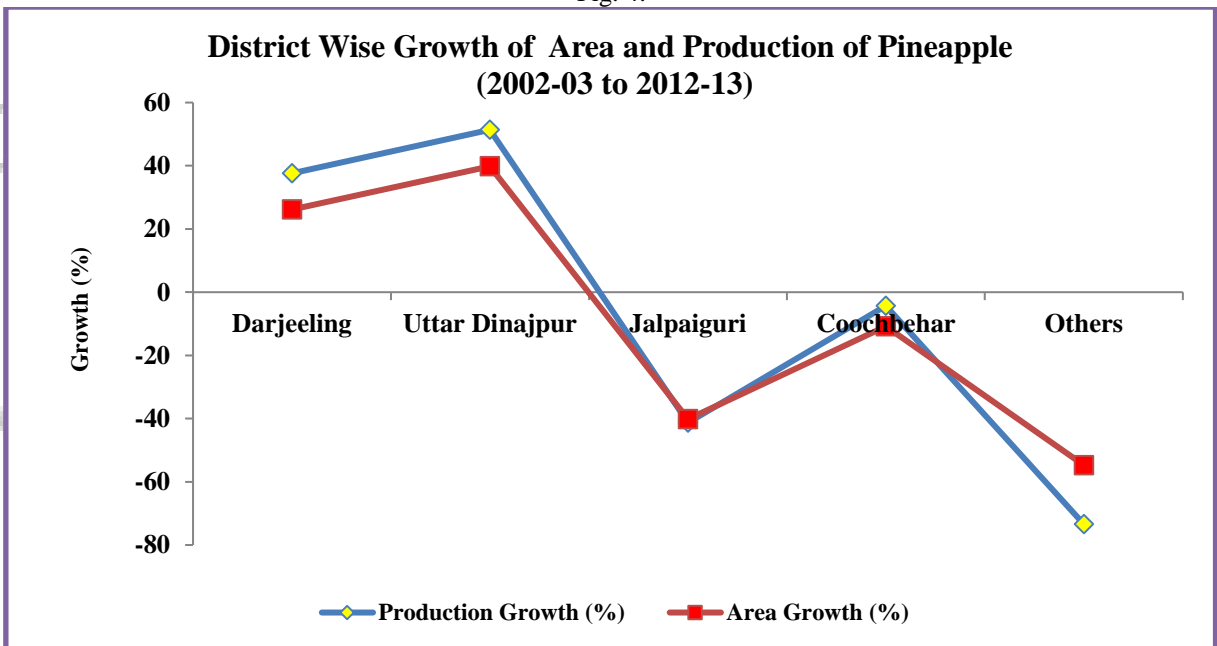


Fig. 5:

B. Problems of Pineapple Cultivation in West Bengal

Pineapple, having its highly perishable nature poses major problems in West Bengal as well as the whole country. After harvesting, fully mature fruits cannot be stored for more than 4- days. Therefore the fruit becomes very risky to transport over long distances and it becomes necessary to take adequate care to avoid any injuries. Besides this there is a lack of processing industry in the state, those are not well developed which led to constraints in the processing of pineapple. Non-availability of fruits throughout the year and the high cost of canning are also major problems of pineapple cultivation in the study area. There is a lack of a locally regulated market which led the farmers to sell their produce to middlemen who dictate the price.

V. RECOMMENDATION

Based on the finding there are some recommendation has been undertaken

- 1) There is an urgent need to develop storage and cold storage facility to minimize the rotten problems.
- 2) Development of infra-structural facilities like transportation, warehouse, and cold storage would encourage farmers' participation in pineapple farming.
- 3) There is a need to develop regulated markets for pineapple.
- 4) Proper market information and healthy government regulation would encourage pineapple farmers to self-marketing.

VI. CONCLUSIONS

Based on the above discussion it can be said that in the last ten years, the area, production, and productivity performance of pineapple in two districts i.e. Darjeeling and North Dinajpur are far better than other districts of the state. For the sake of convenience major four districts have been taken into consideration which produces more than 90 per cent. The area has increased by 26.21 and 39.81 per cent and production by 37.65 and 51.68 per cent from 2002-03 to 2012-13 both Darjeeling and North Dinajpur districts respectively. Similarly district of Jalpaiguri and Coochbehar shows negative performance. The area has decreased from 2.99 to 1.79 thousand hectares and 0.37 to 0.33 thousand hectares, accounting for -40.13 per cent and -10.82 per cent respectively. The production also shows negative during this time, accounting for 41.34 and 4.35 per cent respectively. Though the production of some districts has decreased over decades yet West Bengal is the leading producer in India. There is a bright prospect of pineapple cultivation in West Bengal if farmers adopt standardization of technology which brings down the cost of production and they take timely training from Agriculture Development Office, Krishi Vigyan Kendra, etc.

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