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TOBACCO IN PAKISTAN: A STUDY OF CONSUMPTION, PRODUCTION AND TRADE

by

N. H. Nizami

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PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS,
Old Sind Assembly Building,
Bunder Road, Karachi-1
Pakistan

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The purpose of this paper is to analyse the nature of the supply of and the demand for Pakistani tobacco and to explore the possibilities of increasing its production and exports. The paper has been divided into four parts: in section 1, we analyse the domestic demand for tobacco; analysis of supply of tobacco is undertaken in section II; section III deals with the foreign trade in tobacco with special emphasis on the prospects and problems of exports; and conclusions have been gathered in section IV.

I. DEMAND FOR TOBACCO

An individual's demand for a commodity is dependent upon his income, his preference and the price of the commodity. Similarly, the national demand for a commodity is dependent upon the level of national income, national preferences and the price structure prevailing within the country. Though the demand for tobacco and its products is subject to this generalization,

yet the force of habit, custom and demonstration is probably relatively stronger in the case of tobacco consumption. Still more important factor affecting the consumption of tobacco is the age structure of the population. The desire to consume tobacco products, however, can be turned into effective demand only through the improvements in real per capita income. Assuming that the taste of the consumers remains constant and that the relative price of tobacco vis-a-vis other goods does not change, income becomes an important variable affecting the demand for tobacco products. In short run, consumer's taste and relative prices are generally stable. We shall, therefore, study the relationship between the consumption of tobacco products and the per capita income in urban and rural areas of East and West Pakistan.

a) (Functional Hypotheses)

Several alternative hypotheses regarding variation in the consumption of tobacco products with respect to per capita income were tested. The final selection of the functional form was, however, made on the basis of the highest r^2. We grouped the functions in two categories[1/] and selected one function from each category on the basis of highest r^2. The alternative hypotheses are postulated by the following two sets of functional forms.

1/ The grouping was made on the basis of the necessity of taking log of the dependent variable. In one group we included functions without log of the dependent variable while in the other group we included functions with log of the dependent variable.

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Set I	Set II
1) $v = a + by$	1) $\log v = a + b \log y$
2) $v = a + b \log y$	2) $\log v = a - by$
3) $v = a - by$	3) $\log v = a + by$

Where v = per capita expenditure on tobacco and its products and y = per capita income. "a" and "b" are constant parameters to be estimated. We shall use the following symbols for regional identification.

P = Pakistan

E = East Pakistan

W = West Pakistan

r = rural

u = urban

b) The Analysis of the Estimated Functions

.The data from the Quarterly Survey of Current Economic Conditions, 1963/64 have been utilized for estimating the functions for the demand for tobacco[2/]. The expenditure on tobacco and tobacco products in Pakistan seems to have constant elasticity with income. The second best function, however, gives constant marginal propensity to spend on tobacco and its products. The estimated functions are:-

1) $\log p^v = -1.168 + \underset{(0.032)}{0.695} \log y_p \quad r^2 = 0.98$

2) $p^v = 0.307 + \underset{(0.001)}{0.014} y_p \quad r^2 = 0.97$

2/ For a detailed description of the survey data, see, [4;7].

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When we disaggregate the function at regional levels, we find that the expenditure on tobacco and its products in East Pakistan rises rapidly till a threshold level of income is achieved and then moves gradually to an asymptotic level. The second best fit function gives a steadily rising expenditure on tobacco and its product in East Pakistan. The estimated functions are:-

3) $\log v_E = 0.319 - \underset{(1.637)}{10.844}\ \frac{1}{y_E}$ $\quad r^2 = 0.83$

4) $v_E = -1.723 + \underset{(0.420)}{1.778}\ \log y_E$ $\quad r^2 = 0.67$

In West Pakistan, however, the expenditure on tobacco and its products may be either subject to constant elasticity or to constant marginal propensity to consume. The estimated functions for West Pakistan are:-

5) $\log v_W = -1.272 + \underset{(0.065)}{0.727}\ \log y_W$ $\quad r^2 = 0.93$

6) $v_W = 0.204 + \underset{(0.001)}{0.014}\ y_W$ $\quad r^2 = 0.93$

The disaggregation at rural-urban levels shows that demand for tobacco and its products has either constant elasticity or constant marginal propensity to consume in urban Pakistan, whereas the demand for tobacco and its products may be steadily rising at a slower and slower speed in rural Pakistan.

7) $\log v_{P_r} = -0.975 + 0.554 \log y_{P_r}$ $r^2 = 0.93$

8) $v_{P_r} = -0.909 + 1.102 \log y_{P_r}$ $r^2 = 0.93$

9) $v_{P_u} = -1.028 + 0.674 \log y_{P_u}$ $r^2 = 0.97$

10) $v_{P_u} = 0.406 + 0.017\ y_{P_u}$ $r^2 = 0.96$

A further disaggregation of rural-urban expenditure at regional levels gives the following equations.

11) $\log v_{E_r} = 0.256 - \underset{(1.720)}{9.609} \frac{1}{y_{E_r}}$ $r^2 = 0.78$

12) $v_{E_r} = 1.602 - \underset{(6.152)}{20.018} \frac{1}{y_{E_r}}$ $r^2 = 0.54$

13) $\log v_{E_u} = -1.190 + \underset{(0.067)}{0.824} \log y_{E_u}$ $r^2 = 0.94$

14) $v_{E_u} = -2.956 + \underset{(0.325)}{2.793} \log y_{E_u}$ $r^2 = 0.89$

15) $\log v_{W_r} = -1.178 + \underset{(0.060)}{0.632} \log y_{W_r}$ $r^2 = 0.93$

16) $v_{W_r} = 0.266 + \underset{(0.002)}{0.010}\ y_{W_r}$ $r^2 = 0.93$

17) $\log v_{W_u} = -1.031 + \underset{(0.087)}{0.651} \log y_{W_u}$ $r^2 = 0.86$

18) $v_{W_u} = 0.340 + \underset{(0.002)}{0.016}\ y_{W_u}$ $r^2 = 0.89$

It seems that the behaviour of the rural and urban population with respect to consumption of tobacco and its products taken separately in East and West Pakistan is not different from the behaviour of the aggregate population in East and West Pakistan except that the urban East Pakistan shows a different behaviour from that shown by East Pakistan as a whole.

c) Income Elasticity of Expenditure on Tobacco and its Products

The income elasticity has been estimated at the level of average per capita income. The estimates are shown in Table I. It seems that the demand for tobacco and its products is fairly inelastic, because the income elasticity is less than unity but more than 0.50 in all regions of Pakistan. The interesting points to be noted are:-

1) The income elasticity of demand for tobacco and its products is higher in East than in West Pakistan. This is likely to be due to the income differentials in the two wings of Pakistan.

2) There is no significant difference between urban and rural elasticities.

3) The differentials in elasticities estimated from functions based on alternative hypotheses are not big; the maximum variation is 0.11 in all Pakistan and rural Pakistan.

II. SUPPLY OF TOBACCO

a) Production

Production depends upon acreage as well as the yield. The acreage depends upon demand and price situations, while the yield is affected by soil, climate and inputs like fertilizer and water. The conditions prevailing in

Table I

Income Elasticity of Expenditure on Tobacco and its Products, 1963/64

	Elasticities		Difference between elasticities estimated from alternative functions
	Set I	Set II	
Pakistan	0.59	0.70	0.11
East Pakistan	0.92	0.90	0.02
West Pakistan	0.71	0.73	0.02
Rural Pakistan	0.66	0.55	0.11
Rural East Pakistan	0.85	0.81	0.04
Rural West Pakistan	0.57	0.63	0.06
Urban Pakistan	0.62	0.67	0.05
Urban East Pakistan	0.86	0.82	0.04
Urban West Pakistan	0.65	0.66	0.01

the two wings of Pakistan with regard to soil, climate, prices, and demand are not identical and hence the trends of tobacco production in East and West Pakistan are not the same.

The acreage under tobacco in West Pakistan shows a rising trend while in East Pakistan it has a falling trend (Table II). In West Pakistan, the acreage grew at

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Table II

Acreage under Tobacco in East and West Pakistan

	East Pakistan		West Pakistan		All Pakistan	
	Acreage ('000 acres)	Production ('000 tons)	Acreage ('000 acres)	Production ('000 tons)	Acreage ('000 acres)	Production ('000 tons)
1947/48[a]	131	45	29	15	160	60
1848/49 to 1950/51[b]	127	43	40	24	167	67
1951/52 to 1953/54	131	48	52	33	183	81
1954/55 to 1956/57	119	44	86	55	205	99
1957/58 to 1959/60	109	34	91	58	200	92
1960/61 to 1962/63	104	29	107	64	211	93
1963/64 to 1965/66	104	27	125	88	229	115
1966/67[c]	110	37	141	138	251	175

Source: Acreage, from [2;12].

Production, from [6;127].

a/ For one year.

b/ Average for 3 years.

c/ For one year.

the rate of 3.6 per cent per annum during 1947/48 to 1966/67 while in East Pakistan it fell at the rate of 1 per cent per annum. Production in West Pakistan grew during the same period at the rate of 4.2 per cent per annum, while East Pakistan suffered a decline in production at the rate of 1 per cent per annum.

The increase in acreage in West Pakistan has largely been due to favourable demand conditions within the province. The favourable demand conditions encouraged farmers to apply high yielding inputs like fertilizer and water as a result of which production increased faster than the acreage. The falling trend in acreage as well as production in East Pakistan can be similarly attributed to unfavourable demand conditions due to the shrinking of Indian and Burma markets for Pakistan's manufactured tobacco.

The question to be asked now is: why West Pakistan went for expansion of acreage under tobacco when East Pakistan's tobacco industry was suffering from shrinking market? Since both the wings of Pakistan are within a custom union, tobacco produced in East Pakistan could have been exported to West Pakistan, when tobacco export from East Pakistan to India and Burma was slackening. Probably the cost of transport between the two wings of Pakistan is high enough to make it profitable for

West Pakistan to produce rather than to import tobacco from East Pakistan. There may be some quality differentials in the products of the two wings as well. Another important factor was that the water requirement was less, a scarce factor in West Pakistan, in tobacco production compared to substitute crops. Although the fixation of minimum price for sugarcane and monopsonistic element in tobacco marketing worked to make sugarcane more profitable than tobacco, yet tobacco acreage and output in water scarce areas of West Pakistan increased because sugarcane, as compared to tobacco, cannot be grown in areas suffering from scarcity of irrigation water [5, p. 23].

b) Elasticity of Supply

Since the yields of agricultural products are affected by wheather and other climatic conditions, it is more advisable to estimate the elasticity of supply of tobacco on the basis of acreage response to price rather than output response to price. The relevant price to be used is the harvest price. We shall, however, use the general wholesale average price largely because of the unavailability of harvest price. Since there does not seem to be any particular crop which competes for land with tobacco, we preferred to use absolute rather than the relative price. The acreage-price relationship is hypothesised by the equation:- $A_t = a + b P_{t-1}$

Where A = acreage under tobacco; P = average wholesale price of tobacco, and t = crop year. The estimated functions are:-

$$1)\ A_t^W = -54.168 + \underset{(0.2218)}{1.4059}\ P_{t-1}^W \qquad r^2 = 0.57$$

$$2)\ A_t^E = 101.13 + \underset{(0.16)}{0.11}\ P_{t-1}^E \qquad r^2 = 0.04$$

where E = East Pakistan and W = West Pakistan.

It can be seen that price changes affect the acreage in East Pakistan and West Pakistan quite differently. In East Pakistan, price does not seem to have any significant influence on the acreage under tobacco, because the variance explained is only 4 per cent and the standard error of the coefficient is bigger than the coefficient. The acreage under tobacco in West Pakistan is, however, quite responsive to price change; 57 percent of the variations in acreage is explained by price changes. The coefficient of regression is significantly different from zero at 99-per-cent level of confidence. Assuming that the yield remains constant with changes in acreage under tobacco, the price elasticity of supply of tobacco in West Pakistan is 1.63 which is quite high. Thus producers of tobacco in West Pakistan are highly responsive to price changes. Production of tobacco in West Pakistan may, therefore, be increased by giving proper price incentives to the farmers.

The farmers in West Pakistan seem to be more responsive to changes in value per acre than in prices of tobacco. The acreage response to value per acre of tobacco in West Pakistan is estimated as follows:

$$y = 44.62 + \underset{(0.0065)}{0.0278} X \qquad r^2 = .76$$

where y = acreage under tobacco in thousand acres,

X = value for acre of tobacco.

Thus, we can see that 76 per cent of the variation in acreage under tobacco in West Pakistan is explained by the variation in value per acre and the regression coefficient is significantly different from zero.

Acreage under tobacco in West Pakistan seems to be increasing at the expense of acreage under wheat. The acreage response of the farmers to the changes in relative values (per acre) from tobacco and wheat is quite significant as seen from the following estimated relationship.

$$y = 41.11 + \underset{(3.16)}{10.48} X \qquad r^2 = .79$$

where y = acreage under tobacco in thousand acres,

X = value per acre of tobacco divided by the value per acre of wheat.

c) <u>ways of Increasing Tobacco Production</u>,

i) <u>Shifting the present area under alternate crops to tobacco:</u> The conditions pertaining to climate, soil, water supply and seasonal sowing,

nursery, harvesting and marketing periods are not identical in East and West Pakistan. Tobacco is a rabi crop in East Pakistan. It is, however, an additional rabi crop in West Pakistan and its cultivation mostly takes place at the end of the rabi and beginning of the kharif season. Thus, it competes with wheat, gram, fodder, cotton, sugarcane, and pulses in West Pakistan. However, the total area under Virginia tobacco in Pakistan comes to about 0.25 million acres, which is so small in relation to the total cropped area expected to be 68.4 million acres by the end of the Third Five Year Plan, that it can be increased many times without substantially affecting the area under other crops [11, p.401].

ii) Raising the average yield of tobacco: The tobacco yields in Pakistan are low in comparison to other advanced countries like the United States, Canada, France, Italy, Poland, and Japan. Table III indicates the yields of tobacco in Pakistan as compared with some of the important tobacco-producing countries.

Table III

Yield Per Acre of Tobacco in Principal Countries

Country	Average 1948/49 to 1952/53	1963/64	1964/65	1965/66
	(--------in maunds ----------)			
United States	15	24	25	24
France	19	21	22	24
Japan	19	24	27	24
Canada	15	21	21	22
Poland	16	23	20	n.a.
Italy	15	14	16	13
Mexico	15	14	14	n.a.
Pakistan	11	12	13	13
India	9	10	9	10
Brazil	9	9	9	n.a.

n.a. = not available. Source: [13].

Tobacco yields in East Pakistan are much lower than in West Pakistan. Provision of irrigational facilities, control of various diseases, and appropriate use of fertilizer are required to increase yield in East Pakistan. Irrigation water is now available for 94 thousand acres in the Ganges-Kobadak area and for 91 thousand acres in the Thakurgaon tubewell project area [3, Pp. 323 and 345]. Table IV shows per acre tobacco yields in both the wings of Pakistan.

Table IV

Yield Per Acre of Tobacco in Pakistan

	Average 1950/51 to 1954/55	Average 1955/56 to 1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66
	(----------in maunds ----------)							
Pakistan	12.3	12.6	12.5	12.5	11.3	13.2	13.1	11.6
E. Pakistan	9.8	9.1	6.8	7.9	7.6	7.5	7.1	6.7
W. Pakistan	17.3	16.1	16.8	16.7	16.6	18.5	18.3	20.4

Source: [3;9].

In West Pakistan the results of the use of fertilizer on tobacco crop appear to be quite significant. Return on one rupee spent on fertilizer comes to 12 rupees and consumption of fertilizer averaged 448 pounds per cultivator. This is about ten times the quantity used in East Pakistan which is due, partly, to better financial conditions but mainly to larger size of holdings. In case of major crops like wheat and cotton, the consumption of fertilizer was even higher. In order to increase the use of fertilizer in West Pakistan, increase in irrigation water, and provision of credit facilities appear to be very important [10, Pp. 69, 94].

d) Prospects of increasing tobacco production

Production target of tobacco by the end of the Third Five Year Plan is estimated to be 273 million pounds. Table V shows the percentage increase in tobacco production

aimed at in 1969/70 over the base period 1964/65 in both the wings of Pakistan. The third-plan target of 273 million pounds (122 thousand tons) had been exceeded in the very first year of the Plan when the tobacco production had reached 137 thousand tons.

Table V

Targets of Tobacco Crop Production

Production in base period 1964/65			Production Target in 1969/70			Percentage increase		
East Pakistan	West Pakistan	Total	East Pakistan	West Pakistan	Total	East Pakistan	West Pakistan	Total
(million pounds)			(million pounds)			(per cent)		
63.0	170.0	233.0	78.0	195.0	273.0	15	24	17

Source: [11].

3. Trade: Foreign and Interwing

a) Imports

Table VI gives tobacco imports in Pakistan since 1954/55. The imports have no trend. The total value of the imports was in 12.1 million rupees/1955/56 but it decreased to only 7.5 million rupees in 1966/67. This was due to the fact that our own tobacco crop had been quite good during the last two years. A remarkable increase in the production of Virginia variety has also taken place.

b) Exports

Pakistan, being predominantly a producer of indigenous varieties of tobacco, has not been able to make an appreciable headway in the export market because the

Table VI

Imports of Tobacco in Pakistan

Year	Tobacco unmanufactured		Tobacco manufactured		
	Quantity	Value	Quantity	Value	Total Value
	(000 Lbs)	(000 Rs.)	(000 Lbs.)	(000 Rs)	(000 Rs.)
1954/55	1,762	4,396	128	662	5,058
1955/56	3,322	11,862	28	330	12,192
1956/57	2,139	8,821	99	951	9,772
1957/58	631	2,159	46	367	2,526
1958/59	221	806	17	184	992
1959/60	1,156	4,997	138	831	5,828
1960/61	1,296	6,207	98	604	6,811
1961/62	1,758	8,546	35	201	8,747
1962/63	2,650	11,911	75	648	12,559
1963/64	1,540	7,967	97	755	8,722
1964/65	n.a.	n.a.	n.a.	n.a.	18,208
1965/66	n.a.	7,575	n.a.	1,184	8,759
1966/67	n.a.	6,861	n.a.	703	7,564

n.a. means not available.

Source: Taken from the unpublished revised record of the Central Statistical Office.

international requirements are mostly limited to flue-cured varieties. During the pre-Partition period some quantities of cigar tobacco and snuff were exported to India and Burma. The Burma market was lost during the Second World War due to the occupation of that country by Japan. The export trade in tobacco with India was curtailed by the Indian Government soon after Partition. Table VII indicates the exports of tobacco since 1957 from both the wings of Pakistan.

Exports from East Pakistan are practically nil and even from West Pakistan they appear to be only nominal. Only during 1964/65 did the exports show an

Table VII

Exports of Tobacco Including Manufactures from Pakistan (in thousand Rs.)

Year	Pakistan	West Pakistan	East Pakistan
1957 (Jan.,-December)	490	490	-
1958 "	388	388	-
1959/60(July-June)	106	106	0
1960/61(July-June)	70	52	18
1961/62(July-June)	62	62	-
1962/63(July-June)	276	276	-
1963/64(July-May)	220	208	12
1964/65(July-May)	1747	1747	-
1965/66	825	n.a.	n.a.

- means nil. Source: [14].

n.a. means not available.

encouraging sign of rise when 1747 thousand rupees worth of tobacco was exported as against 1963/64 exports valued at 220 thousand rupees. Pakistan now exports unmanufactured tobacco to the United Kingdom, the United States, Netherland, Germany and Ceylon; and manufactured tobacco (snuff, chewing tobacco) to Afghanistan, Behrain, Muscat, Qatar, Oman, and Persian Gulf. These exports are, however, nominal.

There are hopeful possibilities of Virginia tobacco finding a good market abroad, provided its cultivation is sufficiently expanded to make appreciable quantities available for export. [illegible] is a pre-requisite to orderly marketing of virginia Variety and more so for export purposes. As the area under Virginia variety in Pakistan increased to 94 thousand acres in 1967 compared to 65 thousand acres in 1966, the production of leaf tobacco also increased from 63.2 million pounds in 1966 to 63.5 million pounds in 1967. The increase was adequate to meet the requirements of the manufacturing industry and leave a surplus for export as well.[3/] In East Pakistan there has been a successful experiment in producing sufficient quantities of air-cured Virginia tobacco from the 1967 crop to satisfy the needs of the cigarette factories in that wing. As for the flue-cured Virginia tobacco, experiments have started in the new Kushtia area in addition to Rangpur and Thakurgaon and the indications are that the difficulties of low yields, various diseases and high fuel-costs would soon be overcome. Strenuous efforts are being made to achieve self-sufficiency in the flue-cured Virginia variety in East Pakistan. In the year ended 31st March, 1967, over a million pounds of tobacco were exported from East Pakistan and it is expected that there may be considerable

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3/These figures are based on information received from Pakistan Tobacco Company Limited, Karachi.

improvement on this if the 1967 crop comes up to the expectations[4/].

c) Interzonal Trade of Pakistan in Tobacco

Due to diversity in the production of tobacco varieties in the two wings of Pakistan, there is some interzonal trade between East and West Pakistan. Table VIII indicates the magnitude of tobacco imports into West Pakistan from East Pakistan and vice versa.

It further revealsa continuously rising interzonal trade in tobacco between the two wings since 1952/53. In case of unmanufactured tobacco, West Pakistan imports jati, matihari and bispat varieties which are exclusively grown in East Pakistan. Manufactured tobacco products, such as cigars and cheroots, are also imported from East Pakistan.

As against this, exports from West Pakistan to East Pakistan include Virginia flue-cured and sufeed patta tobacco; in case of manufactured tobacco products, some quantities of cigarettes of superior quality not being produced presently in East Pakistan are exported.

4/ The information regarding exports of Virginia variety from East Pakistan is based on the statement of the Chairman of Pakistan Tobacco Company Limited which he made at the 20th Annual General Meeting of the Company, held in Karachi on 8th July, 1967.

Table VIII

Interzonal Trade in Tobacco between East and West Pakistan

Year (July-June)	Imports into West Pakistan			Imports into East Pakistan		
	Tobacco manufactured	Tobacco unmanufactured	Total value	Tobacco manufactured	Tobacco unmanufactured	Total value
	(000Rs.)	(000 Rs.)	(000 Rs.)	(000 Rs.)	(000 Rs.)	(000 Rs.)
1952/53	205	2,004	2,209	4,591	3,771	8,362
1953/54	467	2,185	2,652	38,017	-	38,017
1954/55	221	4,163	4,384	26,702	5,565	32,267
1955/56	418	1,712	2,130	16,985	19,260	36,245
1956/57	95	1,625	1,720	23,500	16,951	40,451
1957/58	57	1,584	1,684	10,887	19,962	30,849
1958/59	115	3,218	3,333	19,911	22,171	42,082
1959/60	24	2,187	2,211	18,451	25,358	43,809
1960/61	90	1,313	1,383	4,888	26,066	30,954
1961/62	400	3,711	4,111	32,266	28,859	61,125
1962/63	36	1,205	1,241	26,195	40,028	66,223
1963/64	380	2,054	2,434	24,318	46,869	71,187
1964/65	926	3,004	3,930	41,918	47,591	89,509

Source: [6].

In this study, we have examined consumption, production, and trade of tobacco and its products. Although

the consumption of tobacco and its products is highly influenced by habits and customs of the society, the desire to consume tobacco products is satisfied more when income rises. The expenditure on tobacco and its products has been found to vary significantly with the variation in income; the income elasticity of demand for tobacco is fairly high.

The production of tobacco is highly influenced by the demand conditions. Rising demand for tobacco in West Pakistan gives incentive to the farmers to grow more tobacco. The less-water requirement for tobacco as compared with sugarcane, cotton, and other crops also enables the farmers in water-scarce areas to grow tobacco. In East Pakistan, the fall in demand has resulted in the shrinkage of acreage under tobacco.

The rising domestic production of Virginia variety to meet the requirements of Pakistan's tobacco manufacturing industry has prevented imports to rise; while the limited supply of flue-cured Virginia tobacco which can make its way in the international market and the loss of trade with Burma and India prevented the exports from expansion.

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