

TOBACCO PRODUCTION IN ASIA: IMPACT OF WHO-FCTC

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Asia is the largest producer of tobacco in the world accounting for about 63 percent of production and about 61 percent of area and embraces 24 percent of tobacco exports in the world. The present paper is an attempt to assess the performance of tobacco production and exports in Asia and impact of supply side measures of Framework Convention on Tobacco Control implementation (FCTC) in Asia. The study was primarily based on the time-series secondary data on area, production, and productivity and exports of tobacco from Asia. The growth dynamics of tobacco production and exports in Asia have been analysed during the past two decades. The results have depicted that the supply side measures of FCTC has not made discernible impact on reduction of tobacco production and exports in Asia, especially in mega countries like China and India during post-FCTC period. However, the future prospects of tobacco production is emerging in hitherto small producing countries of Asia like Pakistan and Bangladesh as their productivity is higher than the global average. Concluding remarks suggest that framing a region specific policy to address the issues related to stable production of food and non-food commodities, climate change impact, natural resource degradation and public health in conjunction with international policy environment for a sustainable and balanced development of agriculture sector in Asia.

Introduction

Tobacco cultivation has assumed greater proportions in the world as a most important non-food crop with great economic and social significance. Tobacco as a cash crop and tobacco products as commodities with almost guaranteed demand, make tobacco industry as a unique industry in the world. Presently, Asia is the largest producer of tobacco in the world, accounting for about 63 percent of global production and about

61 percent of the world's area under tobacco (FAOSTAT, 2019). Further, only a few countries contribute major share to tobacco production in Asia and exhibits a wide variability in their production and productivity. On the other hand, globally, in order to curtail the tobacco use through policy instruments (demand and supply side); the WHO-FCTC (Framework Convention on Tobacco Control), the first international public health treaty was introduced in 2005. Of the 195 WHO member states, 168 have signed the treaty and 175 have become parties making it one of the most rapidly embraced covenants in United Nations history. The present paper mainly focus on impact of supply side measures of the FCTC on tobacco production and exports. Keeping this in view, the study has explored the growth dynamics of tobacco production and exports in Asia during the past two decades, and has made an impact analysis of FCTC implementation in Asia.

Data and Methodology

The study is primarily based on the time-series secondary data on area, production and productivity and exports of tobacco for Asian region obtained from the official website of UN-FAO (www.faostat.fao.org). The production dynamics of tobacco in Asia was probed using tabular analysis and the compound annual growth rates (CAGR) of area, production and productivity were estimated as follows:

$$Y_t = AB^t e$$

Writing it in semi log form as,

$$\ln Y_t = \ln A + (\ln B) t + \ln e$$

where,

$$B = (1+r)$$

Y_t = Area/yield/production of tobacco in the t^{th} period,

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t = Time variable (1, 2, 3... n),
 A and B = Parameters to be estimated,
 r = Compound growth rate, and
 e = Error-term.

The exponential function was transformed to the semi log model and estimated using ordinary least square (OLS). Further, to examine the stability in tobacco productivity in Asia, coefficient of variation (CV) was estimated which in conjunction with compound annual growth rate (CAGR).

$$CV = \frac{\sigma_x}{\bar{X}}$$

where,

σ_x = standard deviation of X, and \bar{X} = Mean of x.

RESULTS AND DISCUSSION

Current Tobacco Scenario in the World

Tobacco cultivation takes place approximately in 3.53 million hectares of land (more than 120 countries) in all most all the regions of the world. Tobacco is grown on less than one percent of the world's agricultural land and on a wide variety of soils and climates. During 2017, in Asia, 2.15 million ha area is under tobacco cultivation, producing about 4.08 million tons of tobacco. America, stands second in tobacco area (0.67 million ha) next to Asia with its production share (23 percent) is significant while the Africa with 0.61 of tobacco area contributes 11 percent of total

tobacco production in the world. Hence, it is clearly indicated that the Asia commands future tobacco area and production in the world. Further, Asia, despite the fact that, largest producer of tobacco in the world, its productivity in lower compared to America and Europe (Table 1).

The Asian Context of Tobacco Growing

During 2017, in Asia, tobacco is grown in around 2147 thousand ha area with the production of 4084 million kg of tobacco which accounts for 63 percent of tobacco in the world. In 2017, in China, 1081 thousand ha (50 percent) area is under tobacco cultivation, producing about 2392 million kg (59 percent) of tobacco in the Asia. India stands second in tobacco area with 468 thousand ha (22 percent) next to China with its production share (20 percent) is significant while the Indonesia with 186 thousand ha of tobacco area contributes 4 percent of total tobacco production in the Asia. Pakistan and Bangladesh, small players in Asian tobacco landscape, together constitute nearly 4 per cent of the area and produce around 5 per cent of tobacco production. Hence, it is clearly indicated that the China commands future tobacco area and production in the Asia. Further, these five countries together represent nearly 88 per cent of the Asian tobacco production and 85 per cent of Asian tobacco harvested area. Finally, the mega countries, China and India together constitute nearly 72 percent of the area and harvest around 71 percent of tobacco production in Asia. (Table 2).

Table 1: Tobacco producing regions and their contribution to Global Tobacco Landscape (based on 2017 data)

Region	Area (million ha)	Production (million tons)	Productivity (kg/ha)
Asia	2.15 (61)	4.08 (63)	1902
America	0.67 (19)	1.48 (23)	2213
Africa	0.61 (17)	0.71 (11)	1171
Europe	0.10 (3)	0.22 (3)	2171
World	3.53 (100)	6.50 (100)	1843

Source: FAOSTAT accessed on 15.04.2019

Note: Figures in the parentheses are percentages of total

Growth dynamics of area, production and productivity of tobacco in Asia

The growth rate in the area of tobacco in Asia was found to be reversed from negative (-3.83 percent) during pre-FCTC period to positive (0.01 percent) in post-FCTC period. During the same period, the growth rate of production, though negative, increased significantly to positive due to increase in growth rate of productivity. The growth rates of production and productivity were significant during post-FCTC period, which might be due to R&D efforts and technological interventions across the Asian countries. Further, instability in tobacco productivity over the years was examined by estimating CV during pre and post-FCTC periods. It was found that CV has slightly increased from 3.49 percent during pre-FCTC period to 3.77 percent in post-FCTC period, which indicates increased instability in tobacco productivity in Asia (Table 3).

Table 4 throws light on the changing aspects of tobacco production in Asian countries. During pre-FCTC period, the two leading producers, China and India showed negative growth rate in area and production, but positive growth rate in productivity. In contrast, during post-FCTC period, in India, growth rate in area and production shifted from negative to positive and growth rate in productivity was sustained positive, while in China, growth rate in area remained negative and production shifted from negative to positive. Among the other Asian countries, Indonesia showed positive growth rate in area, production and productivity during both pre-FCTC period and post-FCTC period. It is important to note that growth rate in area in Bangladesh (a small player in tobacco production) shifted from negative in pre-FCTC period to positive to post-FCTC period. This might be due to area substitution in favour of tobacco from other crops, which give comparatively higher income. Further,

Table 2: Tobacco producing countries and their contribution to Asian Tobacco Landscape (based on 2017 data)

Asian Countries	Area (000 ha)	Production (million kg)	Productivity (kg/ha)
China	1081 (50)	2392 (59)	2212
India	468 (22)	800 (20)	1711
Indonesia	186 (9)	152 (4)	820
Pakistan	50 (2)	118 (3)	2368
Bangladesh	46 (2)	91 (2)	1990
Asia	2147 (100)	4084 (100)	1902

Source: FAOSTAT accessed on 15.04.2019

Note: Figures in the parentheses are percentages of total

Table 3: Compound annual growth rate in area, production and productivity of tobacco in Asia

Period	Area (million ha)	Production (million kg)	Productivity (kg/ha)
Pre-FCTC (1996-2005)	-3.83	-3.16	0.70 (3.49)
Post-FCTC (2006-2017)	0.01	0.90	0.90 (3.77)

Note: Figures in parentheses are coefficients of variation

in countries such as Myanmar, Republic of Korea and Turkey a negative growth rate in tobacco area and production has been observed in both pre and post FCTC- periods. However, significant increase in production has been witnessed in Asia due to enhancement in tobacco productivity in leading tobacco producing countries of Asia during post-FCTC period.

Temporal changes of Tobacco Production in Asia

On regional scale, the total tobacco production in Asia was about 4032 million kg, which came from about 2.29 million hectares during TE 2017. On production pattern, there has been a notable transformation in tobacco production in Asia during the post-FCTC period. Further, China followed by India and Indonesia maintained their position as a leading producers of tobacco not only in Asia, but also in the world. The most notable feature is that the tobacco production in India is increased by 45 percent, owing primarily to productivity enhancement, while in China; it has increased by 9 percent from TE 2005 to TE 2017. Among other Asian countries, tobacco production in Bangladesh has very significantly increased by 139 percent from TE 2005 to TE 2017, whereas in

Pakistan; it has increased by 29 percent during the corresponding period. However, the Asian countries such as Turkey, Thailand, Myanmar and Republic of Korea has showed a negative trend in tobacco production during the corresponding period. This implies that the tobacco area is replaced by other crops in these countries of Asia during the same period (Table 5).

Comparison of Tobacco Productivity in Asian Countries with World Average during TE 2017

By analysing the cross-country data of tobacco in Asia and comparing tobacco productivity with the world average productivity during TE 2017, it was found that Thailand, ROK, Pakistan, which had less share in area and production of tobacco, had productivity more than the world average. China, that had maximum share in area and production of tobacco, had productivity more than the world average. Most notable feature is that India, which ranked second after China in area, showed a lower productivity than the world average. Similar is the case with Indonesia and Turkey, which fall in top ten major producing countries had productivity lesser than the world average (Table 6). Thus, the results have depicted the lesser productivity of tobacco in some of the major players of Asia and on the other hand revealed the potential of small

Table 4: Categorization of Asian countries according to compound annual growth rate of tobacco

Period	Production		Productivity			
	Area Positive CAGR	Negative CAGR	Positive CAGR	Negative CAGR	Positive CAGR	Negative CAGR
Pre-FCTC (1996-2005)	Indonesia	Bangladesh	Bangladesh	China	Bangladesh	Turkey
		China	Indonesia	India	China	
		India	Pakistan	Myanmar	India	
		Myanmar	Thailand	ROK	Indonesia	
		Pakistan		Turkey	Myanmar	
		ROK			Pakistan	
		Thailand			ROK	
Post-FCTC (2006-2017)	Bangladesh	China	Bangladesh	Myanmar	Bangladesh	Myanmar
		India	China	ROK	China	
		Indonesia	India	Turkey	India	
			Indonesia		Indonesia	
			Pakistan		Pakistan	
			Thailand		ROK	
			Turkey		Thailand	
			Turkey			

Note: ROK- Republic of Korea

Table 5: Changes in Tobacco Production in Asian Countries (million kg)

Countries	Average Production		Increase in Production(%)
	TE 2005	TE 2017	
China	2453	2678	9
India	530	769	45
Indonesia	173	181	5
Turkey	127	75	-41
Pakistan	92	118	29
Thailand	43	28	-34
Myanmar	72	63	-12
Bangladesh	38	91	139
ROK	36	29	-19
Others	375	351	-16
Asia	3563	4032	13

Note: TE-Triennium Ending, ROK- Republic of Korea

players of Asia in tobacco production, as productivity of tobacco in these countries was higher than the world average.

Table 6: Cross-Country comparison of Tobacco Productivity in Asia with World Average Productivity during TE 2017

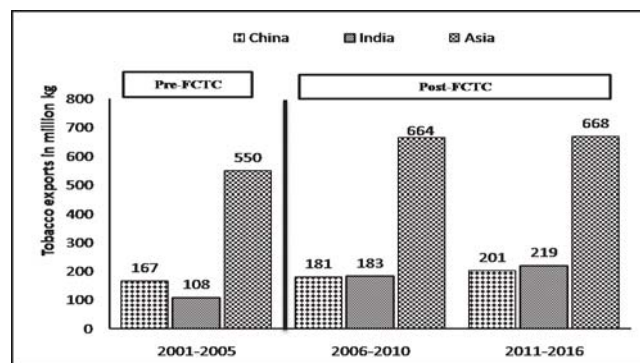
Productivity	Productivity > World average	Productivity < World average
Countries	Thailand ROK Pakistan China	India Indonesia Turkey Bangladesh Myanmar

Note: ROK-Republic of Korea

Changes in Tobacco Exports from Asian Region

On exports front, Asian region accounts for 24 percent of total tobacco exports, with 60 percent of global production in the world. This implies that there is high level of domestic consumption of tobacco in Asia. In order to assess the impact of FCTC on tobacco exports from Asia, the average tobacco exports during pre-FCTC period and post-FCTC period was analysed for major producing countries in Asia. Figure 1 indicates the increasing trend in Asian tobacco exports from 550 million kg to 668 million kg while in China and India; it

has increased from 167 million kg to 201 million kg and 108 million kg to 219 million kg, respectively in post-FCTC (2011-2016) compared to pre-FCTC period (2001-2005). The increase in tobacco exports from Asia was 21.5 percent whereas in China and India it was around 20.35 percent and 103 percent, respectively during the post-FCTC period. The notable feature is that the increase in tobacco exports from India outperformed China during the corresponding period. Largely, this shows that there is no visible impact of FCTC on the reduction of tobacco exports (FCTC was envisioned to reduce the tobacco production and exports) in Asia in general, India and China in particular during in post-FCTC period.



Source: FAOSTAT accessed on 15.01.2019

Fig 1: Trends in tobacco exports in major tobacco producing countries of Asia

Conclusion and Policy Implications

The tobacco production in Asia is emerging as a major driving factor for the growth of tobacco production in the world during the past two decades. The growing trends of tobacco production is evident in Asia, though the rate of increase might vary from country to country. Further, the tobacco exports have registered a commendable rise especially in mega countries like India and China during post-FCTC period. Nevertheless, the future prospects of tobacco production is emerging in hitherto small producing countries of Asia (Bangladesh and Pakistan), as the productivity in these countries is higher than the world average. Conversely, the supply side measures of FCTC has not made substantial impact on tobacco production and exports in Asia in general, India and China in particular, during post-FCTC period as there is no declining trend of tobacco production, and exports. With a large chunk of the world's population, there is huge demand for agricultural commodities especially the food commodities in Asia. The policy implications emerging are framing a country or region specific policies to address the issues related to production of food and non-food commodities, climate change

impact, natural resource degradation and public health in conjunction with international policy environment for a balanced development of agriculture sector in Asia.

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