Impact of WHO-FCTC on the performance of Indian tobacco sector

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Tobacco, a commercial crop, plays a vital role in contributing significantly to the national exchequer besides providing livelihood security to a sizeable population in India. The present study assessed the impact of WHO-FCTC on the performance of the Indian tobacco sector. The growth rate, instability and competitive indices were estimated using the secondary data by dividing the study period into pre-FCTC (1998–2005), transitional-FCTC (2006–13), and post-FCTC (2013–20) regimes. The analysis revealed that tobacco production and export witnessed a high growth rate, high export instability and enhanced export competitiveness during pre- and trans-FCTC regimes, and a low growth rate in production and export with low instability and declining global competitiveness in the post-FCTC regime. This implies the growing public awareness of the adverse effects of tobacco and the practical implementation of tobacco control policies in India and across the globe. Nevertheless, policy interventions need to be further accelerated. Also, it is inevitable to identify economically viable alternative crops and other enterprises to avert possible adverse environmental and socio-economic impacts from the multiple cultivators and other stakeholders in India.

Keywords: Commercial crops, control policies, production and export, public awareness, tobacco sector.

TOBACCO is a commercial crop grown in more than 120 countries across the world. The top five tobacco producers are China, India, Brazil, USA and Zimbabwe. Currently, India is the second largest producer, with a production of 761 million kg, accounting for 13% of the global production[1]. Of this, about 201 million kg is FCV (Flue-Cured Virginia) tobacco, mainly for the external market[2]. India is recognized as an exporter of high-quality tobacco, with a global reputation in special features like rich heritage, colour and flavour that are preferred in the international markets. In the post-World Trade Organization regime, agricultural exports have gained additional significance, particularly in developing countries like India. Largely, agricultural exports have been an important source of earning foreign exchange in the Indian economy. Commercial crops in India have high export potential; their significance in the national economy has grown considerably in recent decades and is expected to increase in the future. As a balanced strategy, India's foreign trade policy is steered by twin planks, viz. ensuring food security to the nation and building export markets for augmenting the farmers' income[3]. As is evident from the competitive indices, a high degree of comparative advantage in exports was witnessed in commercial crops such as tobacco, cotton and spices over the years, as these commodities exhibited strong export competitiveness[4]. However, in the recent past, tobacco production and export have been drawing the attention of trade, industry, policymakers and farmers for their significant contribution to the national economy on the one hand and growing awareness about the adverse impacts of the tobacco supply chain on public health and environment on the other.

WHO-FCTC (World Health Organization-Framework Convention on Tobacco Control) is the first global treaty that came into force on 27 February 2005. Presently, there are 168 Signatories and 182 Parties covering more than 90% of the global population. The main provisions of FCTC contain the instruments to reduce tobacco consumption in the world. The Government of India ratified the Convention in 2004, which solicits key strategies for reducing the demand and supply of tobacco. Tobacco consumption can be reduced through both demand and supply-side policy instruments. The demand-side measures (Articles 6-14) include price and tax measures, regulation of the contents of tobacco products and tobacco product disclosures, education, communication, etc. The supply-side reduction measures include (Articles 15-17) provision of support for economically viable alternative activities and control of illicit trade in tobacco products[5]. The ASEAN region faces different challenges to regulating tobacco, viz. tackling the increased disease burden of tobacco consumption, intervention of the tobacco industry, and better governance based on stronger government commitment. Overall, the regional differences point towards the gaps in implementation, which indicates an opportunity for the robust implementers to share their experiences and knowledge with neighbouring countries and work towards stronger collective action on tobacco regulation[6]. FCTC is an agreement between governments and becomes obligatory only for those who have ratified it. The governments which ratify FCTC need to pass national legislation to implement the treaty in their country. Subsequently, the treaty becomes national law that the countries can enforce..

In the tobacco sector, there has been an increase in research and public awareness about the negative impact on public health and the environment across the globe. However, a sizeable population (mostly rural women, tribes and other weaker sections of the society) in India depend on tobacco crops for their livelihood and have limited means of alternative income opportunities. However, the public perception of tobacco is generally negative and growing with time because of the health risks and environmental issues associated with its production and consumption. Apprehensions were raised against tobacco consumption during the COVID-19 pandemic. Accordingly, the demand for tobacco and

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tobacco products is expected to be reduced because of the restrictions on its usage and consequently affecting the supply side.

For instance, in India, the policy-led approach implemented to regulate crop size in FCV tobacco in Andhra Pradesh was materialized as one of the potential instruments to foster the transition from tobacco to other sustainable crops, which has been witnessed in the tobacco-growing regions of the state in the recent past[7]. A study[8] analysed the data available in the public domain on industrial tobacco pollution and found considerable negative environmental impact, which advises that the tobacco industry should have in-built an environmental analysis system. Nevertheless, the countries targeting to accomplish the Sustainable Development Goals (SDGs) must take action to reduce the negative environmental impacts caused by the tobacco industry[8]. With this background, a study was undertaken to assess the impact of WHO-FCTC on the performance of the Indian tobacco sector in the milieu of changing global and national policy regimes in the sector.

The study aimed at assessing the performance of the Indian tobacco sector with a focus on the dynamics of tobacco production and export, market stability and global competitiveness using secondary time-series data accessed from FAOSTAT. For comparative analysis, the study period was divided into three regimes, viz. pre-FCTC regime (1998–2005), transitional FCTC regime (2006–2013) and post-FCTC regime (2013–2020). This was based on the assumption that growing public awareness about the effects of tobacco consumption and tobacco-related policy regimes (global and national) in FCTC-ratified countries have made a significant dent in its production and export.

To compare the performance of production and export of Indian tobacco during the three regimes, the compound annual growth rates were estimated as follows

$$Yt = ab^t u^t,$$

where Yt is the production or export of tobacco in year t, which takes values 1, 2, …, n, u^t is the error term, and a and b are regression parameters to be estimated.

The compound growth rate (g; %/yr) was estimated by

$$\text{CAGR}(g) = (\text{antilog of } (\log b) - 1) * 100.$$

We computed the instability using the coefficient of variation (CV) to examine the magnitude of instability in tobacco export over the years.

CV was calculated using the formula

$$\text{CV} = \sigma/(\bar{x}),$$

where σ is the standard deviation and $\bar{x}$ is the mean of the variable.

The widely used concept of competitiveness is revealed comparative advantage (RCA)[9]. RCA was estimated using the formula

$$B = (X_{ij}/X_{ik})/(X_{nj}/X_{nk}),$$

where X_{ij} is the export of country i of commodity j, X_{ik} the export of country i of a set of commodities k, X_{nj} the export of a set of countries n of commodity j and X_{nk} is the export of a set of countries n of a set of commodities k.

In this study, country i refers to India, commodity j refers to any of the selected agricultural commodities, set of commodities k refers to the total agricultural commodities, and set of countries n refers to Asia. The index was made symmetric by the following methodology of Dalum *et al.*[10] and a new index proposed, viz. revealed symmetric comparative advantage (RSCA). Mathematically, it can be expressed as

$$\text{RSCA} = (\text{RCA} - 1)/(\text{RCA} + 1).$$

This measure ranges between –1 and +1.

Table 1 presents the dynamics of tobacco production and export during the pre-, transitional, and post-FCTC regimes. In the pre-FCTC regime, tobacco production recorded a negative growth rate, possibly due to the crop holiday in 2001 in Andhra Pradesh and drought in the tobacco-growing regions. However, the export volume and value recorded an increase in the growth rate of 7.4% per year and 5.8% per year in the corresponding periods. During the transitional FCTC regime, the production, export volume, and value registered a high growth rate of 7.7%, and export volume and value witnessed a growth rate of 5.5% per year and 13.9% per year respectively. The export performance of tobacco in terms of value was high mainly because of high unit value realization in the transitional FCTC regime. Nevertheless, during the post-FCTC regime, production registered a marginal growth rate of 0.4%, and export volume and value witnessed negative growth rates of –4.16% and –5.7% respectively. This implies that tobacco production and export clearly show a declining trend during India's post-FCTC regime.

The trends in Indian tobacco production and export were analysed from 1998 to 2020 (Figure 1). The production fluctuated over the years but increased from 648 million kg to a peak level of 830 million kg in 2011 and gradually declined to 761 million kg in 2020.

The climatic factors, small-scale subsistence farms and tobacco-related policies such as crop size reduction in FCV tobacco in India could be the factors attributed to this fluctuation in production. On the export front, the volume of export increased from 75 million kg in 1998 and steadily increased over the years; it reached a high level of 254 million kg in 2013 and further drastically declined to 177 million kg in 2020.

The difference in comparative advantage, natural resource endowments of a country, geographical proximity and trade barriers are the major determinants of export markets for any agricultural commodity. Indian tobacco is exported to more than 100 export destinations across the world. The major export destinations are Belgium, Germany, Egypt,

Table 1. Dynamics of production and export of tobacco during pre-, transitional and post-FCTC regimes

Period	Variables	Mean	CAGR
Pre-FCTC regime (1998–2005)	Production (million kg)	548	–2.7
	Export volume (million kg)	109	7.4
	Export value (million US$)	171	5.8
Transitional FCTC regime (2006–13)	Production (million kg)	649	7.7
	Export volume (million kg)	201	5.5
	Export value (million US$)	564	13.9
Post-FCTC regime (2013–20)	Production (million kg)	752	0.4
	Export volume (million kg)	205	–4.16
	Export value (million US$)	639	–5.7

Source: Estimated from FAOSTAT data 2022. CAGR, Compound annual growth rate.

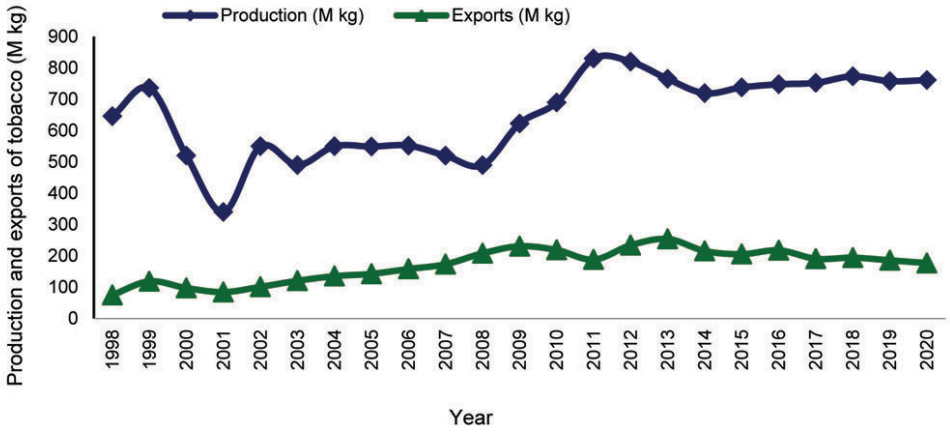

Figure 1. Tobacco production and export from India, 1998–2020. Source: ref. 1.

Nepal, the Netherlands, the Philippines, Russia, UAE and the USA. Belgium has grown over the years, and so the volume and value of tobacco exports have increased by 12.7 million kg and 24.0 million US$ during the pre-FCTC regime, 36.6 million kg and 127.6 million US$ in the transitional FCTC regime and 45.3 million kg and 166.3 million US$ during the post-FCTC regime respectively. In another major export destination, Egypt, the volume and value of tobacco exports have increased by 4.2 million kg and 6.8 million US$ during the pre-FCTC regime, 9.2 million kg and 21.7 million US$ in the transitional FCTC regime and touched 17.5 million kg and 37.3 million US$ during the post-FCTC regime respectively (Table 2). However, Russia has shrunk in the corresponding period. Though the overall exports declined during the post-FCTC regime, some of the export markets that have witnessed an increased share in the volume are Belgium, Egypt, Nepal, Philippines, the Netherlands, UAE and the USA, though there are year-to-year variations.

The primary exports commonly fluctuate in developing countries like India because the export basket comprises agricultural commodities subject to a supply–demand mismatch. Yet, export promotion and management of price risk in agricultural commodities and stabilizing foreign exchange earnings are important policy issues in developing countries, and India is no exception. Hence, managing and stabilizing export instability is important to maximize foreign exchange earnings from agricultural exports in countries that are highly dependent on such exports.

The degree of instability in tobacco exports (volume and value) was analysed during the pre-FCTC, transitional FCTC and post-FCTC regimes (Table 3). In the volume of tobacco exports, the degree of instability decreased from 20.5% in the pre-FCTC regime to 14.7% in the transitional FCTC and further declined to 11.0% during the post-FCTC regime. However, the overall degree of instability in the value of tobacco exports increased from 19.7% in the pre-FCTC regime to 30.7% during the transitional FCTC regime and again declined to 14.9% during the post-FCTC regime. In the most important export destination, Belgium, the degree of instability in export volume decreased from 22.0% in the pre-FCTC regime to 9.5% during the post-FCTC regime. The decline in instability implies that tobacco exports are relatively more stable than in earlier periods. It was observed that instability in some individual export markets was much higher than in the total export market during the entire period. An alarmingly high degree of instability in export volume was observed in the markets of the Philippines (114.1%), Egypt (63.0%), UAE (54.9%) and the Netherlands (36.6%) during the pre-FCTC regime. The degree of instability declined in the Philippines (54.9%), Egypt

Table 2. Changes in value and volume of tobacco export to major destinations during pre-FCTC, transitional FCTC and post-FCTC regimes

Export destination	Variable	Pre-FCTC regime (1998–2005)	Trans-FCTC regime (2006–2013)	Post-FCTC regime (2013–2020)
Belgium	Export volume (M kg)	12.7	36.6	45.3
	Export value (M US$)	24.0	127.6	166.3
Egypt	Export volume (M kg)	4.2	9.2	17.5
	Export value (M US$)	6.8	21.7	37.3
Germany	Export volume (M kg)	7.4	10.6	5.5
	Export value (M US$)	16.2	34.4	16.0
Nepal	Export volume (M kg)	3.9	6.8	8.1
	Export value (M US$)	5.3	16.0	24.4
The Netherlands	Export volume (M kg)	4.1	9.0	5.7
	Export value (M US$)	7.9	32.5	24.5
Philippines	Export volume (M kg)	0.9	7.3	8.6
	Export value (M US$)	2.2	21.8	21.2
Russia	Export volume (M kg)	24.0	15.0	7.3
	Export value (M US$)	29.8	39.5	27.7
UAE	Export volume (M kg)	1.2	4.9	9.7
	Export value (M US$)	1.9	11.9	23.1
USA	Export volume (M kg)	2.6	7.6	6.5
	Export value (M US$)	2.5	14.2	11.2

Table 3. Instability index of major export markets for Indian tobacco

Export destination	Variable	Pre-FCTC regime (1998–2005)	Trans-FCTC regime (2006–2013)	Post-FCTC regime (2013–2020)
Belgium	Export volume (M kg)	22.0	28.5	9.5
	Export value (M US$)	28.7	40.9	9.5
Egypt	Export volume (M kg)	63.0	37.8	14.3
	Export value (M US$)	71.3	49.0	28.8
Germany	Export volume (M kg)	37.0	15.4	12.9
	Export value (M US$)	30.7	27.9	18.1
Nepal	Export volume (M kg)	12.1	24.8	11.7
	Export value (M US$)	17.3	36.1	14.8
The Netherlands	Export volume (M kg)	36.6	18.4	43.0
	Export value (M US$)	38.4	37.5	42.9
Philippines	Export volume (M kg)	114	43.6	43.8
	Export value (M US$)	118	33.8	44.7
Russia	Export volume (M kg)	26.2	19.0	21.6
	Export value (M US$)	28.5	20.5	24.5
UAE	Export volume (M kg)	54.9	64.9	18.3
	Export value (M US$)	50.6	75.9	17.1
USA	Export volume (M kg)	31.4	41.4	25.8
	Export value (M US$)	31.6	44.1	25.0
Overall	Export volume (M kg)	20.5	14.7	11.0
	Export value (M US$)	19.7	30.7	14.9

(14.0%) and UAE (18.7%) during the post-FCTC regime, which implies that these markets are moving towards attaining stability. However, the highly stable export destinations were Belgium, Germany and Nepal, where the degree of instability was significantly low and further declined in the post-FCTC regime.

The comparative advantage of any commodity is influenced by a country's national and foreign trade policies like, government interventions, supply and demand conditions, export prices, import restrictions, subsidies, quotas, tariffs, etc. The international competitiveness of some agricultural commodities of India has already been established[11,12]. A declining trend in the RCA index and, consequently the export competitiveness of horticultural products such as tomatoes during the post-WTO regime (1994–97) has also been witnessed[13]. In the post-liberalization period, countries with export competitiveness in a commodity shall only survive in the long term and harness trade dividends. To ascertain India's competitiveness in tobacco exports during changing policy regimes regarding this sector, the indices of RCA and RSCA were estimated (Table 4). The results indicate that the country has demonstrated a varied degree of competitiveness in tobacco exports over the years. The index value for RCA was more than unity and positive for

Table 4. Competitive indices of Indian tobacco export during pre-, transitional and post-FCTC regimes

Pre-FCTC regime (1998–2005)			Transitional FCTC regime (2006–2013)			Post-FCTC regime (2013–2020)		
Year	RCA	RSCA	Year	RCA	RSCA	Year	RCA	RSCA
1998	1.87	0.30	2006	2.52	0.43	2013	2.43	0.42
1999	2.86	0.48	2007	2.23	0.38	2014	2.27	0.39
2000	2.28	0.39	2008	4.15	0.61	2015	2.59	0.44
2001	1.85	0.30	2009	4.37	0.63	2016	2.87	0.48
2002	2.38	0.41	2010	3.80	0.58	2017	2.53	0.43
2003	2.46	0.42	2011	2.41	0.41	2018	2.56	0.44
2004	2.72	0.46	2012	2.16	0.37	2019	2.63	0.45
2005	2.53	0.43	2013	2.43	0.42	2020	2.58	0.44
Mean	2.37	0.40		3.01	0.48		2.58	0.44

RCA, Revealed comparative advantage; RSCA, Revealed symmetric comparative advantage.

RSCA during the entire period. The mean values of the RCA index (3.01) and RSCA index (0.48) were higher in the transitional FCTC regime compared to the pre-FCTC regime (RCA index – 2.37 and RSCA index – 0.40) and started gradually declining during the post-FCTC regime (RCA index – 2.58 and RSCA index – 0.44). This implies a slightly declining competitive advantage for Indian tobacco exports in the international markets. This might be due to factors such as the decline in global consumption and demand for Indian tobacco and the effective implementation of tobacco-related policies in the importing countries.

The present study analysed the impact of WHO-FCTC on the performance of the Indian tobacco sector to assess the level of impact of the global health treaty. It is evident that tobacco production and export witnessed a high growth rate in the pre- and transitional FCTC regimes. However, the growth in tobacco production and export showed a significant decline though with relatively more stability in export markets, and global competitiveness also witnessed a declining trend during the post-FCTC régime. Though India has made tremendous progress in tobacco export, there are apprehensions regarding tobacco cultivation as it is in a whirlpool of conflicting concerns due to public health and environmental impact. However, with the growing public awareness of the adverse effects of tobacco consumption and the changing environment of global and national policies regarding the tobacco sector, its consumption, demand, and supply have decreased recently. Moreover, India has ratified FCTC, thus making a dent in tobacco production and export in recent years. Hence, the demand for tobacco is anticipated to decrease, subsequently affecting the supply and production side as well. Thus, it is inevitable to take policy interventions to promote viable alternative crops to avert possible economic and environment implications which may emerge from the different stakeholders in Indian tobacco sector.

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