Economics of Tobacco in Bangladesh: Lessons Learned and Recommentations for Policy

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Abstract

Cigarette smoking and other tobacco use impose a large and growing public health burden, accounting for 5 million deaths globally per year with about half of the incidences in low and middle-income countries. In Bangladesh, tobacco usage high, with orals provenance of about 37 percent among 15+ years population Between 1996 and 2004, (combined) cigarette and bidi consumption per capita per day increased from 2.4 to 2.9 sticks. About 10 percent people of age 30 and above suffer from tobacco-related diseases are responsible for 16 percent of all deaths in the country. Total annual costs incurred due to tobacco-related illnesses amount to Taka 147.7 billion, considering that 25 percent patients attend inpatient hospital care. Of this total, Taka 60.6 billion (41%) can be attributed directly to tobacco usage. The net costs directly attributable to tobacco usage amount to Taka 27.3 billion per year (equivalent to almost 1% of the GDP of Bangladesh). To decrease the use of tobacco and the cost to the national economy resulting from the tobacco related diseases and deaths, the government should continue increasing the supplementary duty on cigarettes, bidi, and other tobacco products. Increase in the tax rates on tobacco products should ocompanit by measures to strengthen the tax administration to minimize tax evasion. Given Bangladesh's low share in international tobacco leaf market, low contribution to GDP and employment, and negative trade balance, there is less rationale for promoting tobacco cultivation. Government should declare tobacco as a "merit bad" and should take appropriate initiatives to ensure agricultural diversification away from tobacco. Bangladesh Smoking and Tobacco Products Usage (Control) Act 2005 should include provision for pictorial warnings showing the health hazards of tobacco use. Government should ensure that the stipulations in the Act are maintained

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properly and people do not smoke in public places. The taskforce committees set up at the district and upazila levels for the implementation of the Act should be made effective

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1. Introduction

Cigarette smoking and other tobacco use impose a large and growing public health burden, currently accounting for about 5 million deaths globally per year. Currently, about half of the deaths caused by tobacco are in low and middle-income countries. While generally declining in high-income countries, tobacco use is rising in low and middle-income countries. Given these trends, tobacco use will cause approximately 10 million deaths per year by 2030, with an increasing share of the public health burden from tobacco falling on low and middle-income countries (Jha P *et. al.*, 2006, Barkat *et. al.*, 2008).

Bangladesh is one of the most populous countries in the world with about 150 million people coupled with a high proportion of people-in-poverty (40% according to head-count measure), relatively high prevalence of tobacco usage (both smoking and smokeless), and is the 5th largest country in terms of incidences of tuberculosis. In 2004, overall prevalence of smoking tobacco among 15+ years aged population was 21 percent in the country. Prevalence of either smoking or smokeless tobacco was 37 percent among 15+ years population with 49 percent for male population and 25 percent for female population. The prevalence of both smoking and smokeless tobacco is higher among the lower economic class of people for both men and women. The average expenditure on tobacco and tobacco products constitute around 2.5 percent of monthly total household expenditure (Barkat *et. al.*, 2008). Over 95 percent of tobacco products consumed in Bangladesh are manufactured domestically and the amount of cigarette produced annually is 23 billion sticks (in 2003/04). There is no official

statistics of the amount of *bidi*-sticks produced and estimates show some 84 billion sticks of *bidi* produced annually. Therefore, roughly some 100 billion sticks of cigarette and *bidi* are produced annually in a country with a population of 150 million, implying some 667 sticks per capita per year or about 2 sticks per capita per day. Between 1996 and 2004, both cigarette and bidi consumption increased by 65 percent with consumption of cigarette increased by 20 percent and that of *bidi* by 84 percent. During the same period, while the per capita cigarette consumption per day (15+) decreased from 0.71 to 0.64 sticks, the per capita *bidi* consumption per day increased from 1.7 to 2.3 sticks. Combinedly cigarette and *bidi* consumption per capita per day increased from 2.4 to 2.9 sticks. The relative increase in bidi consumption is both an indicator of rising poverty in the country and increase in the burden of diseases of poverty. Therefore, all out efforts are needed to reduce the prevalence of tobacco usage – both smoking and smokeless.

Cigarette smoking and other forms of tobacco chewing cause at least eight life-threatening diseases including lung cancer, cancers of the mouth and larynx, stroke , ischemic heart diseases (IHD), chronic obstructive pulmonary disease (COPD), pulmonary tuberculosis, and buerger's disease . A recent study revealed that 10 percent people of age 30 and above suffer from eight tobacco-related diseases in the country. It has been estimated that these diseases are responsible for 16 percent of all deaths, and 9 percent of all deaths are attributable to tobacco (Acharya *et. al.*, 2006). According to the Bangladesh Cancer Society, an estimated half of the annual deaths from cancer in the country (75,000 people) results from the use of tobacco. Another study suggests that tobacco growing is a significant cause of deforestation in Bangladesh accounting for over 30 percent of annual deforestation, putting the country third internationally in terms of severity of the problem (Geist H J 1999).

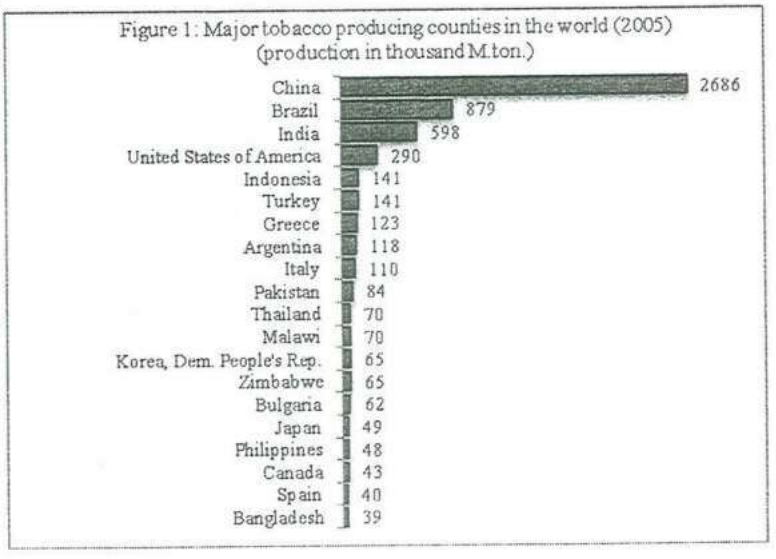
Given this background the objective of this paper is to present the key economic issues pertaining to tobacco cultivation and production, table 2) the costs and benefits associated with tobacco usage, (Section 3) possible tobacco taxation options and (Section 4), relevant policy interventions (Section 5).

2. Economics of Tobacco: Key Issues

The argument often placed in favour of tobacco cultivation in the developing countries is that it is the most valuable non-food cash crop and a major contributor to the national economy. It is claimed that the socio-economic influence of tobacco farming extends beyond the interest of the farmer and affects the

economy of the entire nation. It is also argued that it is a potential source of employment, revenue and foreign exchange and that any reduction in tobacco farming may harm the economy and lead to increased poverty[1]. This section analyses the role of tobacco in Bangladesh economy including its share in international tobacco market, area and production of tobacco and its contribution to GDP, revenue, foreign exchange earning and employment generation and attempts to analyze the economic rationale of producing tobacco in a country like Bangladesh.

Area and Production of Tobacco: With a total production of 39,000 metric tons of tobacco leaf, Bangladesh ranked 20th among the tobacco producing countries in 2005, the top tobacco producing countries being China, Brazil, and India with annual production of 2,686,000 metric tons, 879,000 metric tons, and 598,000



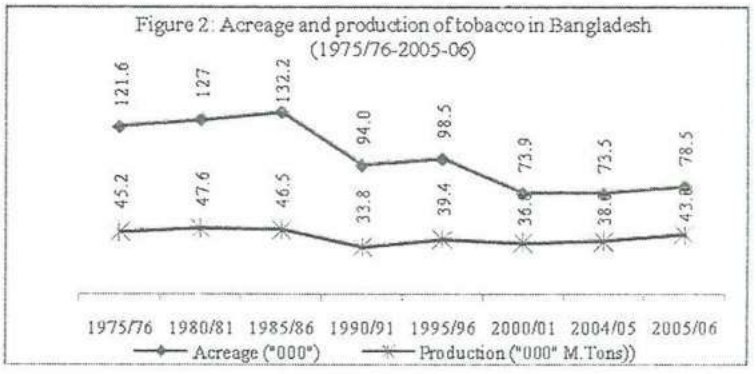
metric tons, respectively. Bangladesh's total annual leaf production accounts a very scanty share in international leaf market with 0.7 percent of the amount of leaf produced by the top 20 nations in the world.[2]An analysis of the trend of tobacco cultivation during the last three decades shows that there has been a gradual decline in both the acreage under cultivation and the amount of production of tobacco. Between 1975/76 and 2005/06, the acreage under tobacco production has destined by 36 percent and the amount of production has decamped by 5 percent, indicating that the reduction in the acreage under

1 Tobacco in the Developing World (http:www.tobaccoleaf.org.)

2 FAO-website: (http://www.fao.org/ES/ESS/INDEX_ENASP).

tobacco cultivation has not been accompanied by proportionate decline in the amount of production, which is due to increased yield rate of tobacco over time. Both the acreage and production of tobacco tend to show and increase during mid-seventies to mid-eighties of the last century, a decrease during mid-eighties to late nineties, and increase during the beginning of this century till date (Figure 2).

Figure 2: Acreage and production of tobacco in Bangladesh (1975/76-2005-06)



Tobacco's Contribution to GDP and Revenue: The Gross Domestic Product (GDP) value of tobacco manufacturing refers to the total market value of all final tobacco products in the country in a given period of time. The data of GDP value of tobacco manufacturing over time shows that the contribution of tobacco manufacturing is 1% of GDP (Table 1).

However, tobacco is considered an important source of revenue for the government in Bangladesh. This revenue comes from taxes on the stored leaf as well as on the manufactured tobaco and excise taxes on imported tobacco. Value-

Table 1 : GDP value of tobacco manufacturing (in 1995/96 market price)

Year	Tobacco manufacturing (in billion Tk.)	All manufacturing (in billion Tk.)	GDP at constant producer's price (billion Tk.)	% of all manufacturing GDP	% of Total GDP
1996/97	14.1	258.8	1,679.5	5.4	0.8
1998/99	16.7	289.9	1,857.6	5.8	0.9
2000/01	18.0	324.0	2,078.2	5.6	0.9
2002/03	23.5	364.8	2,284.5	6.4	1.0
2004/05	26.3	422.7	2,561	6.2	1.0

Source: Statistical Year Book (BBS 2005)

added tax, customs duty, and supplementary taxes and duties on domestically produced as well as imported tobacco products are the froms of tobacco revenue. On average, overall tobacco industry contributes 9 percent of the total tax revenue (Table 2).

Employment in Tobacco: Production of tobacco product involves three stages: (i) cultivation (i.e., leaf growing and initial processing), (ii) manufacturing, and (iii)

Table 2 : Share of tobacco taxes in total tax revenue

	Tax revenue (in billion Tk.)		Tobacco tax plus duty as
Year	Total national tax	Tobacco tax & duty	% of total tax revenue
1995-96	12.1	1.1	9.4
1997-98	15.4	1.4	9.2
1999-00	16.1	1.4	8.7
2001-02	21.3	2.0	9.5
2003-04	28.3	2.6	9.3
2005-06	36.2	3.4	9.3

Source: Total tax from Bangladesh Economic Review 2006. Financial Division, NBR & BBS (figure based on revised budget), tobacco product tax from NBR

distribution and retailing. To have an accurate estimate of employment in this sector, both the backward and forward linkage of tobacco manufacturing is to be considered. In Bangladesh, manufacturing of tobacco refers to the manufacturing of cigarettes; cigars and cheroots; *bidi;* tobacco steaming and re-drying; and *zarda* and *guivam*. Cultivation of tobacco-leaf forms the backward linkage while the activities related to the distribution and retailing constitute the forward linkage of the industry. According to official statistics, the total number of employment in tobacco agriculture (cultivation) and manufacturing was 244,600 in 2005/06 with 115,500 in tobacco-agriculture and 129,000 in tobacco-manufacturing. Employment in tobacco agriculture account for 0.5 percent of agriculture labour force while the employment in tobacco agriculture and manufacturing together constitutes 0.5 percent of total labour force in the economy (Table 3). Therefore, statistical evidence does not support the widely held perception that the cultivation and manufacturing of tobacco contributes an important share in the economy's employment.

Balance of Trade in Tobacco Products: Bangladesh exports and imports both the raw materials of tobacco industry, such as tobacco leaves, and the finished

product, such as manufactured cigarettes, *bidis*, *cigars* and *cheroots*, and *zarda* and *quivers*. However, statistical evidence suggests that Bangladesh is a net importer of tobacco products again indicating Bangladesh's relative disadvantage in the production and trade of tobacco products (Table 3).

Table 3: Employed persons aged 15 years and over in tobacco agriculture and manufacturing by sex in 2005-06 (number, in thousand)

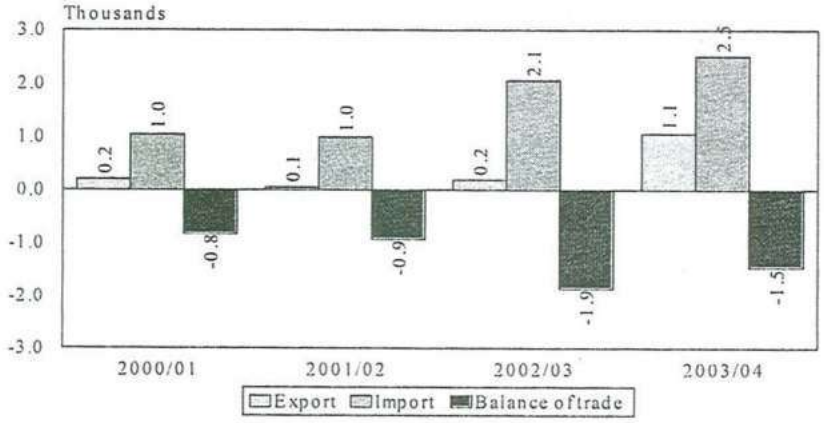
Name of activities	Total	Male	Female
Employment in growing tobacco, *ganza* & narcotic plants	115.5	28.4	87.2
Total employment in agriculture, hunting and forestry	21,672	14,168	7,504
*Employment in tobacco agriculture as % of all agricultural employment**	*0.5*	*0.2*	*1.2*
Employment in manufacturing of cigarettes	5.9	5.8	0.1
Employment in manufacturing of *cigars* and *cherots*	4.7	3.3	1.4
Employment in manufacturing of *bidies*	112.1	38.3	73.9
Employment in manufacturing of tobacco steaming & re-drying	2.5	1.8	0.7
Employment in manufacturing of *zarda* and *quivam*	3.9	3.5	0.4
Total employment in all tobacco manufacturing activities	129.0	52.5	76.5
Employment in all manufacturing activities	5,224	3,926	1,298
Employment in all tobacco manufacturing as % of all manufacturing employment	*2.5*	*1.3*	*5.9*
Total employment in tobacco agriculture and manufacturing	*244.6*	*80.9*	*163.7*
Total employment in all sectors of the economy**	47,357	36,080	11,277
Employment in tobacco agriculture and manufacturing % of total employment	0.5	0.2	1.5

Note:* Employment in tobacco agriculture as % of all agricultural employment shows an overestimate because the employment figure in tobacco growing is reported together with the employment figures in ganza & narcotic plants.

** Include the following sectors: (i) Agriculture, hunting and forestry; (ii) Fishing; (iii) Mining and quarrying; (iv) Manufacturing; (v) Electricity, gas and water supply; (vi) Construction, (vii) Wholesale and retail trade; (viii) Hotels and restaurants; (ix) Transport, storage and communications; (x) Financial intermediation; (xi) Real estate, renting and business activities; (xii) Public administration and defense; (xiii)Education; (xiv)Health and social work; (xv) Other community, social and personal service activities.

Source: Labour Force Survey 2005-06 (BBS-2008).

Figure 3 : Export, Import and Balance of Trade of Tobacco Products (unmanufactured, manufactured, cigarettes: million Tk.)



Data source: Bangladesh Bureau of Statistics, *Statistical Year Book of Bangladesh (2005)*

3. Cost-benefits of Tobacco Usage

The first systematic study to assess the disease burden due to smoking and other forms of tobacco usage and the associated costs to the economy was conducted by the World Health Organization (WHO) and the Ministry of Health and Family Welfare of Bangladesh Government in 2004. The study by Acharya *et. al.*, (2006) examined the cost of tobacco usage in Bangladesh by determining (i) the prevalence of tobacco related diseases; (ii) disabilities and deaths attributable to tobacco; and (iii) direct (out-of-pocket and health system cost) and indirect cost (due to premature deaths and disabilities). It also examined the benefits from tobacco consumption by estimating the tax revenue collected on domestic tobacco consumption and the net wages earned in the tobacco sector. The study is based on the data collected through a countrywide sample survey of 2,467 households, hospital cost and patient surveys in three public and one private medical college hospitals, an expert survey on 120 physicians to determine the survival rate and quality of life after occurrence of the diseases attributable to tobacco, and a supplementary survey of four specialized institutes to identify the additional cost of specialized treatment of tobacco-related diseases. Based on the study by Acharya *et. al.*, (2006), which presented the estimates of the costs and benefits of tobacco usage in 2003-04 prices, Barkat *et. al.*, (2008) gave an estimate of those in 2007-08 prices. This section presents an excerpt of the analysis of the cost and benefit of tobacco usage presented in the study by Acharya *et. al.*, 2006 and Barkat *et. al.*, 2008.

Direct Costs Due to Tobacco-Related Illnesses: In the cost-of-illness approach, the direct cost of tobacco consumption is broken down into two types of costs: (i) out-of-pocket expenditures of households which include costs borne away from medical facilities as well as cost of hospitalization, and (ii) costs borne by the health system in the public sector. For arriving at the total direct cost, the average cost per patient is calculated from household and hospital surveys, which then is multiplied by the number of cases of the tobacco-related illnesses predicted using the rate of prevalence and the population attributable risk ratio of these illnesses.

Acharya *et. al.,* (2006) identified eight diseases as tobacco-attributable—lung cancer, cancers of the mouth and larynx, stroke and ischemic heart diseases (IHD), chronic obstructive pulmonary disease (COPD), pulmonary tuberculosis, and buerger's disease (thromboangiitis obliterans) (Table 4). Using household survey data, Acharya *et. al.,* (2006) found that 9% of Bangladeshis over age 30 years[3] have these diseases, of which 41% are attributable to tobacco consumption. The study further estimated that these eight diseases are responsible for 16% of all deaths in the country and 9% of all deaths are attributable to tobacco consumption. It is predicted that 2.9 million cases of these eight tobacco related illnesses can be found in the population, of which 1.2 million can be attributed to tobacco usage (based on the assumption that 41% of these are directly attributable to tobacco).

Table 4 : Predicted total number of tobacco-related diseases in the population and the total number attributable to tobacco usage in Bangladesh, 2004 (in thousands)

Diseases	Total number of cases in the population	Number of cases attributable to tobacco usage
Ischemic heart disease	735.9	139.8
Stroke	567.7	107.9
Buerger's disease	28.0	NA
Oral cancer	49.1	39.2
Lung cancer	195.6	113.4
Laryngeal cancer	71.4	51.4
COPD	967.1	595.1
Pulmonary tuberculosis	322.4	151.5
Total	2, 937.1	1, 226.3

Source: Acharya *et. al.,* (2006).

Note: NA stands for 'not available' implying that no cases were observed in the sample.

3. The population of interest for the study by Acharya et al (2006) is the adults aged 30 years and above, because tobacco related illnesses are observed primarily among people at this stage of life cycle.

In the absence of any unified estimate of the rate of hospital attendance of tobacco-related patients and in view of the perceived gap between the observed and the ideal rates of attendance, a simulation analysis was undertaken to show how total health system cost would change if the rate of hospital attendance varies from 25 percent to 50 percent to 75 percent to 100 percent (full coverage). The annual total out-of pocket expenditure, if 25 percent patients seek hospital inpatient care, was estimated to be Taka 45.8 billion. The estimate gradually increased to Taka 67.7, 90.5, and 112.4 billion with greater health care coverage of 50 percent, 75 percent and 100 percent. The corresponding out-of-pocket expenditure attributable to tobacco usage (41%) was calculated to be Taka 18.8, 27.8, 37.1, and 46.1 billion respectively.

In order to determine the cost to the health system owing to the specified eight illnesses, the average cost of hospital inpatients was obtained from four hospitals under survey (three public and one private). For this purpose, the total hospital system costs were apportioned to the OPDs and the IPDs following the allocation method in Baltussen *et. al.*, (2004). The average IPD cost per bed-day was multiplied by the number of inpatients suffering from these illnesses and the average length of their hospital episode.

The direct cost to the health system amounted to Taka 21.4 billion for providing inpatient care at 25 percent of patient attendance, Taka 37.9 billion for 50 percent attendance, Taka 55.1 billion for 75 percent attendance, and Taka 71.7 billion for 100 percent attendance (Table 5). The OPD attendance for the eight illnesses was nearly 7.2 percent of all OPD patients according to the hospital survey. At this rate, the total OPD cost amounted to Taka 0.4 billion. Keeping the rate of OPD attendance at the same level and varying the rate of IPD attendance, the total cost to the health system was estimated to be Taka 21.8, 38.3, 55.5, and 72.0 billion respectively for 25 percent, 50 percent, 75 percent, and 100 percent attendance of inpatient care. (Table).

The total out-of-pocket expenditure of the households includes the costs incurred for the care received in hospital as well as in other health care facilities, and the cost for treatment abroad. The total annual direct cost is the sum of the hospital system cost and household out-of-pocket expenditure. Finally, the total annual direct cost attributable to tobacco usage was estimated as 41 percent of the total direct cost. For 25 percent, 50 percent, 75 percent, and 100 percent hospital attendance for inpatient care, this cost was estimated to be Taka 27.7, 43.5, 59.8, and 75.6 billion, respectively (Table 5).

Table 5 : Direct costs of eight tobacco-related illnesses (billion Tk. in 2007-08 prices)

Cost items	Percentage of patients with tobacco-related illnesses receiving inpatient treatment			
	25%	50%	75%	100%
A. Hospital costs borne by the health system				
Total cost of OPD usage	0.4	0.4	0.4	0.4
Total cost of IPD usage	21.4	37.9	55.1	71.7
Total cost of health system	21.8	38.3	55.5	72.0
B. Costs borne by households (out-of-pocket expenditure)				
Cost borne by non-hospitalized patients	2.6	2.6	2.6	2.6
Cost borne by hospitalized patients	28.1	50.1	72.8	94.7
Cost for treatment abroad	15.2	15.2	15.2	15.2
Total out-of-pocket expenditure	45.8	67.7	90.5	112.4
Total (A + B)	*67.6*	*106.0*	*145.8*	*184.4*
Attributable to tobacco (41%)	*27.7*	*43.5*	*59.8*	*75.6*

Source: Acharya et. al., (2006).

Indirect Costs: Tobacco-attributable indirect costs refer to the loss of productivity from tobacco-related deaths and disabilities. In assessing the number of the dead and the disabled, it was assumed that all deaths in a given year would come from those at the late stage of the illnesses. Those at the early and typical stages of illnesses were considered disabled.

It was estimated that 102,117 deaths in the population (16% of all deaths of people aged 30 years and over) were caused by eight illnesses that were attributable in part to tobacco use. Of these, 57,583 cases were directly attributed to tobacco usage. According to Lopez *et. al.,*. (2002), it was estimated that these people on average lose 17 years of life conditional on survival up to 55 years (which is the median age of the adult population diagnosed with one of the eight illnesses in the hospital survey). The discounted stream of net wages (wages minus the stream of consumption) lost is due to these working years lost. Keeping at par with the current growth rate of GDP at 5 percent (that is assuming zero rate of time preference), the annual discount rate was set at 5 percent and was assumed to be the same over the whole period.

The degree of disability was determined according to disease specific EuroQol rating based on the survey of expert physicians. It was determined that on average the health status of those living with any of the eight illnesses would be impaired by 32 percent. It was assumed that wages would decrease at higher level of disability. The net loss would be this wage loss less consumption expenditure.

This calculation was made for one year. The net wage losses owing to premature death and disability make up the total indirect cost due to tobacco related illnesses. Using the average wage and expenditure data from the Statistical Yearbook of Bangladesh and extrapolating to the predicted number of deaths and disabilities, the total loss of income due to death and disability from tobacco related illnesses was estimated to be approximately Taka 61.8 billion in 2007-08 prices.

The study accounted for most of the cost that can be attributed to tobacco usage. The cost reported in the study, although highly significant is still likely to be an underestimation for the following reasons as reported in Acharya *et. al.*, (2006):

1. The study did not fully account for the fact that the better health care seeking behavior would entail significant increase in OPD attendance, raising the direct medical costs.
2. The cost for treatment abroad is an underestimation given the unavailability of reliable data[4].
3. The estimates of cost of tobacco-related illnesses are likely to be an undercount as it did not include patients suffering from tobacco related illnesses aged below 30 years.
4. The list of tobacco-related diseases is not exhaustive. There are other diseases related to tobacco usage, although their contribution is considered to be minimal[5].
5. Cost of absenteeism due to these illnesses that most tobacco users endure throughout their lives before being incapacitated was not included.

Opportunity Costs: Tobacco consumption causes poor people to spend their sparse resources on tobacco rather than their basic needs. There is an opportunity

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[4] As suggested by expert survey, these patients incur high costs that are surely a burden on the economy, although it is difficult to get the exact number of patients going abroad.

[5] For example, about 9% of the household members of tobacco cultivating households and also 9% of the household members of bidi workers are affected by the green tobacco sicknesses (nausea, vomiting, physical weakness, dizziness, difficulty in breathing, fluctuation in pulse, etc.) [Details are analyzed in Barkat et.al., 2009]. The study by Acharya et al (2006) did not consider these diseases in their study, although these impose a cost to the economy. However, there is no national level statistics of the number of tobacco cultivating and bidi making households in the country. According to the Labour Force Survey 2005-06, the total number of employment in tobacco agriculture and manufacturing is 244,600 in the country. It indicates that a good number of people are affected in these illnesses every year and the associated health burden and cost to the economy can- no way be simplified.

cost of essential consumption items foregone for the spending on tobacco in addition to the direct medical and indirect human capital costs. Efroymson *et. al.*,. (2001) estimated that an average male smoker of cigarettes could purchase 1,402 calories of rice per day with the money he spent on tobacco, while an average female smoker could have had 770 calories. On average, tobacco expenditure constitutes 2.8 percent of total income of a typical Bangladeshi household. Their estimate shows that if the poor stopped using tobacco and re-allocated just 69 percent—the percentage of income going to food in the lowest income groups—of their tobacco expenditures to food, then over 10.5 million people currently malnourished could have an adequate diet.

Contributions of Tobacco to the National Economy: The benefits of tobacco consumption are derived from two sources: tax revenue for the government and net wages (wages minus individual consumption) earned in the tobacco sector. Tax revenue is composed of value added tax (VAT) and supplementary domestic production tax. According to government statistics, the revenue collection from tobacco sector amounted to Taka 20.3 billion in 2003-04. In Acharya *et. al.*, (2006), the wage for a tobacco worker was obtained by using the total value added

Table 6 : Costs and Benefits of Tobacco Usage (billion Tk. in 2007-08 prices)

Description	Percentage of patients with tobacco-related illnesses receiving inpatient care			
	25%	50%	75%	100%
Direct costs of medical care	*67.6*	*106.0*	*145.8*	*184.4*
Health system cost	21.6	38.3	55.5	72.0
Out-of-pocket cost	45.8	67.7	90.5	112.4
Indirect costs	*80.3*	*94.3*	*108.6*	*122.6*
Loss of net-wages due to deaths	40.6	55.2	70.4	85.1
Current year loss of net-wages due to disability	39.8	38.9	38.3	37.5
Total costs imposed on society due to the prevalence of tobacco-related illnesses	*147.7*	*200.2*	*254.5*	*307.0*
Total cost imposed on society directly due to tobacco usage (41%)	*60.6*	*82.1*	*104.3*	*125.8*
Total benefit	*33.3*	*33.3*	*33.3*	*33.3*
Total revenue collected	27.3	27.3	27.3	27.3
Net-wage labor earned	6.0	6.0	6.0	6.0
Net costs on society due to tobacco usage	*27.3*	*48.7*	*71.0*	*92.5*
US$ equivalent in 2007-08 (billion) at US$1 = Taka 68.58	*0.40*	*0.71*	*1.04*	*1.35*

Source: Acharya et. al., (2006).

in the tobacco industry and then by dividing by the number of workers in the industry. From this figure average consumption was subtracted to obtain net wages. The net wage earning from tobacco sector was estimated at Taka 4.5 billion and the total benefit amounted to approximately Taka 24.8 billion a year in 2003-04.

Cost-Benefit: The total annual costs incurred due to tobacco-related illnesses amount to Taka 147.7 billion, when both direct and indirect costs are taken into account and considering that 25 percent patients would attend inpatient hospital care. Of this total, Taka 60.6 billion (41%) can be attributed directly to tobacco usage. The net difference between costs due to tobacco-related illnesses directly attributable to tobacco and benefits from tobacco usage is nearly Taka 27.3 billion per year. In the survey year of 2004, this net cost was equivalent to almost 1% of the current GDP of Bangladesh. These costs and benefit calculations, however, exclude those arising from second hand smoking, which are delineated Table 7 below.

Table 7 : Costs of Secondhand Smoking

Costs	Amount (billion Taka)
Direct costs of medical care	*3.8*
Health system cost	1.5
Out-of-pocket-cost	2.3
Indirect costs	*4.0*
Loss of net-wages due to deaths	1.6
Current year loss of net-wages due to disability	2.4
Total cost to society due to secondhand smoking	7.8

Source: Acharya et. al., (2006).

Cost of Secondhand Smoking: The net cost presented Table is an underestimate of the full cost because it excludes the cost to society due to secondhand smoke. According to Acharya *et. al.*, (2006), approximately 44 percent of the total population is exposed to secondhand smoke at home and the total number of deaths attributable to passive smoking is 5,788 a year. This estimate accounts for approximately 1percent of total deaths from these diseases in the country every year. For those who stay alive with these diseases, 70,497 people become disabled, accounting for 10 percent of all disabilities caused by these diseases.

4. Tax and Revenue Options

It has been discussed in the earlier section that tobacco use – smoking and smokeless – causes huge national costs by imposing burden on the public health

system and individual out-of-pocket expenditures resulting from tobacco related diseases, disabilities, and deaths. However, imposing taxes on different types of tobacco products could lower the national costs by lowering tobacco products-usage rates, increasing government revenue, and ultimately by lowering deaths and disabilities attributable to tobacco use. This section presents the possible impacts of different tobacco taxation options on price, consumption, revenue, poverty, and health benefits. The analyses presented in this section are mostly drawn from the analyses presented in Barkat *et. al.*, 2008.

Present Tax and Duty Structure on Tobacco Products: Tax revenue of tobacco products consists of taxes on domestic production only as tax and duty on exports and imports are very small. Value added tax is not only invariant among various price levels of cigarettes, it is invariant over all other products and their imports. It is the supplementary duty (SD) that varies among different price levels of cigarette as well as other tobacco products.

It transpires thus that the different taxation options would imply various options of supplementary duty. Barkat *et.al* (2008) have made some projections regarding the possible impact of price increase of 10 percent, 33 percent, 50 percent, and 70

Table 8 : Tax and duty structure of cigarette manufacturing: 2006-07 (%)

Supplementary duty at sales price per 10 pieces (in Tk.)	VAT	SD	Duty rate Average	Total tax rate (VAT & SD)
6.00-11.99	15	32	49	71.4
12.00-18.99	15	52		
19.00-34.00	15	55		
35.00+	15	57		

Note: The average supplementary duty rates represent simple average. The SD is imposed on ex-factory cost and then VAT is calculated by multiplicative method. Thus, with ex-factor cost of Tk. 100, total tax = (100x1.49x1.15)-100 = 71.35 taka and total tax rate = 71.35%

percent. Given the baseline tax structure with 15 percent VAT and 49 percent supplementary duty (in 2004), they have warranted the following taxation options to estimate the corresponding increases in price of cigarettes, decreases in consumption, increases in revenue, and decreases of deaths:

Supplementary duty: 63.9%, 98.1%, 123.5% and 153.3%
Overall tax rate: 88.4%, 127.8%, 157.0% and 191.2%

Impacts on Consumption: Smoking prevalence depends on the attitude towards smoking of the youngsters entering into the smoking age-group, the yet non-

Table 9 : Tax and Duty Structure at Import Level, FY 2006-07 and 2007-08

HS code	Description	FY: 2006-2007			FY : 2007-2008		
		CD	SD	VAT	CD	SD	VAT
2401.10.00	Tobacco, Not Stemmed/Striped	25	25	15	25	20	15
2401.20.00	Tobacco, Partly or Wholly temmed/Striped	25	25	15	25	20	15
2401.30.00	Tobacco Refuse	25	25	15	25	20	15
2401.10.00	Cigars, Cheroots and Cigarillos Containing Tobacco	25	100	15	25	100	15
2401.20.00	Cigarettes Containing Tobacco	25	350	15	25	350	15
2402.90.10	Hand or manually made cigarettes containing tobacco(*BIDI*)	25	100	15	25	100	15
2402.90.90	Cigarettes, excl. hand or manually made cigarettes	25	100	15	25	100	15

Note: *All figures are percentages. The customs duty (CD) rates are applied on CIF values and then multiplication method is applied to estimate other types of taxes*

smokers and the smokers. Higher prices of tobacco products are expected to produce negative attitude to smoking of youngsters, discourage the yet non-

Table 10 : Estimates and baseline information used in Barkat et. al., 2008

Categories	Value
SR elasticity of demand	-0.4
LR elasticity of demand	-0.6
Baseline (2004) information:	
Price per 20 stick pack of cigarette, in Tk.	20.0
Ex-factory cost of 1 pack, in Tk.	11.4
Consumption of cigarette, million packs	1,151.2
Sale value of cigarette, in million Tk.	22,989.0
Government revenue, in million Tk.	9,842.0

Source: Barkat et. al., 2008

smokers to become smokers and encourage some smokers to decrease the intensity of smoking and still other smokers, to quit smoking. All in all, higher prices will lower consumption. The estimated price-consumption relationship of cigarette – both in the short-run and long-run – shows that the long-run effects are substantially larger than the short-run ones. (Table 11). For example, at 33 percent increase in price the short-run decrease in consumption is about 14 percent against about 19 percent in the long-run decrease. At 70 percent increase in price, the short-run and long run declines are about 29 percent and 40 percent respectively.

Impacts on Government Revenue: Fiscal policy measures serve the twin purposes of influencing economic activity and the exchequer. The impact of various price options on the demand condition is discussed above. The resulting impacts of this

Table 11 : Impacts on consumption of cigarette at different price levels (%)

Price increase (%)	Quantity decrease (short-run)	Quantity decrease (long-run)
10	4.1	5.7
33	13.6	18.8
50	20.5	28.5
70	28.7	39.9

Source: Barkat *et. al.*, 2008

price-demand relationship on the exchequer explains that the long run tax revenue increases at higher rates than the percentage increases in prices except in the case

Table 12 : Percentage increase of price and percent increase of revenue

Price increase (%) (1)	Prices per pack (20 stick) of cigarette (2)	Demand (million packs) (3)		Sale(million Tk.) (4)		Government revenue (million Tk.) (5)		Increase of revenue (%) (6)	
0.0	20.0	1,151.2		22,989		9,842[6]		0.0	
		SR	LR	SR	LR	SR	LR	SR	LR
10	21.0	1,104	1,085	24,255	23,837	11,647	11,446	18.3	16.2
33	26.6	995	934	26,427	24,807	15,064	14,141	53.0	43.6
50	30.0	915	823	27,404	24,649	16,955	15,250	72.2	55.0
70	33.9	821	692	27,865	23,486	18,489	15,583	87.8	58.3

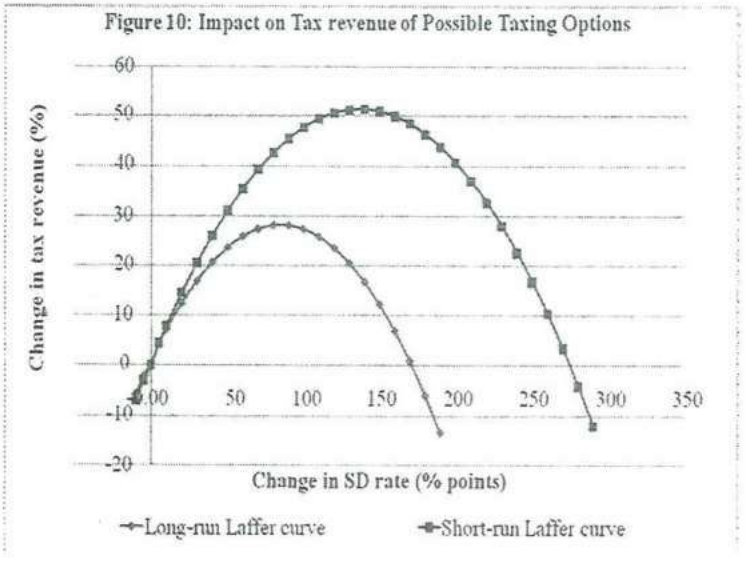
Source: Barkat et. al., 2008

Note: Figures of columns (2) and (3), serve the baseline values, are obtained by applying the information of table 10 to the baseline values; figures of column (4) are obtained from the information of columns (2) and (3); government revenue is the sale value minus demand of cigarette at ex-factory cost.

[6] The estimated baseline government revenue comes to be unusually high relative to the observed overall tax revenue. However, the main point here is to see how tax revenue responds to various taxation options. The percentage increase of tax revenue is the focus of our emphasis in the present case. From this viewpoint, the percentage increase in tax revenue calculated on the basis of the estimated baseline figure can amply indicate the impact on revenue as would do another baseline revenue amount of, say, 245 million taka. One word about the high estimated baseline tax revenue. The price of the brand –Star– that is considered for demand analysis, by Barkat et al 2008, lies at the border line between the high quality brands which are about 5 to 6 in number and the low quality brands which are numerous – about 35 brands. Low value (priced) brands predominates in terms of quantity of sale. The price of star brand is about twice the low priced brands. This has given rise to very high nominal value of overall estimated sale and consequently the tax revenue.

of 70 percent increase in price. The short-run rates of increase of tax revenue are higher still. (Table 12).

One can notice that government revenue and hence the percentage increase of revenue are increasing but at decreasing rates. These points to the fact that if tax rate goes on increasing there will eventually come a situation when government revenue will cease to increase. That is, there exists some optimal tax rate which maximizes government revenue. The thesis proposes that taxes above the optimal rate discourage production to such an extent that results in lower revenues than before. It is of interest to see when this happens. Instead of the traditional analysis of Laffer curve where tax rates are related to total tax revenue, the Laffer curve estimated by Barkat *et. al,* (2008) relates percentage point increase of supplementary duty to percentage increase of tax revenue. In the short-run, government revenue will no longer increase when the percentage points increase of supplementary duty is 270 from the baseline duty rate. In the long-run, the situation occurs when the percentage points increase of supplementary duty is



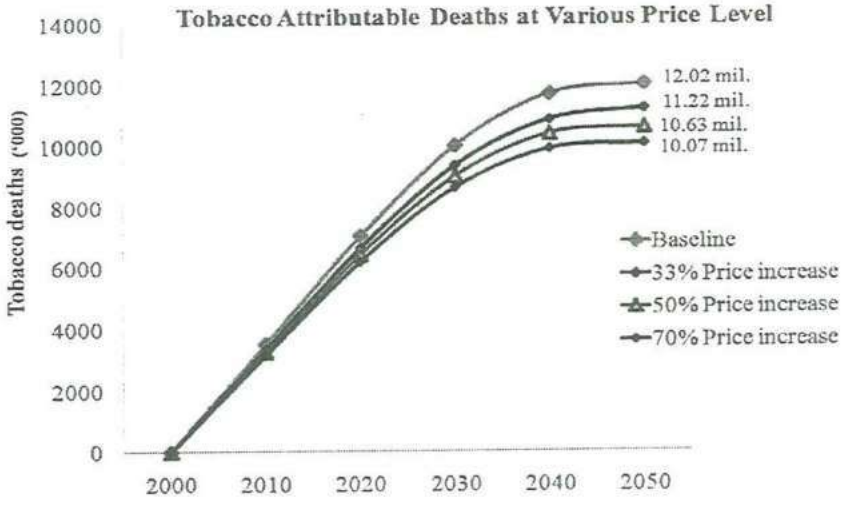
170. In other words, government revenue attains maximum level at supplementary duty rates of 319 percent and 219 percent, respectively, in the short-run and in the long-run.

Impacts on Poverty: The various taxation options under consideration, no doubt, will have some direct dampening effect on employment.However, in a developing country like Bangladesh where about 40 percent of the people are poor and where

prevalence of smoking is higher among the poorer section of the population, high consumption of tobacco imposes on the poor high opportunity cost in terms of foregone essential food and non-food items. The extent of such opportunity costs for an adult smoker in Bangladesh is Tk. 333 per month, which, if spent for consumption of food like rice, would provide adequate diet for about 10.5 million malnourished people (Efroymson *et. al.*, 2001).

Various taxation-cum-price options have significant impacts on consumption of tobacco products. It can be assumed that net cost to the society will come down at about the same rate at which consumption decreases in response to various price increases. It is instructive to note that it is the poorer people who derive the greater portion of benefit of this reduced cost. This is because the indirect costs of tobacco consumption are mainly poverty-related costs because firstly it is the poorer people who are users of low quality-low priced products that are more injurious to health. Secondly, these poorer people cannot afford better diet to at least partially avert the health damaging effects of tobacco use. As a result, they are the worst sufferers of tobacco-related death and disability. This implies that various taxation-cum-price options are more pro-poor fiscal intervention.

Impacts on Health Benefits: Tobacco products constitute one of the most health hazardous consumption items. And more importantly, it is the poorer sections of the population that are the first to beer the brunt of the tobacco-related diseases. Among the various components of costs imposed to the society by the tobacco-



related diseases, the loss of net wages due to premature deaths stands out prominently. It accounts for about 27 percent of all costs imposed to the society by tobacco-related diseases.

In view of this, Barkat *et. al.*, (2008) carried out a simulation exercise to visualize the impacts of various price options on tobacco-related deaths over various years. The model has some key assumptions that include assumptions regarding population, tobacco mortality, maximum smoking reduction, smoking prevalence, prevalence impact, and price elasticity. Under these assumptions, the model traces total and cumulative deaths of a static population over time. It is estimated that the cumulative deaths up to 2050 without any intervention would be 12.0 million; it would be 11.2 million with 33 percent price increase, 10.6 million with 50 percent increase, and 10.1 million at 70 percent price increase. It clearly implies that with higher price interventions the death toll due to tobacco reduces significantly. For example, 33 percent price increase reduces cumulative death by 0.8 million from the baseline and 70 percent price increase is even more effective as it reduces cumulative death by 1.95 million from the base. Thus, price increase reduces cumulative death more than proportionately.

5. Key lessons for Policy

To decrease the use of tobacco and the cost to the national economy resulting from the tobacco related diseases and deaths, the government should continue increasing the supplementary duty on cigarettes, *bidi,* and other tobacco products in its national budget. It is estimated that the increase of supplementary duty to 98 percent from 49 percent in 2007/08 would increase price of cigarette and *bidi* by 33 percent; decrease use rate by 14 percent and 19 percent in short and long-run, respectively; raise government revenue earning by 53 percent and 44 percent in short-run and long-run respectively; and avert 800,000 premature deaths in next 40 years. The increase in tax rates on tobacco products should be aocompmend by measures to strengthen the tax administration to minimize tax evasion, particularly in bidi and low brand cigarettes.

Given Bangladesh's low share in international tobacco leaf market, low contribution to GDP and employment, and negative trade balance, there is less rationale for promoting tobacco cultivation from a macroeconomic point of view. It is true that tobaccos has signifier contribution to generating revenue for the economy with 9 percent of the total tax revenue coming from this industry. But tax revere can not be the sob justification for arguing in favour of tobacco cultivation, its many negative consequences including on health and environment.

So, the government should consider that tobacco is a "merit bad" and should take appropriate initiatives to ensure agricultural diversification away from tobacco. Cultivation of high value food crops that are currently imported to supplement domestic production should be encouraged and promoted. To this end, the government needs to provide easy credit facilities and other supports to the farmers. To raise awareness about the health and environmental hazards of tobacco cultivation and processing, the government can send messages to the grassroots-level farmers through the Sub-Assistant Agriculture Officers. However, any effort to diversifying away from tobacco has to be accompanied by demand side intervention i.e., imposing higher taxes on tobacco products like *bidi*, cigarettes, *hooka, zarda,* etc. Higher taxes on these commodities will have a consequence on the demand for tobacco-leaf and the incidence of the tax will fall beyond the smokers in the long run to all the stakeholders associated with the cultivation and production of tobacco. However, it is to be noted in this regard that any tax-measures to curtail the production of tobacco may not necessarily reduce the tax-payment from this sector and the consequences will ultimately depend on how the government tackles the dilemma[7].

Bangladesh signed the Framework Convention on Tobacco Control (FCTC) in 2003 and passed the Bangladesh Smoking and Tobacco Products Usage (Control) Act 2005 but the Act does not include measures to promote cessation of tobacco use and adequate treatment for tobacco dependence and does not indicate tax measures to reduce tobacco consumption. These issues should be addressed by making necessary amendments and changes in the Act. The Act should make stipulation about pictorial warnings showing the health hazards of tobacco use. However, it should be noted that most of the stipulations in the Act are not maintained and people still smoke freely in pubic places, although the Act has banned smoking in public places and public transport and designated smoking places. It is necessary to form an implementation and monitoring cell by involving anti-tobacco organizations and civil society members so that the periodical review of progress of implementation of the Bangladesh Smoking and Tobacco Products Usage (Control) Act 2005 can be made. The taskforce committees set up at the district and *upazila* levels for the implementation of the Act are not active and in

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7 For example, if the government taxes high on *bidi* and cigarette, it will have two offsetting consequences on the revenue: higher taxation will have a revenue-lessening impact through the lesser demand of cigarettes, and will also have a revenue-enhancing impact through the increased taxes. So the determination of the optimal amount of tax is critical for any taxation measures to be adopted.

many districts and *upazilas* these committees have not been set up yet. The Government should take all out measures to activate these committees.

Although tobacco advertisements in the media have been banned, indirect promotion of tobacco companies and their products both in the media and in the form of free distribution of samples targeting mostly the younger generation is continuing. Mass media should play important roles in creating public awareness against the use of tobacco. Promotion of games and sports and social events by the tobacco companies should be prohibited. The relevant textbooks in the schools should contain topics on ill effects of tobacco and smoking. The local level social organizations, NGOs, professional bodies, student fronts, political parties, and other components of civil society (including *Imams* of about 500,000 mosques) should be vocal about the dangers of production and consumption of tobacco.

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