Estimating the Size of Tendu Leaf and Bidi Trade Using a Simple Back-of-the-Envelop Method

Pranay Lal

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INTRODUCTION

Since independence from the British in 1947, India has relied heavily on forest resources, including extraction of *tendu* leaves, to provide livelihood options for its marginalised tribal and forest-dependent communities. *Tendu* leaves are used to make *bidis*, an indigenous leaf-rolled cigarette made from coarse uncured tobacco, tied with a coloured string at one end. It is widely smoked in the Indian subcontinent and is gaining popularity globally, especially in USA, Germany, Middle East, Eastern Europe and Japan (Tobacco Board of India 2010). *Bidis* are harmful and pose a serious challenge to the health of youth globally and especially in the US where a health advisory warns of the potential harm (CDC http://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/bidis_kreteks/).

Curiously the use of *tendu* to make *bidis* is more recent, with the accidental discovery of *tendu* as the most suitable leaf to wrap tobacco and make *bidis*. The *tendu* tree (*Diospyros melanoxylon* or the black or east Indian ebony) grows in degraded deciduous forests of peninsular India, where once *sal* trees (*Shorea robusta*) were felled to make railway sleepers. *Tendu* leaves are available for plucking soon after the tobacco crop is ready and cured, when most other deciduous trees have shed their leaves in summer (April–June). *Tendu* leaves have all the characteristics of an excellent wrapper material—they are large and pliable, and do not crack on rolling when dry; their leathery texture is also more acceptable than the veins and rough textures of

other leaves; and they match well with and augment the taste of tobacco, without interfering with the tobacco flavour. The first *bidi* factory was set up in 1911 in Jabalpur in erstwhile Central Provinces (now in the state of Madhya Pradesh), where *tendu* was most abundantly available. *Bidis* found wide consumer acceptance especially during the ‘*Swadeshi andolan*’ (a civil disobedience movement to boycott Imperial British goods during India’s struggle for independence) which was started by Mahatma Gandhi in 1920. This uplifted the prestige of the *bidi* that even educated Indians started smoking *bidis* instead of cigarettes. The two World Wars further spurred the use of *bidis* as they accompanied Indian soldiers to far-flung places (Lal 2009).

HISTORICAL BACKGROUND

Bidi trade and *tendu* plucking grew rapidly. Many states regulated *tendu* trade through state policies. Between 1964 and 1981, all major *tendu* producing states began regularising auctions and had set trade rules (Gupta and Guleria 1982). Foreign aid especially from donors like the World Bank pushed for development of sub-national and national level policies and joint forest management programmes since late 1980s which promoted *tendu* trade (Kumar 2000). As a result, *tendu* leaves and *bidi* rolling are perceived as an important source of employment for the rural poor (Planning Commission 2011) despite providing seasonal, part-time or home-based employment. *Tendu* plucking generates only part-time employment for about 7.5 million people (Arnold 1995) while rolling *bidis* engages nearly 4.4 million women and children (Ministry of Labour 2000). *Tendu* plucking provides 106 million

person-days of employment in collecting activities and 675 million person-days in secondary processing (World Bank 2006).

Tendu harvests are variable. In the mid-1980s, annual production of *tendu* leaves was supposedly stable at around 300 000 metric tonnes (mt) (Gupta, B.N. *State of non-wood forest products in India*. Paper presented at the regional expert consultation on non-wood forest products at FAO Regional Office for Asia & Pacific, Bangkok, 5–8 November 1991 (Unpublished)) but grew to 450 to 500 000 mt in 1990s, and declined to 400 000 mt in 1999 (FAO 2005). In 2002–2003, 360 000 mt was produced (World Bank 2006), which equates to producing 400–450 billion *bidis* (based on FAO estimate that a standard bag weighs around 40 kg and contains 50 000 leaves) (FAO 2005). Like *tendu*, data for *bidis* produced is hard to come by. In 1966, the *bidi* industry association estimated that 400 to 480 billion *bidis* were produced in India (Anonymous 1967). A industry report suggest that about 740 billion *bidis* were sold in 1970, which peaked in 1993 to around 990 billion *bidis* before declining to about 810 billion sticks in 1999 (World Tobacco 2001). Between 675 and 700 billion *bidis* were produced in the mid 1990s (WHO 1997, ILO 2003) and in 2005–2006, it is estimated that 750 billion to 1.2 trillion *bidis* were made annually (Sunley 2008). Nearly 73.3 million people smoke *bidis* in India (International Institute for Population Sciences, Ministry of Health, Family Welfare 2010) and over half (54%) of all tobacco consumed in India is smoked as *bidis* (Directorate of Tobacco Development 2010). As a result of its cultural acceptance and phenomenal growth, *bidis* have become the single largest cause of premature adult death in India (Gupta and Asma 2008).

Not surprisingly, 76 districts where *tendu* is plucked and eight important *bidi* rolling centres (Lal 2009) are in the poorest 100 districts as identified by the Government of India (Planning Commission 2001). The paradox of poverty and impoverishment is startling, given that the forest department and a handful of *tendu* traders and *bidi* barons benefit from this trade. Since 1990 in Orissa, one of India's poorest states, *tendu* leaves have contributed between 70 and 80% to forest departments' revenue (Saxena 2003). Yet the economic contribution of *tendu* to households can be as little as 2.2 to 2.7% of the total annual income for the poor in forest villages (Bahuguna 2000) with widespread corruption, malpractices and inefficiencies which deprives the poor of their share from the revenue (Saxena 2003).

BACK-OF-THE-ENVELOPE ESTIMATION OF *TENDU* AND *BIDIS* PRODUCED

Despite the concomitant growth of *tendu* harvesting and *bidi* trade, accurate estimates for *tendu* is difficult to find.

The reasons for this complex, but can be attributed to complicity, corruption and deception of politicians, traders and policymakers (Saxena 2010; Lele et al. 2010). Illicit *tendu* trade flourishes under the patronage of insurgent groups called the Naxalites who benefit from it (World Bank 2006) and funds their arms caches, which is instrumental for destabilising weak states and the country (The Economist 2006). In the state of Maharashtra, *tendu* trade has become a major drain for the forest department as Naxalites claim most of the benefits of the *tendu* harvest (CAG (Comptroller and Auditor General of India) 2008).

Beside economic and political criticisms, *tendu* plucking is detrimental for local ecology. *Tendu* leaves are harvested at the beginning of the summer season when much of the forest has lost its foliage. After all leaves have been plucked from these bushy trees, the base of the trees is scorched with fire, with the intent of improving the quantity and quality of leaf in the next harvest. This practice has little scientific validity (Gupta and Guleria 1982). Uncontrolled forest fires are frequently reported in states where *tendu* harvesting takes place (Singh 2008; Pallavi 2010). Widespread burning year after year reduces tree and shrub diversity (Saha 2002; Saha and Howe 2003) and increases emissions (Shekar-Reddy and Venkataraman 2002) in deciduous forests. In 1995, a legal suit challenged *tendu* plucking in protected forests areas like national parks (Supreme Court of India 1996). Although the Forest Rights Act, 2006 recognises the right of the community's ownership to forest produce including *tendu* (Mahapatra 2010), it faces challenges from other interests like Project Tiger which by identifying "critical tiger habitats" bans or restricts *tendu* plucking (Ministry of Environment and Forests 2010).

The challenge in *tendu* has been that despite the enormity of its trade, revenues and supposed income generated for the poor, there are very few rigorous national estimates. For better decision-making, management and regulation, it is important that rigorous estimates for *tendu* and *bidis* are accessible.

Back of the envelope calculation (Fig. 1) suggests that *tendu* and *bidi* production is variable. *Tendu* production grew from 1975 to 1999–2000 (dotted trendline in Fig. 1). Post-2000, with the creation of new states, new institutional processes for *tendu* collections and auction were slow to take off in some states which led to a gradual decline in *tendu* leaves supply. This trend is mirrored in *bidi* production as well. From 1975 *bidis* grew from 0.55 trillion to nearly one trillion by 1990. By mid-1990s, more than one trillion *bidis* were produced, but it started to decline after 1998. Between 1997 and 2002, Gujarat, the leading *bidi* tobacco producer has shown a steady decline (Rajaratnam et al. 2010). It has become variable in parts of Maharashtra and only in Nippani region of Karnataka is *bidi* tobacco production sustained (Bidi Tobacco Research Station 2002). The *bidi* estimates presented here correspond well with

Fig. 1 Estimated *tendu* harvested and *bidis* produced (1975–2008), in billion. To estimate the national *tendu* production (and auction) data from Madhya Pradesh (MP), the largest *tendu* producing state, is extrapolated (MPFDC (Madhya Pradesh State Minor Forest Produce (Trading and Development) Coop Federation Ltd) 2011; Singh 1997). Prior to 2000, MP produced nearly 41–45% of the total *tendu* (Gupta Unpublished; Joshi 2003). After MP's bifurcation to create a separate state—Chhattisgarh the proportion has been reduced to about 25% since 2001 (FSLG, undated). To be on the conservative side, 45% is used as MP's share of the national production prior to 2000. To test whether these ratios are effective, national, and state level data from MP from 1975 to 1998, from two other studies are compared and find only minor variations (± 3 to $\pm 5\%$) (Singh 1997; Kushwaha and Kumar 2007). For the sake of simplicity, grey *bidi* tobacco market

and adulteration in raw *bidi* tobacco are excluded from the estimation. Since every *bidi* contains on an average 0.2 grams of tobacco (Gupta and Asma 2008), dividing *bidi* tobacco produced (Directorate of Tobacco Development 2010) by this will give the *bidis* produced. Export of *bidi* tobacco is too small (only 0.14% in 1996–1997) and is therefore ignored in this estimation. For simplicity of calculation and accounting for production factors (like quality of leaves, skill of labour which can reduce wastage, damage to leaves during the entire production cycle, etc.) it is assumed that every *tendu* leaf produces just one *bidi* (Giriappa 1987; Lingaraj 1980). The difference between the total number of *bidis* produced (using *bidi* tobacco production data) and the national *tendu* production provides an estimate of the size of the private, unregulated and illicit *tendu* market

tendu auctioned (FAO 2005) and *bidi* estimates claimed by the *bidi* industry lobby, the All India Bidi Industry Federation, of around 550 billion pieces during this period (All India Bidi Industry Federation 2000). The current level of *bidis* produced is 650–720 billion (605 billion in 2007–2008) estimated here, is considerably less than more recent estimate of 1 to 1.2 trillion *bidis* (Sunley 2008).

The difference between estimated *tendu* produced versus total *bidis* made is nearly 40 to 50% and is met through illicitly or privately traded *tendu*. In 2007–2008, only 310 billion *tendu* leaves was legally available but nearly 605 billion *bidis* were made—which is about 49% *tendu* was acquired illegally by *bidi* manufacturers.

CONCLUSION

These figures, however, simplistically derived, are the first comparative estimate of *tendu* and *bidis* produced and provide evidence to the size of illicit *tendu* trade. The most obvious

consequences of illicit trade is revenue loss to state and central government, and more importantly, deprivation of income and livelihood support for the poor and marginalised. The *tendu* policy environment does not serve its economic, ecologic and social purpose. There is a clear need for reform.

In March 2011, The Union Ministry of Environment and Forest announced the constitution of a one-person committee (called the Haque Committee) to recommend minimum support price for *tendu*, but this too is not guided by validation of information and historical realities from states and districts, nor does this prescribe how price setting would benefit *tendu* pluckers (Srivastava 2011) or how it will overcome illicit trade. The reform process must begin with better stocktaking and a comprehensive socio-economic assessment whether *tendu* trade provides the desired benefits for those it is intended for.

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Pranay Lal (✉)

Address: International Union Against Tuberculosis and Lung Disease (The Union), C-6, Qutub Institutional Area, New Delhi 110016, India
e-mail: plal@theunion.org