

The global diversion of pharmaceutical drugs

India: the third largest illicit opium producer?

Letizia Paoli¹, Victoria A. Greenfield², Molly Charles³ & Peter Reuter⁴

Leuven Institute of Criminology, K. U. Leuven Faculty of Law, Leuven, Belgium,¹ Department of Economics, US Naval Academy, Annapolis, MD, USA,² Mumbai, India³ and School of Public Policy and Department of Criminology, University of Maryland, College Park, MD, USA and Drug Policy Research Center, RAND Corporation, Washington, DC, USA⁴

ABSTRACT

Aims This paper explores India's role in the world illicit opiate market, particularly its role as a producer. India, a major illicit opiate consumer, is also the sole licensed exporter of raw opium: this unique status may be enabling substantial diversion to the illicit market. **Methods** Participant observation and interviews were carried out at eight different sites. Information was also drawn from all standard secondary sources and the analysis of about 180 drug-related criminal proceedings reviewed by Indian High Courts and the Supreme Court from 1985 to 2001. **Findings** Diversion from licit opium production takes place on such a large scale that India may be the third largest illicit opium producer after Afghanistan and Burma. With the possible exceptions of 2005 and 2006, 200–300 tons of India's opium may be diverted yearly. After estimating India's opiate consumption on the basis of UN-reported prevalence estimates, we find that diversion from licit production might have satisfied a quarter to more than a third of India's illicit opiate demand to 2004. **Conclusions** India is not only among the world's largest consumer of illicit opiates but also one of the largest illicit opium producers. In contrast to all other illicit producers, India owes the latter distinction not to blatantly illicit cultivation but to diversion from licit cultivation. India's experience suggests the difficulty of preventing substantial leakage, even in a relatively well-governed nation.

Keywords Cultivation, diversion, heroin, India, licence, opium.

Correspondence to: Letizia Paoli, Leuven Institute of Criminology, K. U. Leuven Faculty of Law, Hooverplein 10–11, B-3000 Leuven, Belgium. E-mail: letizia.paoli@kuleuven.be

Submitted 18 February 2008; initial review completed 24 June 2008; final version accepted 28 November 2008

INTRODUCTION

The international literature on illegal drug markets makes inappropriately scant reference to India. India may be the world's largest consumer of illicit opiates and an important supplier of illicit opiates. For several decades, India has been the main licit producer and sole supplier of opium (as a final product) to the world pharmaceutical market [1]; however, as a consequence of significant diversion from licit cultivation it may, *de facto*, also be a leading illicit producer. Some foreign and Indian officials conjecture that a substantial share, at least 30%, of India's officially sanctioned production seeps into the illicit market. With the possible exceptions of 2005 and 2006, we find plausible that Indian producers divert illegally 200–300 tons of opium yearly, enough to make it the third largest illicit opium producer after Afghanistan and Burma [unless specified otherwise, data are '90%

solid'; that is, assume a 90% solid content of raw opium, as does the United Nations Office on Drugs and Crime (UNODC) [2] and the US Department of State [3]]. The prospect that this diverted production never leaves India—the country's internal demand may be large enough to absorb it and considerably more—may explain why the country is ignored routinely in supply-side studies of the world heroin market.

The primary purpose of this paper is to explore India's role in the world illicit opiate market, particularly as a producer. The first section describes our data collection methods. The second provides indicators of India's illicit opiate consumption. The third reviews the sources of illegal opiates in India, singling out diversion from licit production as an important, although unacknowledged, source. The fourth section provides an account of actual diversion, examining the challenges of law enforcement and the political and social context of the licit opium

industry. It also attempts to estimate how much opium may be diverted each year. We discuss our findings in the final section.

METHODS

This paper is part of a larger research project on the world opiate market [4]. The project entailed primary data collection in India and eight other opiate producing or trafficking countries. In each country, local researchers were asked to prepare detailed reports on market conditions, legal institutions and the extent and effects of enforcement on the basis of a common research protocol. Molly Charles was in charge of the primary data collection in India, which she conducted at eight different sites using a variety of mainly qualitative research methods. In addition to participant observation, Charles interviewed 20 national law enforcement officials and lawyers, seven health professionals, 30 users of heroin and other hard drugs and five petty dealers and other informants on the basis of a semi-structured questionnaire. Letizia Paoli also interviewed four senior Indian law enforcement officers, five foreign liaison officers and one diplomat in Delhi and Mumbai. Information was also drawn from standard secondary sources and the analysis of about 180 drug-related criminal proceedings reviewed by Indian High Courts and the Supreme Court from 1985 to 2001. The present study builds additionally on extensive fieldwork carried out particularly in Mumbai by Molly Charles and colleagues during the late 1990s [5,6].

Opiate consumption in India

Although rough recent estimates suggest that India's opiate consumption is higher than any other nation's, both in terms of the number of users and the quantity of opiates consumed, this record is not the result of an exceptionally high prevalence rate—India's prevalence rate, 0.4%, is on a par with the global average—but of an exceptionally large population ([4], 2: 76, 393–4). Recent survey data and other UN-reported prevalence estimates suggest that India has between 2.1 and 2.8 million opiate users, depending on the method of estimation and the year of reference ([7], p. 2). At the low end of the range, UNODC and the Indian Ministry of Social Justice and Empowerment ([7], p. 19–26) extrapolate from the first National Household Survey (NHS), which referred to 2001 and covered only the male population aged 12–60; in so doing, they estimate that about 1.5 million people consume opium regularly and about 600 000 people consume heroin regularly—the latter figure probably being too low, as household surveys are known to miss many problem drug users [8]. According to our detailed calculations [4], which are consistent with

the UN-reported prevalence estimates, potential opiate consumption in India could have totalled as much as 78 tons (pure heroin equivalent) annually in the 2001–03 period, more than twice as much as was consumed by the second and third largest consumer countries, Iran and Russia, respectively.

India permits limited distribution of licit opium. Today less than 1% of India's current opium users are officially registered opium addicts and therefore entitled to purchase opium from state-sanctioned distribution outlets, of which there are also few. In 1997, the last year for which data are available, only about 10 000 people were registered, hence eligible to use 131 outlets ([9], p. 268). Moreover, the opium released to Indian states (ranging from 146 to 1240 kg yearly in the 1990s; [9], p. 270) is not sufficient to meet the demand of the registered addicts. Thus, the vast majority of India's current opium users—and all its heroin users—must purchase their opiates illegally or substitute instead synthetic products, such as buprenorphine. The literature documents a progressive shift towards synthetic opiates, favoured by easy availability and low prices ([10,11,12], p. 278). However, as a rule synthetic opiate users are distinguished from opium and heroin users in the UN-sponsored survey and estimates. In the NHS, for example, they accounted for an extra 0.2%, corresponding to another 600 000 people ([7], p. 21). The remainder of our discussion focuses upon agriculturally derived illicit opiates.

The illicit sources of opiates

There are three potential sources of agriculturally derived illicit opiates in India: blatantly illicit domestic cultivation, imports from Afghanistan, imports from Burma and diversion from licit production. We assess the relevance of each to opium and heroin.

Opium

In the case of opium one source, diversion, appears to dominate. Although ethnographic research indicates that Afghan opium is available in a few exclusive circles of users (M. Charles, personal observation, 1999, [13]), law enforcement agencies have no evidence of its regular importation (e.g. [14], p. 15). Blatantly illicit domestic production also plays a minor part in the market: since the mid-1990s the bulk of India's illicit cultivation has been very limited and confined to Arunachal Pradesh, the most remote and least developed of the northeastern states; there is no evidence of local opium being trafficked to other parts of the country ([12], p. 277; [15], p. 15). Thus, we conjecture that a large majority of the opium needed to satisfy the demand of Indian users is produced domestically under licit auspices.

Heroin

The analysis is more complicated in the case of heroin. The Narcotics Control Bureau (NCB)'s Annual Reports present Southwest Asia, hence Afghanistan and Pakistan, as the main source of heroin sold in India. The NCB's claims of the predominance of Southwest Asian heroin are, however, undermined partially by its own statistics. Although Southwest Asian heroin constituted 48% of the heroin seized in 1997, that share fell to just 5% in 2002. The drop in the share of seizures might be related to the reduction in opium production in Afghanistan in 2001, but data on seizures from Afghanistan's neighbors do not indicate similarly large drops. The absence of data in the NCB's more recent Annual Report (e.g. [16]) leaves us with little or no basis for determining whether the percentage of Southwest Asian heroin has rebounded since 2002.

Heroin from Southeast Asia, namely from Burma, accounts for a very small share of India's seizures. According to NCB statistics, heroin that could be traced with certainty to Burmese sources represented a minimum of 0.6% and a maximum of 2.1% of yearly total seizures in the period 1997–2002. Although some experts in both India and Burma judge the Indo-Burmese drug trade to be expanding rapidly (e.g. [17]), our own data collection in Manipur confirms the NCB assessment of a limited, relatively disorganized inflow of heroin from Burma.

Even if Southwest Asia's share of total heroin seizures in the late 1990s is assumed to represent its share of the Indian heroin market at the beginning of the new century, one may still ask where the rest of the heroin consumed in India comes from. The NCB reports do not answer this question explicitly and only in one of the more recent editions are two references made in passing to the diversion of opium from licit production ([15], p. 2, 14). The US Department of State does not share the NCB's ambiguities: the 2007 edition of the *International Narcotics Control Strategy Report* states that locally produced 'morphine base ('brown sugar' heroin) is India's most popularly abused heroin [*sic*] derivative' ([3], p. 240). The US assessment supports the findings of our fieldwork: interviews with the drug users and foreign and locally based Indian law enforcement officers pointed consistently to the growing use of Indian 'brown sugar'. A spread in several Indian cities, dating back to the mid-1990s, has also been noted by scholars (e.g. [10,18]). In the absence of a standardized heroin signature programme, the locally based officers estimated that up to 80% of the heroin consumed in major cities such as Delhi and Mumbai comes from diversion from licit production. We explore this possibility below, in relation to our estimates of diversion.

Diversion from licit production and its share of the illicit market

Licit opium poppy cultivation in India is a labour-intensive and geographically dispersed industry, which is inherently difficult to control. Both the CBN and NCB stress the strictness of the Indian licensing and control system (see [15,19], p. 13–14); however, an analysis of the system and qualitative fieldwork in production areas indicates that diversion is a routine and openly tolerated activity and, to a certain extent, even promoted by local cultural norms and social structures.

Diversion can occur in four ways. First, cultivators in licit growing regions may plant additional hectares without proper licences. Secondly, cultivators may claim falsely that licensed fields in licit growing regions are not harvestable, then sell their harvests illicitly. Thirdly, a properly licensed and harvested field may yield more than the minimum qualifying yield (MQY) and an unreported excess may be sold into the illicit market. Fourthly, diversion could occur after the government has purchased or processed the opium, with corrupt agents selling out of the government's inventory. We have found little evidence of additional, unlicensed fields or sales from inventory; false claims of unharvestable hectares and excess yields may be important.

The licit opium industry: the regulatory process and its difficulties

India is the largest producer of opium for the world's pharmaceutical industry. Between 2000 and 2006, India's licit opium production has ranged from a low of 332 metric tonnes in 2006, when 7252 hectares were licensed, to a high of 1326 in 2000, when 35 270 hectares were licensed ([19]; see Tables 1 and 2). India is the only country that permits the legal extraction and export of opium gum rather than poppy straw concentrate (CPS), which is much less prone to diversion.

The Central Bureau of Narcotics (CBN), an agency of the Ministry of Finance, organizes and supervises the licit cultivation of opium poppy. Before sowing begins, the CBN decides on the quantity of opium it intends to purchase the following year and determines the expected yield per hectare in each province, referred to as the MQY: a farmer who fails to achieve the MQY is ineligible to receive a licence for opium-growing the following year. On this basis, the CBN then establishes the area to be planted and the number of licences to be issued. After the harvest, the CBN collects opium gum from farmers and operates two processing centres, in Madhya Pradesh and Uttar Pradesh, where the opium is purified, dried, weighed and packaged for export or partially refined to supply Indian pharmaceutical companies [19].

Table 1 Number of cultivators and licit cultivation area—1996–2006.

<i>Crop year</i>	<i>Number of cultivators</i>	<i>Area licensed in hectares</i>	<i>Area harvested in hectares</i>	<i>Area not harvested in hectares</i>	<i>Area not harvested as a share of area licensed</i>
1996	78 670	26 437	22 593	3 844	0.15
1997	76 130	29 799	24 591	5 208	0.17
1998	92 292	30 714	10 098	20 616	0.67
1999	156 071	33 459	29 163	4 296	0.13
2000	159 884	35 270	32 085	3 185	0.09
2001	133 408	26 683	18 086	8 597	0.32
2002	114 486	22 847	18 447	4 400	0.19
2003	102 042	20 410	12 320	8 090	0.40
2004	105 697	21 141	18 591	2 550	0.12
2005	87 670	8 770	7 833	937	0.11
2006	72 478	7 252	6 976	276	0.04

Source: [12], p. 274; [19].

Table 2 Licit opium production and proportional estimates of diversion in tons—1996–2006.

<i>Crop year</i>	<i>Licit production at 70% solid</i>	<i>Licit production at 90% solid</i>	<i>Diversion of 10% of production at 90% solid</i>	<i>Diversion of 30% of production at 90% solid</i>
1996	1077	838	83.8	251.4
1997	1271	989	98.9	296.7
1998	335	261	26.1	78.3
1999	1382	1075	107.5	322.5
2000	1705	1326	132.6	397.8
2001	995	774	77.4	232.2
2002	1055	821	82.1	246.3
2003	684	532	53.2	159.6
2004	1087	845	84.5	253.5
2005	439	347	34.7	104.1
2006	427	332	33.2	99.6

Source: Authors' calculations based on [19].

With the partial support of the NCB and state police forces, the CBN also faces the daunting task of monitoring a very labour-intensive and fragmented activity [20]. As shown in Table 1, the CBN licensed 72 000 to 160 000 farmers each year during the 1996–2006 period. Each licensed farmer is allowed to cultivate a maximum of one-fifth of a hectare. If one includes farm workers, approximately 1 million people may come into contact with poppy plants and opium gum yearly. Following recent declines in the area licensed for cultivation, the level of participation in the licit programme, measured by the number of licensed cultivators, has also declined, but less so than the area licensed for cultivation, implying that each cultivator can produce less opium for the licit market now than previously. In 2000, the average licensed area per cultivator was just over a fifth of a hectare, the legal maximum; in 2006, it was only a tenth of a hectare. The control of the area under cultivation is made even more difficult by the fact that poppy fields are

usually far away from the main roads and that roads are still scarce in parts of Madhya Pradesh, Rajasthan and Uttar Pradesh.

In late autumn of each year, 800 narcotics officials attempt to measure the licensed but as-yet-unplanted fields and, up to the point of harvest, patrol these fields regularly. Since 2003, the CBN has also estimated the actual acreage under licit opium cultivation by using satellite imagery, and then comparing it with exact field measurements. However, for a month or two prior to the opium harvesting, which occurs in April, enforcement relies on elected village headmen (the *lambardhar*). It is up to *lambardhar* to record the daily yield of opium from the cultivators under their charge. Previously, in exchange for their services, the *lambardhar* received a commission of 1.5% of the total price of the opium produced. To increase their loyalty, their commission rate has been increased recently to 10% ([21], p. 23–4; [3], p. 239–42).

The difficulties of enforcement are also evidenced by discrepancies between the area licensed for cultivation and the area that is finally harvested. As shown by the last columns of Table 1, in the period 1996–2003 this gap has oscillated between a low of 3185 hectares in 2000, amounting to 9% of all licensed hectares, and a high of 20 616 hectares (67%) in 1998. The gap declined substantially in 2004, 2005 and 2006, reaching a low of 276 hectares, or 4% of licensed hectares in 2006, and suggesting that either the Indian government has tightened its controls sharply, reacting possibly to international pressures ([3], p. 238–44), or that other market conditions have changed, making diversion less attractive. Whereas the huge discrepancy in 1998 was due largely to a cultivators' strike, in other years the gap between the area licensed for cultivation and the area harvested is attributed officially to a variety of causes: drought or, more generally, bad weather conditions, plant diseases, insects or the Nilghai, a type of cow that is said to eat the poppy crop. Our primary data collection, in contrast, shows that under-reporting of hectares harvested and false declarations of opium destruction are relatively frequent—to divert opium onto the illicit market or to save it for personal use.

It is usually up to the *lambardhar* to issue a declaration of opium destruction, after he himself or his agents have visited the area under cultivation that has been claimed 'unharvestable', and ensured that the crop is burnt. However, according to several interviewees, these officers are often willing to make false statements about the extent of the crop destroyed in return for a 'fee'. Mansfield ([21]: 23) also singles out the *lambardhar* 'as playing a key role in the diversion process'.

The traditional non-state institutions of caste, kinship and credit networks, which are still important in the rural opium-producing areas, weaken further the control apparatus set by the CBN. Bound by caste and clan ties and embedded in patron–client relationships with local power-holders, the *lambardhar* as well as the CBN and state police officers are often unable or unwilling to exercise properly the enforcement tasks that are entrusted to them. In an ethnographic study of the social control of opium production in Rajasthan, De Wilde ([22], p. 3) reports that 'the strictness of harvest monitoring and collection, for which the *lambardhar* is responsible, is subject to a variety of extra-legal constraints, and apparently depends more on networks of patronage and credit subject to caste and kinship formations, and less on the letter of the law' (see also [21]). The 'extra-legal constraints' are most binding when the *lambardhar* must deal with powerful landowners, who usually belong to the upper castes and often hold large numbers of licences, obtained on their behalf by members of their extended families or poor farmers or sharecroppers.

MQYs and the opium lobby

One of the CBN's most sensitive tasks is to establish yearly a MQY, the number of kilograms of opium to be produced per hectare in each state. The MQYs are based on historical yield levels from licensed farmers during previous years and are set by the CBN prior to licensing. Simultaneously, the CBN also publishes the price per kilogram the farmer will receive for opium produced that meets the MQY, as well as significantly higher prices for all over-MQY opium turned into the CBN.

The CBN has almost doubled the MQY since the early 1980s. From a low of 25 kg per hectare in 1981 it has risen to 54 kg in Madhya Pradesh and Rajasthan and to 48 kg per hectare in Uttar Pradesh in 2006. Average yields have increased along with the MQY: these have risen from a low of 30.8 kg per hectare in 1984 to a high of 61.2 kg in 2006 (all yield figures, here and in the Discussion, are at 70% solid).

The long-term increases in MQY and average yields reflect advances in technology and irrigation. Moreover, they are also evidence of the CBN's increasingly stringent policy. Raising the MQY may be the CBN's most effective means of deterring diversion: if the MQY is too low, farmers can divert clandestinely the excess opium they produce into illicit channels. In its 2005 report, the US State Department ([12], p. 274) concludes: 'an accurate estimate of the MQY is crucial to the success of the Indian licit production regime'.

In reality, the setting of the MQY is politicized. Each year opium farmers and their political patrons try to negotiate the lowest possible MQY. According to many of our Indian and foreign interviewees, the opium farmers' political patrons constitute an effective, although informal, opium lobby, whose members include high-ranking politicians and CBN officers and, in the past, even federal ministers (see also [23,24]). In the early 1990s, for example, the MQY was fixed at 34 kg per hectare at 70% solid. As the government moved to raise it to 38 kg, the opium growers applied pressure and the MQY was set at 37 kg. The case of the farmers was pleaded openly by 14 members of parliament belonging to all parties [23].

If unsatisfied with their patrons' representations, opium farmers can mobilize. In late 1997 30 000 cultivators went 'on strike', relinquishing their licences voluntarily to demand reductions in the MQYs and increases in the area of cultivation. Although the CBN replaced the striking farmers by issuing 26 000 new licences in 3 days, the 1998 harvest was one of the smallest on record: about 260 metric tonnes. Of the 30 714 hectares licensed for production, an extraordinary two-thirds was not harvested, suggesting strongly an increase in diversion. The following year the MQY was reduced for all three states to 30 kg per hectare [25].

The amount paid per kilogram of opium at 70% solid rose steadily in nominal terms from 1996 to 2005, from a low of about \$14 at the start of the period to a high of \$33, falling back only slightly in 2006 to \$32 ([26], p. 15). According to our informants, the price paid on the illicit market is substantially higher, ranging from \$107 to \$320 per kilogram in the period 2000–04 ([13], p. 28–29). Farmers who submit opium above the MQY are paid a premium, but not nearly enough to bridge the gap between the licit and illicit markets.

Calculations of farm revenue and net income for the period 2000–04—the period for which we have licit and illicit price estimates—illustrate further the relative attractiveness of illicit sales. A farmer cultivating the maximum area, i.e. a fifth of a hectare, may have harvested just over 11 kg of opium at 70% solid, suggesting CBN payments—or gross income—of about \$230–350. After subtracting production costs, the net income per farmer, according to our informants, might have been as low as 10% of the gross, amounting to \$23–35 in our example, although the sale of licit opium by-products (poppy seeds and straw) may have generated more farm income than the opium sold to the CBN, thus suggesting a higher overall net ([21], p. 15). If sold on the illicit market, the same opium yield could have generated revenue of about \$1200–3580 and net income of \$990–3260, assuming no differences in production costs and before accounting for the sale of any poppy seeds or straw. Some Indian government officials have described diversion as ‘an economic necessity’ ([21], p. 24; see also [27]); at the very least, our analysis suggests it is economically advantageous.

Attempts to estimate diversion

The INCB, US State Department Bureau for International Narcotics and Law Enforcement Affairs, and others,

assert routinely that ‘certain quantities of licitly produced opium continued to be diverted into illicit channels’ ([28], p. 62). Whereas the INCB does not attempt an estimate, the US State Department ([3], p. 239) has stated in its annual report that ‘between 20–30 percent of the opium crop is diverted’, although it offers no basis for that claim. The foreign diplomats interviewed in Delhi for the project considered this rate very conservative.

Using the 30% rate, diversion in the 1996–2006 period may have ranged between 78 tons in 1998 and almost 400 tons in 2000 at 90% solid (see Table 2). This would imply that in most recent years more illicit opium was produced in India than in all other illicit opium-producing countries, except Afghanistan and Burma. In the decade 1996–2005, the three other major illicit producers—Laos, Colombia or Mexico—produced on average 113, 75 and 57 tons, respectively [2], p. 57.

These analyses assume that the amount diverted is a fixed portion of what is actually sold to the government and, by implication, government requirements; if this were the case, then less licensing would lead to less diversion. However, there are plausible scenarios in which the assumption of fixed proportionality might fail; for example, when licensing declines, farmers who would not otherwise divert may not earn enough income through licit sales alone to meet basic household requirements. The data on ‘area not harvested’, serving as a proxy for diversion, suggest that fixed proportionality is unlikely and provide mixed evidence of an inverse relationship (see figures 7.2 and 7.3 in [4]). For example, from harvest-years 2000–01, government licensing declined by almost 25% and the area not harvested or ‘destroyed’ more than doubled; in contrast both licensed and unharvested hectares declined in 2005 and 2006.

In our analysis we posit a mix of diversion from official production and from officially unharvested hectares (see Table 3). Averaging the tonnage figures from the 30%

Table 3 Authors’ estimates of diversion in tons—1996–2006.

<i>Crop year</i>	<i>Diversion of 30% of production</i>	<i>Potential diversion from unharvested hectares</i>	<i>Mix of diversion from production and unharvested hectares (simple average)</i>
1996	251.4	142.6	197
1997	296.7	209.4	253
1998	78.3	530.7	304.4
1999	322.5	158.4	240.5
2000	397.8	131.5	264.7
2001	232.2	367.8	299.9
2002	246.3	195.8	221
2003	159.6	349.8	254.8
2004	253.5	116	184.8
2005	104.1	40.8	72.5
2006	99.6	13.1	56.4

'rule' (column 2) and from the unharvested hectares (column 3) year-by-year, we conclude that actual diversion may have ranged from about 200 to 300 tons yearly to 2004, but has probably declined since then (column 4).

If India's illicit opiate demand amounts to 78 tons of pure heroin equivalent or 780 tons of opium each year, our calculations imply that diversion from licit production accounts for a quarter to more than a third of that demand, at least to 2004. Given the NCB's seizure data, the source of the remaining two-thirds to three-quarters remains a puzzle. There are three possible explanations: the NCB seizure data understate imports from Afghanistan or Burma; many more heroin users use synthetic opiates routinely than acknowledged officially; we have underestimated diversion.

DISCUSSION

The previous analysis suggests that India is not only the world's largest consumer of illicit opiates but, *de facto*, also one of the largest illicit opium producers. In contrast to all other illicit producers, India owes the latter distinction not to blatantly illicit cultivation but to diversion from licit cultivation.

Since the late 1990s, the Indian government has been under increasing pressure by the INCB and the US government to monitor licit production and to fight diversion more effectively ([3], p. 244). As shown in the preceding pages, controls may have tightened since 2004.

Market forces also challenge increasingly India's opium production. In particular, US and other pharmaceutical companies have become interested in working with CPS, instead of raw opium, for ease of extracting the narcotic opiate alkaloids, primarily morphine, codeine and thebaine ([12], p. 275). Thus, the demand for Indian opium has declined ([1], p. 77). In response, the Indian government is exploring a partial shift to CPS, but it may face daunting financial, social and technological challenges ([12], p. 275). For example, the countries that currently produce CPS, namely France and Australia, may be reluctant to share their technology. Moreover, India may have little or no advantage in CPS production, which is relatively capital-intensive.

No matter how the international demand for India's opium evolves, there are voices even within India that question the economic and political sense of the Indian licit opium industry. The official justification for the industry is that it provides a livelihood for a significant number of farmers and their families; however, the low earnings of licit opium farmers suggests that one reason why the opium lobby promotes licit cultivation so forcefully is that it provides a cover for participation in the illicit market. Given the low earnings, some Indian

observers question the reasonableness of running expensive monitoring and enforcement regimes and protecting an industry, which not only helps to spread corruption but also enhances local opium and heroin consumption (e.g. [29]).

Declarations of Interest

None.

Acknowledgements

The larger project on the world heroin market was funded by the Netherlands Ministry of Justice and its Scientific Research and Documentation Centre (known as WODC from its Dutch acronym), the United Kingdom Foreign and Commonwealth Office, the Smith Richardson Foundation and the Max Planck Institute for Foreign and International Criminal Law. The views expressed in this article are entirely our own.

References

1. International Narcotics Control Board. *Narcotic Drugs: Estimated World Requirements for 2008—Statistics for 2006*. New York: United Nations; 2008.
2. United Nations Office on Drugs and Crime (UNODC). *World Drug Report*. Vienna: UNODC; 2006.
3. US Department of State, Bureau for International Narcotics and Law Enforcement Affairs. *International Narcotics Control Strategy Report 2007*. Washington, DC: US Department of State; 2007.
4. Paoli L., Greenfield V., Reuter P. *The World Heroin Market: Can Supply Be Cut?* New York: Oxford University Press; 2009.
5. Charles M., Nair K. S., Britto G. *Drug Culture in India. A Street Ethnographic Study of Heroin Addiction in Bombay*. New Delhi: Rawat; 1999.
6. Charles M., Nair K. S., Das A. A., Britto G. Bombay underworld: a descriptive account and its role in the drug trade. In: Geffray C., Fabre E., Schiray M., editors. *Globalisation, Drugs and Criminalisation: Final Research Report on Brazil, China, India and Mexico*. Paris: United Nations Educational Scientific and Cultural Organization (UNESCO); 2002. p. 7–50.
7. United Nations Office on Drugs and Crime (UNODC) and Ministry of Social Justice and Empowerment, Government of India. *The Extent, Pattern and Trends of Drug Abuse in India. National Survey*. New Delhi: Ministry of Social Justice and Empowerment, Government of India and UNODC Regional Office for South Asia; 2004.
8. Reuter P. Drug use measures: what are they really telling us. *Natl Inst Justice J* 1999; April: 12–19.
9. United Nations International Drug Control Program (UNDCP) Regional Office for South Asia. *South Asia Drug Demand Reduction Report*. New Delhi: UNDCP Regional Office for South Asia, 1998.
10. Dorabjee J., Samson L. A multicentre rapid assessment of injecting drug use in India. *Int J Drug Policy* 2000; 11: 99–112.
11. Kumar M. S., Mudaliar S., Thyagarajan S. P., Kumar S., Selvanayagam A., Daniels D. Rapid assessment and

- response to injecting drug use in Madras, South India. *Int J Drug Policy* 2000; 11: 83–98.
12. US Department of State, Bureau for International Narcotics and Law Enforcement Affairs. *International Narcotics Control Strategy Report 2005*. Washington, DC: U.S. Department of State; 2005.
 13. Charles M. *Drug Trade Dynamics in India*. Report submitted for the project 'Modeling the World Heroin Market: Assessing the Consequences of Changes in Afghanistan Production'; 2004. Mimeo. Available at: <http://laniel.free.fr/INDEXES/PapersIndex/INDIAMOLLY/DRUGSDYNAMICSININDIA.htm> (accessed 12 June 2006)
 14. Narcotics Control Bureau. *India. Annual Report 2001–2002*. Delhi: Narcotics Control Bureau; 2002.
 15. Narcotics Control Bureau. *Narcotics Annual Report 2002*. Delhi: Narcotics Control Bureau; 2003.
 16. Narcotics Control Bureau. *Narcotics Annual Report 2003*. Delhi: Narcotics Control Bureau; 2004.
 17. Nepram B. *South Asia's Fractured Frontier: Armed Conflict, Narcotics and Small Arms Proliferation in India's North East*. New Delhi: Mittal; 2002.
 18. Charles M. The drug scene in India. *Seminar* 2001; August: 17–22.
 19. Central Bureau of Narcotics. *Licit Cultivation, 2007*. Available at: <http://cbn.nic.in/html/operationscbn.htm> (accessed 30 June 2007).
 20. US Department of State, Bureau for International Narcotics and Law Enforcement Affairs. *International Narcotics Control Strategy Report 2003*. Washington, DC: US Department of State; 2004.
 21. Mansfield D. *An Analysis of Licit Opium Poppy Cultivation: India and Turkey*. 2001. Available at: http://www.davidmansfield.org/policy_advice.php (accessed 31 January 2008).
 22. De Wilde R. *Research Summary: The Formal and Informal Institutions of Legal Opium Production: Narcotics Law, Caste and Credit in Southern Rajasthan*. Mimeo; 2003 (quoted in [4], p. 152).
 23. Sharma N. D. Opium factor in Mandasaur. *The Tribunal*; 1999; 9 September.
 24. Tiwari D. Opium woman: Femida Berhamuddin controls her uncle's smuggling operations. *The Week*; 2000; 17 September.
 25. US Department of State, Bureau for International Narcotics and Law Enforcement Affairs. *International Narcotics Control Strategy Report 1998*. Washington, DC: US Department of State; 1999.
 26. Bhattacharaji R. *Case study: India's experiences in licensing poppy cultivation for the production of essential medicines. Lessons for Afghanistan*. London: Senlis Council; 2007. Available at: http://www.senliscouncil.net/documents/india_case_study (accessed 12 December 2007).
 27. Chouvy P.-A. *Le défi afghan de l'Opium* [The Afghan Defeat of Opium]. Paris: Etudes; 2006.
 28. International Narcotics Control Board. *Narcotic Drugs: Estimated World Requirements for 2005—Statistics for 2003*. New York: United Nations; 2005.
 29. Samanta P. D. Drugs on our doorstep. *The Hindu*, 2002; 7 April.