UNITED NATIONS
Office on Drugs and Crime

Central Committee for Drug Abuse Control

Lao National Commission for Drug Control and Supervision

Office of the Narcotics Control Board

Opium Poppy Cultivation in South East Asia

Lao PDR, Myanmar, Thailand

data collection

data transfer

data transfer

December 2008

UNODC's Illicit Crop Monitoring Programme (ICMP) promotes the development and maintenance of a global network of illicit crop monitoring systems in the context of the illicit crop elimination objective set by the United Nations General Assembly Special Session on Drugs. ICMP provides overall coordination as well as direct technical support and supervision to UNODC supported illicit crop surveys at the country level.

The implementation of UNODC's Illicit Crop Monitoring Programme in South East Asia was made possible thanks to financial contributions from the Government of Japan and from the United States.

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http://www.unodc.org/unodc/en/crop-monitoring/index.html

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PREFACE

This year's *South East Asia Opium Survey* shows that the region, once notorious as heroin's Golden Triangle, has a limited opium problem that is concentrated in one region of Myanmar. The region accounts for 424 tons of opium (down from 472 tons a year earlier) for around 5% of the world's total illicit opium output, down from 33% in 1998 and more than 50% in 1990.

Thailand and the Lao PDR are almost opium free. Myanmar remains the world's second biggest source of opium, accounting for 28,500 hectares in 2008 (a 3% rise over last year). Cultivation is mostly limited to the Shan State which accounts for 89% of the national total.

To put this into perspective, compare with Afghanistan. In 1996 there were 163,000 hectares of opium in Myanmar, about the same amount grown in Afghanistan this year (157,000 ha). The yield in Myanmar is four times lower than in Afghanistan: 14.4 kg/ha as opposed to 45-50kg/ha. Because of scarcity, prices are much higher than in Afghanistan, and there is major price divergence within South East Asia. This suggests that the market is fractured, and mostly catering to local or regional demand.

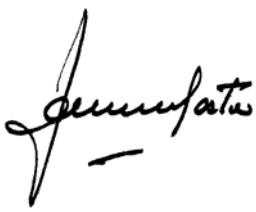
While opium's impact on Myanmar is waning, for a poor country, opium production of 410 tons in 2008, resulting in a potential value of $123 million (at the farm gate) is a significant cash crop, and one that involves 840,000 people. Further progress is needed if the government is going to reach its target (set in 1999) of making Myanmar opium-free by 2014.

At least there were significant increases in eradication in 2008. Indeed, at 4,820 hectares, Myanmar eradicated almost as much opium as Afghanistan (5,480 ha) even though Afghanistan had five times more land under opium cultivation.

Eradication of poverty is a greater challenge. Many of the opium farmers in South East Asia are extremely poor. Rising opium prices may make it more attractive for farmers to revert back to opium cultivation, especially if no alternative sources of income are available. Further development assistance is therefore needed, not least in Laos that has made significant progress in reducing opium cultivation over the past five years.

Drug use remains a problem in the region, particularly in opium growing communities. A new book of photographs on the Golden Triangle by former UNODC Goodwill Ambassador Alessandro Scotti shows the human tragedy of addiction.

Despite the diminishing prevalence of opium in South East Asia, the region still has a drug problem. As revealed in UNODC's 2008 *Global Assessment of amphetamines (ATS) and ecstasy*, the Greater Mekong sub-region has become a major hub for the production and trafficking of synthetic drugs. Urgent steps are therefore needed to consolidate progress towards making the Golden Triangle opium free, and to head off a major ATS crisis.



Antonio Maria Costa
Executive Director
UNODC

PART 1. REGIONAL OVERVIEW

FACT SHEET - SOUTH EAST ASIA OPIUM SURVEYS 2008

		2007	2008	Variation
Opium poppy cultivation[1]		**29,431 ha**	**30,388 ha**	**+3.3%**
Of which	Lao PDR	*1,500 ha*	*1,600 ha*	*+7%*
	Thailand[2]	*231 ha*	*288 ha*	*+24.6%*
	Myanmar	*27,700 ha*	*28,500 ha*	*+3%*
Weighted average dry opium yield				
	Lao PDR	*6 kg/ha*	*6 kg/ha*	*0%*
	Thailand	*15.6 kg/ha*	*15.6 kg/ha*	*0%*
	Myanmar	*16.6 kg/ha*	*14.4 kg/ha*	*-12.7%*
Potential production of dry opium[1]		**472 mt**	**424 mt**	**-10%**
Of which	Lao PDR	*9.2 mt*	*9.6 mt*	*+7%*
	Thailand	*3.6 mt*	*4.5 mt*	*+24.7%*
	Myanmar	*460 mt*	*410 mt*	*-10.9%*
Opium poppy eradication		**4,647 ha**	**5,679.5 ha**	**+22.2%**
Of which	Lao PDR	*779 ha*	*575 ha*	*-26%*
	Thailand	*220 ha*	*284.5 ha*	*+29.5%*
	Myanmar	*3,598 ha*	*4,820 ha*	*+34%*
Average price of dry opium				
	Lao PDR	*US$ 974 /kg*	*US$ 1,227 /kg*	*+26%*
	Thailand[3]	*US$ 1,071 /kg*	*US$ 1,250 /kg*	*+17%*
	Myanmar	*US$ 261 /kg*	*US$ 301 /kg*	*+15.3%*
Total potential value of opium production		**US$ 132.5 million**	**US$ 140.4 million**	*+6%*
Of which	Lao PDR	*US$ 8.9 million*	*US$ 11.8 million*	*+32.6%*
	Thailand	*US$ 3.6 million*	*US$ 5.6 million*	*+55.6%*
	Myanmar	*US$ 120 million*	*US$ 123 million*	*+2.4%*
Households involved in opium poppy cultivation				
Of which Lao PDR		*n/a*	*n/a*	*n/a*
	Thailand	*1,600*	*1,800*	*+12.5%*
	Myanmar	*163,000*	*168,000*	*+3%*
Yearly income of opium poppy growing				
households	Lao PDR	*n/a*	*n/a*	*n/a*
	Thailand	*n/a*	*n/a*	*n/a*
	Myanmar	*US$ 501*	*US$ 687*	*+37%*
Of which from opium sale				
	Lao PDR	*n/a*	*n/a*	*n/a*
	Thailand	*n/a*	*n/a*	*n/a*
	Myanmar	*US$ 227*	*US$ 253*	*+11%*
Addiction rate in opium poppy growing regions				
	Lao PDR	*0.58%*	*0.19%*	*-67%*
	Thailand	*n/a*	*n/a*	*n/a*
	Myanmar[4]	*0.75%*	*1.1%*	*n/a*

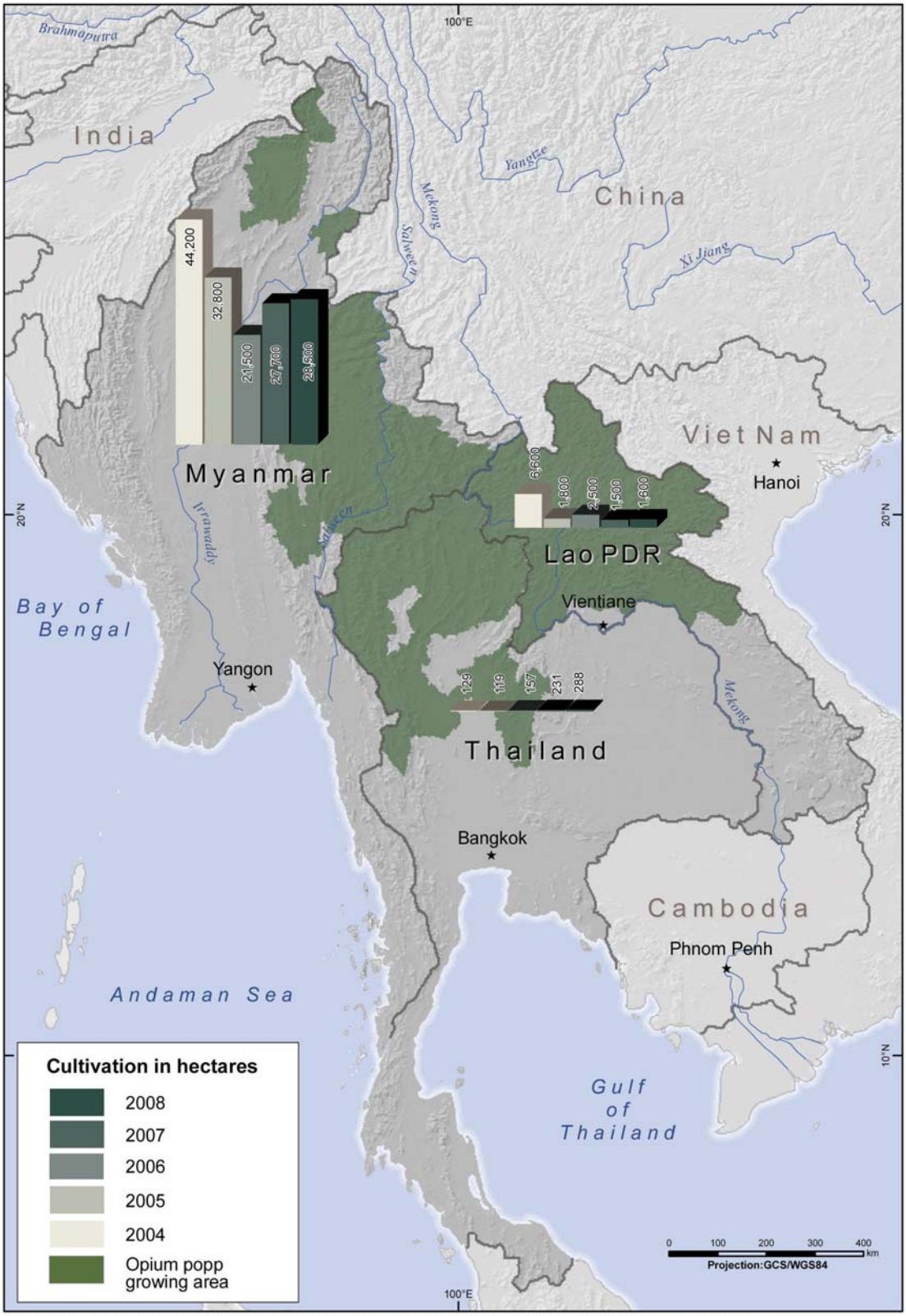
[1] These figures differ slightly from those published in the World Drug Report 2008, which subsumes Thailand under the category of "other countries".

[2] Source: Government of Thailand.

[3] Increase due to change of currency exchange rate. In the local currency Thai Baht, prices did not change significantly.

[4] Surveyed areas of 2007 and 2008 are not comparable.

Map 1: Opium poppy cultivation in South East Asia (hectares), 2004 – 2008



Sources:Governments of Lao PDR, Myanmar and Thailand, national monitoring systems supported by UNODC in Lao PDR and Myanmar
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

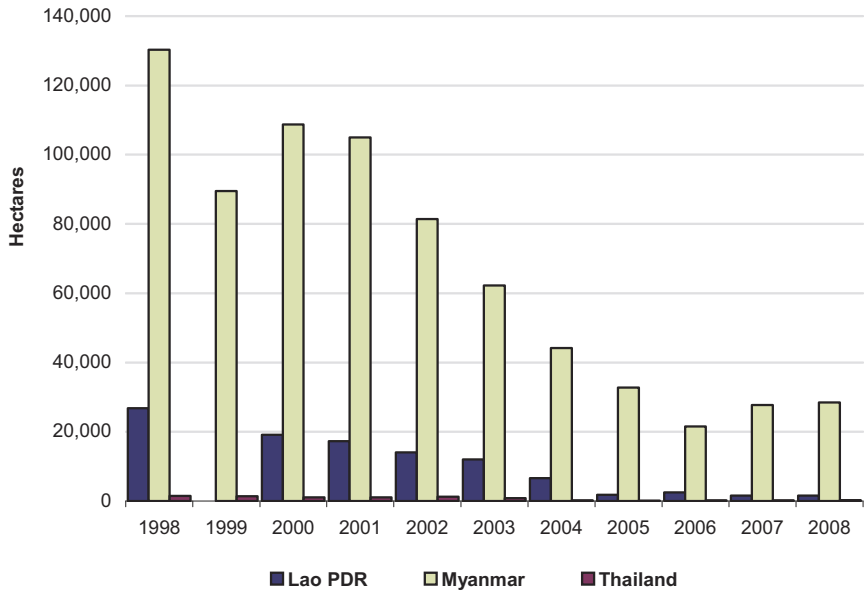
REGIONAL OVERVIEW

In order to assess the scope of opium poppy cultivation and opium production, UNODC has been carrying out opium surveys in cooperation with the respective Governments, in Lao PDR since 1992 and in Myanmar since 2002, whereas Thailand has established its own monitoring system. This report contains the results of the UNODC supported opium poppy cultivation surveys in Lao PDR and Myanmar as well as results from the opium poppy surveys implemented by the Thai Office of the Narcotics Control Board.

Opium poppy cultivation in South East Asia

The major part of opium poppy cultivation in South East Asia is in Lao PDR, Myanmar and Thailand. Eradication figures reported by the Government of Vietnam indicate that only a negligible amount of opium poppy is cultivated there. In the last ten years the cultivation of opium in these three countries decreased from a total estimated 157,900 hectares[5] cultivated in 1998 to only 30,400 hectares in 2008. This correspond to an overall reduction by 81% in 11 years. If this decrease can be sustained in the future, it will be a remarkable and so far unmatched success in the reduction of illicit crops and an important step towards the goal of eliminating the cultivation of illicit crops worldwide.

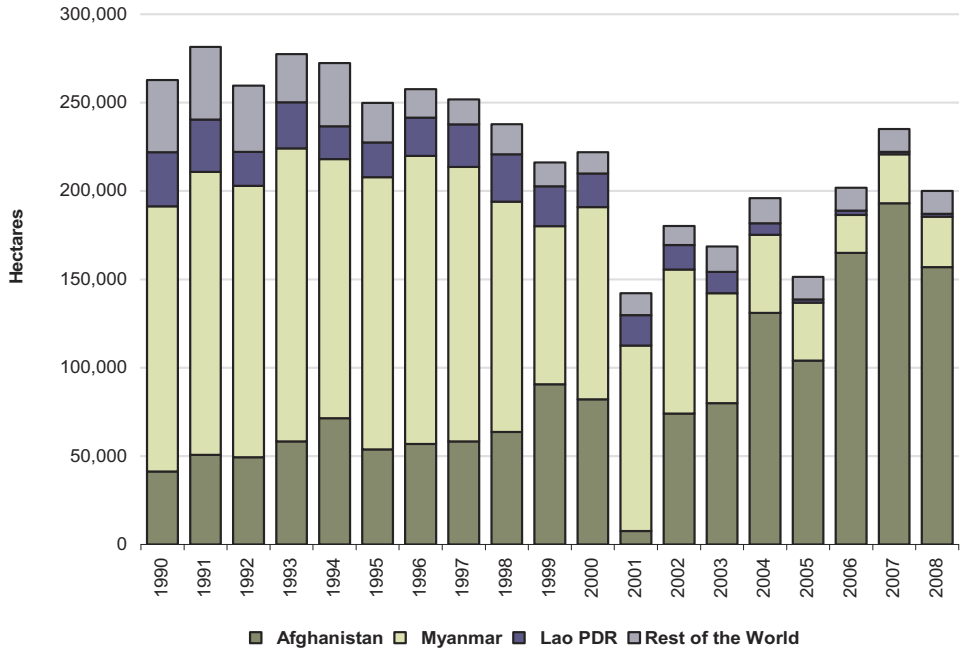
Figure 1: Opium poppy cultivation in South East Asia (hectares), 1998 - 2008



Myanmar, the largest opium cultivator in the region, has seen major decreases over the years from 130,300 ha in 1998 to only 21,500 ha in 2006 (minus 83% from 1998-2006). The downward trend was consistent form 2000 to 2006, but was followed by an upward trend in 2007 and a *de-facto* stabilization in 2008. Cultivation increased by (statistically not significant) 3% to 28,500 ha in 2008. In the Lao PDR, the area under opium poppy decreased from 26,800 ha in 1998 to only 1,600 ha in 2008. This is a reduction of 94% between 1998 and 2008, the largest proportional reduction among the three countries. The figures reported by the Thai Government indicated a reduction of its opium poppy cultivation area from 1,486 ha in 1998 to 288 ha in 2008 (81%). The Lao PDR and Thailand have both reached such low levels of opium poppy cultivation that they do no longer produce opium for the international market.

[5] Source: World Drug Report 2008.

Figure 2: Global opium poppy cultivation (hectares), 1990 - 2008*



** Data for 2008 for Rest of the World are based on preliminary estimates.*

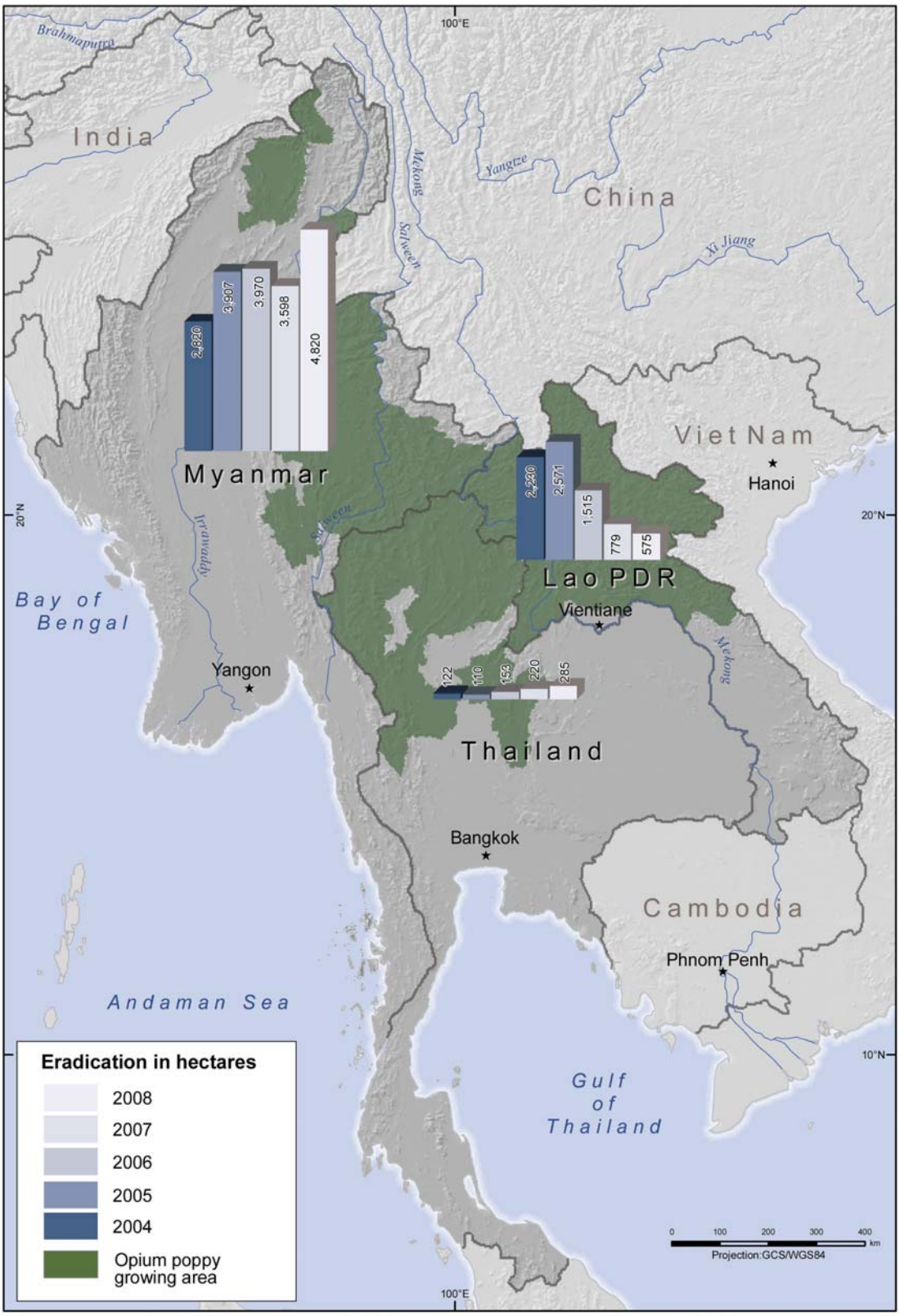
Despite the strong declines over the last decade, Myanmar is still the second largest opium poppy grower in the world after Afghanistan. According to preliminary estimates, Myanmar contributes in 2008 to around 14% of the world opium cultivation; this is a similar share as in 2007 (12%). The Lao PDR continues accounting for less than 1% in 2008. Since 2003, South East Asia has clearly ceased to be the largest opium poppy cultivating region. Its share of the world opium cultivation fell from 66% in 1998 to around 15% in 2008.

Opium poppy farmers in the Lao PDR, Myanmar and Thailand are ethnically diverse and live in remote, mountainous regions. In these upland areas, difficult agricultural and geographic conditions contribute to high levels of poverty. Opium poppy is currently cultivated in Kachin, Kayah and Shan States in Myanmar, in the five northern-most provinces of Lao PDR and in the 10 northern provinces of Thailand. Those regions have produced most of Southeast Asia's opium over the last fifty years or more. Motivated by a desire of modernization and poverty alleviation, the Governments of Lao PDR, Myanmar and Thailand made the commitment to end opium cultivation in these areas by the year 2000 for Thailand, by 2006 for Lao PDR and by 2014 for Myanmar. So far, Lao PDR and Thailand are on the verge of complying with this commitment. The situation in Myanmar has improved compared to a decade ago but deteriorated if compared to 2006. It still needs to be closely monitored.

Eradication

Official reports from the Governments of Lao PDR, Myanmar and Thailand indicate that a total of 5,680 hectares of opium poppy were eradicated in 2008. The represents an increase of 22% compared to 2007, when 4,647 were eradicated in the region. A total of 575 ha were eradicated in Lao PDDR (36% of cultivated opium poppy), 4,820 ha in Myanmar and 285 ha in Thailand.

Map 2: Opium poppy eradication in South East Asia (hectares), 2004 - 2008



Sources: Governments of Lao PDR, Myanmar and Thailand, national monitoring systems supported by UNODC in Lao PDR and Myanmar
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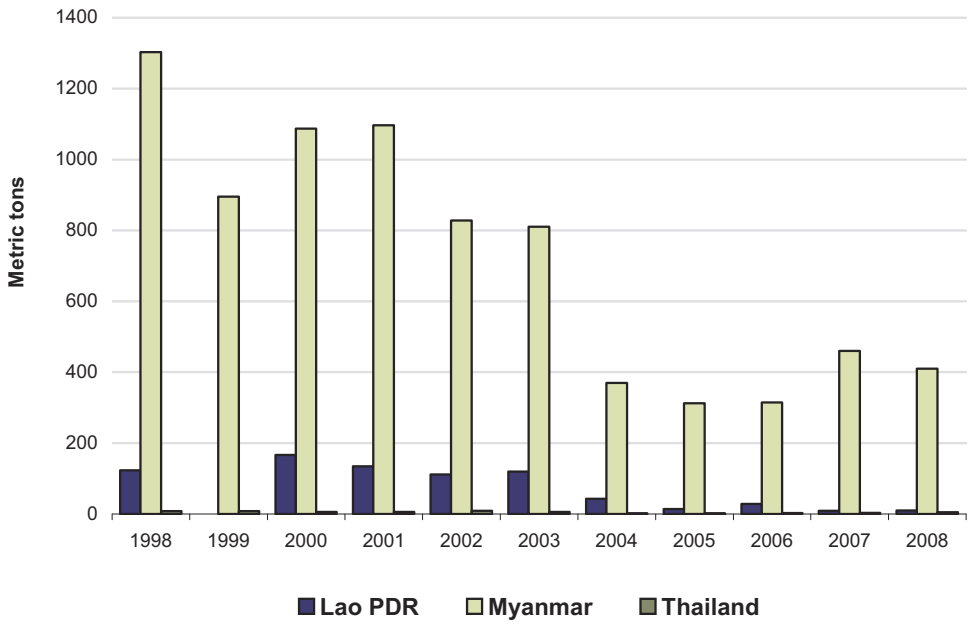
Opium yield and production

Opium poppy in South East Asia is mostly cultivated on steep hills with poor soil and no irrigation facilities. Opium yields are much lower than in Afghanistan where the crop is often cultivated on good soil and irrigated land. In 2008, opium yields were estimated at 6 kg/ha in Laos, 14.4 kg/ha in Myanmar and 15.6 kg/ha in Thailand.

The total potential opium production in South East Asia has decreased from an estimated 1,435 mt in 1998[6] to 328 mt in 2005 (-77%), but has seen again an increase to 424 mt in 2008 (+29% over the 2005-2008 period). In spite of this increase, opium production still fell by 70% compared to 1998, the year of UNGASS[7], and by 10% from 2007. The South East Asia region, known as the Golden Triangle, which was producing 33% of the world opium production in 1998, now produces only about 5%. While the huge decline over the last decade was primarily due reductions in the land dedicated for opium poppy cultivation, the decline in 2008 reflected primarily lower yields. The overall success of the countries of South-East Asia in reducing illegal opium production remains, nonetheless, impressive. The South East Asia region, also known as the Golden Triangle, used to produce more than have of all opium in 1990 and still some 33% of the world opium production in 1998. This share has fallen to about 5% in 2008.

Figure 3: Opium production in South East Asia (metric tons), 1998 - 2008

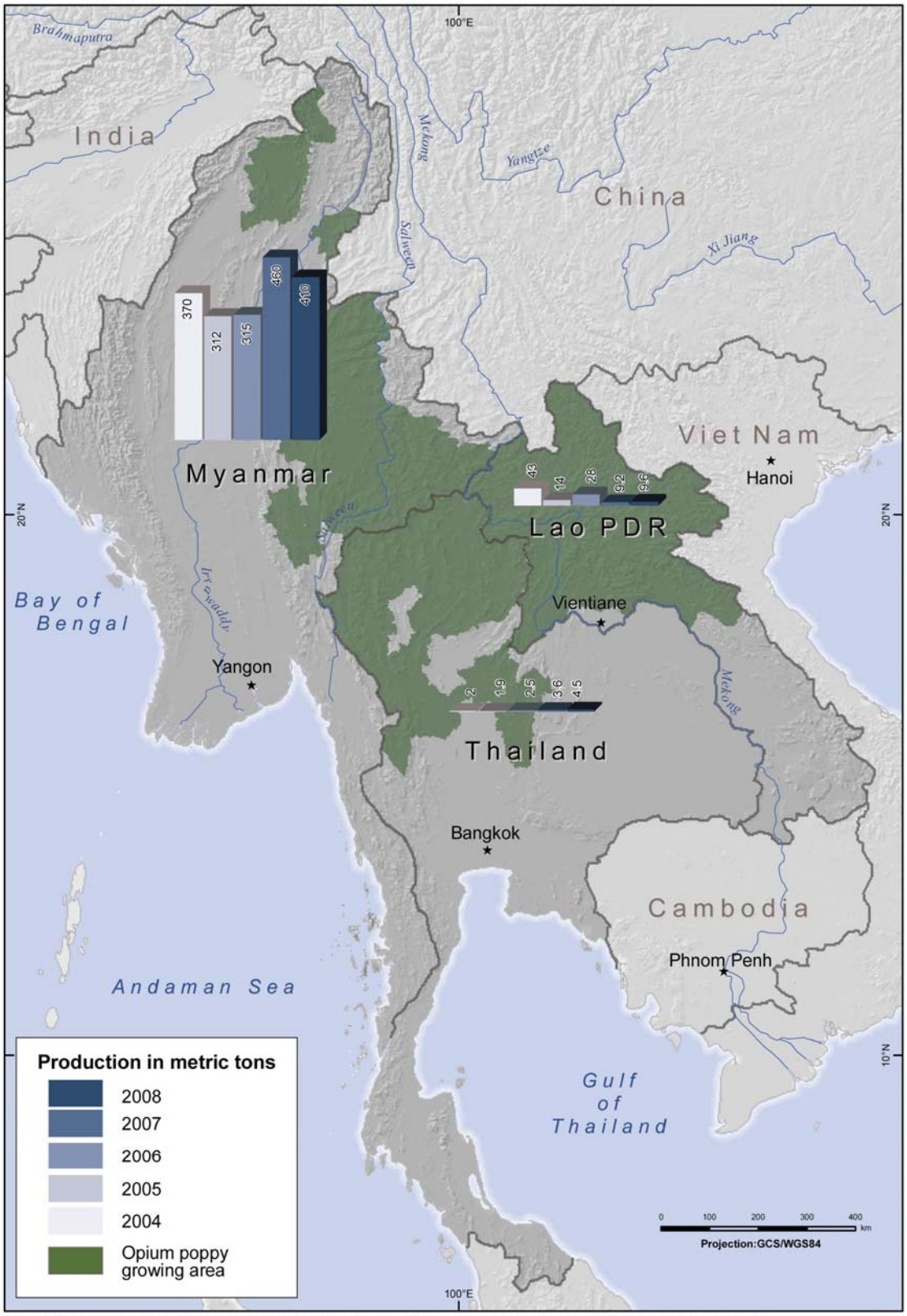


Myanmar played a significant role in this regard. Myanmar is still the second largest opium producer worldwide. However, its share of the world opium production fell from 30% in 1998 to only 5% in 2008.

[6] Source: World Drug Report 2008.

[7] Source: UNGASS refers to the United Nations General Assembly Special Session devoted to countering the World Drug Problem.

Map 3: Opium production in South East Asia (metric tons), 2004 - 2008



Sources: Governments of Lao PDR, Myanmar and Thailand, national monitoring systems supported by UNODC in Lao PDR and Myanmar
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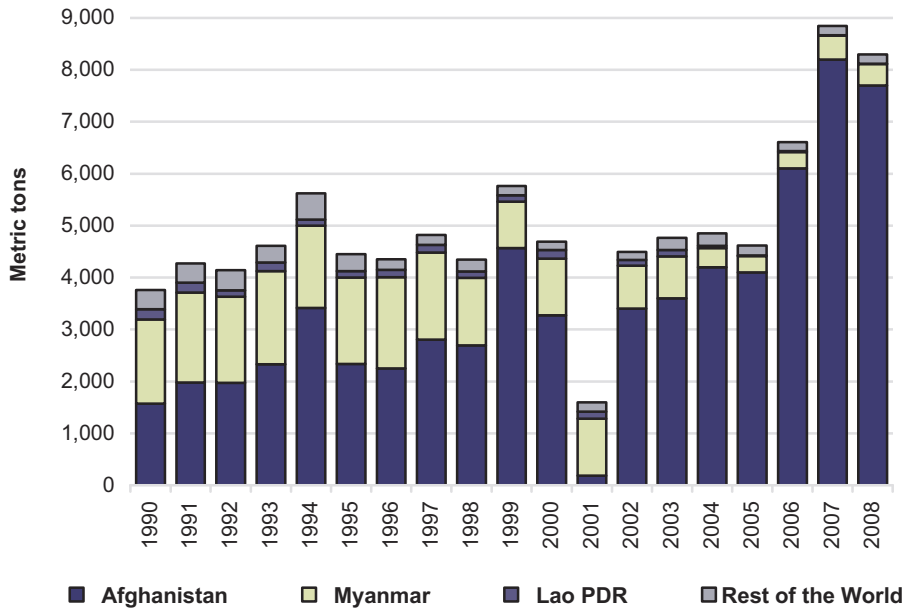
Figure 4: Global opium production (metric tons), 1990 - 2008*



** Data for 2007 for Rest of the World are based on preliminary estimates.*

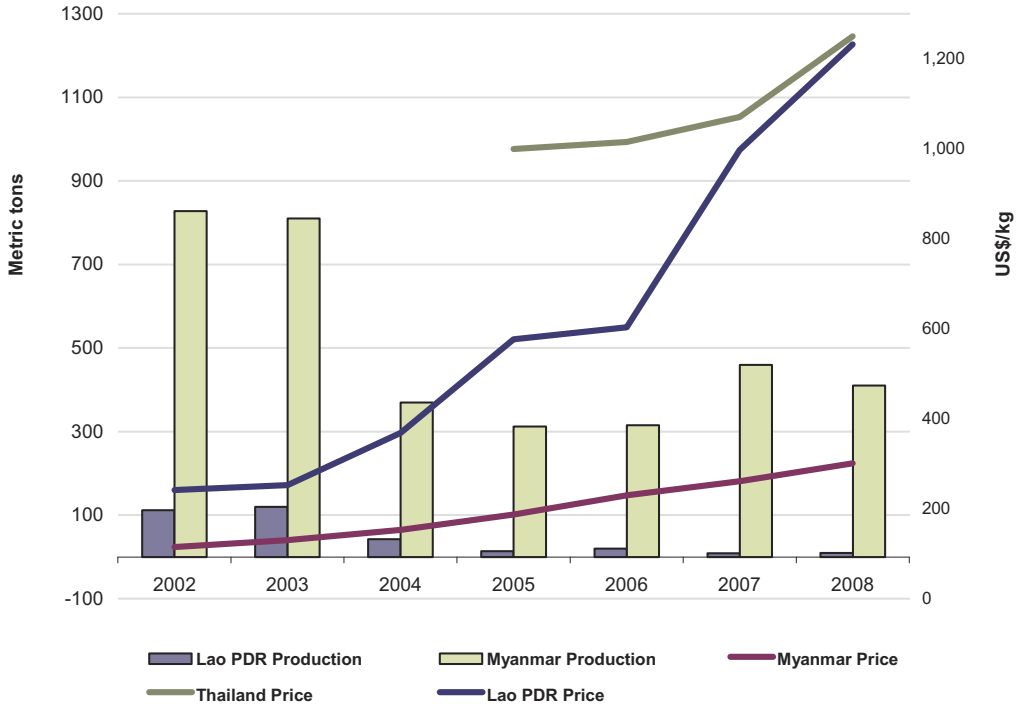
Opium prices

The tracking of the opium trade and related transactions in the Lao PDR, Myanmar and Thailand is not easy. This makes it difficult to determine the price level in a continuum. Nevertheless, there is sufficient evidence to suggest that opium prices in South East Asia have increased strongly over the past few years, reflecting the production declines in the region and ongoing demand for opiates in China, other countries in the region and in some overseas markets (e.g. Australia). The upward trend of opium prices in South-East Asia is in sharp contrast to the falling opium prices in Afghanistan, the world's largest opium producing country, suggesting that the markets of South-East Asia and South-West Asia may not be - as yet - closely linked.

Irrespective of the overall upward trend of opium prices in South-East Asia, there are still pronounced price differences between countries as well as between regions within these countries. In 2008, the average price of dry opium was highest in Thailand and Lao PDR with prices of US$ 1,250/kg and US$ 1,227/kg, respectively, and, similar to the situation in the last few years, lowest in the largest opium producing country of the region, Myanmar (US$ 301/kg at the farm-gate). But even the 'low' opium prices of Myanmar are still substantially higher than the opium prices reported from Afghanistan (US$ 95/kg in 2008), the world's largest opium producing country.

The steep upsurge of prices in the Lao PDR is clearly linked to the scarcity of opium in the country. In some regions, opium cultivation has been completely eliminated or is very scarce, even though the local demand is still rather high. In Myanmar, by far the largest producer in the region, prices rose much slower, from US$ 261/kg in 2007 to US$ 301/kg in 2008. Prices in Thailand also increased and thus remained at over US$ 1000/kg for the fourth year in a row.

Figure 5: Opium production and prices in producing areas in Lao PDR, Myanmar, and Thailand, 2002 - 2008

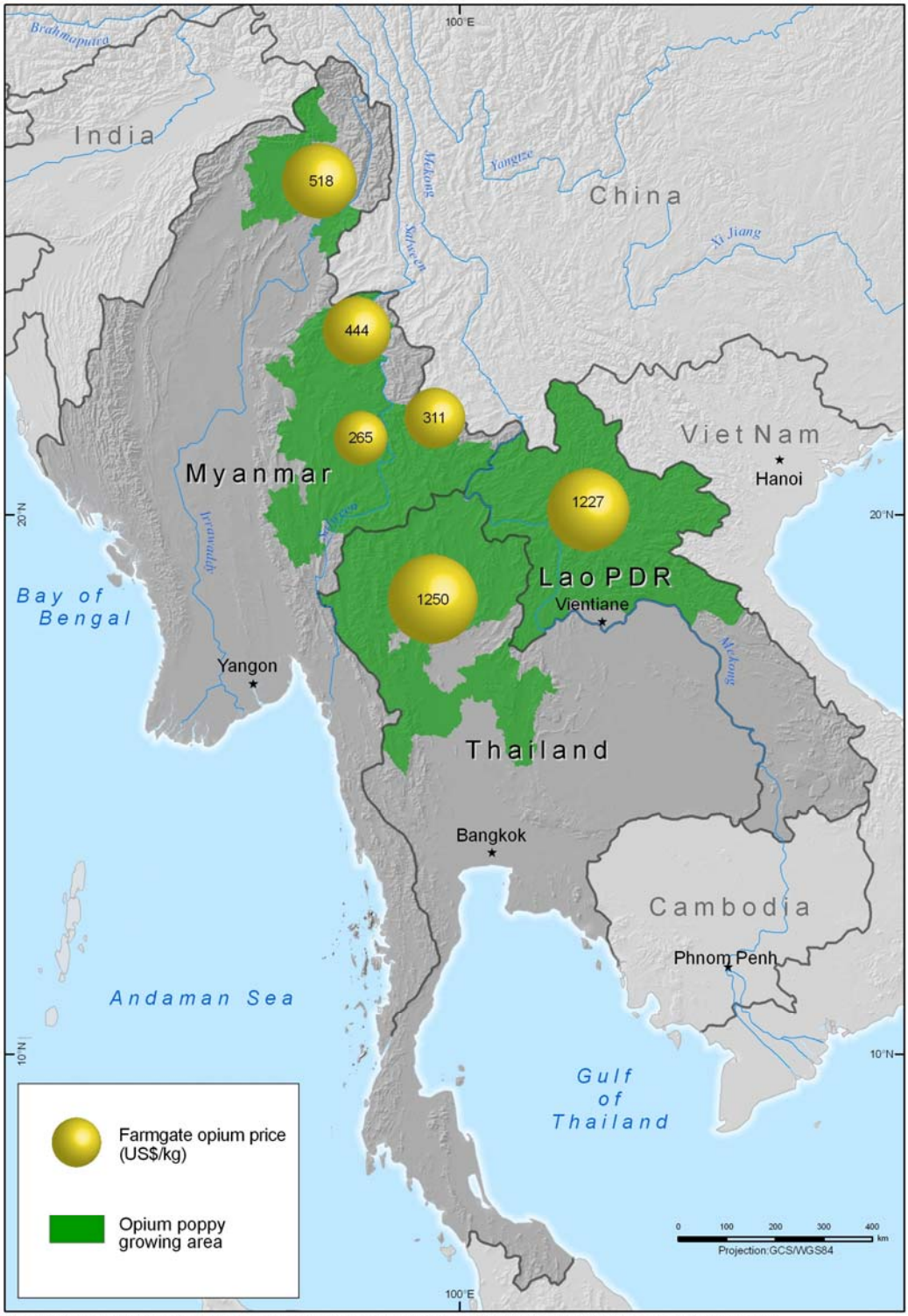


Household income from opium

The contribution of opium sales to the household income of farmers cultivating opium poppy varies considerably. In Myanmar, opium sales constitute among poppy farmers in the opium producing regions around 37% of their annual household cash income. The money is mainly used to cover food shortages. In comparison, in the Lao PDR and in Thailand income from opium represents, on average, only 10% of total cash income among opium poppy farmers.

Since a large proportion of the household cash income is generated by opium, farmers in the opium producing regions of Myanmar are vulnerable to opium price fluctuations and decreases in production, whether caused by drought, disease or law enforcement. While declines in opium production are generally welcome, it must be noted that such changes can have a serious and immediate impact on household food security, requiring assistance for the farmers concerned. For instance, in the Special Region 2 (Wa) where local authorities enforced an opium ban in 2005, farmers have lost up to 70% of their cash income. In the Lao PDR, where opium cultivation was at lower level and elimination has been more gradual, farmers are better off in terms of food security. In Thailand, opium elimination has taken place over more than 30 years with sufficient alternative livelihood provided to farmers who lost their opium income.

Map 4: Prices of dry opium in South East Asia (US$/kg), 2008



Sources: Governments of Lao PDR, Myanmar and Thailand, national monitoring systems supported by UNODC in Lao PDR and Myanmar
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Opium abuse

In South East Asia opium addiction is mostly found in places where opium poppy is also cultivated. The rising cost of opium has encouraged, or forced, many users to try to stop smoking opium, either by self-treatment or through treatment programmes. The prevalence rate of opium smoking in the Lao PDR was reported to have declined from 0.6% in 2007 to 0.2% of the population age 15-64 in 2008. Almost all of the addicts come from the northern belt. In Myanmar, opium addiction remains high at 1.1% of the population age 15 and above in the areas investigated (mostly Shan State), which is almost three times the global average of opiate abuse (0.4%). In contrast to the Lao PDR, the use of opium appears to have increased again in Myanmar in 2008 on a year earlier, to levels reported in previous surveys, suggesting that relapse rates may be rather high.

The impact of opium poppy elimination on rural livelihoods

Rural households that abandoned opium poppy cultivation have reported both positive and negative changes as a result. Positive impacts include the rehabilitation of addicts, lightening of women's workload, and the opportunity to diversify out of an unreliable and illicit cash crop. Negative impacts include shortage of food and cash, increased debt and higher levels of stress.

A number of studies conducted over the years in Thailand and other countries showed that farming communities benefited from giving up opium poppy cultivation, as this enabled them to better participate in the overall economic development of the country and facilitated private sector investment. This was also due to generous alternative development projects implemented in areas that had been previously used to cultivate opium poppy.

The situation is, however, still different in Myanmar due to a lack of large-scale alternative development activities, supported by the local authorities, bilateral donors and the international community.

A vulnerability analysis of farmers in areas where opium has been banned showed a limited impact on living conditions for non opium poppy farmers. The same cannot be said for ex-opium farmers. Their situation has worsened due to their loss of income. Within these two groupings there were still farmers who have coped more successfully than others in dealing with the changes caused by the ban. In terms of coping strategies, some ex-opium poppy farmers have developed alternative means of income by working as casual labourers, selling livestock, collecting non-timber forest products and diversifying their agricultural activities such as starting rubber tree and tea cultivation. However, not all of these strategies are economically and environmentally sustainable. As a result, farmers in difficulty have been forced to borrow money or reduce their expenditures by limiting their household's access to food, health facilities, education and primary needs. This has contributed to a deterioration of their living conditions, their debt has increased and there is little opportunity for them to improve this situation without any external capital.

For non-opium poppy farmers, who were already engaged in non-opium income generation activities and who possessed some material assets such as livestock, land, etc. and thus had a reasonably good level of food security, the opium ban has had little effect on their situation. But there exists a group of non-opium poppy farmers who are in a very vulnerable situation due to now clearly insufficient levels of income. Their situation has also worsened after the ban due to a lack of casual labour opportunities in the opium poppy fields as the cultivation of other crops tends to be less labour intensive and less lucrative to afford external labour. The needs of such vulnerable farmers are far greater than the level of assistance provided thus far. Therefore, emergency aid and sustainable development programs are urgently needed to support such farmers to develop alternative livelihoods. This would also prevent out-migration of the people and the resumption of opium poppy cultivation in new locations, as has already been observed in some parts of Myanmar.

PART 2. LAOS

ABBREVIATIONS

DCDC	District Committee for Drug Control
GoL	Government of Lao PDR
ICMP	Illicit Crop Monitoring Programme
LCDC	Lao National Commission for Drug Control and Supervision
MDG	Millennium Development Goals
PCDC	Provincial Committee for Drug Control
PFU	Programme Facilitation Unit
PPP	Purchasing Power Parity
SASS	Statistics and Surveys Section (UNODC)
UNODC	United Nation Office on Drug and Crime

ACKNOWLEDGEMENTS

Government of the Lao PDR

LCDC

Kou Chansina	National Programme Director of PFU, Acting Deputy Chairman of LCDC

UNODC Lao PDR

Leik Boonwaat	Resident Representative in Lao PDR
Oudone Sisongkham	Senior Programme Officer, PFU
Seungdeuane Phomavongsa	Programme Officer, (Country Office Lao PDR)
David Dunn	Senior pilot, Lao West Coast Helicopter Company

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PREFACE

The area under opium poppy cultivation remains stable at 1,600 hectares with a reported 575 hectares eradicated in 2008. However elimination of opium poppy remains very fragile. The Government's Programme Strategy to sustain opium elimination in the Post Opium Scenario (2006-2009) has seen three new alternative development projects begin implementation in Oudomxay in partnership with UNIDO, in Houaphan province implemented in parallel with an ADB poverty reduction project and in Phongsaly.

The present socio-economic survey carried out in conjunction with the opium survey for 2008 identifies six additional districts and 500 villages that would need priority alternative sustainable livelihoods development assistance in the immediate future to ensure communities do not revert back to opium poppy cultivation. Of concern is the increased relapse of treated opium addicts in areas where opium remains available.

The Lao PDR is located at the hub of the Greater Mekong Sub Region (GMSR). It is the only country that shares borders with all five countries of the GMSR. Over 5000 kilometres of porous borders makes it vulnerable to transnational threats to human security and development.

The Government of the Lao PDR with support from UNODC is developing a new comprehensive National Drug Control Master-plan. The National Drug Control Master-plan will not only address the need to sustain opium elimination by providing assistance to former opium poppy cultivating communities. It will also address the recent proliferation of illicit drug trafficking and abuse, as well as related criminal activity in the Lao PDR. The Master plan responds to the heightened risks this activity poses to the country's social order and national stability through a comprehensive nine point strategy. This new Master-plan will also facilitate implementation of the new National Drug Law that was passed by the National Assembly in December 2007. The successful implementation of this new drug control master-plan is seen as crucial to the country achieving its socio economic development goals as well as aim to graduate from the status of least development country by 2020.

Leik Boonwaat

Representative

UNODC Lao PDR

FACT SHEET - LAO PDR OPIUM SURVEY 2008

	2006	2007	2008	Variation from 2007
Opium poppy cultivation	2,500 ha	1,500 ha	1,600 ha	+7%
Average dry opium yield	8 kg/ha	6 kg/ha	6 kg/ha [1]	-
Potential production of dry opium	20 mt	9.0 mt	9.6 mt	+7%
No. of households growing opium poppy	5,800	n/a	n/a	
Average retail/wholesale price of opium [2]	US$ 550/kg	US$ 974/kg	US$1,227/kg	+26%
Eradication [3]	1,518 ha	779 ha	575 ha	-26%
Number of new opium addicts	11,200	7,700	4,906 [4]	-36%
Average drug prevalence rate (based on 8 northern provinces in 2006 and 7 in 2006 and 2008)	0.58%	0.30%	0.19%	

[1] In the absence of a yield survey in 2008, it was used the yield per hectare for 2007.

[2] Source LCDC, Provincial authorities survey. Due to the limited market for opium, a clear distinction between farm gate, wholesale and retail prices could not be established.

[3] Source: LCDC. The 2006 and 2007 eradication campaigns were conducted before and after the survey. In 2008, eradication was mainly conducted during and after the survey.

[4] The number does not take into account the possible relapse of recently treated addicts. There were 7,774 addicts, who ha been treated since 2003, who relapsed. The total number (cumulative – since 2003) of current addicts in 2008 amounts to 12,680. The relapse rate is 34%

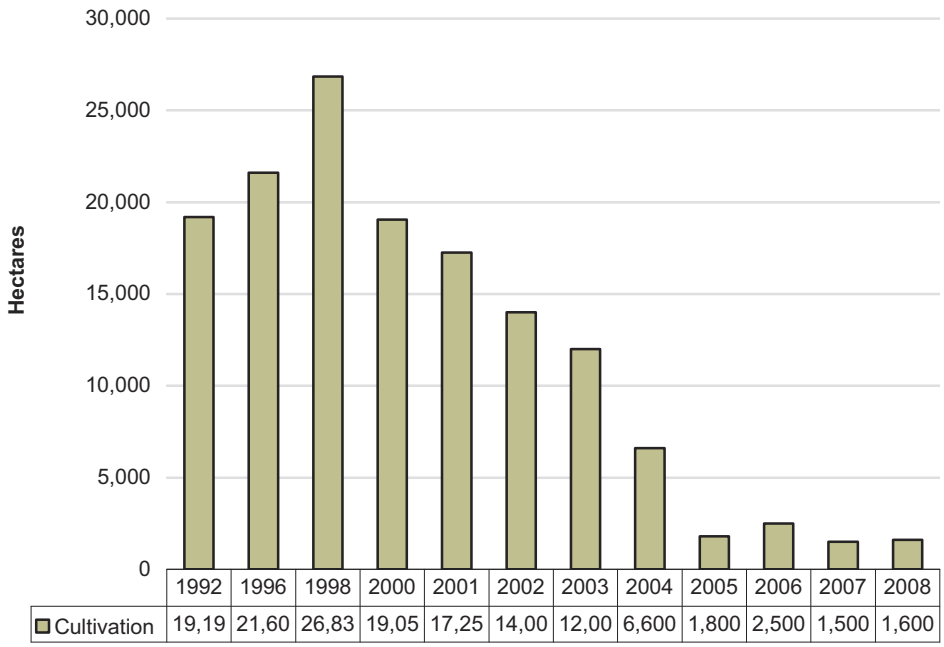
EXECUTIVE SUMMARY

The Lao PDR Opium Survey 2008 was carried out jointly by the Government of Lao PDR and UNODC. Since 2005, the methodology has consisted of an aerial survey by helicopter over sample sites in 6 provinces in northern Lao PDR.

Opium poppy cultivation

In 2008, opium poppy cultivation was found in all six surveyed provinces. The total area under opium poppy cultivation in the Lao PDR increased by 7% in 2008 to 1,600 hectares. Overall, the level of opium poppy cultivation in the country remains extremely low and is restricted to isolated plots in remote areas.

Figure 1: Estimated area under opium poppy cultivation in Lao PDR, 1992-2008



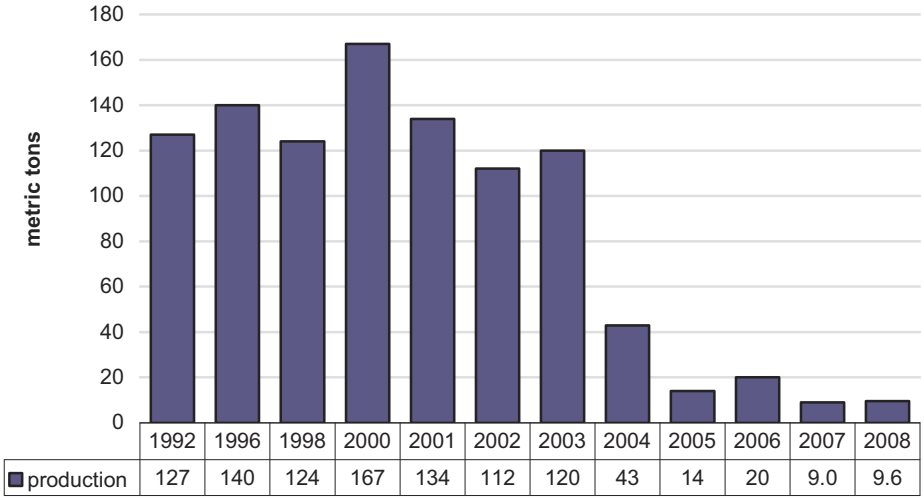
	1992	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cultivation	19,19	21,60	26,83	19,05	17,25	14,00	12,00	6,600	1,800	2,500	1,500	1,600

Opium yield and production

Bad weather conditions in Northern Lao PDR did not permit the survey team to undertake a yield survey in 2008. However, observations made from the helicopter indicated that crop health was similar to that of 2007, i.e. characterised by poor fields and weak plants. At the harvest stage, the capsules observed were small and capable of producing only a limited amount of opium gum, leading to a yield estimate of 6 kg/ha, as in 2007.

The potential production of opium for the year 2008 was estimated at 9.6 metric tons (mt), representing a 7% increase in production over 2007 based on the estimated area under cultivation.

Figure 2: Potential opium production (metric tons), 1992-2008



	1992	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
production	127	140	124	167	134	112	120	43	14	20	9.0	9.6

Opium prices and trade

The low level of cultivation, the disparate locations and security issues due to continued opium ban enforcement, made it difficult to collect price data at the farm gate level. However, opium prices were collected at the provincial level by local authorities during or soon after the 2008 opium harvest[5]. The average opium price increased to US$ 1,227/kg in 2008, a 26% increase over the same period in 2007.

Strong regional disparities in price indicate that there are significant local variations in supply and market access. Opium prices ranged between US$ 556/kg and US$744/kg in in Phonsaly and Huanphan, where opium poppy production still exits, and reached record levels of US$ 2,209/kg and 2,124/kg in Vientiane and Luang Prabang where opium poppy cultivation has been completely eliminated, or is very scarce, and where demand is high. The demand pull on prices in markets where opium cultivation has ceased or declined makes it more attractive for farmers to revert back to opium poppy cultivation, especially if no alternative sources of income are available. It is therefore of vital importance to continue to provide assistance to the most affected population.

Opium poppy eradication

The opium survey does not monitor or validate the results of the eradication campaign carried out by the Government of Lao PDR. According to Government reports, eradication took place on 575 ha (during or after the helicopter survey). In the majority of cases, eradication took place when opium harvesting was already underway. The largest area eradicated was in Phongsaly where 310 ha, (or 54% of the total eradication), were eradicated, followed by Huapanh (53 ha) and Oudomxay (47 ha).

Addiction

In line with a decrease in opium production, the survey found a decline in the prevalence rate of opium use the ten northern provinces from 0.6% in 2006 to 0.3% in 2007 and 0.2% in 2008 (expressed as a percentage of the population age 15 and above).

[5] . Since 2006, no clear distinction can be made between retail, wholesale and farm-gate prices. Limited amounts of opium are thought to be sold in or to markets outside the province of origin.

Relapse, however, continues being a problem. In 2008, 4,906 opium addicts were identified as having relapsed. The total number of addicts amounted to 12,680. The overall relapse rate is 34%. Almost 40% of the addicted persons come from Huaphan and Phonsaly where the bulk of opium poppy cultivation was identified. Since 2003, a total of 22,555 opium addicts were treated. There were an estimated 35,000 to 40,000 amphetamine-type stimulants (ATS) addicts in 2008.

Opium addict smoking opium pipe in his house

1 INTRODUCTION

This report presents the results of the ninth Lao PDR opium survey. The survey has been conducted annually since 1999 jointly by the Lao National Commission for Drug Control and Supervision (LCDC) and UNODC.[6]

In 1999, the Government of Lao PDR and UNODC developed the programme strategy "Balanced approach to opium elimination in the Lao PDR." In November 2000 Prime Minister Order Fourteen stipulated concrete Government measures against opium poppy cultivation and opium abuse. In 2001, the 7th National Party Congress called for opium production and use to be eliminated by 2005, and linked this with poverty reduction. A National Campaign against Drugs was launched in October 2001 to encourage communities to give up opium production. The Government increased the momentum of this campaign in 2004 and 2005 to measurable success, Lao PDR was declared opium free in February 2006.

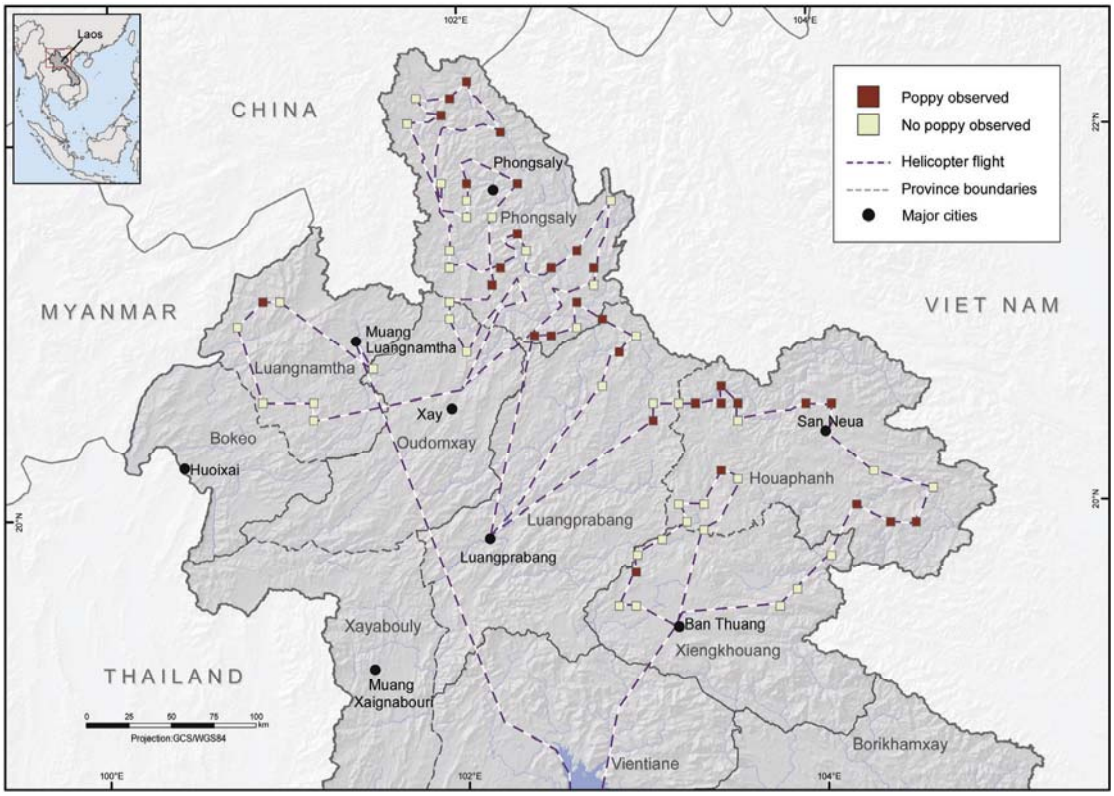
The results of the 2006, 2007 and 2008 surveys demonstrate that a total elimination of opium poppy cultivation has not yet been achieved and levels of cultivation still appear at marginal levels. While these are small enough to enable the country to be declared 'opium free' they are large enough to ensure that the knowledge of opium production (a) remains in the country (b) is still used to supply addiction and other needs (c) is still used for livelihood by some communities and (d) most importantly, could be returned to as a livelihood strategy relatively easily in the absence of alternatives. Therefore, it is necessary to closely monitor the remaining opium cultivation, not only to sustain the achievements reached so far but also to prevent a possible resumption of opium poppy cultivation.[7] Further, it is necessary to assess coping strategies for ex-opium poppy farmers to facilitate the transition towards productivity and livelihood generation I the licit economy. UNODC aims to continue providing technical support to the Lao PDR, both to monitor the opium poppy elimination process and to analyse the livelihood strategies of farmers who abandoned illicit cultivation.

Since 2005, a helicopter was used to survey six provinces of Northern Lao where opium poppy cultivation had taken place and where the probability of finding poppy fields remains relatively high. Surveys by helicopter proved to be cost effective in situations where opium poppy cultivation is limited, dispersed and moving into remote areas.

[6] UNODC began initial surveying in Lao PDR PDR in 1992 based on an inventory of all known opium producing villages. Similar surveys were conducted in 1996, 1998 and then annually since 2000.

[7] A similar situation exists in neighbouring Thailand, where opium poppy monitoring continues and a few hundred hectares of opium poppy are reported every year, although the country was declared opium free in 2002.

Map 1: Sample segments surveyed by helicopter, Northern Lao PDR, 2008



Source: Government of Laos - National monitoring system supported by UNODCThe boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

2 FINDINGS

The helicopter survey implemented by UNODC in coordination with the Ministry of Defence of Lao PDR covered the six northern provinces of Lao PDR. The survey covered a distance of approximately 3,900 km over the provinces of Phongsaly, Luang Namtha, Oudomxay, Luang Prabang, Xieng Khouang, and Huaphanh during more than 23 flight hours. The aerial survey covered 70 randomly sampled segments of 5 x 5 km each. In addition, observations were made from the helicopter in the corridors between the segments. This information was not used for statistical analysis but as a reference for future surveys. The total area covered during the flight was approximately 1,730 km^2, corresponding to 6 % of the total area under risk (31,165 km2) of the six provinces surveyed.

Data on opium yield could not be collected during the helicopter survey.

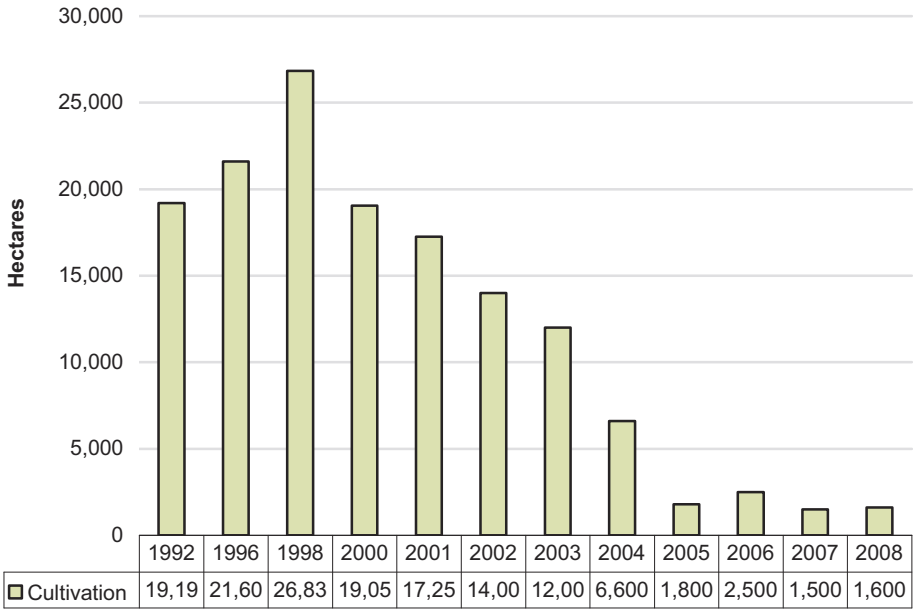
2.1. Area under opium poppy cultivation

The aerial survey revealed the existence of opium poppy cultivation in six provinces in Northern Lao PDR (Phongsaly, Luang Namtha, Oudomxay, Luang Prabang, Huaphanh and Xaien Khoung).

The total area under opium cultivation was estimated at 1,560 ha (rounded up to 1,600 ha), with a confidence interval ranging from 700 to 2,700 ha at 90 % confidence. This represents a negligible variation in area compared to 2007 (1,540 ha), and is 94% lower than in 1998 (26,800 ha). It can be assumed that the actual area harvested was smaller due to the Government eradication. However, similar to 2007, eradication took place after the aerial survey in 2008, when harvesting was already underway or completed. Eradication efforts by the Government might have reduced the area where opium was actually harvested, to less than 575 ha. Because the opium poppy fields

are planted at increasing distance from villages, as well as in remote clearings on forested slopes, eradication teams had a great deal of difficulty in reaching and destroying these fields.

Figure 3: Estimated area under opium poppy cultivation (ha), 1992 – 2008



	1992	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cultivation	19,19	21,60	26,83	19,05	17,25	14,00	12,00	6,600	1,800	2,500	1,500	1,600

The estimated area under opium poppy cultivation was calculated based on a sampling frame which included the potential area for opium poppy cultivation in Phongsaly, Luang Namtha, Oudomxay, Luang Prabang, Huaphanh, Xieng Khouang. Taking into account the results of previous surveys, as well as information from the Government and UNODC projects, it was assumed that opium poppy cultivation outside the sample area was negligible.

Opium poppy fields were found in 30 out of 70 randomly selected grids. All the grids were surveyed. The average land under opium poppy cultivation was 1.1 hectare per grid of 25 km^2.

As in the 2007 findings, the proportion of opium poppy fields observed in very remote locations (far from any villages and/or access roads) increased. This in many cases makes it impossible to identify the village that grows the field. This is thought to be a risk (eradication and/or law enforcement) averting strategy on the part of the farmers. Temporary settlements observed near these fields are thought to have allowed labourers to reside close to plots during the opium poppy growing season. Observations also revealed some staggered cropping with fields in the same settlement at different stages of plant development.

According to information, it seems that 20% of the former opium poppy growing villages in Phonsaly resumed poppy cultivation for both livelihood and personal consumption. It was also reported that some opium poppy farmers in Luang Namtha near the border sell their opium to the Shan State in Myanmar.

The number of opium poppy cultivating households in 2008 was not assessed by the Government of Lao PDR due to the remoteness of most of opium fields and the difficulty of associating them to established villages.

Table 1: Estimated no. of opium cultivating villages and households, 2002- 2008

Year	No. of opium growing villages	No. of opium growing households
2003	1,537	40,000
2004	846	22,800
2005	270	6,200
2006	n/a	5,800
2007	n/a	n/a
2008	n/a	n/a

2.2. Cultivation practices and crop calendar

Opium poppy cultivation in Lao PDR has become rare over the last few years. The main area of cultivation and production is now found in Phongsaly province and Huaphanh, with small pockets of cultivation remaining in the other four northern provinces. Over the last five years, three trends in opium cultivation have emerged, each of which is a response to the risk of eradication.

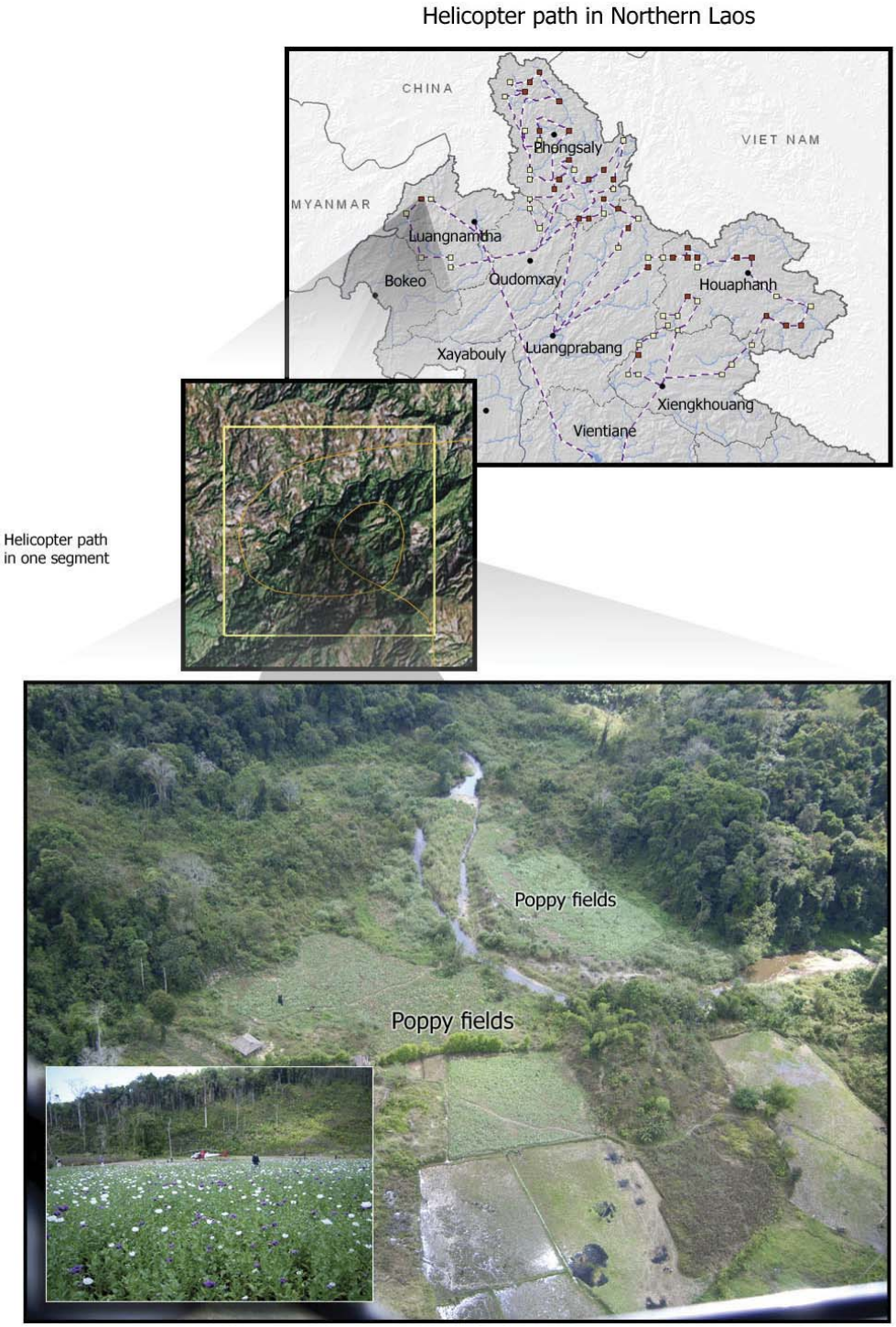
- Farmers are increasingly moving illicit cultivation to remote locations to avoid eradication. These locations share common characteristics, in most cases they are far away from villages, fairly well hidden in deep jungle or on remote mountainsides where there are no access roads.
- Farmers are cultivating less, but on better soils with improved cultivation techniques. Several opium poppy fields have been found near rivers and streams which eases manual hydration of fields.
- The survey team also witnessed multi-staged cropping (planting the same crop in temporal intervals on the same field). This is done to avoid eradication of the entire harvest, since eradication teams hardly ever return to the same field in the same year.

Table 2: Crop calendar of opium poppy

	Field preparation	Sowing	Harvest
Average	Mid Sept –end October	Early October –mid November	End January –mid March

Large areas of poppy fields throughout a mountain of Phonsaly Province

Map 2: Example of opium poppy fields identified during the helicopter survey



2.3. Yield and production

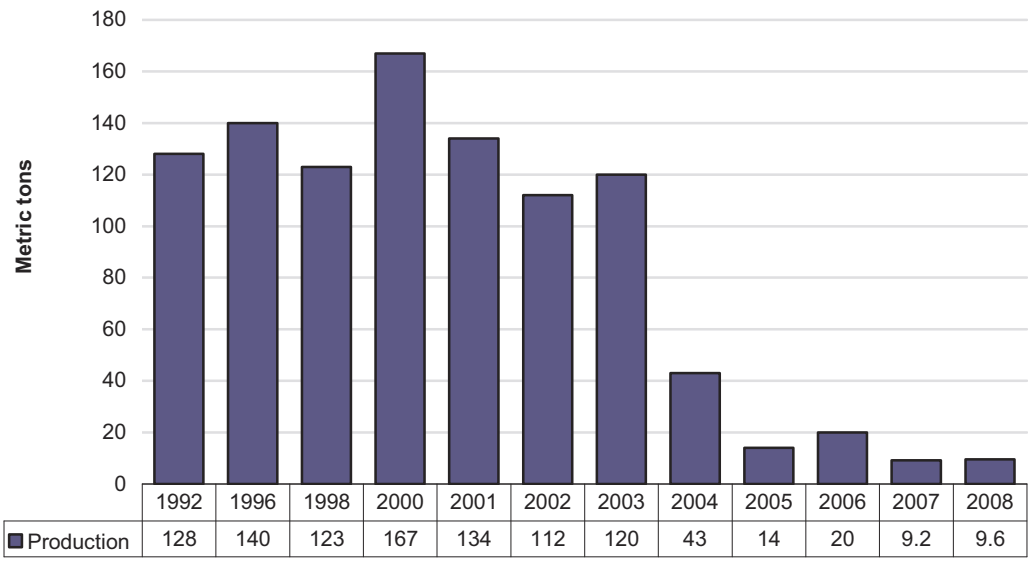
Because of the bad weather conditions in the northern part of the country, the survey team was not in a position to undertake a yield survey in 2008. Most of the observations from the helicopter showed poor fields with weak plants, similar to the situation in 2007. Even when the poppy fields were at harvest stage, the capsules were small and produced only a small amount of opium gum. Therefore, the yield of 6 kg/ha, estimated for 2007 was used to calculate the total production.

Based on the estimated area under cultivation, the potential production of dry opium for the year 2008 was 9.6 mt, which represents a 7% increase over 2007. The actual amount of opium harvested in 2008 could be lower than the estimated potential production due to the impact of eradication.

Table 3: Opium yield (kg/ha), 1992 - 2008

	1992	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
Potential Opium yield (kg/ha)	6.6	6.4	4.6	8.7	7.2	8	10	6.5	8	8	6	6

Figure 4: Potential opium production (metric tons), 1992 - 2008



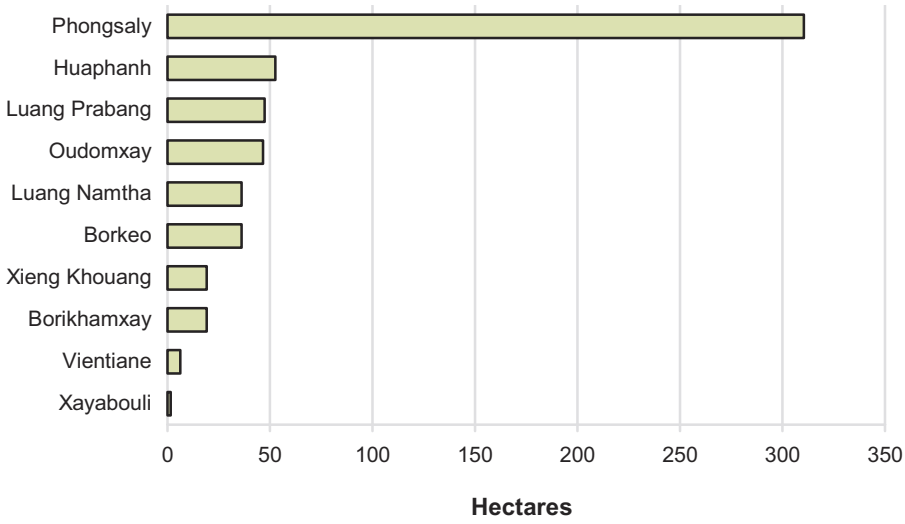
2.4. Opium poppy eradication

This opium survey was not designed to monitor or validate the results of the eradication campaign carried out by the Government of Lao PDR. According to Government reports, eradication took place on 575 ha during or after the helicopter survey, and in most cases at a time when opium harvesting was already underway. The biggest effort was made in Phongsaly with 310 ha which represents 54% of the total eradication, followed by Huapanh (53 ha) and Oudomxay (47 ha).

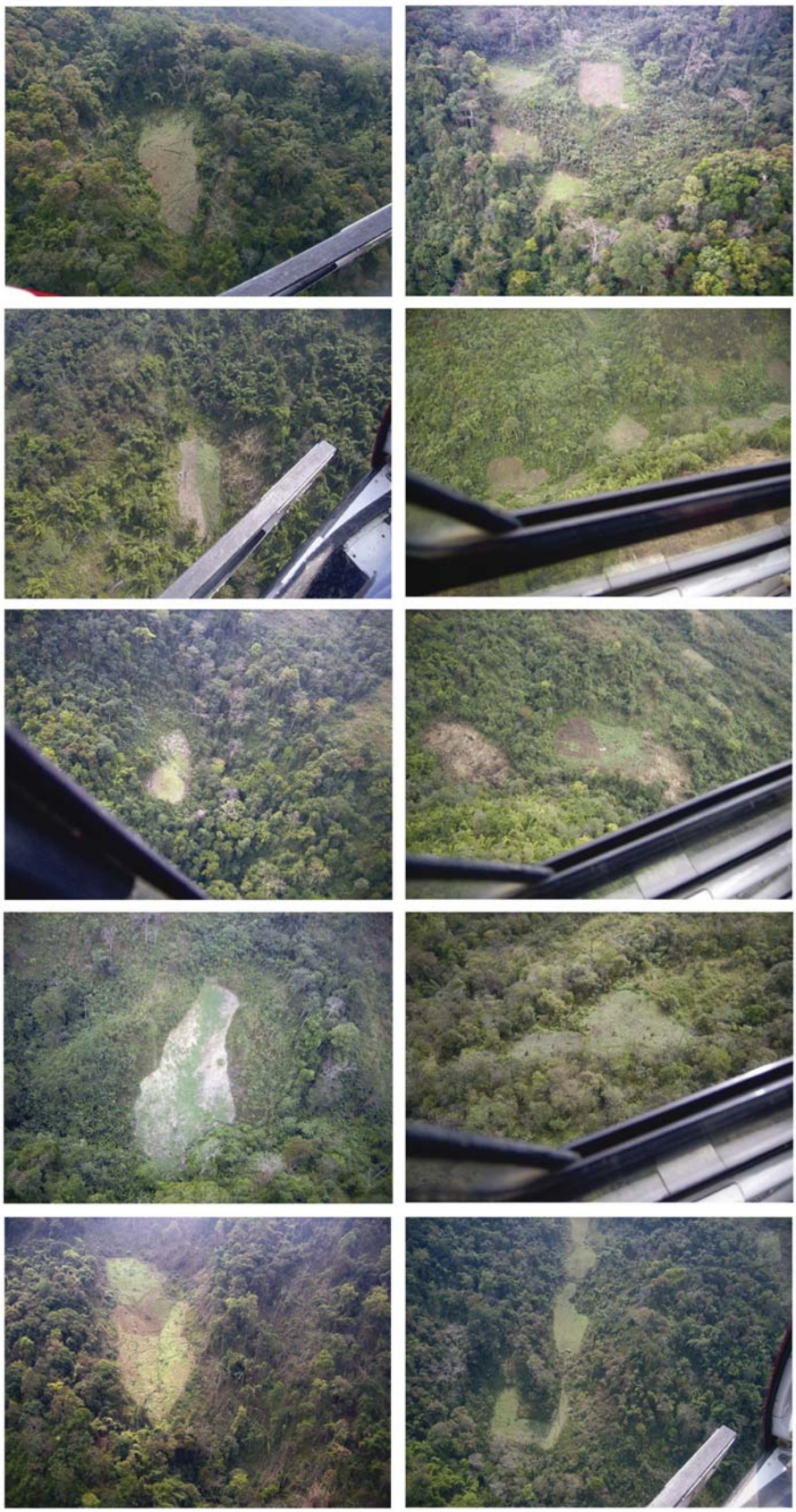
Table 4: Reported eradication by district (ha), 2008

No	Province	District	Eradication area (Ha)	Eradication period
1	Bolikhamxay	Khamkerth	12.07	29/2-10/3
		NamNhou	7.02	2-13/3
		Total	19.09	
2	Oudomxay	Xay	18.16	9/3-30/3
		La	3.27	10-25/3
		Namore	7.67	27/2-10/3/
		Nga	14	5-15/3
		Beng	0.67	2-15/3
		Hoon	2.8	28/2-3/3
		Total	46.57	
3	Houaphan	Viengxay	4.2	2-17/3
		Add	1.6	6-19/3
		Viengthong	8.41	7-30/3
		XamNeua	3.2	4-16/3
		Sobbao	4.5	1-20/3
		Huameuang	5.3	28/2-14/3
		Xamtai	25.5	1-30/3
		Total	52.71	
4	Xayabouly	Xayabouly	0.01	5/3
		Phieng	0.749	13/3
		Hongsa	0.74	13/3
		Total	1.499	
5	Xiengkhouang	Pek	0.1894	3/2
		Kham	3.073	2-5/3.
		Phoukood	5.3	2-10/3.
		Phaxay	0.075	3/2
		Nonghed	2.213	1-3/3.
		Khoune	5.8	1-10/3.
		Mok	2.2	3-6/3.
		Thathom	0.42	1/3
		Total	19.27	
6	Luang Prabang	Luang Prabang	0.15	4-17/3
		XiengNgeunh	0.1	
		Nane	6.18	6-19/3
		Pak Ou	1.81	7-30/3
		Nambak	1.4	4-16/3
		Ngoy	13.43	1-25/3
		PakXeng	0.5	1-3/3.
		Phonxay	2.62	27/2-6/3
		Chompheth	0.15	28/3
		Viengkham	12.5	11-19/3
		Phoukhoune	8.46	8-30/3
		Total	47.3	
7	Bokeo	Houayxay	5.25	1-19/3
		Thonpheung	1.301	1-6/3.
		Pak-Tha	14.88	3-26/3
		Pha Oudom	12.6	8-20/3
		Meung	3.044	4-9/3.
		Total	36.075	
8	Vientiane	Hom	2.76	10-19/3
		Xaysomboun	1.44	2-9/3.
		Kasy	2.07	27-28/2
		Total	6.27	
9	Luangnamtha	Luangnamtha	2.69	28/2-6/3
		Sing	6.44	28/2-10/3
		Long	13.28	28/2-20/3
		Viengphoukha	6.28	27/2-10/3
		Nalae	7.5	1-10/3.
		Total	36.19	
10	Phongsaly	Phongsaly	218	3-24/3
		Mai	9.84	3/2-29/3
		Khua	8	5-20/4
		Xamphan	40.47	5/2-28/3
		BounNeua	11.81	7-29/3
		Nhot Ou	21.5	28/2-20/3
		Bountai	0.8	15/3
		Total	310.42	
		Grand total	**575.39**	

Figure 5: Reported eradication by province (ha), 2008



Opium poppy fields are planted in remote clearings on forested slopes, hidden from eradication teams



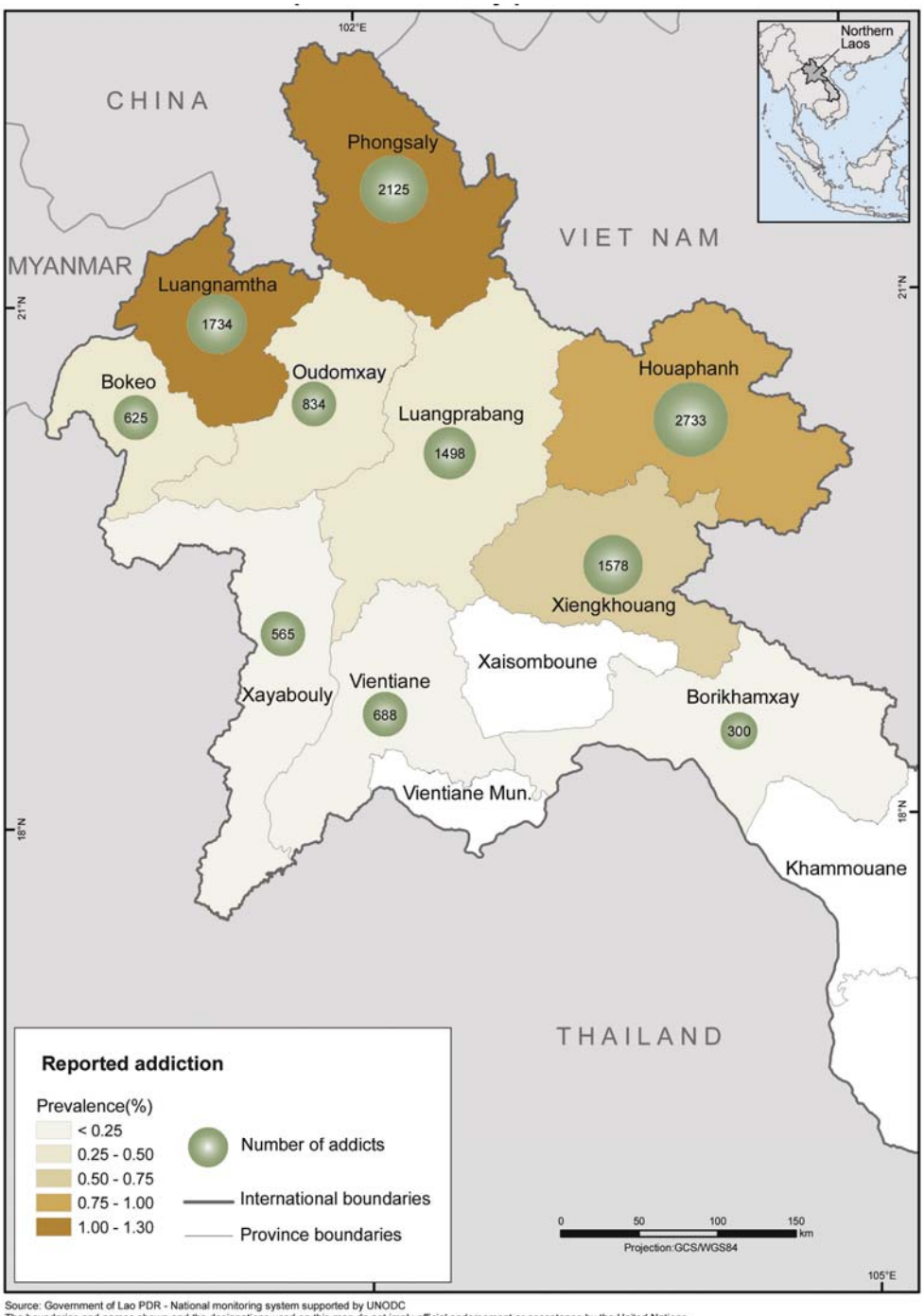
2.5. Opium addiction

In 2008, 4,906 former opium addicts were identified as having relapsed. The total number of remaining addicts in 2008 amounted to 7,774, raising the total number of addicts to 12,680.

Almost 40% of addicted persons come from Houaphanh and Phongsaly: the provinces where the majority opium poppy cultivation was identified. All of the country's 12,680 opium addicts are from the Northern provinces. Since 2003, a total of 22,555 opium addicts were treated with a relapse rate of 34%.

There are a reported estimated 35,000 to 40,000 amphetamine-type stimulants (ATS) addicts in 2008.

Map 3: Number of opium addicts and prevalence, Northern Lao PDR, 2008



Source: Government of Lao PDR - National monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

2.6. Post Opium Socio-Economic Impact Survey in Lao PDR, 2008

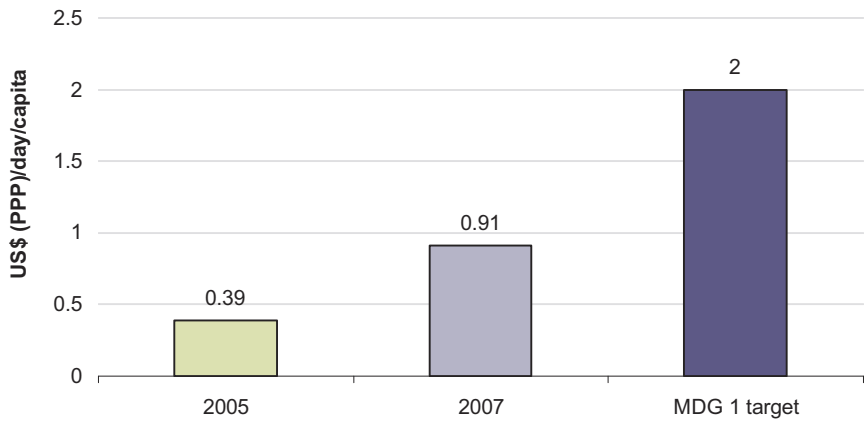
On 14 February 2006, the Government of Lao PDR (GoL) officially declared its success in being able to reduce opium poppy cultivation to insignificant levels. This is seen as a praiseworthy and historical achievement. However, the UNODC report, *Opium Poppy Cultivation in the Golden Triangle* for 2006 reported that 2,500 hectare were under poppy cultivation, an increase of 40% from the previous year. Nevertheless, in 2007, UNODC reported that poppy cultivation has decreased to 1,500 hectares. This is in keeping with the findings of a study on coping strategies carried out in 2005 which revealed that approximately half of the former opium poppy cultivating communities were at risk of resuming poppy cultivation because they lacked alternative livelihood strategies. This points towards the conclusion that opium poppy elimination remains a fragile achievement.

To assess the current situation and changes since the cessation of poppy cultivation, UNODC Lao PDR conducted a socio-economic survey in the period between January to July 2008. Six of the most vulnerable former opium poppy growing districts in Northern Laos–Nhot Ou, Namor, Viengphoukha, Vienthong, Xamtai, and Khoune districts–were surveyed using a sample of 190 households and 60 villages. The following summarizes the results of this survey.

Improvement of the general standards of living of former opium poppy growing communities…

This socio-economic survey found that in the study districts the most vulnerable former poppy growing communities had reorganized their entire agricultural system by intensifying production resulting in improved standards of living. The average household rice production increased by 7% since 2005 from 2.28 to 2.45 tons in 2007 while, at the same time, many households have more livestock or have started raising animals. This process led to a slight improvement of food security for former poppy growing households: 59% of the former poppy growing households became rice sufficient in 2007 against 56% of them in 2005. Furthermore, increased construction of village feeder roads created improved marketing opportunities for the villages in the study area. This can be clearly seen in the increase – from an extremely low base – of the daily cash income per capita from 0.39 (PPP US$) to 0.91 (PPP US$) in 2007[8]. When compared to the PPP US$ 2 per day and per capita set up as a poverty line within the MDG 1, this indicates that former opium poppy farmers are still living in abject poverty. But this additional income for former poppy growing farmers has at least allowed them to slightly improve their economic situation so that they can better afford education and health services that are now becoming more accessible at the village level thanks to the effort of the Lao Government as well as international organizations.

Figure 6: Daily cash income per capita of the former poppy growing households and comparison with the MDG 1 target (PPP US$)



[8] In 2005, World bank PPP conversion factor in Lao PDR (LCU per international dollar) was 2988.38 In 2007 World bank PPP conversion factor in Lao PDR (LCU per international dollar) was 3076.00

…But the pace of development for ex-growers is slower than for non-opium poppy growing communities…

Despite this improvement of living standards of former poppy growing communities, they are falling behind communities that had not been growing opium poppy. For these communities, rice production increased by 19% against only 7% for poppy growing households. There is a similar trend regarding livestock production. It appears that former poppy growing households did not benefit as much from the agricultural development opportunities as the non-opium growing communities. As a result, the income for the former poppy grower households (which traditionally was lower than the non-growing villages to start with) increased by an average of 247% from 2005 to 2007 against 338% for non-poppy growing villages. There are similar trends regarding access to health and education. Despite the fact that former poppy growing villages are now provided with better access to education and health facilities, fewer households in former poppy growing communities are making use of these services than those in non-growing villages.

…which make former opium poppy growing communities more vulnerable to reverting to growing the illicit crop…

Before the end of poppy cultivation, former growers were considered more vulnerable than non-growing households. They already had a lower cash income. In consequence, the fact that non-growers have increased their cash income almost two times faster than former growers has accentuated the inequality between former growing household and non growing households.

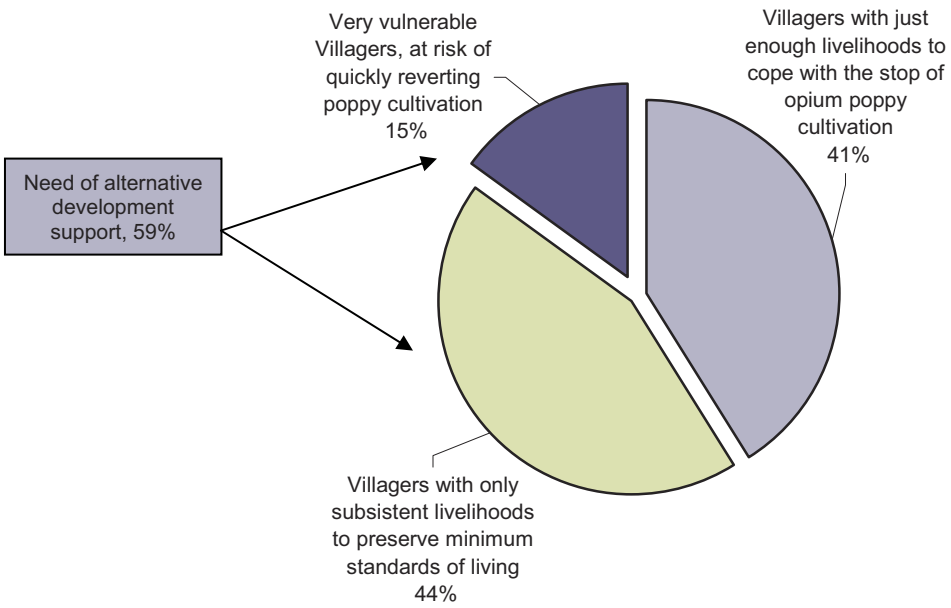
Today, in the most vulnerable former poppy growing districts, only 41 % of the former poppy growing households have just enough livelihoods assets to cope with the stop of opium cultivation by themselves. This implies that 59% of the households only have livelihoods resources subsistent to preserve minimum standards of living but not enough to cope with shocks, unexpected hardships and/or to invest in new alternatives development activities. Moreover, out of the 59% of households which need alternative development support, 15% have very poor living standards and are considered at risk of quickly reverting to poppy cultivation. These households subsist day by day and, because of limited access to alternative livelihoods, some have no choice but to resume poppy cultivation to survive. Despite the fact that the total area under poppy cultivation has significantly decreased since 2005, it appears that there is an increase in the number of households involved in opium production. This holds true for all the former poppy growing districts and was specifically observed in the six surveyed districts out of which Nhot Ou, Viengphoukha and Khoune districts are the most vulnerable.

…and enhance their needs of assistance.

From the 2,056 villages which produced opium in 1998, it was estimated by the Government of Lao PDR and UNODC in 2005 that about 1,100 villages needed urgent alternative development assistance. The 2008 socio-economic survey has found that a maximum of 1,400 villages currently need alternative development assistance, which matches with the government priorities. Moreover, out of these 1,400 villages, 500 are at risk of quickly reverting poppy cultivation in the near future. Therefore, emergency action and sustainable alternative development assistance are urgently needed, especially in the six surveyed districts.

In response to this situation, the Government of Lao PDR, supported by UNODC, has developed the Comprehensive National Drug Control Master Plan (2009–2013). The Alternative Development part of which provides sufficient support for the critical period of 3-5 years after poppy cultivation elimination. This assistance will help make the opium elimination sustainable.

Figure 7: Living conditions of the former poppy growing households



METHODOLOGY

2.7. Helicopter survey 2008

Under its global illicit crop-monitoring programme, The United Nations Office for Drugs and Crime (UNODC) has established methodologies for data collection and analysis, with a view to increasing the government's capacity to monitor illicit crops and assisting the international community in monitoring the extent, growth and contraction of illicit crop cultivation.

In Lao PDR, the area under opium poppy cultivation is small and not easily accessible. This, coupled with the relative scarcity of the target crop, meant that an aerial survey by helicopter was chosen as the optimal method of estimating the extent of cultivation.

The survey team visited selected sites by helicopter and an estimation of the area covered by poppy was made for each field within the selected site. The sites were selected through a poppy risk definition. In order to calibrate the poppy cultivation area visually estimated from the helicopter, various ground measurements were made and compared to the estimate from the air.

Poppy field photographed at 500 feet (160 metres)

Same field as above taken from the ground. The measurement of the field will be used to gauge the other poppy fields taken at the same altitude.

2.8. Sampling frame

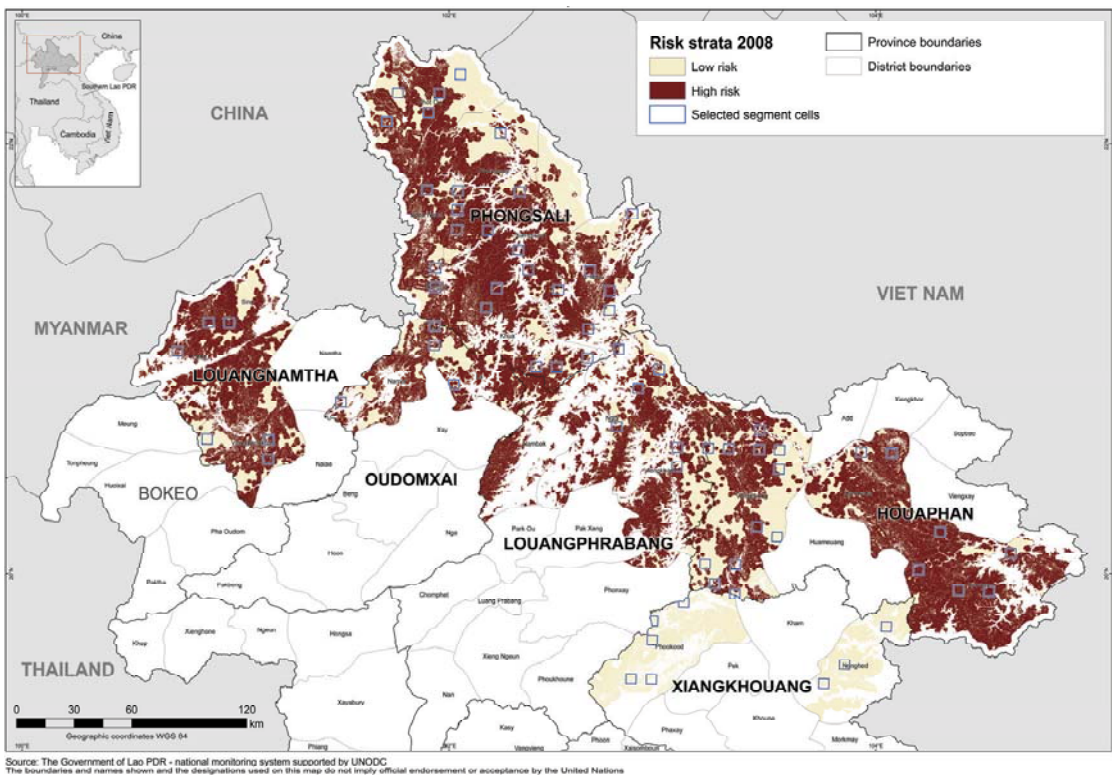
The quality of the data collected from the aerial survey depends to a large extent on the quality of the sampling frame from which the sample is selected. Building the sampling frame and estimating the extent of illicit crop cultivation in Lao PDR is challenging due to the fact that cultivation is highly dispersed and normally takes place in small plots.

Therefore a well-defined sampling frame is required. This process begins with a selection of provinces and districts where poppy cultivation is hypothesized to occur. This is made on the basis of information from experts on the ground. In 2008, the sampling frame for the area estimation was established by defining the potential land available for opium poppy cultivation within the six selected provinces in Northern Lao PDR (Phongsaly, Luang Namtha, Oudomxay, Luang Prabang, Huaphanh, and Xieng Khouang). Within this frame, a sample of plots was selected.

In Northern Lao PDR plots where opium is cultivated are mainly found in mountainous areas. Farmers avoid the large, sparsely forested plains and densely inhabited/settled areas, which are located at the lower altitudes. Past surveys have indicated that up to 80% of opium poppy-growing villages are above 700 meters in altitude and on slopes with inclines of over 10%. Because these topographic conditions correspond so closely with actual cultivation patterns (past) and probable cultivation patters (forecast) they were used to define the frames themselves. The calculations were performed with the help of a Geographic Information System. A digital elevation model (90 meter pixels) and its derived slope map were used to delineate (a) the areas above 700 meters altitude and (b) slopes of more than 10% incline. The sampling frame was further defined by a 3 kilometre buffer area along the country's the international borders which was completely excluded from all survey activities for security reasons.

The resulting sampling frame was divided into a set of grids of 5km by 5km (25 km^2). The estimate for opium poppy cultivation in the 2008 survey is only for the area within the sampling frame.

Map 4: Sampling frame and selected segment cells in Northern Lao PDR, 2008



Source: The Government of Lao PDR - national monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Table 5: Stratified risk areas used for the segment selection, 2008

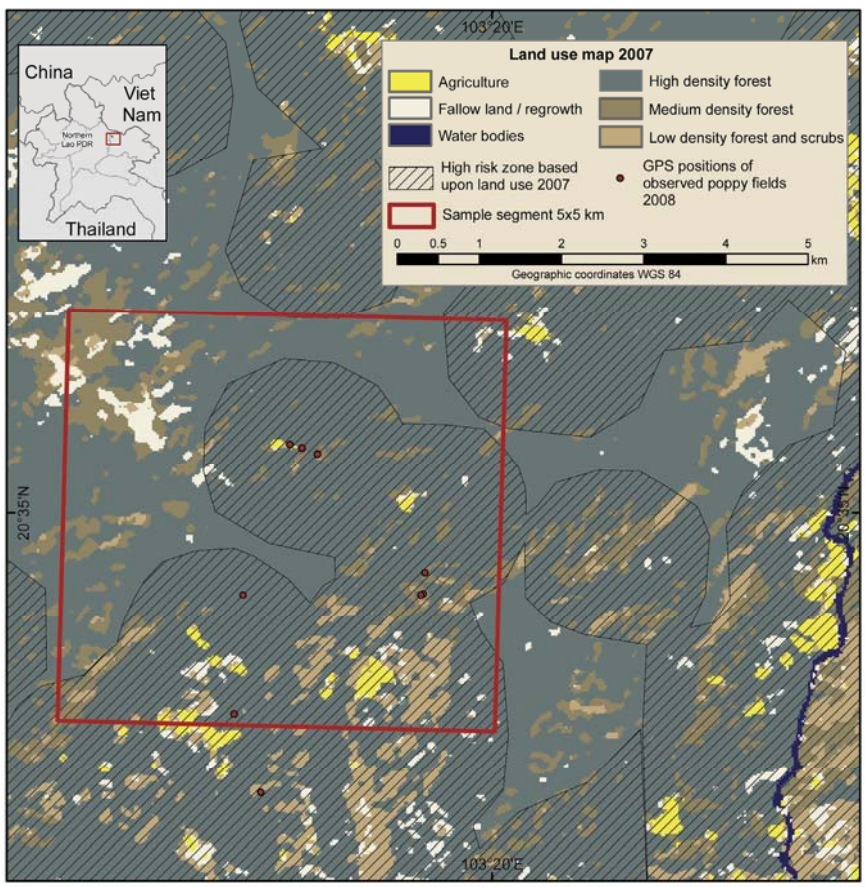
Strata	Area (km²)	Area (%)
High risk	22,005	71
Moderate risk	9,160	29
Total	**31,165**	**100**

2.9. Stratification

Previous sample designs and data analysis have demonstrated that there are sharp differences in the distribution of opium poppy cultivation across the entire survey area. Therefore, the results of the previous surveys and auxiliary geographic data were used to define areas with higher risk of opium poppy cultivation.

Agricultural plots for poppy cultivation are typically small fields. They are normally not identified on low definition land cover maps. However, poppy fields proved to be close to the larger agricultural areas in existing land cover maps. This characteristic has been used to design the stratification of the sampling frame. In 2007, 88% of identified opium poppy fields were located less than 4,000 meters from agricultural areas as defined in a 2003 land use map (scale: 1:100,000). In 2008, a new land cover map was developed which enabled a more accurate stratification. The updated land use map was developed on the basis of 6 Landsat-5 images taken between December 2006 and March 2007. The result is displayed in the map below and analysis shows that the standard distance of identified poppy fields to agricultural areas could be decreased to 1, 000 meters, with almost 90% of the poppy fields in 2007 found within this distance.

Map 5: Example area with poppy fields observed from the helicopter in 2008 and their locations close to agricultural land.



Source: The Government of Lao PDR - national monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Photo taken at the same location of the example area above, with a poppy field in the center.

2.10. Sampling frame

Buffer areas with 1 km width were established to surround each agricultural area. These were identified as areas where it was most likely that poppy cultivation would occur. The buffer calculation was performed in a Geographic Information System and resulted in two risk stratums.

- Stratum 1 - Areas with *high* risk of opium poppy cultivation; 1 kilometer or less away from agricultural areas identified by the land use map of 2007.
- Stratum 2 - Areas with *moderate* risk of opium poppy cultivation; more than 1 kilometer away from agricultural areas identified by the land use map of 2007.

Information from the ground indicated that opium poppy in Xieng Khouang Province is grown at significantly lower altitudes than in the rest of the area. Therefore, the calculated stratums were lowered by one step (the high risk area was lowered to moderate and moderate risk to no risk, i.e. excluded from the sampling frame).

Table 6:Sampling frame stratification

Strata	Area (km2)	Area (%)
High Risk	22,005	70
Medium Risk	9,160	30
Total	**31,165**	**100**

The final sampling frame consisted of 31,165 km^2 distributed in 583 grids.

The type of sampling method used to estimate the area under opium poppy cultivation corresponds to a Stratified Area Sampling Frame approach. This technique is often used in agricultural and crops surveys. The methodology starts by dividing the target area into mutually exclusive and collectively exhaustive subgroups or strata. Subsequently, separate samples are then selected from each stratum.

2.11. Sample size

An imperative consideration in the determination of the sample size for a survey is the quality of the data that will be collected. On the other hand, financial resources are serious constraints limiting the scope of the survey. Compromising both conditions, the resulting sample size was calculated as a function of the costs associated to the helicopter flying time and the precision.

The budget available limited the number of flying hours up to the maximum of 25 hours. Therefore, in order to estimate the number of potential selected segments, it was necessary to investigate the helicopter characteristics.

The helicopter used for the survey was a "Squirrel" helicopter. This type of helicopter is used mostly for rescue, aero medical, survey and military roles. The Squirrel has a maximum cruise speed of 220 kph powered by a single jet engine. It can accommodate up to four passengers and carry loads of up to 750 kg.

To determine the maximum number of sample segments, a compromise between a sampling ratio of 5.4% of the total potential area and the maximum total of segments has been taken.

The total number of segments is derived from the following formula:

$$n_{\alpha} \leq MAX\left[\left[\left\{\frac{TEDWs \bullet n}{ESWs}\right\}\right]+\left\{\frac{(MaxDBs - MinDBs)\bullet n}{ESBs}\right\}\right] + BTso \leq 33\,h$$

Where:

TEDWs = Total expected surveillance distance traveled within segments

ESWs= Total expected Helicopter speed within segments

MaxDBS, MinDBs = Maximum and Minimum expected distance between segments

ESBs= Total expected helicopter speed between segments

Btso = Buffer time to stopovers

And,

$$n_{\beta \leq} PotentialL\ and * 5\%$$

Where:

Potential Land = Total potential land for opium poppy cultivation in Lao PDR

or

40,463X0.05=2,023, or in terms of segments equals to 80 grids.

Finally,

$$n = Min\{n_{\alpha}, n_{\beta}\}$$

or n =Min (65,80)

Table 7:Final Sample Size

Sample Size	Grids	Area Sq Km
High Risk	47	1,173
Moderate Risk	23	557
Total	70	1,730

The sample allocation used for this survey is optimum allocation. Optimum allocation distributes the sample proportionally using the opium poppy area standard deviation on each grid.

The sample of 25km^2-grids was systematically selected using probability proportional to size (PPS) approach. PPS sampling is a technique that employs auxiliary data to yield dramatic increases in the precision of survey estimates, particularly if the measures of size are accurate and the variables of interest are correlated with the size of the unit.

In this survey, the variable used was the size of the potential land area for opium poppy cultivation. It is the methodology of choice for sampling areas for most crop estimation surveys. PPS sampling yields unequal probabilities of selection for primary sampling areas. Essentially, the measure of size of the primary sampling areas determines its probability of selection.

Table 8:Number of selected grid samples by province

Province	Sample
HOUAPHAN	19
LOUANGNAMTHA	6
LOUANGPHRABANG	6
OUDOMXAI	3
PHONGSALI	28
XIANGKHOUANG	8
Total	**70**

2.12. Estimation procedure

The estimation of the area under opium poppy cultivation was based on the information collected during the helicopter survey. The expansion area for the aerial research was limited to the sampling frame and does not consider opium poppy fields outside this domain.

Ratio estimation formulae were used to estimate the extent of the opium poppy cultivation at the stratum level using the equations described below.

a. Average proportion of opium poppy cultivation per stratum:

$$\bar{p}_k = \sum_{j=1}^{t} \frac{Poppy\_in\_segment\_j}{Potential\_land\_in\_segment\_j}$$

k =1,2 and j=1,…,28, or 37

b. Average proportion of opium cultivation in Northern Lao PDR.

$$\bar{p}_{st} = \frac{1}{N} \sum_{h}^{3} N_h \bar{p}_h$$

Or

$$\bar{p}_{st} = \sum_{k}^{3} W_k * \bar{p}_k$$

W_h= relative weight for each stratum

c. Unbiased estimate of the variance of the proportion of opium poppy cultivation in Northern Lao PDR:

$$Var(\bar{p}_{st}) = \frac{1}{N^2} * \sum_{1}^{3} \frac{N_h^2 (N_h - n_h)}{N_h - 1} * \frac{P_h * Q_h}{n_h}$$

The second term on the right represents the reduction due to the finite population correction[9].

The results for the two strata were refined by the bootstrap method[10]. Bootstrapping is recommended[11] for cases when the sample observations have different sizes. This was the case in the survey area, where the potential land suitable for opium poppy cultivation as defined by the sampling frame within the selected grids was very different from each other. The bootstrap method does not have a significant influence on the mean estimation. The main reason for using bootstrap is to calculate the standard error of the estimates.

Bootstrapping consist of sampling with replacement from the original sample thousands of times. The collection of 84 selected grids constitutes the original sample. After performing each iteration, a mean value is estimated and scored. At the last stage, a distribution of means can be observed, producing a mean estimate and a confidence interval for the mean.

9 Cochran, W.G.; Sampling techniques, Third edition; Wiley Eds. 1977.

10 Resampling Stats. Stand alone Version 5.0 with 100,000 iterations.

11 Resampling methods, a practical guide to data analysis; Good, P. Birkhauser 2006

PART 2. MYANMAR

CONTENTS

ABBREVIATIONS

CCDAC	Central Committee for Drug Abuse Control
GOUM	Government of the Union of Myanmar
ICMP	UNODC Illicit Crop Monitoring Programme
INGO	International Non-Governmental Organization
SASS	Statistics and Surveys Section (UNODC)
SR	Special Region
UNODC	United Nations Office on Drugs and Crime
USG	United States Government
WCS	Wildlife Conservation Society

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PREFACE

The annual opium surveys remain essential and a source of reliable information to assess the extent and trends of opium poppy cultivation, as well as the coping strategies of the ex/opium farmers in the Country.

In 2008, the total area under opium poppy cultivation in Myanmar is estimated at 28,500 hectares, representing an increase of 3 per cent from 27, 700 hectares in 2007. Opium poppy cultivation is concentrated, primarily, in Shan State, where 89 per cent of the total opium poppy was grown. The weighted national average opium yield for 2008 is estimated at 14.4 kilograms per hectare, leading to an estimated potential opium production of 410 metric tones. Compared to the estimated yield of 16.6 per cent and the estimated potential opium production of 460 metric tones in 2007, the estimates this year indicate a drop both in the yield and production of opium by 13 and 11 per cent, respectively.

The survey in 2008 finds that the opium farmers are poorer than the non-opium farmers. The average cash income of households was higher in villages that never grew opium poppy, compared to the ones, which grew it in the past and stopped cultivation. The findings also show that households in former poppy growing villages could not find adequate means of substituting their lost income from opium, their economic situation worsened and they require continued assistance. The most common coping strategy for the farmers, who had stopped opium poppy cultivation, was to grow more rice and maize and to sell livestock. There is also some evidence of migration occurring in Special Region 2 where opium poppy cultivation was abandoned in 2005.

The villages reporting opium poppy cultivation continue to be characterized by lower food security and higher intensity of shifting cultivation, both in terms of acreage of forest cleared and duration of fallow periods compared to non-growing villages.

The increase in cultivation in 2007 and a slight increase this year needs serious attention of the Government of Myanmar and the International Community. A comprehensive and integrated approach for providing alternative means of livelihood, food security, social and economic support to the ex/opium farming families and communities remain the key in sustaining the impressive decrease in opium poppy cultivation during the period 1998 - 2006 and the transition from lives associated with illicit drug cultivation to a licit and more secure human existence.

Shariq Bin Raza
Representative
UNODC Myanmar

FACT SHEET - MYANMAR OPIUM SURVEY 2008

	Year 2007	Year 2008	Variation from 2007
Opium poppy cultivation in Myanmar	27,700 ha	28,500 ha	+3 %
Opium poppy cultivation in Shan State	25,300 ha	25,300 ha	0 %
Average opium yield (weighted by area)	16.6 kg/ha	14.4 kg/ha	-12.7%
Potential production of dry opium in Myanmar (including the Shan State)	460 mt	410 mt	-10.9%
Opium poppy eradication in Myanmar[1]	3,598 ha	4,820 ha	+34 %
Average farm-gate price of opium[2]	US$ 261/kg	US$ 301/kg	+15.3 %
Total potential value of opium production	US$ 120 million	US$ 123 million	+2.4 %
Estimated number of households involved in opium poppy cultivation in Myanmar	163,000	168,000	+3 %
Number of persons involved in opium poppy cultivation in Myanmar	815,000	840,000	+3 %
Estimated number of households involved in opium poppy cultivation in the Shan State	148,900	148,900	0 %
Average yearly household income in opium producing households (Shan State)	US$ 501	US$ 687	+37 %
Of which from opium sales	US$ 227	US$ 253	+11 %
Per capita income in opium producing households (Shan State)	US$ 100	US$ 137	+37 %
Household average yearly income in non-opium poppy producing households (Shan State)	US$ 455	US$ 721	+58 %
Per capita income in non-opium producing households (Shan State)	US$ 91	US$ 144	+58 %
Addiction prevalence rate in Shan State and Kachin (population aged 15 and above)	0.75 %	1.1 %	+47%

[1] Source: CCDAC.

[2] For 2007: yearly average price. For 2008: price at harvest time.

EXECUTIVE SUMMARY

The 2008 Opium Survey in Myanmar was conducted jointly by the Government of the Union of Myanmar (GOUM) and the United Nations Office on Drugs and Crime (UNODC) There are significant differences in the extent of opium poppy cultivation across the geographic regions in Myanmar. Therefore, it is necessary to apply different methodologies for each region. In South and East Shan State, where most of the opium poppy cultivation takes place, an extensive aerial survey was conducted by the interpretation of satellite images and supplemented with ground verification. A village survey was also done to collect data on socio-economic indicators and also to estimate the area under opium poppy cultivation in North Shan State and in some selected townships of Kachin State and Kayah State. This survey was done through interviewing the village headmen and a group of farmers was also conducted Finally, in the Special Region 1 (Kokang), Special Region 2 (Wa), and Special Region 4, a moderate visual non-random walk was done to verify the opium free status on these regions.

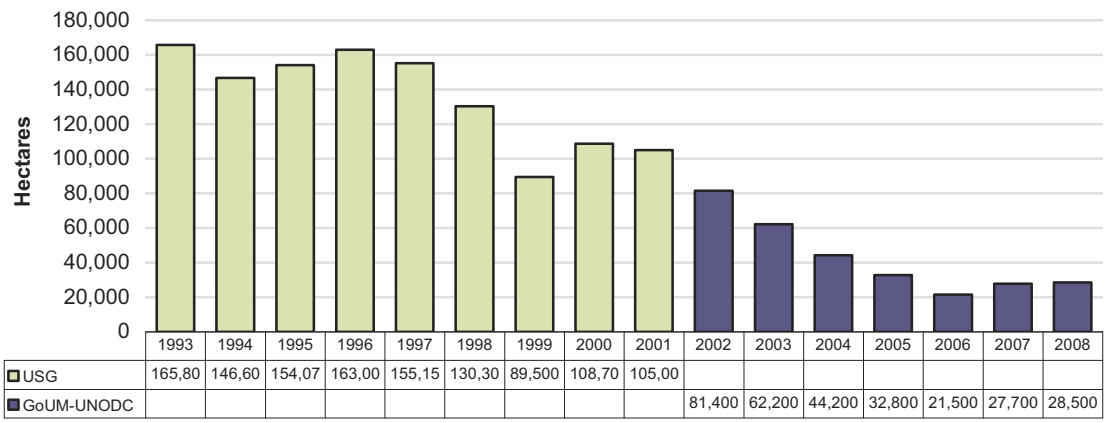
Opium poppy cultivation

In 2008, the total area under opium poppy cultivation in Myanmar is estimated at 28,500 hectares, representing an increase of 3% from the 27,700 ha under cultivation in 2007. The largest cultivation was observed in the Shan State, where 89% of the total opium poppy in Myanmar was grown. Within this state, South Shan and East Shan accounted for 53.7% and 33% respectively, of the national cultivation of opium poppy. The North Shan remained low cultivation area with only 3% of national cultivation, even though it increased in cultivation by 105% from 2007 and by 233% from 2006. Meanwhile, Kachin and Kayah states remained with low levels of cultivation, 5% and 6% respectively in 2008, but some attention should be put on Kayah State where the cultivation was doubled this year as compared to previous year.

Table 1: Opium poppy cultivation in Myanmar by state (ha), 2006-2008

Region	2006	2007	2008	% of total area under opium poppy cultivation
East Shan	4,550	7,000	9,500	33%
North Shan	240	390	800	3%
South Shan	15,660	18,000	15,000	53%
Special Region 2 Wa	0	0	0	0%
Shan State Total	**20,450**	**25,390**	**25,300**	**89%**
Kachin	1,020	1,440	1,400	5%
Kayah	15	870	1,800	6%
National Total	**21,485**	**27,700**	**28,500**	**100%**
Rounded Total	**21,500**	**27,700**	**28,500**	**100%**

Figure 2: Opium poppy cultivation (hectares), 1993-2008



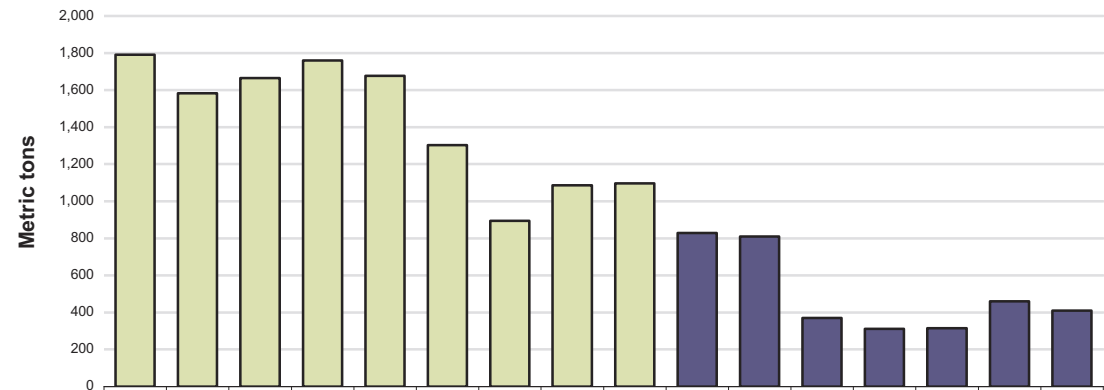
Opium yield and production

Based on a total of 312 fields, measured in this study, the weighted national average opium yield for 2008 is estimated at 14.4 kg/ha, leading to an estimated potential opium production of 410 metric tonnes. In 2007, the estimated yield was 16.6 kg/ha and the estimated potential opium production was 460 metric tonnes in 2007. This shows a drop both in yield and production of opium by 13% and 11% respectively.

Similar to the cultivation findings, the survey results show that opium production was highest in the Shan state (88%), particularly in South Shan (56%) and East Shan (30%). States of Kachin and Kayah both contributed with 6% each to the opium production at the national level.

Notwithstanding the size of the capsule, the opium gum is yielded. The first picture shows a huge capsule and the second one a rather small capsule both yielding opium

Figure 3: Opium production in Myanmar (metric tons), 1993-2008



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
USG	1,791	1,583	1,664	1,760	1,676	1,303	895	1,087	1,097							
GoUM-UNODC										828	810	370	312	315	460	410

Opium prices

The prices of fresh opium varied significantly across regions. This year, the average farm-gate price of opium at harvest time, was estimated at 301 US$/kg. This represents an increase by 36% compared to the average price reported in 2007 (265 US $/kg). The price continues to differ across the states, with Kachin reporting the highest price (518 US$/kg) and South Shan state reporting the lowest price (265 US$/kg). The highest increase in price compared to last year were observed in Kachin and North Shan States, whereas in South Shan and East Shan States, price increase was moderate. The current fragmentation of the opium market in Myanmar was also observed in the village survey.

Household income from opium

In 2008, the average annual cash income of an opium poppy growing household was estimated at US$ 687, while that of a non-opium poppy cultivating household was slightly higher, at US$ 721.

Different to the observations of previous years, the average cash income of households was higher in villages that never grew opium poppy, compared to the ones, which grew it in the past and stopped cultivation this year. In 2008, the findings also showed that households in former poppy growing villages could not find adequate means of substituting their lost income from opium. Their economic situation worsened and they require continued assistance.

Addiction

Opium users in Shan State, Kachin and Kayah represent 1.1% of the total adult population (15 years and above). Within the surveyed area, the average level of addiction was higher in villages with opium poppy cultivation (2.3%), compared to non-growing villages (0.5%). As in previous years, opium addiction continues to be predominantly among the males: 2% of the male population was addicted compared to 0.2% of the female population. The level of amphetamine type stimulant (ATS) and heroin addiction was low compared to opium abuse in both growing and non-growing villages. The survey did not cover urban areas where these types of addiction are thought to be higher.

Eradication

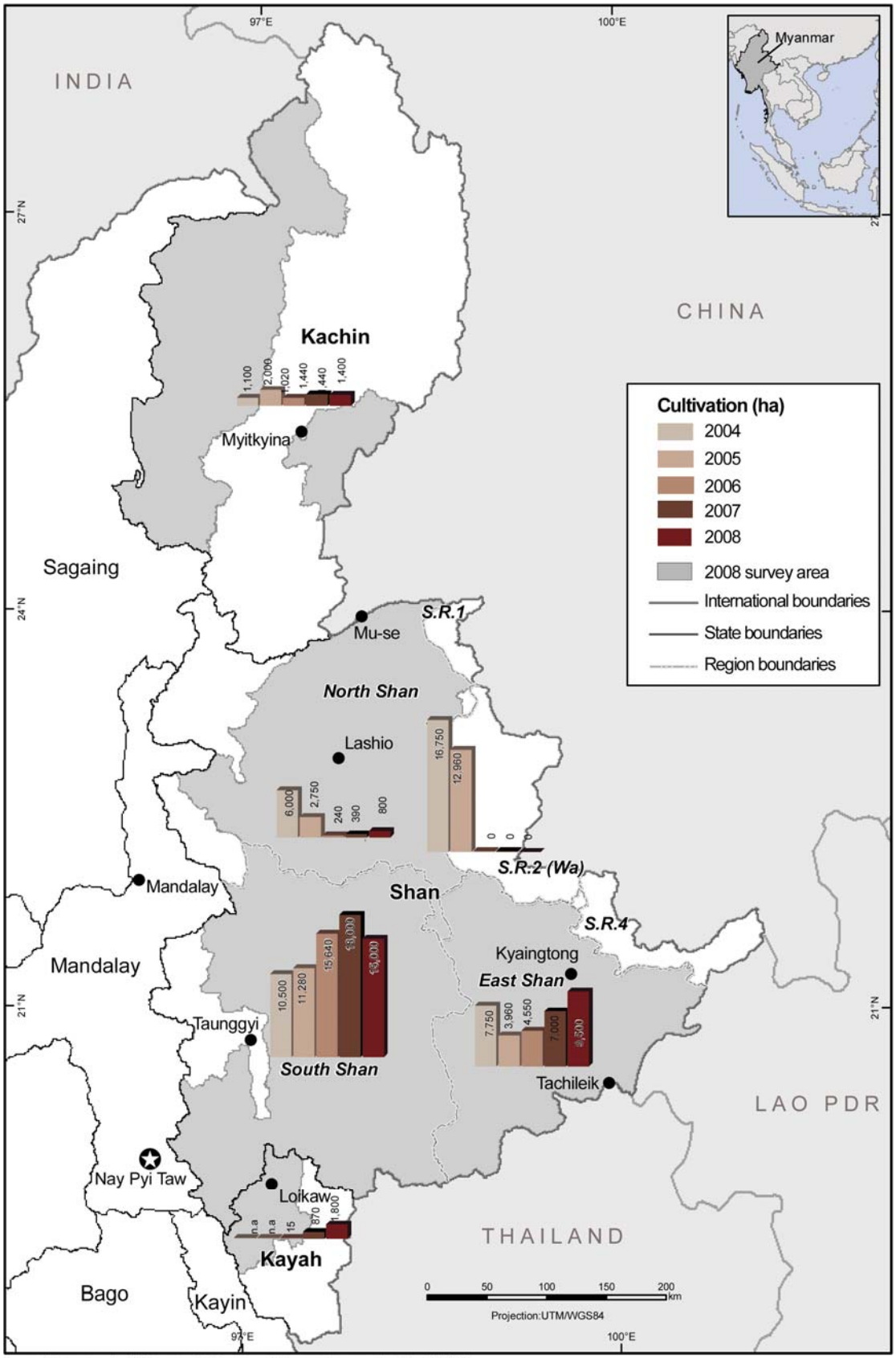
According to official reports from the Government of Myanmar, 4,820 ha of opium poppy were eradicated in 2008. Eradication saw an increase in East Shan State (+13%) and South Shan State (+33%). In North Shan State, eradication remained at the same level as last year. In Kachin, the military eradicated more than 3 times more as compared to last year. In Chin State, eradication teams eradicated all the opium poppy found in the region, which was mainly concentrated on the Indian borders.

Eradication in Chin State

Food security and coping strategies

The 2008 survey shows that villages reporting opium poppy cultivation continue to be characterised by lower food security compared to opium poppy-free villages. As observed in previous years, villages with access to paddy land tend to cultivate less opium poppy, suggesting that they can achieve a higher level of food security through cultivation of rice. Villages growing opium poppy showed a significantly higher intensity of shifting cultivation, both in terms of acreage of forest cleared and duration of fallow periods compared to non-growing villages. The most common coping strategy for the farmers, who had stopped opium poppy cultivation, was to grow more rice and maize and to sell livestock. There is also some evidence of migration occurring in the Wa region where opium poppy cultivation was abandoned in 2005.

Map 1: Opium poppy cultivation in Kachin, Kayah, and Shan States, Myanmar 2004- 2008



Source: Government of Myanmar - National monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

1 INTRODUCTION

This report presents the results of the annual opium survey in Myanmar, conducted for the seventh consecutive year by the Central Committee for Drug Abuse Control (CCDAC) of Myanmar, with the support and participation of UNODC. Since 2001, UNODC has collected statistical information on illicit crop cultivation in Myanmar, within the framework of its Illicit Crop Monitoring Programme (ICMP). ICMP works with national governments to increase their capacity to monitor illicit crops and supports the international community in monitoring the extent and evolution of illicit crops in the context of the elimination strategy adopted by United Nations General Assembly Special Session on Drugs in June, 1998. The survey methodology combines satellite imagery with field and village surveys. In combination, these three surveys provide the information needed to determine the extent of opium poppy cultivation and production and the socio-economic situation of farmers at the village level.

Opium poppy has been grown in Southeast Asia as a medicinal and cash crop for centuries. Some 150 years ago, cultivation of the crop was commercialized in what was then known as Burma. For the past 50 years, the farm-gate buyers of opium have been mainly Chinese merchants connected with international groups operating from China and Thailand. Through collection of taxes and protection money, various ethnic insurgent groups have used proceeds from onward sales of opium and heroin to finance their activities.

Opium poppy cultivation has remained village-based, widely dispersed and very "low tech". The agricultural economy of opium–growing regions of Myanmar is based on a traditional opium poppy-maize-rice cropping system. Surplus opium, which is not needed for medicinal purposes or consumed by addicts in their own household, is sold to alleviate food shortages, as most households are not self-sufficient in food.

In the 1980s, Myanmar was the world's largest producer of illicit opium. Between 1981 and 1987, it had an average annual production of about 700 metric tons. Opium production in Myanmar continued to increase until 1996, reaching annual production levels of some 1,600 metric tons. Afghanistan replaced Myanmar as the world's largest producer of opium in 1991, primarily due to its higher opium yield per hectare. The area under cultivation remained larger in Myanmar than in Afghanistan in most years until 2003.

In 1996, the surrender of the notorious drug trafficker Khun Sa, leader of the Mong Tai Army, resulted in the collapse of armed resistance movements and led to the negotiation of a series of truce agreements with most break-away factions. This paved the way for control of opium poppy-growing regions and allowed the implementation of measures to reduce opium poppy cultivation.

In 1999, the Government of Myanmar and local authorities in areas cultivating opium poppy decided to engage in a 15-year plan to eliminate the illicit crop by the year 2014. Since then, there has been a considerable decrease in the area under cultivation and a strong decline in potential opium production in Myanmar. Opium poppy has been confined almost entirely to the Shan State with a few pockets of cultivation in other states. The Wa Region of Shan State, played a major role in opium production in the past. After a ban on opium cultivation was declared in June 2005, the Wa Region remained poppy free. Similarly, no significant opium poppy production has been observed in Kokang and in Special Region 4 since 2003.

The achievements in reducing cultivation and production of opium and the efforts made to treat opium abusers, can only be sustained if alternative livelihoods for local communities are available. Farmers are very vulnerable to loss of income derived from opium, especially those who depend on this source to cope with food shortages. Also, opium cultivation is often linked to a lack of peace and security, which also contributes to impoverishment of the local population.

The annual opium surveys remain essential to assess the extent of opium poppy cultivation within the country and shifts in cultivation, in addition to being a useful tool for gauging the effectiveness of opium bans and their implications. The present survey examines, among other things, how farmers continue to cope with the opium ban. Such information is essential for developing effective strategies to sustain the transition from an illicit economy to a licit economy.

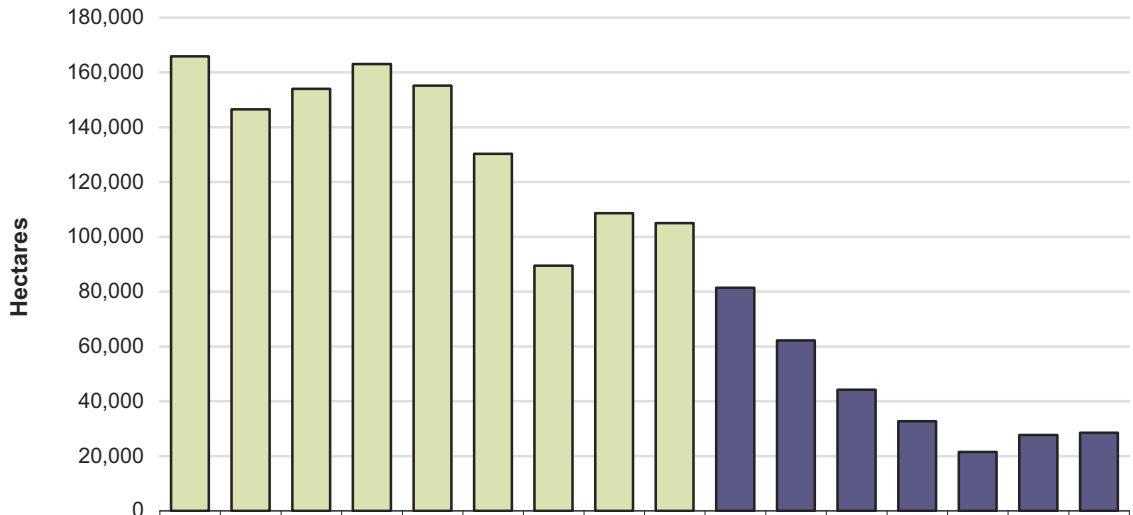
2 FINDINGS

2.1 Opium poppy cultivation

In 2008 the annual opium survey in Myanmar covered Shan State (North, East, and South Shan), Kachin and Kayah States, where opium poppy cultivation was reported. As in 2007, the survey also included Chin State and several Special Regions in Shan (Wa Special Region 2, Kokang Special Region 1 and Special Region 4), where rapid assessments were conducted. The survey confirmed the sustainability of the opium-ban in the 3 Special Regions. However, in Chin State, some opium poppy cultivations were observed close to the Indian border, in 2008. A rapid assessment was also planned for Sagaing Division, but this survey was not permitted to proceed.

In 2008, the total area under opium poppy cultivation in Myanmar was estimated at 28,500ha, a slight increase (3%) compared to 27,700 ha in 2007. This upward trend started from 2007 after five years of decline (2002 to 2006). The area under opium cultivation is however still lower than it was in 2005.

Figure 4: Opium poppy cultivation in Myanmar (ha), 1993-2008



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
USG	165,80	146,60	154,07	163,00	155,15	130,30	89,500	108,70	105,00							
GoUM-UNODC										81,400	62,200	44,200	32,800	21,500	27,700	28,500

The vast majority of the opium poppy cultivation in Myanmar continued to take place in South Shan (53%) and East Shan State (33%). In North Shan State, the level of opium poppy cultivation accounted for only 3% of the total area. In Kachin State, poppy is cultivated in the areas of Tanai, Waingmaw and Hpakant. In Kayah State, an increase of cultivation along the border with Shan State in Demosso, Fruso townships was observed.

In 2008, the most important increase in opium poppy cultivation was observed in East Shan State, with 36% more opium poppy under cultivation as compared to 2007, whereas in South Shan State cultivation decrease by 17%., There was a significant percentage increase (105%) in North Shan State, but the magnitude of cultivation remained modest compared to other regions. Nonetheless, a special attention should be given to this region in the next survey.

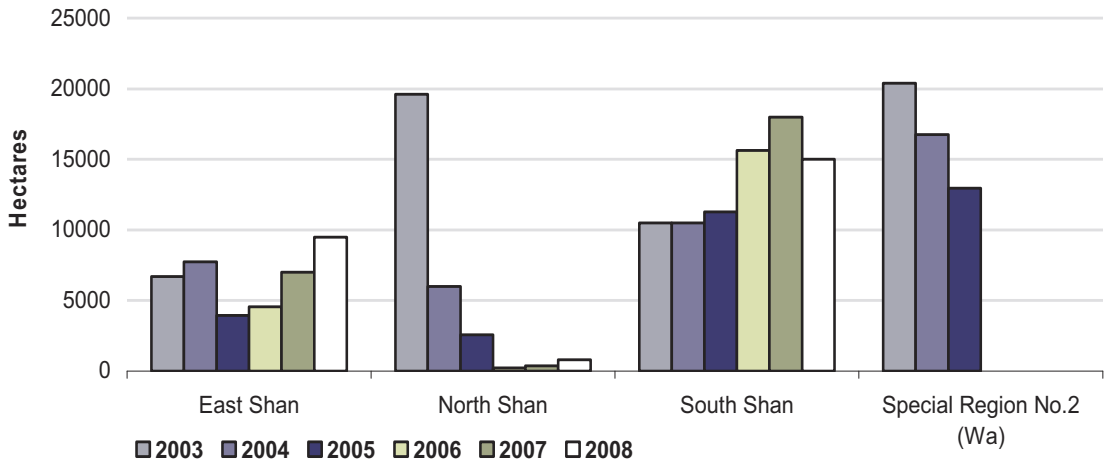
Table 2: Opium poppy cultivation by state (ha), 2007-2008

Administrative unit	2007 Opium poppy cultivation (ha)	2008 Opium poppy cultivation (ha)	2008 % of total area under opium cultivation	Variation (%)
Shan State	25,390	25,300	89%	-0.4%
Kachin State	1,440	1,400	5%	-3%
Kayah State	870	1,800	6%	+107%
National Total	27,700	27,700	100%	
Rounded Total	**27,700**	**28,500**	**100 %**	**+3%**

Table 3: Opium poppy cultivation in the Shan State (ha), 2007-2008

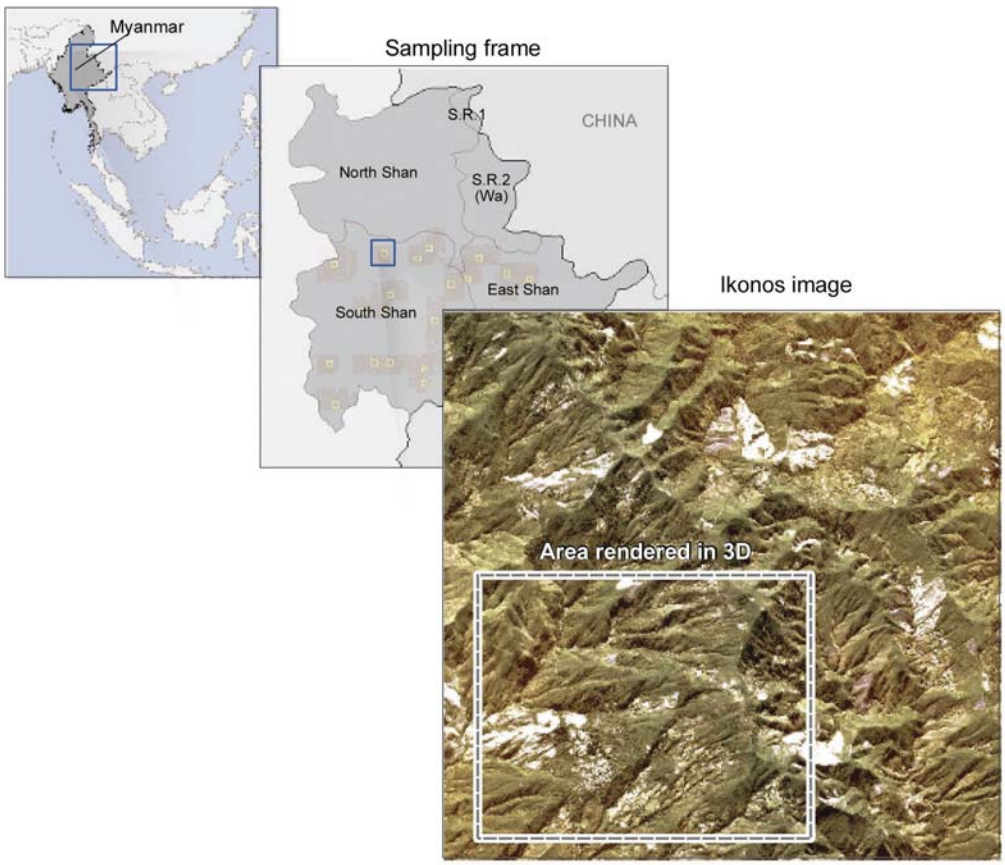
Administrative unit	2007 Opium poppy cultivation (ha)	2008 Opium poppy cultivation (ha)	Variation (%)
East Shan	7,000	9,500	+36%
North Shan	390	800	+105%
South Shan	18,000	15,000	-17%
Special Region No.2 (Wa)	0	0	0%
Total (rounded)	**25,390**	**25,300**	**-0.4%**

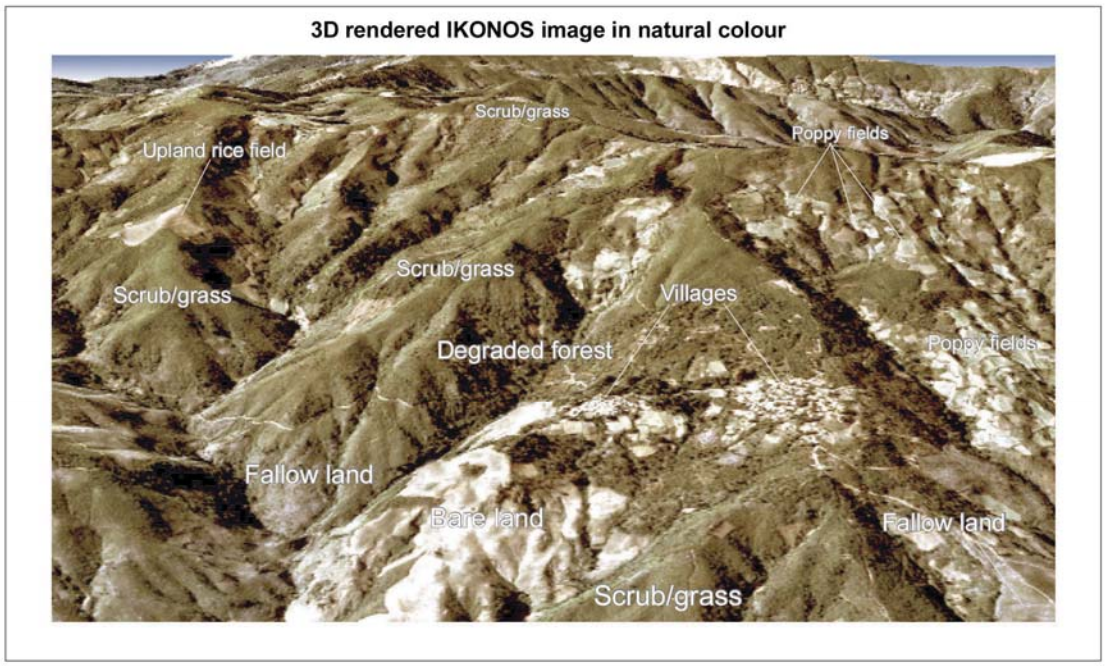
Figure 5: Opium poppy cultivation in the Shan State (ha), 2003-2008



Poppy fields in Hsih seng

Map 2: Three dimensional view of opium poppy fields on a satellite image

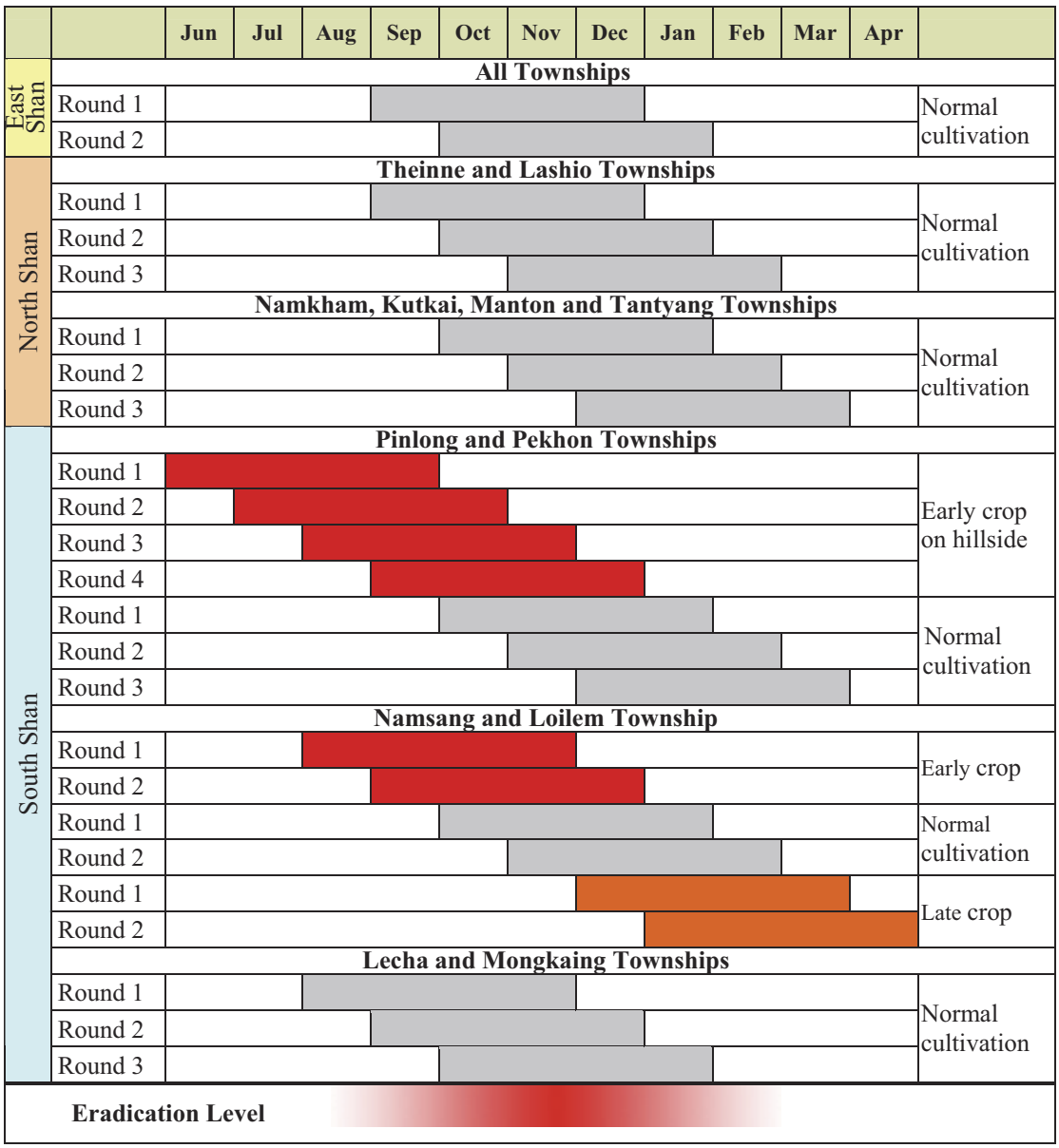




Villages and farmers involved in opium poppy cultivation

It is estimated that a total of 168,000 households were involved in opium poppy cultivation in Myanmar in 2008, with an average area under cultivation of 0.17[3] ha per household. The number of households cultivating opium poppy increased by 3% in Kayah state. The village survey revealed that opium cultivation took place in 18% of villages in the Shan State, with a higher concentration in East Shan State (31%) and South Shan State (30%). A high concentration of villages cultivating opium was found in two of the five townships surveyed in Kachin State.

Figure 6: Opium poppy calendar in Shan State



[3] Source: UNODC/CCDAC opium poppy surveys 2001 to 2004.

Early cultivation during the monsoon season

In 2008, off-season cultivation of opium poppy, i.e. early cultivation during the monsoon season, was only observed in the South Shan State. An off-season survey was conducted in September 2007[4] and additional information was collected through field observations and interviews during the village survey in 2008.

According to information gathered in previous surveys, off-season opium poppy cultivation during the rainy season takes place in addition to the normal winter opium poppy cultivation. It is unlikely that farmers cultivate opium poppy only during the off-season. Off-season cultivation was observed almost exclusively in well-drained slopes at higher altitudes. Only few, isolated cases of scarce fields with off-season cultivation were observed under other conditions.

Farmers distribute opium poppy cultivation to spread workload, to avoid the risk of crop loss due to unfavourable weather during germination or harvest, and to minimize the negative factors that may affect their fields. On large slopes with opium poppy fields, only some fields may be used for off-season opium poppy, e.g. those with good drainage close to thicker vegetation in the upper area of the slope, where water run-off can be managed by digging horizontal drainage channels across the field. The fields used for off-season cultivation may also be close to fields where opium poppy is grown at other times of the year. For example, a farmer may cultivate off-season opium poppy on field from July to October, on the adjacent field from September to December, and on another field from October to January, depending on when and where the conditions at this micro-level are optimal for opium poppy cultivation.

Data on off-season cultivation was collected in September 2007 in five townships in South Shan State (SSS), two of which showed opium poppy cultivation at a "commercial" level" (Pinlaung and Pekong). The other three had a very low level of off-season crop and is mainly destined for local consumption. Furthermore, the ecological conditions in this area were favourable for off-season cultivation as described above. Off-season opium poppy cultivation is becoming a normal practice in a few townships, calling for a need to closely monitor through extensive survey as it could contribute to an increase in the national opium production.

The practice of multistage cropping

Multistage cropping is often employed in opium poppy fields where significant eradication campaigns have taken place or where shortage of labour exists. During multistage cropping, opium poppy seeds are sown twice in the same field with an interval of one to two months. Hence, plants of two different sizes are growing in the same field at the same time.

Even if the plants from the first sowing were eradicated, the plants from the second sowing have a chance of surviving and still may provide sufficient yield, which would compensate for the loss of the first stage plants. As shown in the photos, the second crop continues to grow even after the first crop was eradicated. The practice of multistage-cropping has been widely applied throughout South Shan State. Past experience has shown that eradication measures are not conducted on the same land twice. Therefore, by using multistage cropping techniques, opium farmers can compensate some of the eradication losses.

Another practice used by farmers is staggered planting, which consists of sowing opium poppy seeds in different fields at different times in order to spread the harvest over a longer period. The opium poppy plants grow at different stages, and at the time of gum collection in the first field, the other fields will not yet be at the flowering stage, and therefore, labour requirements are better distributed.

[4] Off-season surveys started in 2006

2.2 Yield and production

The average national opium yield was estimated at 14.4 kg/ha (weighted average). This estimate was based on capsule measurements in 312 fields. This represents a 10.9% decrease compared to 2007 (which was exceptionally high). It is comparable with the estimates prior to 2007. Farmers, over the last few years, have improved opium cultivation practices by introducing better irrigation, multistage cropping and applying fertilizer when available.

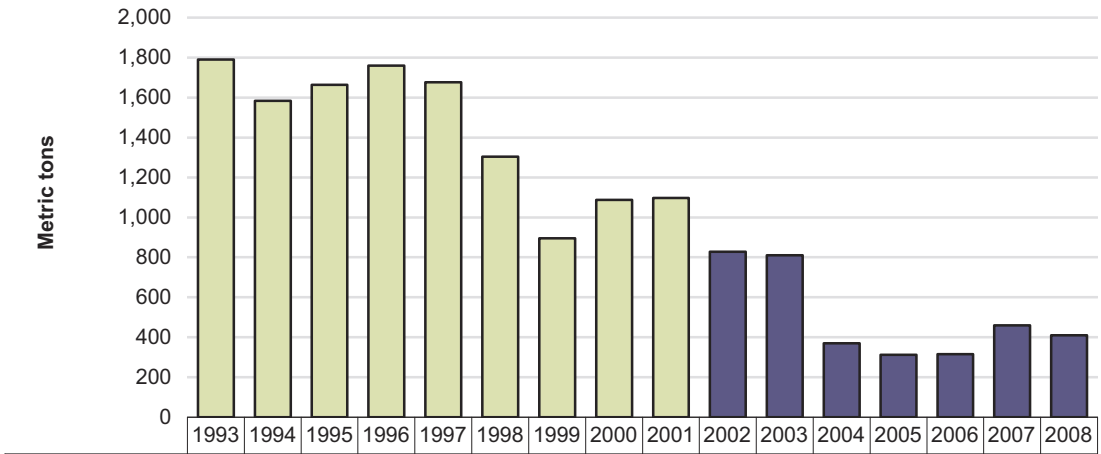
In regions where no formal yield measurements were taken or too few opium poppy fields were found, such as in Kayah, and North Shan States, the average national yield was used to calculate the potential opium production.

In some areas of Myanmar, a few opium poppy farmers sow seeds during the monsoon and then harvest before the end of the rainy season. Even if these fields are carefully maintained, the gum which is harvested from tiny capsules produces poorer quality opium that will only constitute a supplementary income for these farmers. For other farmers in these regions, it is the only poppy crop of the year. Although this practice is marginal and concentrated mainly in the South Shan State, it should be closely monitored in the future.

A very limited quantity of opium was produced in the off-season cultivation mainly in the South Shan State for internal consumption.

The total 2008 potential opium production in Myanmar was 410 metric tons, which is a 10.9% decrease compared to 2007 (460 metric tons). The decline is mainly due to the lower yield. South and East Shan State produced by far the largest amount of opium, representing 86% of Myanmar's total opium production.

Figure 7: Potential opium production (metric tons), 1993-2008

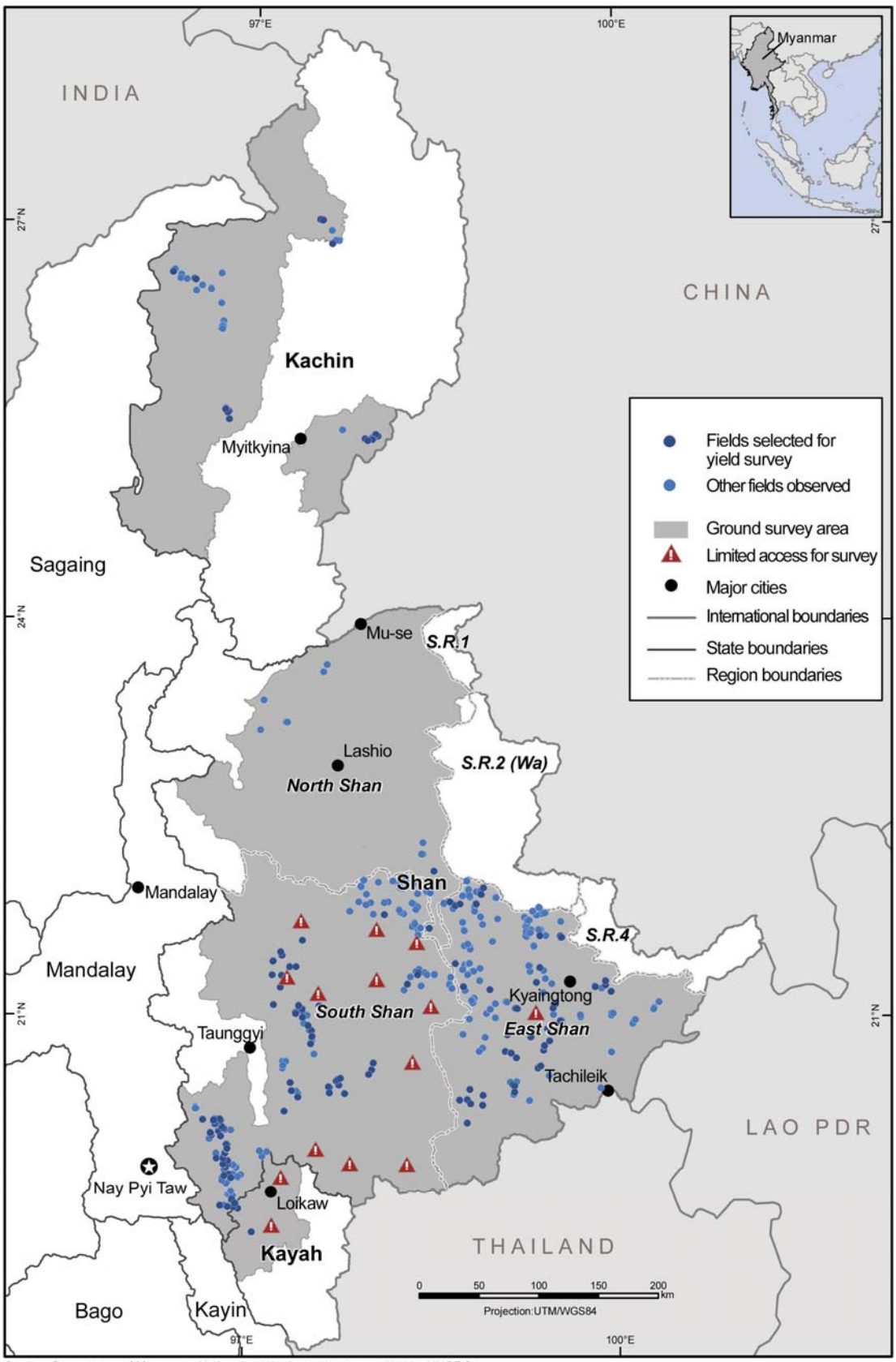


	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
USG	1,791	1,583	1,664	1,760	1,676	1,303	895	1,087	1,097							
GoUM-UNODC										828	810	370	312	315	460	410

Table 4: Potential opium production by region (mt), 2008

Region	Potential production (mt)
Kachin	25.1
Kayah	23.2
East Shan	122.6
North Shan	10.3
South Shan	228.0
Total (rounded)	**410**

Map 3: Location of opium poppy fields observed during the survey in Kachin and Shan States, Myanmar 2008



Source: Government of Myanmar - National monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

2.3 Opium prices

The price of opium in non-growing villages is usually higher than in growing villages, since opium prices are determined by the access to markets, as well as by supply and demand. In 2008, the average farm-gate price of opium weighted by the estimated area under cultivation was US$ 301/kg, which represents a 15.3 % increase from US$ 261/kg in 2007 (weighted average). The average opium price per region for 2007 was updated with information given by farmers in early 2008. This revised price is more accurate than prices reported in the 2007 survey, which only covered the first months of 2007.

The average farm-gate prices by region was: South Shan US$ 265/kg, East Shan US$ 311/kg, Kachin, US$ 518/kg and North Shan US$ 444/kg. High opium prices in North Shan State and Kachin were due to low production levels. In general, the differences in prices observed in the regions reflect the levels of availability of opium and the fragmented opium market.

Figure 8: Average farm-gate price of dry opium (US$/kg), 2007-2008

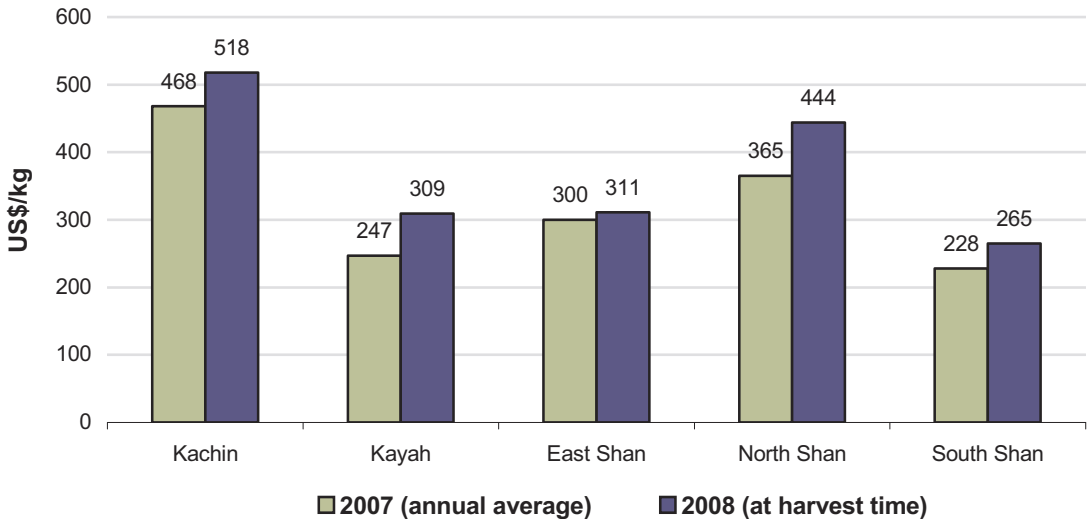
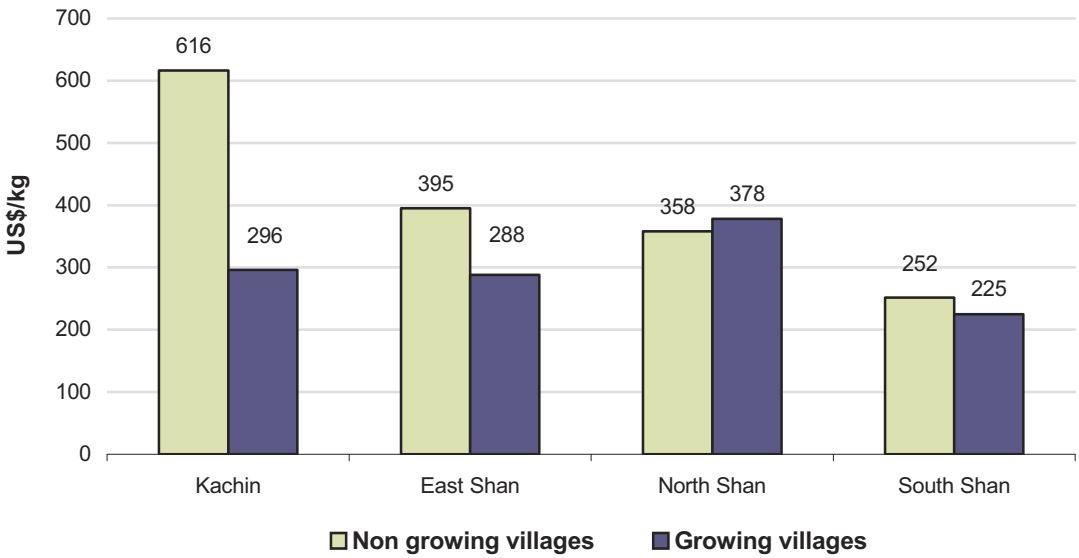


Figure 9: Farm-gate price of dry opium in growing & non growing villages (US$/kg), 2007

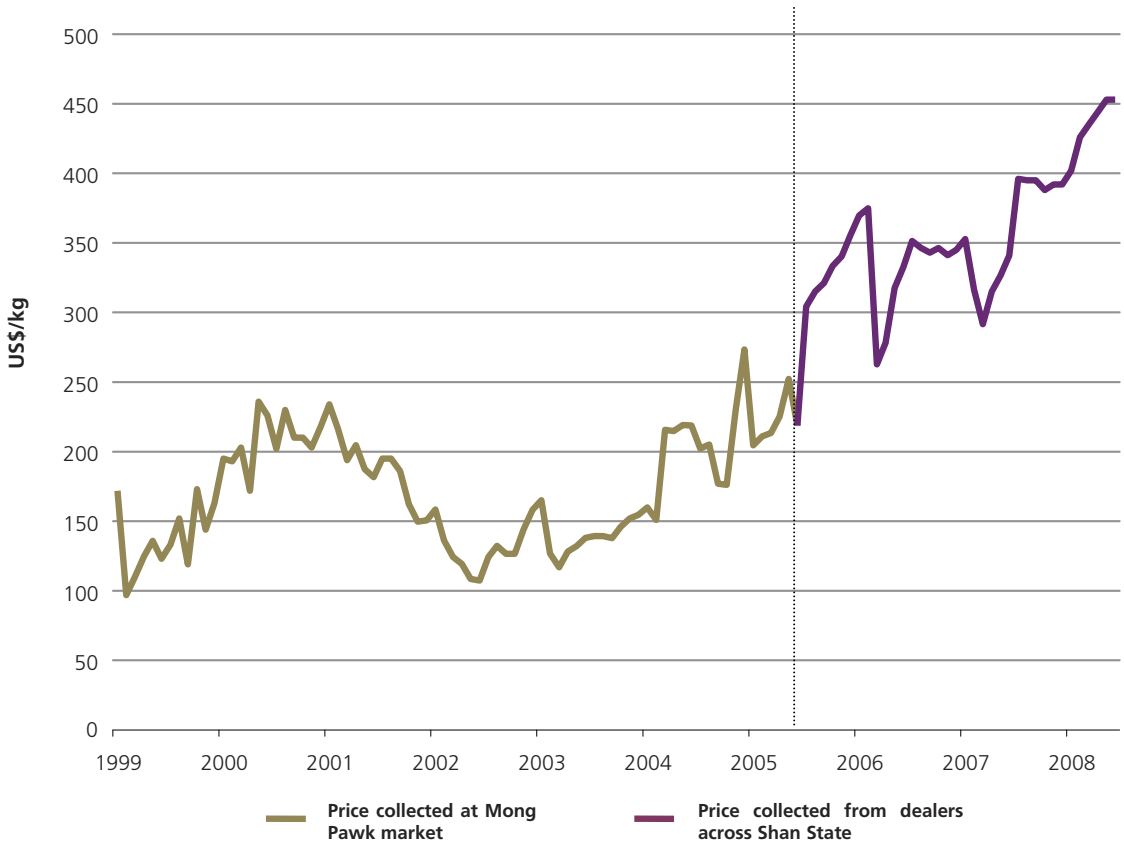


Despite an effective opium ban in Special Region 2 (Wa), opium continues to be illegally sold. The opium price in the Wa region was higher than in the South Shan State, where opium is produced in large quantities, and similar to opium prices in East Shan State, which has close links with the Wa region. It seems that the Wa region is becoming a platform where opium is bought from various regions in Shan State and sold abroad for additional profit.

Table 5: Monthly wholesale prices for dry opium at Mong Pawk, (US$/kg), 1999-2008

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
1999	172	97	110	125	136	123	133	152	119	173	144	163	137
2000	195	193	203	172	236	226	202	230	210	210	203	218	208
2001	234	215	193	204	187	181	194	195	186	162	149	150	188
2002	158	136	124	119	108	107	124	132	126	126	144	158	130
2003	165	126	117	128	132	138	146	139	137	146	152	155	140
2004	155	151	215	214	219	218	202	205	176	176	230	273	203
2005	204	211	213	225	252	300	302	315	321	333	341	355	281
2006	370	375	263	278	318	332	351	346	343	346	341	345	334
2007	353	316	292	315	327	341	396	395	395	388	392	392	359
2008	402	426	435	444	453	453							n/a

Figure 10: Monthly wholesale prices for dry opium at Mong Pawk, (US$/kg), 1999- 2008



2.4 Household cash income

In 2008, the average annual cash income of opium producing households saw an increase of 37% from last year and is estimated at US$ 687 The average annual cash income of non-opium cultivating households, including households that never cultivated and households that stopped opium poppy cultivation, is estimated to be slightly higher at US$ 721 This suggests that the poorest farmers continued growing opium poppy in 2008. An interesting trend that is observable from the last years is that the average cash income of non opium poppy growing households grew stronger (59%) than that of opium poppy growing households (37%), despite the high opium prices.

The highest income among growing and non-growing villages was found in Kachin, followed by South Shan State.

As in previous years, data showed that in East Shan State, North Shan State, and Kachin, the average income of households in villages that never grew opium poppy was higher than in villages, which grow or used to grow opium poppy. The same situation was observed in Kayah but not in South Shan State where farmers cultivated more hectares per household and obtained higher yields.

In North Shan State there is a significant difference in the total cash income in villages growing poppy compared to villages not growing poppy. In addition, the search for cash income is a determinant to grow or not grow opium poppy. There are poorer farmers growing opium poppy than richer farmers growing poppy

Figure 11: Average household cash income (US$/year), 2007- 2008

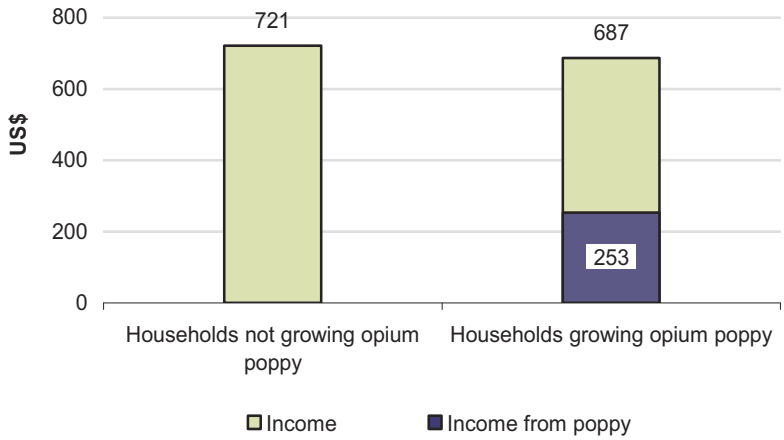


Figure 12: Average household cash income in opium poppy growing villages (US$/year), 2007- 2008

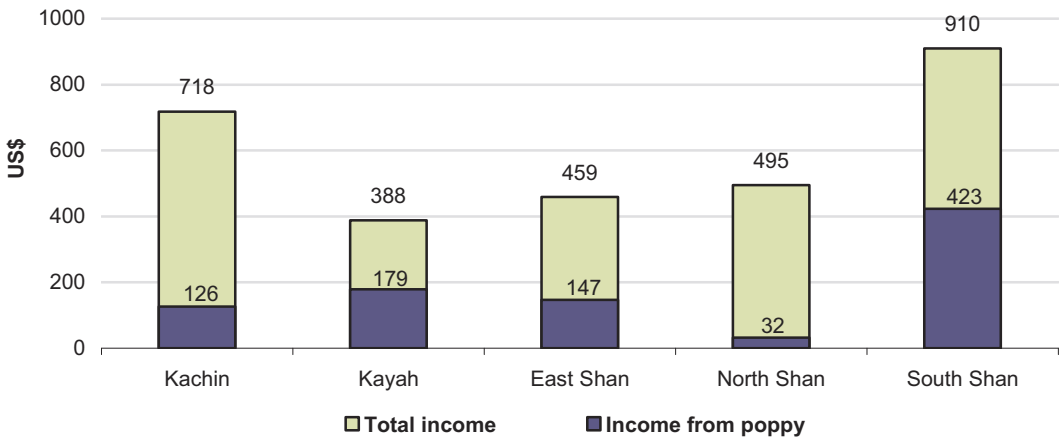
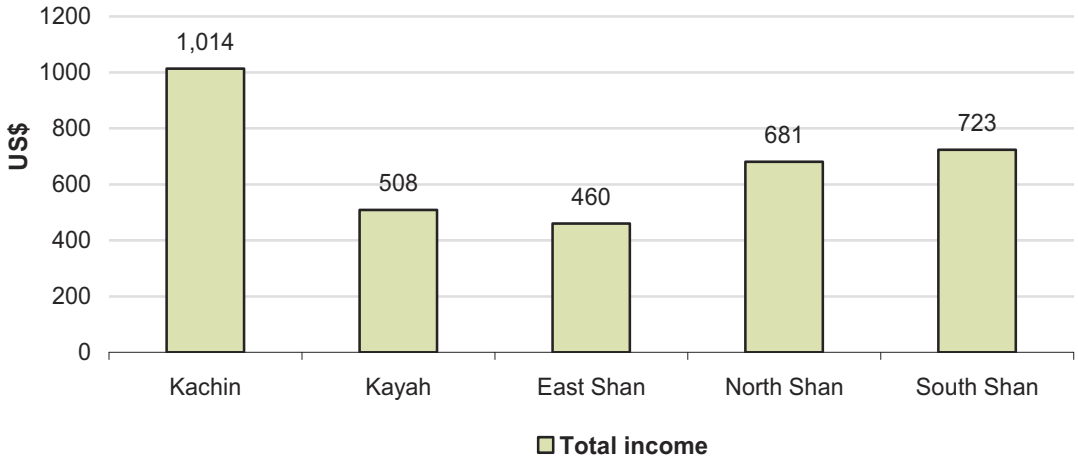


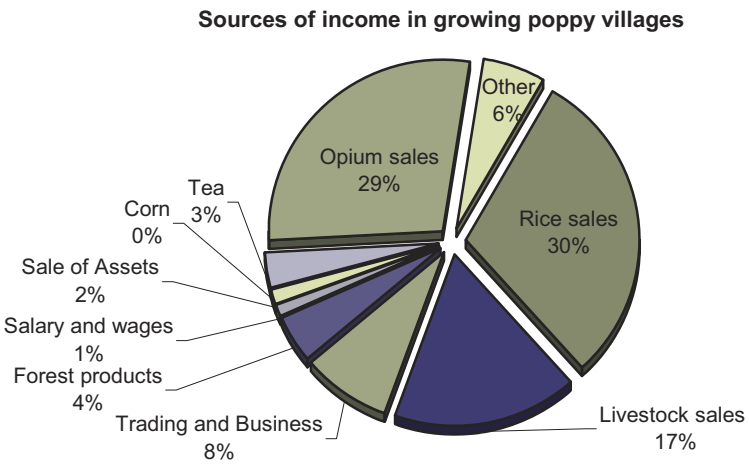
Figure 13: Average household income in non-opium poppy growing villages (US$/year), 2007- 2008

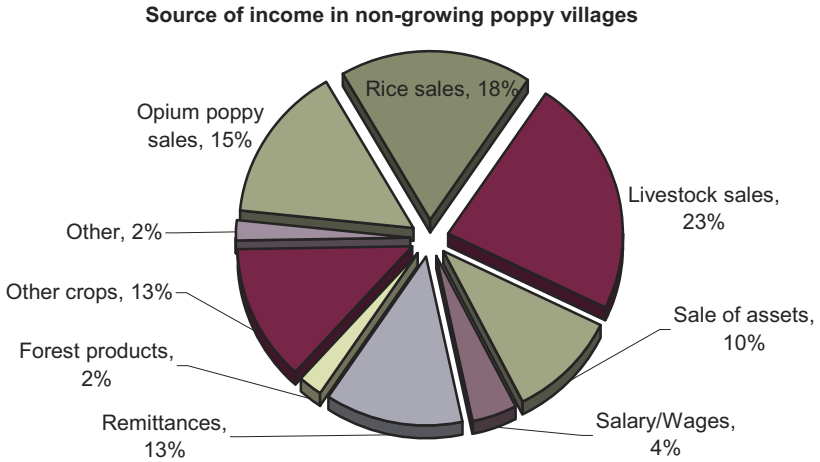


Source of income

An analysis of the different sources of household income shows that rice and livestock sales account for almost 33% of the main source of cash income in non opium poppy growing villages while it is 47% in the opium poppy growing villages. Opium sales accounted for almost 30% of household income in opium poppy growing villages. Non-opium growing villages had more rice available for sale, probably due to the availability of paddy land.

Figure 14: Income sources in villages by opium poppy status

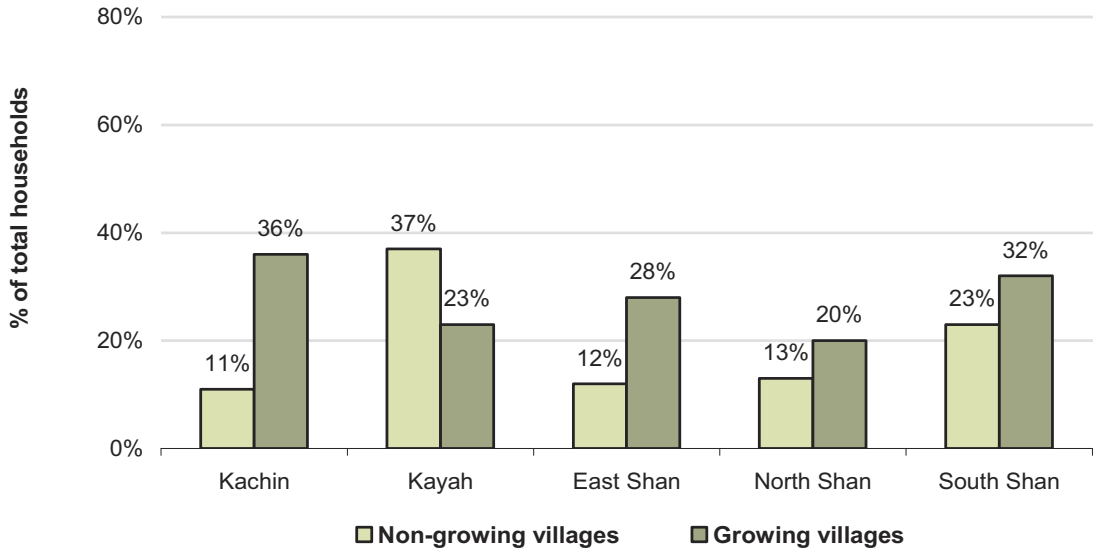




Loans

There are more households in debt in opium poppy growing villages than in non-growing villages in all regions except for Kayah State (where opium production is limited). This seems to reflect more widespread poverty in opium growing villages.

Figure 15: Households with outstanding loans from 2007



2.5 Addiction

Data on opium addiction (for population age 15 years and above) was collected during interviews with village headmen. The addicts themselves were not interviewed and no data on their level of consumption was collected.

According to the data reported by the headmen, the prevalence rate of opium users in Shan State, Kachin and Kayah was 1.1%. This proportion was higher in opium growing villages (2.3%) compared to non-growing villages (0.5%). The level of opium addiction found in East Shan State was the highest with 1.8 %, followed by Kachin state with a prevalence rate of 1.6%.

In the East Shan State and the South Shan State, there is a significant difference in the number of people using opium daily between villages growing poppy and those not growing poppy. Opium addiction resulted to be a significant predictor in estimating the village probability of growing poppy in a logistic regression ($p < 0.001$)[5] and vice versa.

As in previous years, opium abuse was more predominant among men (2 %) than women (0.2%). Data was also collected on treatment of drug addicts. The data shows that only one out of six addicts were untreated. The relapse rate for treated addicts was 34% in non-growing villages, compared to 86% in growing villages. These results demonstrate how difficult it is to successfully treat opium addicts in villages, which still grow opium poppy, and where opium is thus more easily available and cheaper than in non-growing villages.

The overall prevalence rate of heroin users was 0.12%. This is still low though 50% higher than in 2006. The prevalence rate of ATS users was 0.03% (lower than in 2007). Those two types of addiction remain at a low level in rural Myanmar compared to urban areas where other sources indicate higher rates of abuse.

[5] The logistic regression considers as growing and non growing poppy as dependant variable; that means that more numbers of addiction translate into more poppy cultivation.

These results should be interpreted with caution, as there might be a reluctance of respondents to report opium, heroin and ATS addiction in the context of the Government's effort to curb such addition.

Table 6: Opium, heroin and ATS addiction rates as reported by headmen (% of population aged 15 and above), 2008

Description	Non-growing	Growing	Total
Opium addiction (men)	1.0%	4.1%	2.0%
Opium addiction (women)	0.06%	0.5%	0.2%
Heroin addiction	0.16%	0.03%	0.12%
ATS addiction	0.04%	0.01%	0.03%
Ratio of treated to untreated addicts	4.31	9.98	5.67
Rate of relapsed addicts	34%	86%	46%

2.6 Socio-economic characteristics of the surveyed population

The survey aimed at identifying relevant characteristics of opium growing households, including reasons for growing opium poppy and coping strategies when households abandon opium poppy cultivation. It also looked at issues, which could be linked to continuing or stopping opium cultivation, such as shifting cultivation practices and migration.

Food security

Food security (for this purpose defined as: rice self sufficiency) was consistently better in households that were not involved in opium poppy cultivation, compared to households which grew opium poppy. 43% of the households in the growing category in Shan State (North, East and South State) will suffer from rice deficiency versus 25% of those in the non growing category.

In East Shan and South Shan State, about half of the households that were growing poppy, did not have the minimum required quantity of rice. This finding stresses the link between opium poppy cultivation and low food security and draws closer attention at the response, "to buy rice", as one of the main reasons for cultivating opium poppy. In addition, a shortage of livestock, encourages villagers to find alternative ways to assure food security or sources of income.

Table 7: Villages that do not grow opium poppy

Region	Enough rice for 12 months	Rice deficiency			
		3 months	6 months	9 months	12 months
East Shan	82%	11%	4%	3%	1%
Kachin	82%	9%	5%	2%	2%
Kayah	51%	16%	14%	11%	8%
North Shan	77%	11%	6%	4%	2%
South Shan	66%	12%	10%	6%	6%
Total	**75%**	**11%**	**7%**	**4%**	**3%**

Table 8: Villages that grow opium poppy

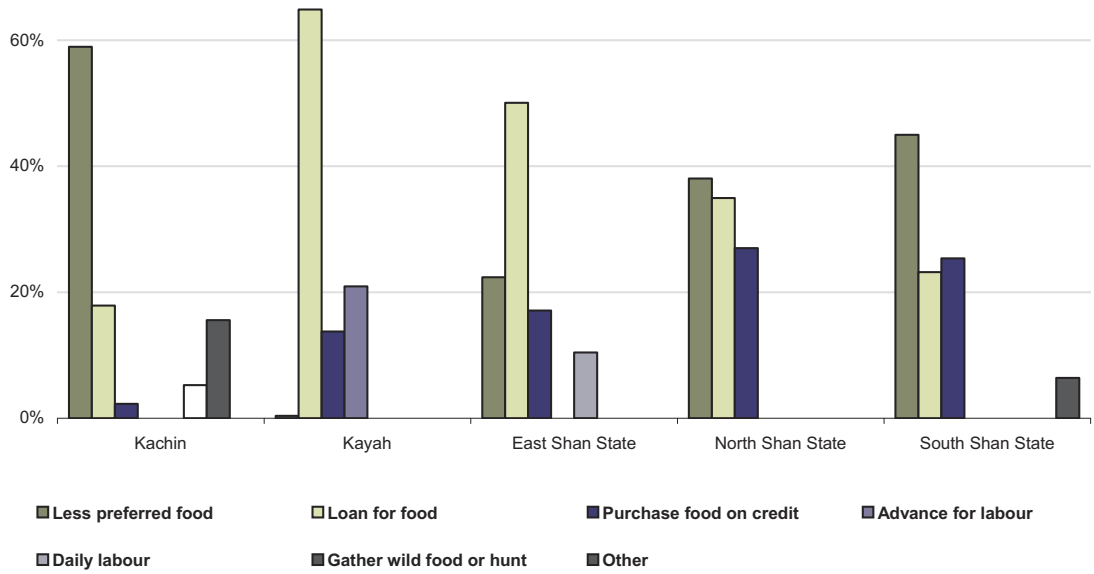
Region	Enough rice for 12 months	Rice deficiency			
		3 months	6 months	9 months	12 months
East Shan	69%	21%	8%	1%	0%
Kachin	51%	24%	14%	4%	7%
Kayah	56%	14%	13%	7%	10%
North Shan	68%	14%	5%	10%	3%
South Shan	51%	20%	13%	8%	7%
Total	**56%**	**20%**	**12%**	**6%**	**6%**

Coping strategies after stopping opium poppy cultivation

In villages that stopped opium poppy cultivation in recent years, households expanded their agricultural activities by growing more maize, rice and other licit crops to compensate for the lost income from opium. Wage labour and sale of livestock also played an important role. More worrying are strategies such as selling household assets, taking children out of school, or taking loans, which indicate a deterioration of the situation of individual households and a long-term erosion of its human and economic assets.

The most frequently mentioned coping strategies in all regions were: assistance from friends and loans for food. This indicates that, contrary to previous years, farmers might have been more inclined to utilize rice banks to overcome their food deficits. Rice banks are village committees that, on behalf of member farmers, receive paddy or seeds from farmers with surpluses and lend them to needy farmers at an appropriate interest rate. The collected interest is used as a village fund.

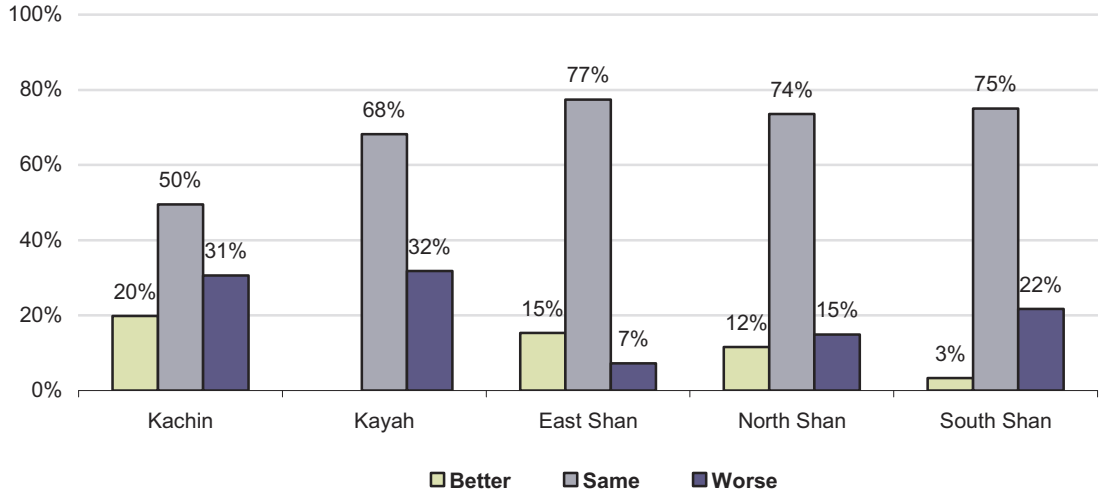
Figure 16: Coping strategies in households that stopped opium poppy cultivation in Shan State



Food situation after stopping opium poppy cultivation

Among the villages that had stopped opium poppy cultivation in mostly in 2006 the food situation became worse in 7% of the villages in East Shan State, 31% in Kachin, 15% in North Shan State and 32% in Kayah. In almost all the villages that grew opium the food situation did not improve, compared to last year. In the villages that never grew poppy only 9% of all villages reported that their food situation worsened.

Figure 17: Change in food situation in villages which stopped opium poppy cultivation



Paddy land availability

In 2008, like in previous surveys, households in non opium poppy growing villages showed a slightly higher ownership of paddy land as well as the size of paddy land owned, compared to households in the opium poppy growing villages.

The national average of land ownership size is 1.7 ha in non opium poppy growing villages versus 0.7 in opium poppy growing villages. In Shan states the average land ownership size is about 0.9 ha in non opium poppy growing villages versus 0.5 ha in growing villages.

In South Shan State the number of households owning paddy land and the average land area are greater in non growing villages than in growing villages.

Table 9: Proportion of owned paddy land and owned average area per household per region, 2008.

Region	Non-growing villages		Growing villages	
	% of paddy land owner	Average area in ha owned per household	% of paddy land owner	Average area in ha owned per household
Kachin	40%	2.4	47%	1.1
Kayah	37%	1.4	57%	1.1
East Shan	50%	0.9	44%	0.6
North Shan	25%	1.0	28%	0.5
South Shan	35%	0.9	27%	0.5
National average	**37%**	**1.7**	**36%**	**0.7**

Shifting Cultivation

Shifting cultivation often takes place in areas unsuitable for permanent cultivation such as steep and hilly areas. The slopes are usually covered by forest and/or shrubs, which farmers clear for opium poppy fields or other crops. Shifting cultivators in the Shan State, who typically have little or no paddy land, grow upland rice and opium poppy, as part of their rotational cultivation system. Most crops produced in these geographical conditions are usually low yielding. Shifting cultivation is a common practice in opium poppy growing villages.

As in previous years, shifting cultivation increased significantly in South Shan State where most of opium poppy was cultivated in 2007 and 2008. The same trend was observed in North Shan State among opium poppy growing villages. Observations and interviews with farmers showed that households that had difficulties used shifting cultivation to make ends meet.

Figure 18: Proportion of households adopting shifting cultivation in non opium poppy growing villages

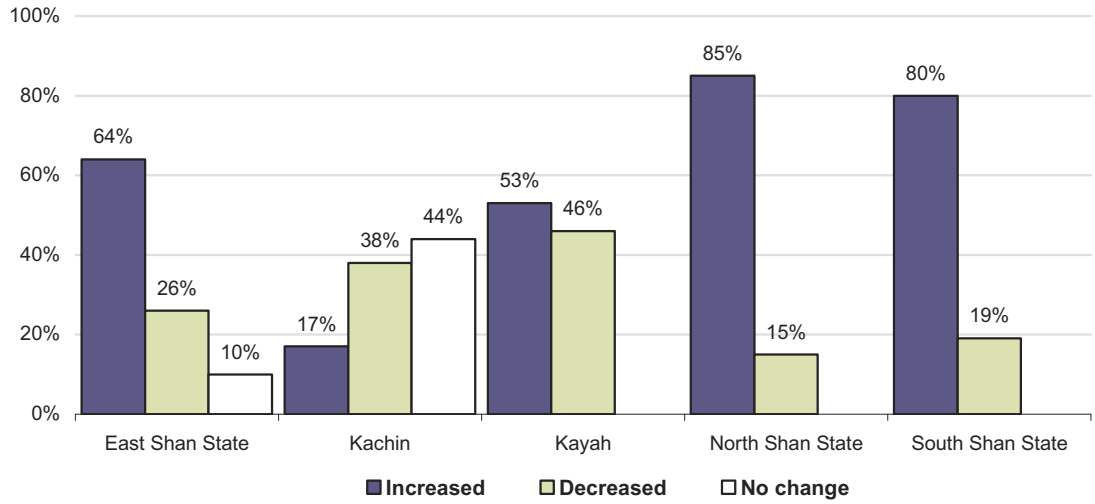
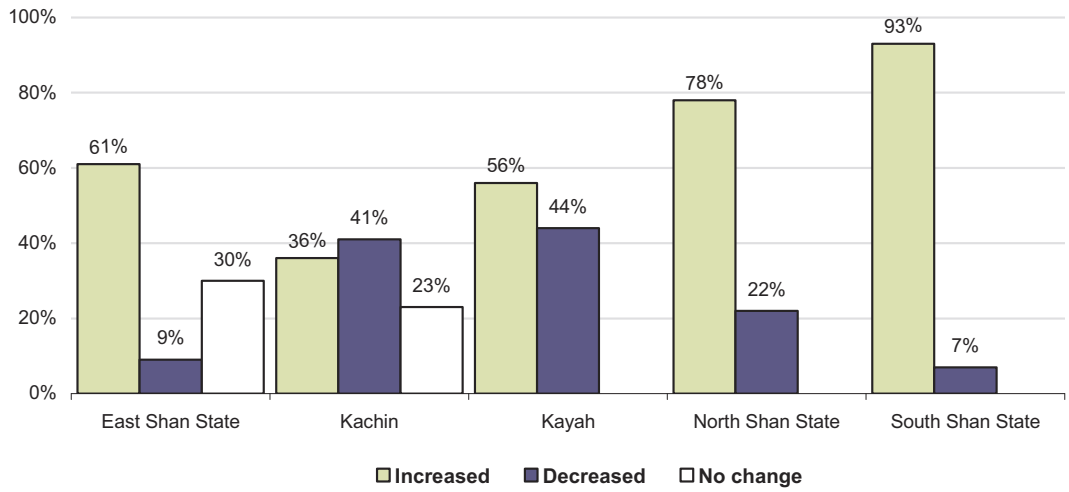


Figure 19: Proportion of households adopting shifting cultivation in opium poppy growing villages



School situation in villages

Access to education is a major problem in Myanmar. Overall, 40% of the surveyed villages do not have schools in their proximity. This figure is quite similar across non-opium poppy growing villages (37%) and opium poppy growing villages (44%). However, looking at different states, it is possible to see from the figure below that while the South Shan state does not offer a marked difference across the two types of villages, the other states indicate stark differences.

In East Shan, for examle, 63% of the opium poppy growing villages do not have access to education in the village, compared to 44% in the non opium poppy growing villages. Access to school with secondary education is limited to only 6% of the vilages surveyed while about 55% of all the villages had primary school at least.

Table 10: Village schooling

School situation	Type of school		
	None	Primary	Secondary
In villages not growing poppy			
Kachin	14%	74%	12%
Kayah	19%	74%	8%
East Shan	44%	51%	5%
North Shan	61%	38%	1%
South Shan	36%	63%	1%
Total in villages not growing poppy	**37%**	**58%**	**5%**
In villages growing poppy			
Kachin	31%	53%	16%
Kayah	0%	89%	11%
East Shan	63%	36%	1%
North Shan	39%	56%	6%
South Shan	32%	59%	8%
Total in villages growing poppy	**44%**	**50%**	**6%**
Total in all surveyed villages	**40%**	**55%**	**6%**

Migration

In almost all regions, migration was higher in 2008 compared to 2007. As in previous years, the highest migration rate with 21 migrants per 1,000 inhabitants was found in Kayah among opium poppy growing villages. In South Shan State 19 people per 1,000 in opium poppy growing villages migrated. In South Shan State, independently of whether villages grew opium poppy or not, up to 17 persons per 1,000 inhabitants migrated. Like last year, Kachin and North Shan had comparatively lower migration rates. According to key informants, there are farmers who used to cultivate opium in the Wa region who are migrating outside the Wa region to grow opium poppy.

In the East Shan State there is a significant difference between the number of people leaving their own villages from the opium poppy growing villages and from the villages not growing opium poppy. In addition, migration, defines whether the village is growing or not growing poppy. In other words, more people leave their villages looking for better economic situation and this is more likely in non opium growing poppy villages.

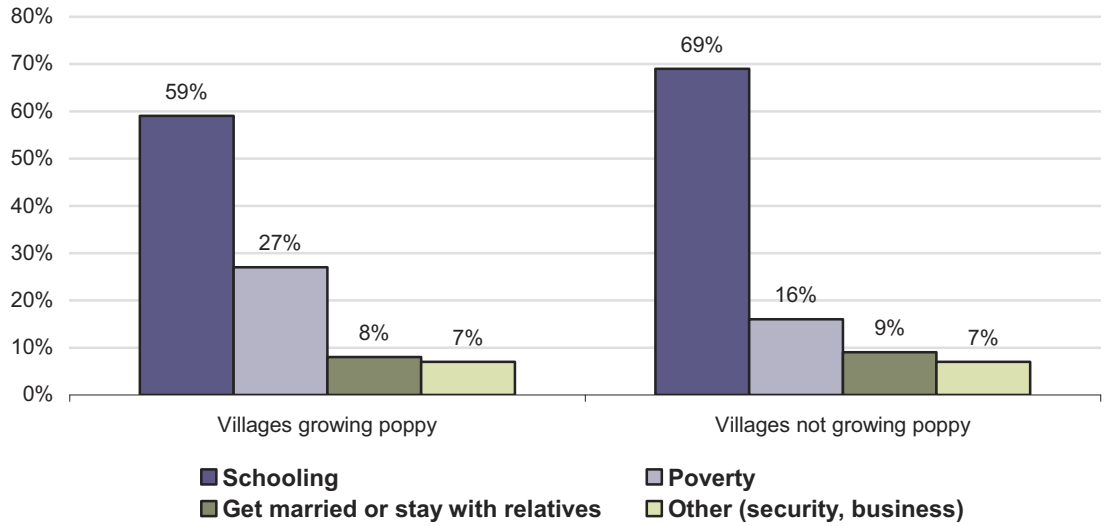
Table 11: Out-migration rates in the sampled villages, 2008

Region	In non-growing villages	In growing villages	Total
Kachin	0.3%	1.1%	0.4%
Kayah	1.3%	2.1%	1.4%
East Shan	1.5%	1.1%	1.3%
North Shan	1.0%	1.2%	1.1%
South Shan	1.4%	1.9%	1.7%
Total	**0.7%**	**1.5%**	**1.0%**

Reasons for emigration

Schooling was the highest reason for emigrating with as many as 59% in opium poppy growing villages and 69% in non opium poppy growing villages mentioning it. A distance second reason was Poverty with 27% and 16% stating it in opium poppy growing and non opium poppy growing villages respectively. About 8%-9% of the respondent indicate marriage as a reason for emigration while only 7% mentioned other reasons which included security, business, opium ban etc.

Figure 20: Reasons for leaving the village.



Communications

Telephones are rare in Myanmar and cellular phones are limited to main cities. Villagers have almost no access to communications. Only 13% of the surveyed villages had access to telephones in 2008. In Shan state only 7% have access to telephone. In Kachin, 36% of the surveyed villages have a telephone. These villages can take advantage of the Chinese telephone network. In Shan State only 3% of the villages growing opium poppy have access to a telephone versus 12% of non-growing villages.

Table 12: Percentage of villages having access to telephone in Shan State

	Proportion of villages with our without telephone in the village	
Shan State	**Without**	**With**
Growing villages		
East Shan	85%	15%
North Shan	88%	12%
South Shan	94%	6%
Total villages growing poppy	**88%**	**12%**
Non-growing villages		
East Shan	99%	1%
North Shan	78%	22%
South Shan	98%	2%
Total villages non growing	**98%**	**3%**
All villages	**93%**	**7%**

ROADS

Roads are usually very under-developed in Myanmar. In 2008, only 9% of the surveyed villages were accessible through a tar road (4% in opium poppy growing villages, 13% in non opium poppy growing villages). In Shan State, only 6% of the surveyed villages have access to a tar road while 13% have no roads at all.

Table 13: Regional road network

Region	Type of roads			
	All weather road	Mud road	Tarmac road	Roads
Kachin	29%	47%	17%	7%
Kayah	23%	54%	24%	0%
East Shan	17%	61%	10%	13%
North Shan	13%	79%	6%	2%
South Shan	23%	55%	11%	11%
Total for non growing villages	**20%**	**61%**	**13%**	**6%**
Kachin	33%	47%	11%	9%
Kayah	44%	44%	11%	0%
East Shan	6%	58%	1%	36%
North Shan	11%	72%	6%	11%
South Shan	18%	75%	5%	2%
Total for growing villages	**16%**	**64%**	**4%**	**17%**
Grand total	**18%**	**62%**	**9%**	**10%**

Assistance

Villages in South Shan State that received no benefit in 2008 from external aid were more likely to plant opium poppy as a coping strategy to guaranty food security in the village. This, however, was the case in Kayah and Kachin States.

Figure 21: % of non-opium growing villages that received aid.

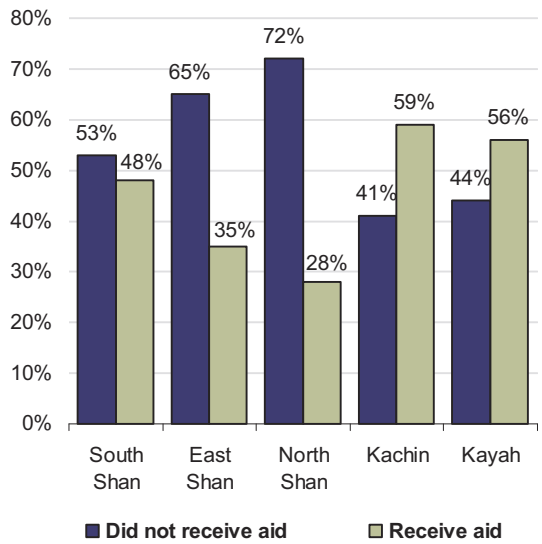
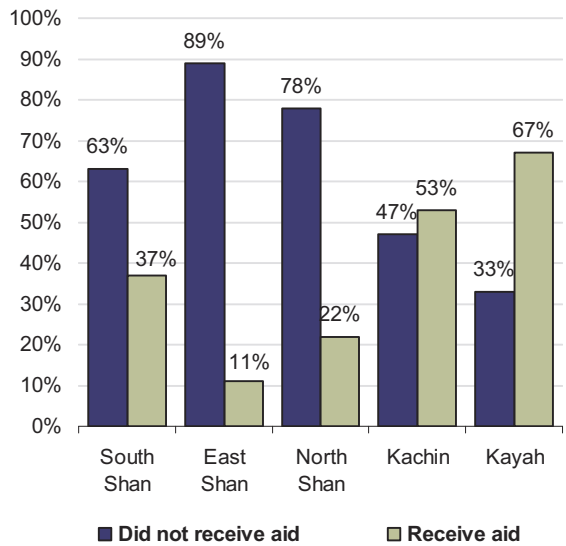


Figure 22: % of opium growing villages that received aid



2.7 Reported Eradication

According to the government of Myanmar reports, a total of 4,820 ha were eradicated in 2007-2008, which is an increase of 34% compared to the eradication in 2006-2007 when 3,598 hectares were eradicated. Eradication in Kachin State was four times higher than a year earlier but still below the level reported in 2005. Eradication in East Shan State increased by 13% and in South Shan State by 33%.

Poppy fields just after eradication.

Some plants survived from the slashing.

Table 14: Eradication by region (ha), 2004-2008

Region	2004	2005	2006	2007	2008
East Shan	195	124	32	1,101	1,249
North Shan	172	1,211	76	916	932
South Shan	2,170	1,203	3,175	1,316	1,748
Shan State Total	**2,537**	**2,538**	**3,283**	**3,333**	**3,929**
Kachin	126	1,341	678	189	790
Kayah	83	8	0	12	12
Total within the surveyed area	**2,746**	**3,887**	**3,961**	**3,534**	**4,731**
Magwe	0	0	0	45	0
Chin	0	3	0	10	86
Mandalay	0	0	9	0	3
Sagaing	74	17	0	9	0
Other States	74	20	9	64	0
National Total	**2,820**	**3,907**	**3,970**	**3,598**	**4,820**

Similar to last year, survey teams observed the re-growth of opium poppy plants in previously eradicated fields indicating that farmers might have practiced multistage cultivation or even replanted their fields after eradication. Those fields were, however, much less productive compared to non-eradicated fields.

Replanted poppy fields in Waingmaw

Some fields were re-planted after eradication in Sadone area in Waing Maw Township. Farmers used plastic sheets to cover the fields from heavy dews and used sprinklers for irrigation. After this treatment plants were more vigorous.

Under the cease-fire agreements, ethnic groups have a certain degree of autonomy and self governance. In the main opium poppy cultivation areas in South Shan State, the Government was able to assert a certain degree of control, and some local authorities agreed to phase out opium poppy cultivation, such as the Paoh National Organization. However in most of these areas, no alternative sources of income were available and, therefore, local authorities were reluctant to conduct eradication activities or proceed with opium elimination.

3 METHODOLOGY

3.1 Description

This is the seventh year the Central Committee for Drug Abuse Control (CCDAC) of the Union of Myanmar collaborates with the United Nations Office on Drugs and Crime to implement the annual Myanmar Opium Survey.

The pattern of opium poppy cultivation continued to change in Myanmar: Some areas became opium free while some others increased their level of cultivation. In South Shan State, the opium poppy crop calendar changed and new patterns such as multi-cropping were observed. Opium fields generally moved further away from the villages and, in certain regions, were subject to eradication. In addition, cultivation possibly shifted to areas already considered opium free or to climatically less favourable regions. In 2008, all these considerations, combined with reduced accessibility and the expected change in cropping pattern, influenced the survey methodology and the sampling procedure for the estimation of the planted area and other socio-economic indicators.

Considerable efforts have been made over the last two years to improve various methodological details and to adapt to the evolving conditions of cultivation. This survey integrated the ground data collection component and combined the use of satellite remote sensing with field surveys and interviews.

The 2008 opium poppy survey was composed of three parallel components:

1. A cultivation estimation survey throughout the three regions of the Shan State (North, South, East), the Kayah State and the Kachin State. The survey was based on the use of satellite remote sensing as the primary source of data for East and South Shan State. In these two regions, satellite remote sensing was supplemented by field surveys to provide ground truthing and to support the interpretation of opium poppy fields. In the remaining regions, the estimate of the planted area was derived from the socio-economic survey described below;

2. An opium yield survey in the three regions of Shan State, and Kachin;
3. A socio-economic survey in 1,000 villages randomly selected in Shan State, Kayah State, and Kachin State based on interviews with village headmen and other people who play an independent role in the life of the villages.
4. Rapid assessment survey.

Sampling procedure for village survey

The planning of the surveys started with the definition of the sampling frame. The sampling frame is composed of the complete village listing provided by the Central Committee for Drug Abuse Control in Myanmar. The village listing includes names of villages, regions, township names and codes, village tract codes and, in some cases, opium poppy growing history. This listing is regularly updated with information obtained through previous surveys to reflect changes in village location or name, village mergers and relocations, and to delete double entries. For many village entries, GPS positions have been added, which facilitates the unique identification of each village. The more information is available about the population, the easier it is to devise a sample that will lead to more accurate estimates.

The definition of the sample size was influenced by a number of requirements and constraints. The main requirement was the level of accuracy considered acceptable for the estimates, whereas the constraints were either economical or logistical.

It was agreed that the socio-economic survey would be conducted with a sample size of 1,000 villages. This is approximately 7% of the 13,049 villages listed by the General Administrative Department. The village database may not be as accurate as desired despite efforts to update it. Thus, a contingency plan was developed at the time of the sample selection. Additional names of villages were selected and added to the list. Nonetheless, the sample size had to be reduced as in several cases neither the originally sampled villages nor the replacement villages could be identified on the ground. The stratification structure of sample, however, was kept intact.

A total of 700 villages in the Shan State, 100 villages in Kayah State and 200 villages in Kachin State were selected, out of which 931 villages could be surveyed.

Table 15: Composition of the sample of the village survey

Particulars	North Shan	South Shan	East Shan	Kayah	Kachin	Total
Projected number of villages to be surveyed	200	250	250	100	200	1,000
Actual number of villages surveyed	183	233	233	89	185	923

The ethnic composition of the regions of the Shan State is possibly the most diversified in the whole of the Union of Myanmar. The sampling of this year reflects major ethnic groups present in each surveyed region.

3.2 Survey Organization

The surveys were coordinated by the UNODC/ICMP office in Yangon and, as in previous years, operationally implemented in close collaboration with Myanmar official institutions.

The ground survey to measure opium yield and socio-economic indicators were supervised and implemented by CCDAC, while UNODC/ICMP provided technical support, coordination and supervision with national and international staff throughout the survey. The rapid assessment survey, as well as the assessment of opium ban in Shan Special Region 2 (Wa), was implemented directly by UNODC/ICMP in close collaboration with CCDAC and Wa local authorities that participated in the field supervision. The other rapid assessment surveys in Shan Special Region 1 (Kokang), Shan Special Region 4 and Chin State were carried out by UNODC/ICMP. A similar rapid survey was programmed for Sagaing but could not be implemented after access to the field had been denied.

The area estimation was conducted in collaboration with the Remote Sensing and GIS Section of the Forest Department, Ministry of Forestry. Three teams, each comprising of two surveyors from the Remote Sensing and GIS Section, visited the field with printouts of the satellite images. Once they reached the area represented in each single scene, they annotated the print with the land use classes and relative boundaries proceeding along with specific transect itineraries. Back in the office, the ground truth data were used to classify the satellite images combining digital and visual interpretations. The results were subject to quality control by an international remote sensing expert at UNODC Headquarters.

3.3 Field Operations

Field operations for the village survey started in the first week of December 2007 and continued until mid-February 2008 for Shan and Kayah States and up to March 2008 for Kachin State. Only 7% of the villages could not be visited by field surveyors.

In 21 out of 22 satellite image locations ground truth data could be collected. For the village and field surveys, 180 surveyors carried out the field work from 5 December 2007 to mid-February 2008. In Kachin State where opium is harvested later, the date was extended up to the end of March 2008. The surveyors were organized in 60 teams (17 teams for North Shan, 16 teams for South Shan, 14 teams for East Shan, 4 teams for Kayah State and, 9 teams for Kachin State). In each team, there was one surveyor from the Myanmar Police Force, one from the General Administrative Department and one from the Settlement and Land Records Department or the Myanmar Agriculture Service from each township. Work was coordinated by a head supervisor and three regional national supervisors. Additionally, one UNODC international officer monitored the entire field work. The survey teams were all involved in interviews with the village headmen and heads of households, as well as in field measurements for the collection of yield estimation variables.

Three survey teams were assigned to each of the three townships with a heavier workload (Pinlaung in South Shan State, Kyaingtong in East Shan State and Waingmaw in Kachin State), and two teams were assigned to another eight townships (Demosso in Kayah State, Lashio, Tant Yang and Thibaw in North Shan State, Mongpyin and Metmang in East Shan State and Putao and Moenyin in Kachin). One survey team was assigned to each of the sub-townships such as, Naungtayar and Pinlon in South Shan State, Tarmonyae in North Shan State, Mongkoe in East Shan State.

The field work survey started on 5 December 2007 in South Shan and Kayah States with all 20 teams and finished on 15 February 2008. 14 teams in East Shan State started working on 25 December 2007 and finished field work on 15 February 2008. Likewise, 17 teams in North Shan State started working on 1 January 2008 and finished on 15 February 2008. The teams in Kachin State (9 teams) started survey work on 20 January 2008 and continued until 31 March 2008. The supervision teams met with all the teams during the field survey to assess

the progress of the survey and ensure quality control. The duration of the main ground survey was 8 weeks, and operations were wrapped up with a debriefing by the end of March 2008.

As the majority of opium gum collection takes place between early September and late December, it was of vital importance that surveyors commence their work as early as possible, in order for them not to miss the opportunity to measure the opium poppy capsules.

For the second time, a limited survey in five townships in South Shan State was conducted from early September until early October prior to the normal season's ground survey in order to study the extent of off-season opium cultivation.

Table 16: Opium poppy yield estimation and socio-economic survey fact sheet

	North Shan	South Shan	East Shan	Kayah	Kachin	Total
Start Date	01-Jan 2007	05-Dec 2007	25-Dec 2007	05-Dec 2007	20-Jan 2008	01-Jan 2007
End Date	15-Feb 2008	15-Feb 2008	15-Feb 2008	15-Feb 2008	31-Mar 2008	31-Mar 2008
Survey Teams	17	16	14	4	9	60
Targeted Village Tracts	195	127	116	53	88	579
Surveyed Village Tracts	178	115	112	50	88	543
% of Village Tracts	91%	91%	97%	94%	100%	94%
Targeted Villages	200	250	250	100	200	1000
Surveyed Villages	183	233	233	89	185	923
% of Villages	92%	93%	93%	89%	93%	92%
Households covered	8558	13753	7113	7055	23858	60337
% of Households	3%	3%	5%	16%	6%	5%
Population covered	45620	75092	38713	38777	147112	345314
% of Population	3%	4%	6%	18%	8%	5%

3.4 Area estimation procedures

The area estimate for South and East Shan were based on the interpretation of satellite images. The other regions required a different approach, as their level of opium poppy cultivation is much lower. Here, the area estimate was based on the village sample survey.

For the area estimate of opium poppy cultivation in South and East Shan, a remote sensing methodology was applied with very high-resolution satellite images from selected sample locations in the study area.

At 28 selected locations, Ikonos images with 4-meter resolution (4 bands) were acquired. The number of images was defined by the availability of the budget, but it is the highest number of sample locations of the last 4 surveys. For every location, images at two different dates were purchased with a 5 weeks interval (December/January and February/March). Two date images facilitate the identification of the opium poppy, taking into account the different crop calendars for every region obtained from the former surveys.

Sampling frame for the selection of satellite image locations

To select the sample locations of the satellite images, the sampling frame of last year's survey was improved and adjusted with new information. The sampling frame was developed by the combination of the following factors:

- Land cover 2005

- Altitude/slope
- Opium poppy free areas according to ground information.

The *land cover map* was developed by classifying 6 Landsat-5 satellite images taken in February/March 2005. From this map, the large agricultural areas were extracted and considered as poppy free, since the cultivation of opium poppy is practised in small agricultural areas, often surrounded by natural vegetation. Wetlands and settlements were also excluded. The other land use classes were considered as potential for opium poppy growing.

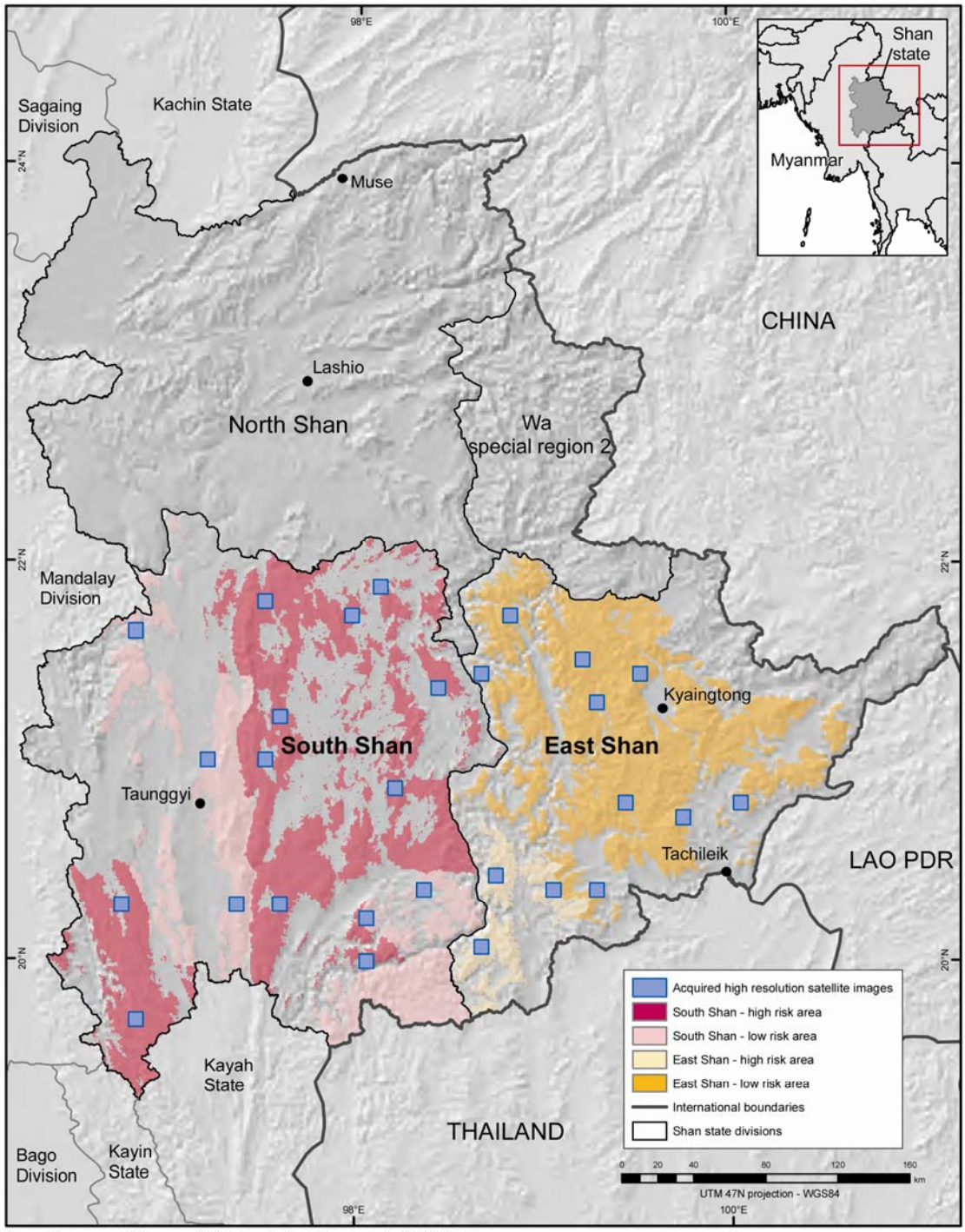
Altitude was taken as a factor since former surveys had revealed that 95% of the opium poppy was cultivated at altitudes between 800-1800 meters. Some large, flat areas were excluded, since the accessibility of these areas is very high, with very low chance to find poppy cultivation.

From information on the ground, several *opium poppy free areas* were identified: Special Region 4 and the townships Maingyang, Kalaw, Pindaya, Taunggyi and Ywangan as well as a 10-km buffer zone along the border with Thailand. These areas were excluded from the sampling frame.

These factors were combined in a Geographic Information System to calculate the sampling frame. East and South Shan were analyzed separately. Both regions the area to be surveyed was stratified into two risk classes (high/low), based upon ground information on differences in the intensity of opium poppy cultivation.

A grid with 8 by 8 kilometer cells was put on top of this sampling frame to select the image locations. Half of the locations that were sampled last year were selected again, if they matched the selection criteria. The rest of the images were selected randomly systematic within the sampling area. In total, 28 locations were selected and all images were successfully acquired for both dates.

Map 4: Sampling frame area and satellite image locations in Myanmar, 2007



Source: Government of Myanmar - National monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

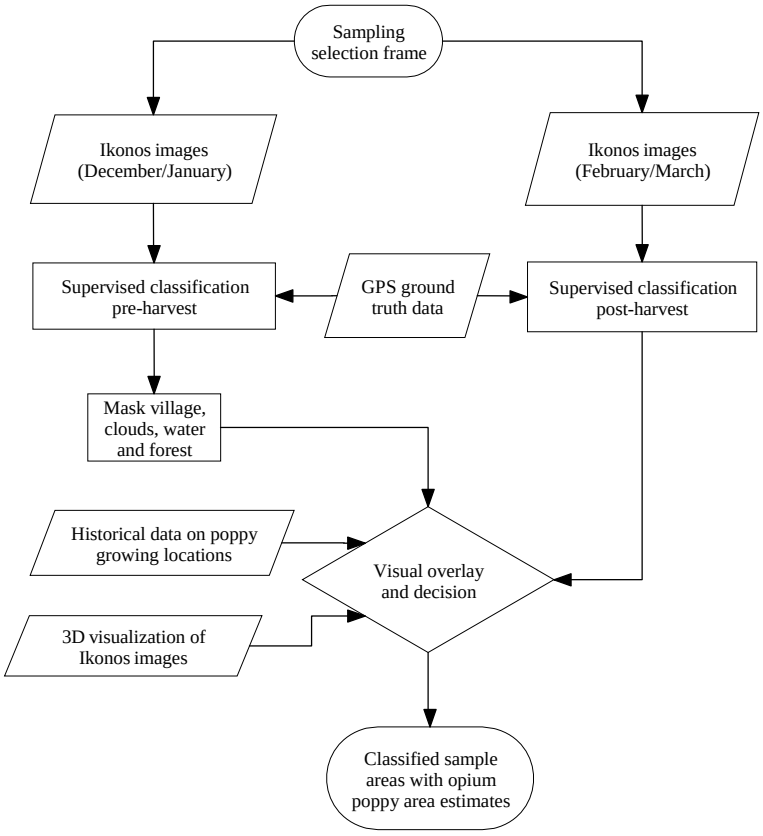
Table 17: Sampling frame area of the South and East Shan

Region	Strata	Area (km²)	% of total area
South Shan	High risk	16,302	17
	Low risk	8,664	9
East Shan	High risk	2,136	2
	Low risk	15,971	17
South and East Shan	Opium poppy free	51,899	55
Total		94,972	100

Processing of the satellite images

The classification procedure of the Ikonos images is illustrated in the following flow chart.

Figure 23: Flow chart of the satellite images processing steps in South and East Shan



The satellite images were classified with the ground truth data collected by the ground control teams. For the first collected images, supervised classifications with maximum likelihood rules were applied to obtain maps that identified different land cover classes as forest, scrubs, grass, agricultural land and possible poppy areas. The second collection images were classified in the same way with bare soil as potential area for harvested poppy areas. By applying logical rules, the two resulting maps were combined. This was done in a visual manner, since the images were not geometrically corrected and automation was not possible due to the displacements of the fields. The rules could vary by region and stage of the poppy crop however the most commonly applied rule was that potential poppy in the first classification, classified as bare soil in the second

classification means that it was opium poppy. Historical data on poppy cultivation and real colour 3D visualization was used to facilitate the decision making.

Area estimation formulae for satellite imagery

East Shan State and South Shan State

A ratio estimate approach was used in order to provide the most accurate approximation of the extent of the opium poppy cultivation in East Shan State and South Shan State.

The estimation of opium poppy cultivation for each segment has been calculated as follows:

$$\bar{p} = \sum_{1}^{22} x \big/ G$$

where
P = *Proportion of poppy cultivation in selected area*
x = *Total opium poppy identified in each segment*
G = *Total agricultural area in each segment*

Estimation of the total opium poppy cultivation:

$$X = p^{*} N_A$$

where
X = *Total opium poppy in region*
P = *Average extent of poppy cultivation in selected area*
N_A = *Sampling Frame in region*

The above estimation was later refined by the bootstrap method with 100,000 iterations. Bootstrapping is recommended when the sample observations have different sizes, which was the case during this survey.

Bootstrapping consists of sampling with replacement from the original sample with multiple iterations, composed in this case of the total poppy areas of the selected segments. After each iteration, a mean value is estimated and scored. At the end, a distribution of means can be observed, producing a mean estimate and a confidence interval for the mean. Bootstrap with 100,000 iterations revealed that there was a 90% probability that the extent of the opium poppy cultivation estimated from satellite images for the East Shan State ranged from 6,800 hectares to 11,800 hectares with a mean estimate of 9,500 hectares. The 90% bootstrap confidence interval for South Shan State ranged from 9,500 hectares to 21,300 hectares with a mean estimate of 15,000 hectares.

Area estimation formulae for Village Ground Survey Data

North Shan State, Kachin State, and Kayah State

During the village ground survey, information on the number of households involved in opium cultivation, total number of households and average size of cultivated poppy fields were collected for each selected village. Estimates of areas under opium poppy cultivation were derived and extrapolated to the sampling frame in the North Shan State, the Kachin State and the Kayah Satate.

Area estimates were calculated using the following formula:

T= *Total number of households growing poppy in the sample*
n= *Sample size, number of villages*
$\bar{X}_{Hh} = T/n$= *Average number of households growing poppy per village*
Ns= *Total number of villages in the sampling frame*
K_h= Average size of opium poppy fields
$A = \sum Ns * X_{Hh} * k_h$ = *Total area under opium poppy cultivation*

As the agricultural land varies from one village to another, the results were refined by the bootstrap method with 100,000 iterations. The bootstrap method also provided the standard error of the estimates.

The 2008 area estimates and confidence intervals for Myanmar are presented in the table below. It has to be noted that upper and lower estimates do not lie symmetrically between the mean estimates because of the different statistical tools used to arrive at the most robust regional estimates.

Table 18: Area estimates with confidence intervals (ha), 2008

Region	Average	Lowest limit of 95% confidence interval	Highest limit of 90% confidence interval
East Shan State	9,300	6,800	11,800
North Shan State	800	400	1,200
South Shan State	15,500	9,500	21,500
Kachin	1,500	11,00	19,00
Kayah	1,850	1,200	2,500
Total	**28,950**	**17,900**	**37,000**

Description of opium poppy cultivation intensity by townships in Shan, Kachin and Kayah States

Based on the results from socio-economic and remote sensing surveys of the last years and field observations during the field survey this year, the townships in Shan, Kachin and Kayah were divided into opium free, low intensity and high intensity opium poppy cultivation regions. The results can be compared with the previous year's classifications. However, one should be cautious in comparing categories across regions because high density in one region could be interpreted as low in others, depending on local conditions.

The 2007 crop calendar indicated that in some townships, opium poppy cultivation had taken place outside the traditional winter growing seasons. Taking this into consideration, in September 2007, an off-season survey was launched in 5 townships of Shan State, namely: Pinlaung, Pekhon, Namsang, Loilem and Mongnea. This was followed by the annual survey from December 2007 to March 2008. Hence, this report is based upon the findings of these two surveys.

Opium poppy-free townships: do not have any trace of opium poppy cultivation in 2008, according to the information available.

Low intensity opium poppy townships: there is evidence of opium poppy cultivation. However, the fields are rather small and not easy to detect, are often far away from roads and villages,only a few villages are involved.

High intensity opium poppy townships: a large number of villages are involved in opium poppy cultivation. The crop is grown openly and in locations, which are easy to detect and close to villages. A tendency towards intensification can be observed, which includes multi-cropping and cultivation of opium poppy on lowland, where it can be irrigated.

Table 19: Township classification in 2007 and 2008

Region	Number of Townships	2007			2008		
		Free	Low	High	Free	Low	High
East Shan	10	1	8	1	1	7	2
North Shan	19	8	5	6	8	7	4
South Shan	21	4	5	12	3	5	13
Kayah	3	0	2	1	0	2	1
Kachin	5	0	2	3	0	2	3
Total	**58**	**13**	**22**	**23**	**12**	**23**	**23**

The findings indicate the following changes from 2007 to 2008:

Out of 13 opium poppy free townships in 2007, 12 townships were remaining opium poppy free in 2008. The number of low intensity townships increased from 22 in 2007 to 23 in 2008 whereas the number of high intensity opium poppy townships remained stable. South Shan State recorded the highest number of high intensity opium poppy townships in both 2007 and 2008.

Opium poppy free townships

12 out of 50 townships in Shan State have been opium poppy free in 2008. None of the townships surveyed in Kachin and Kayah State were found to be opium free.

Table 20: Opium poppy free townships

No	Opium poppy free townships by region				
	East Shan	North Shan	South Shan	Kayah	Kachin
1	Mongyang	Kunlon	Taunggyi		
2		Namsang(N)	Pindaya		
3		Namtu	Ywangan		
4		Hopang			
5		Laukkaing			
6		Kongkyan			
7		Naungcho			
8		Mabein			
No. of townships	**1**	**8**	**3**	**n.a.**	**n.a.**

East Shan State

In 2008, there was only one opium poppy free township, Mongyang in East Shan State.

North Shan State

Laukkaing and Kongkyan townships, located in Kokang Special Region became opium free in 2003. A rapid assessment survey in 2008 reconfirmed this status. Kunlon also ceased opium cultivation in 2003. There was neither local information nor reports about opium poppy cultivation or eradication in Kunlon, Namsang (N), Namtu, Hopang, Laukkaing, Kongkyan, Naungcho, and Mabein Townships in 2008 confirming their opium poppy free status. This year, some eradication has taken place in Muse Township. No eradication has taken place in Namsang (N) Township. Hence, the number of opium free townships remained unchanged.

South Shan State

In 2008, 4 townships, Kalaw, Taunggyi, Pindaya and Ywangan were found to be free of opium poppy cultivation. However, some eradication has taken place in Kalaw Township this year.

Kayah and Kachin State

Only three townships from Kayah State and 5 townships in Kachin State were selected for sampling. None of these were found to be opium free.

Low Intensity Townships

In townships under this category, little opium cultivation took place and it is unlikely to be commercialized.

Table 21: Low intensity opium poppy townships

No	Low intensity opium poppy townships by region				
	East Shan	North Shan	South Shan	Kayah	Kachin
1	Kyaing Tong	Kyaukme	Kalaw	Loikaw	Moenyin
2	Tahileik	Lashio	Nyaung Shwe	Fruso	Hparkant
3	Mongkhat	Mongyai	Mong Pan		
4	Mongtong	Theinne	Hopong		
5	Mongpyat	Thibaw	Lawk Sawk		
6	Metmong	Moemeik			
7	Mong Yawng	Muse			
No of townships	**7**	**7**	**5**	**2**	**2**

East Shan State

Low intensity of opium poppy cultivation was found in **Kyaing Tong**, **Mongpyat**, and **Tachileik** townships. The cultivation was located in the centre of East Shan State, which is under control of the Lahu Militia Group. Significant migration of people from North Shan State and Wa Special Region 2 is still reported for this year, most belonging to Lahu ethnic groups and for the purpose of growing opium poppy. Similar migrations were also reported in Mongkhat and Metmang Townships.

Mong Yawng Township has remained in this category this year. **Mongtong** Township which had high intensity opium cultivation in 2007 was shifted to low intensity township this year.

North Shan State

In North Shan State, 5 townships fell under the low intensity category last year. The number of low intensity townships increased to 8 townships this year. Out of those, **Muse** Township which was opium free last year shifted to this category. Eradication has taken place in 40 ha this year. **Moemeik** Township which was previously opium free was also recorded as "low intensity". Some eradication has taken place in this township.

Lashio, Mongyai, and **Theinne** Townships which were listed as highly intensive townships last year shifted to low intensive townships this year.

Thibaw and **Kyaukme** townships remained in the same category for this year.

South Shan State

Kalaw had been opium poppy free for many years. However, eradication of 3 ha was reported this year. One village-tract in the southern part of Nyaung Shwe Township used to grow poppy. This year, 27 hectares were eradicated in Nyaung Shwe Township. In Hopong Township, an opium ban was enforced last year in Maenai Ranger. This year, police reported that they eradicated 9 ha in

the northern areas that were under the control of insurgents. No information of opium cultivation was received from Lawk Sawk Township. The area under control of insurgent groups is inaccessible. Lawk Sawk is still in the low intensity category.

Kayah State

Loikaw remained under the low intensity category. In **Fruso** Township, many villages are inaccessible. Out of those, three villages tracts, Moso, Hoyar and Kaykaw, are under the control of KNPLF cease-fire group and the rest under the KNPP insurgent group. Opium poppy cultivation increased this year in the villages under KNPLF control.

Kachin State

Opium poppy is only cultivated in the very remote forest areas of **Moenyin** Township. **Hparkant** is famous for its jade mines and gold mines. Most of the villagers work in the jade mines or gold mines.

Gold mining is also a predominant occupation

Gems mine in Mongshu

Township police reported that only three village tracts under KIA control grow poppy. They eradicated 11ha.

Table 22: High Intensity Townships

No	High intensity opium poppy townships by region				
	East Shan	North Shan	South Shan	Kayah	Kachin
1	Mongpyin	Manton	Kunhein	Demosso	Waing Maw
2	Mongsat	Tant Yang	Kyaethi		Putao
3		Kutkai	Hsihseng		Tanai
4		Namkham	Namsang(S)		
5			Pinlaung		
6			Pekhon		
7			Mongnea		
8			Mong Kaing		
9			Mongshu		
10			Maukmai		
11			Leacha		
12			Linkhe		
13			Loilem		
No of townships	**2**	**4**	**13**	**2**	**3**

There were 22 high intensity townships in Shan, Kayah and Kachin States. Out of those, 13 Townships are in South Shan State, 2 townships each in East Shan, North Shan and Kayah States, and 3 in Kachin State.

East Shan State

Mongpyin township went from low intensity last year to high intensity this year. UWSA controls the opium free area along the border of China. Most of the opium poppy was grown in the central and northern parts of the township which is controlled by the militia group. Altogether 651 ha. were eradicated this year. This represents almost 50% of the overall eradicated area in East Shan State i.e. 1,248 hectares.

Mongsat Township shifted to the high intensity category as 221 ha were eradicated this year.

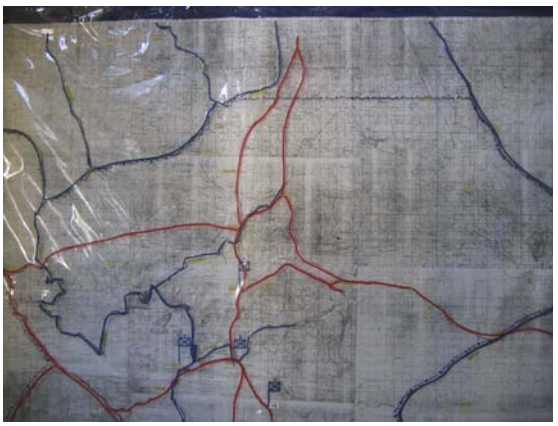
North Shan State

Namkham and **Kutkai** Townships were listed as high intensity townships last year. This year these townships remained in the same category. Opium poppy cultivation took place on the Pansae Range along the border of these two townships. Eradication figures indicate 283 ha were eradicated in Namkham and 272 ha in Kutkai Township. Manton Township is also a highly intensive opium growing area. Opium poppy cultivation was carried out in the areas under control of PSLA (Palaung State Liberation Army). This year 69 ha.were eradicated in this township.

In **Tant Yang** Township, opium poppy cultivation was widely practiced in the south and in most part of the township where there is an administrative gap between the North-Eastern Command and the Eastern Command.

There are two signs posted on the way from Tant Yang to Mongshu. One out of two signs is at N-22.17010: E-098.42668, on the 84 parallel, about 30 miles away from Tant Yang Town, marking the line of demarcation for operations between the two military commands. The other sign was posted at N-22.06492:E-098.36705 marking the territory between North-East command and Eastern Command. It is located at about 40 miles away from Tant Yang Town, leaving 11 villages of Tant Yang Township in the south, stretching about 26 square kilometres. Those villages are literally in Eastern Command area, but they are under administration of the Tant Yang Township and supposed to be controlled by an SSA cease-fire group.

A sign posted on the line of demarcation



Map showing demarcation line (84th parallel)

In this area, Saing Lyan Plain and Loi Lan Ranges are notorious for growing poppy. Large poppy fields can be observed along the side of Loi Lan range even from Panyang, Wa Region. Altogether, 246 ha. were eradicated this year in Tant Yang Township.

South Shan State

Opium poppy was intensively cultivated in areas of South Shan State where some insurgent groups and cease-fire groups were active. Cultivation of opium poppy was primarily dependent upon the intention of the controlling ethnic cease-fire groups.

For example, **Hsihseng** became a low intensity township as one fraction of a cease-fire SNPLA group enforced one opium ban last year. However, it shifted to the high intensity category when another SNPLA faction, which encourages opium poppy cultivation, has taken over power.

There are 13 townships under the high intensity category as Hsihseng reverted to opium cultivation in this year. Previously, opium poppy cultivation usually took place on the slopes of Loi Maw Range. But this year they shifted to Don Min Nyo and Saung Ngaing Villages in the Loiput village tract for commercial cultivation.

Poppy fields in Hsihseng

Opium poppy cultivation in both **Pinlaung** and **Pekhon** Townships has increased this year. About 44% of overall eradicated areas in South Shan State were located in Pinlaung and Pekhon Townships. Pinlaung is under control of PNO cease-fire group while villages in Pekhon are under control of Kayan cease-fire groups. Many opium poppy fields were observed in this township during the off-season survey.

Cultivation by contour lines

Multi-stage cultivation of opium poppy

Multi-stage cultivation means growing opium poppy in one or two months' intervals resulting in different stages of cultivation. In Pinlaung, four stages of opium poppy cultivation (vegetative stage, flowering stage, fruit bearing stage and harvested stage) were observed in some villages at the same time.

A similar situation was also observed in Tanai Township, Kachin State where five stages of cultivation have taken place.

Police reported that they seized an amount of 109 kg of opium in a village in Pinalaung Township in February 2008.

In **Namsang** Township, the Nar-Yine region under Nar Yine group, as well as the Mong Seik region under the Mat-kyan group are highly intensive areas. Nar yine and Mat-kyan are factions of the former MTA group led by Khun Sa. There is no accessibility into Loi La Range region under the SURA group. Some villages in this area cultivate opium. During the off-season survey, many opium poppy fields were observed in the Nar Yine and the Mong Seik regions of this township.

In **Maukmai** Township, Kadugyi region under SNPLA group (comprised of some six village tracts) reported as commercially cultivating opium poppy. The region is not easily accessibility.

In **Linkhe** Township, Homein region under the control of SSS group, is inaccessible and reported opium production in five village tracts. This group is also one of the factions of the former MTA group.

In **Mongnea** Township, Naung Yarsine region under SURA group, Kyaing Toung region under SSS group, Namsapyay region under SNPLA group, and Pansein-Karha regions under SURA group are notorious for opium poppy cultivation. Some Kokang families were found migrating into Mongnea Township for the purpose of opium cultivation. During the off-season survey, some opium poppy fields were observed in this township.

Loilem Township was controlled by three separate groups. Village tracts in the northern part of the township are under control of SURA (aka-SSA-S) insurgent group, the central part is controlled by SNPLA and most of the southern part by PNO.

Opium poppy fields in Loilem

Access is restricted beyond Pinlong town in the north. Extensive opium poppy cultivation was reported in the areas under SURA and SNPLA control. Loi Chai Range in the north-west of Pinlong town is notorious for opium cultivation.

During the off-season survey, many opium poppy fields were observed in this township.

Off season poppy fields

Similar to the previous years, **Leacha** under control of SURA was again not accessible this year. However, the township survey teams accessed some villages in **Mong Kaing** this year.

In **Mongshu** Township, gem mining was commercially practiced in Loi Saung Tauk Range. Beyond this range locally called Apho-aphwar Mauntains, large scale cultivation of opium poppy was practiced.

Mongshu Gems Mine

This mountain range is lying side by side with the notorious opium Loi Lan range and Saing Lyan area where opium poppy cultivation is taking place freely. Many opium fields can be found just beyond the Town.

Kayah State

In Kayah State, there is only one township under this category. Geographically, **Demosso** Township is a continuation of the Pinlaung–Pekhon region of the South Shan State. Opium poppy cultivation was found only in the western part of the township, which is under control of KNPLF cease-fire group. Lopu, Howan, Loarkho, Khubarto, Warsisaung, and Khupara villages are notorious for opium poppy cultivation. Twelve hectares of opium poppy were eradicated in Demosso Township this year.

Kachin State

In Kachin State, there are three townships under this category, Waingmaw, Putao and Tanai Townships.

Waingmaw Township was listed under low intensity category last year as two Kachin ethnic groups restricted opium poppy cultivation in this area. However, the cultivation reverted this year and the township was categorized as highly intensified township. Out of 790 hectares eradicated in Kachin State, 692 hectares were eradicated solely in this township. On a mountain range near Manshan village, Laphai village tract, a large opium poppy field of about 20 ha was found. The police eradicated fields planted in rows, covered with plastic sheets to protect them from heavy fogs. They were irrigated by sprinklers.

In **Putao** Township, 57 hectares of opium poppy fields were eradicated.

Tanai Township is famous for its gold mines, rain forests and for its national park populated with tigers. Most of the villages are located along the main road leading to Ledo town in India. This road was also known as Steelwell Road as it was constructed by General Steelwell of the Allied Forces during World War II. Mountain ranges are located along the township border, whilst the rest of the township consists of flat land covered by a dense forest.

Farmers grow opium poppy in the clearings of the forest in the alluvial plains along the rivers. Almost 6 ha of opium poppy field sharing among some farmers were found. Gold miners are the primary customers of opium from those fields.

Rapid Assessment Survey in Chin State

There are 8 townships in Chin State. The Government put Falam and Tunzan townships in the third phase plan of the opium poppy elimination in 2009-2014.

Our team conducted a rapid survey in northern Chin State in the March 2008 assessment to determine the degree of opium cultivation. Locals and police reported that opium poppy fields were last observed in 1997 in the northern townships, namely, Falam, Tidim and Tunzan. The last eradication was in 2006 when police reported 1 hectare of opium poppy eradicated in Kyikhar sub-township in Tunzan Township.

Although the State has an armed group (CAN), it is not as active as those in the Shan State. Therefore, the entire state may be assumed to be under the effective control of the Government.

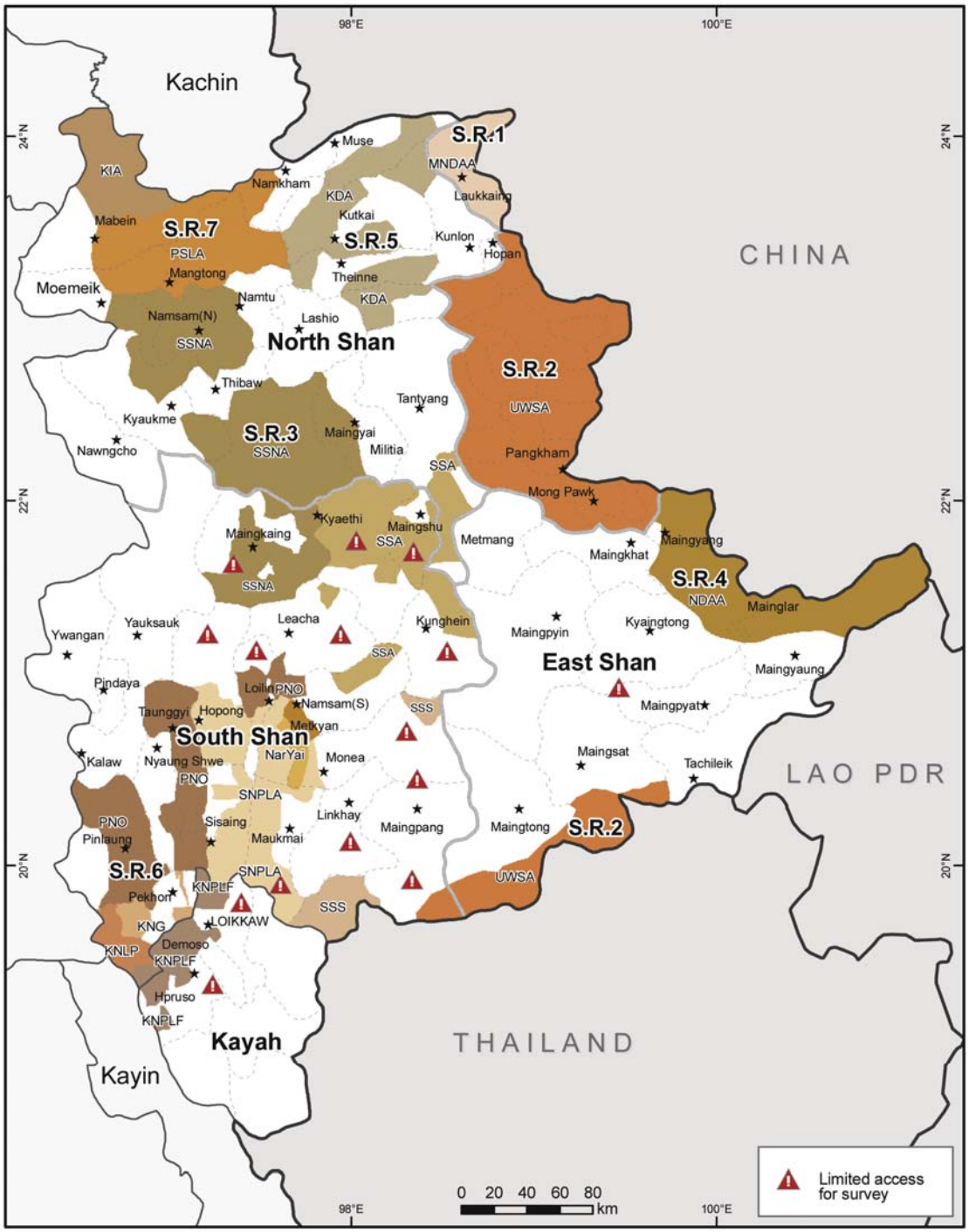
This year, a rapid assessment survey was made in Tunzan Township in Chin State. Opium poppy fields were observed in the Kyikhar sub-township. According to the police report, 86 hectares of opium poppy fields were eradicated in this area in this year.

Eradication force

Rapid Assessment Survey in Special Region 1 (Kokang), Special Region 2 (Wa) and Special Region 4.

There was no evidence of opium poppy cultivation in these areas this year. Special Region 4 has been opium poppy free since 1997, Kokang since 2003 and Special Region 2 Wa since 2005.

Map 5: Special regions and armed ethnic groups who have returned to the legal fold in Shan and Kayah States



Source: Government of Myanmar - National monitoring system supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

The survey found that opium poppy cultivation took place in areas controlled by insurgency and by ceasefire groups. Peace and security is essential to reduce opium poppy cultivation in those areas prior to be able to provide some alternative livelihood to poor farmers.

Table 23: Sampling frame area of the South and East Shan

Region	Strata	Area (km²)	% of total area
South Shan	High risk	16,302	17
	Low risk	8,664	9
East Shan	High risk	2,136	2
	Low risk	15,971	17
South and East Shan	Opium poppy free	51,899	55
Total		**94,972**	**100**

ANNEX

Abbreviations used for armed groups in Shan and Kayah States

KDA	Kachin Defense Army
KIA	Kachin Independent Army
KNG	Kayan National Guard
KNLP	Kayan New Land Party
KNPLF	Karenni State Nationalities Peoples' Liberation Front
KNPP	Karenni National Progressive Party
MNDAA	Myanmar National Democrat Alliance Army
NDAA	National Democratic Alliance Army
NarYai	Naryai Group
PNO	Pa-O National Organization
PSLA	Palaung State Liberation Army
SNPLA	Shan State Nationalities People's Liberation Army
SSA	Shan State Army
SSNA	Shan State National Army
SSS	Shan State South company (Homong Region Development and Welfare Group)
UWSA	United Wa State Army

PART 3. THAILAND

ABBREVIATIONS

ONCB	Office of the Narcotics Control Board
NCSMI	Narcotic Crops Survey and Monitoring Institute
RTA	Royal Thai Army
BPP	Border Patrol Police
PDOCCD	Provincial / District Operation Centres for Combating Drugs

ACKNOWLEDGEMENTS

Police Lt. General Krisna Polananta	Secretary general, Narcotics Control Board.
Pipop Chamnivikaipong	Director, NCSMI

CONTENTS

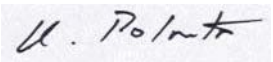
PREFACE

This is the third year that the close cooperation between UNODC and ONCB has led to the publication of this report. The annual opium cultivation survey and the monitoring of cultivation trend have been one of ONCB's top priorities since 1979. With its combination of remote sensing and Geographic Information System (GIS) technologies, the ONCB opium survey reports are one of the most accurate and reliable references on opium poppy cultivation in this sub-region. All reports published so far became crucial information sources, which helped drugs control authorities to access and neutralizing the target areas for illicit crop elimination in the most accountable and effective way.

In the 2007/2008 poppy season, the survey found a total of 288.06 hectares of opium poppy fields. Mostly located in the remote mountain areas of Chiang Mai, Tak and Mae Hong Son, opium cultivation was increasing by 24.63% compared to the last year. In spite of this comparatively high opium cultivation figure, the opium poppy field eradication operation reached and destroyed opium poppy fields in almost all places.

On this occasion, I would like to convey my sincere appreciation with thanks to all agencies, and partners, namely, the U.S. Narcotics Affairs Section (NAS), the French Government, the Third Army Area – RTA, the Border Patrol Police Region 3, the Royal Thai Police Aviation Division, the Provincial / District Operation Centres for Combating Drugs, the Thailand International Development Cooperation Agency (TICA), and the Geo-Informatics and Space Technology Development Agency (GISTDA) for all their courtesies and cooperation extended.

Finally, we would like to express our hopes that this document will serve as a reference and be beneficial to all interested parties in controlling illicit opium cultivation in this sub-region and beyond.



Police Lieutenant General Krisna Polananta

Secretary-General,

Narcotics Control Board

Thailand

FACT SHEET - Thailand OPIUM SURVEY 2008

	Year 2007	Year 2008	Variation from 2007
Opium poppy cultivation (ha)	231	288.06	+24.63
Average opium yield(kg/ha)	15.6	15.6	0%
Potential production of opium (mt)	3.6	4.5	+24.65
Opium poppy eradication (ha)	220	284.46	+29.46
Average farm gate price of opium (US$/kg)	1071	1250	+17%
Total potential value of opium production (mil. US$)	3.6	5.6	+55.56%
Estimated households involved in opium poppy cultivation	1,600	1,800	+12.50%
Number of persons involved in opium poppy cultivation	8,000	7,200	-10%
Household average yearly income in opium poppy producing household	N/a	N/a	N/a
Percentage of opium income in total income	N/a	N/a	N/a
Estimated number of opiates abusers	1,359	N/a	N/a

1 INTRODUCTION

When in 1967 a United Nations team conducted the first opium survey in Thailand that included field checks, it estimated the total opium production in the country at 145 tons. Although this may have been too high because it relied on spot checks and estimates, concerned Thai leaders began then to consider drug control a priority.

In 1969, the Thai efforts were pioneered by King Bhumibol Adulyadej who introduced a crop replacement project after the establishment of his new Phubing Palace in Chiang Mai adjacent to an opium poppy-growing village on the mountain Doi Pui. He promoted a long-term and cooperative approach to opium control that encouraged finding income generation alternatives rather than law enforcement.

When the United Nations Fund for Drug Abuse Control was established in 1971, it established a supply reduction project in northern Thailand that adopted the crop replacement approach. In this and several subsequent projects for the next decade, the approach was to become familiar with the northern Thai highlands, the ethnic minorities growing opium poppy there, and to devise agricultural techniques that could be introduced in an effort to find alternatives to opium production that eventually could reduce opium poppy cultivation.

The Thai Government consolidated drug control agencies in the Office of Narcotics Control Board that was established in 1976. In 1978, and with help over the years from the United Nations and the United States, it began conducting surveys of opium poppy cultivation. The increasingly sophisticated tools that ONCB used were challenged by ingenious farmers. Using techniques that sometimes were learned from development projects, such as intercropping opium poppy with other crops to conceal the opium poppy, growing during the off-season, and irrigating their fields, ONCB faced increasing difficulties in finding the fields.

By 1984, Thai and UN officials had become convinced that sufficient alternatives to opium poppy cultivation existed in villages where projects had started over a decade earlier. Also, although Thai Government agencies were not eradicating opium poppy fields, various indirect methods to convince growers to reduce production were making an impact.

When opium poppy eradication began in 1985, ONCB estimated that opium production in the country had declined to 33 tons. After the Border Patrol Police and other enforcement agencies destroyed opium poppy fields in villages close to Chiang Mai, opium production fell by approximately 50% to about 17 tons in 1986. This resulted in Thailand becoming a net importer of opium, a situation that has continued until the present.

Since then, opium poppy cultivation has declined significantly despite the best efforts of growers. In some places, such as in Tak Province on the Myanmar border, farmers triple crop opium poppy to evade law enforcement officials. According to ONCB estimates, from a cultivated area of about 1,100 hectares in 2000-2001, this fell to about 231 hectares in 2006-2007, following eradication efforts. ONCB estimated that the actual production following eradication was about 56.35 kilograms.

2 FINDINGS

The opium surveys in Thailand are implemented by the Narcotic Crops Survey and Monitoring Institute (NCSMI) of the Office of the Narcotics Control Board (ONCB). This report presents their findings.

2.1 Opium poppy cultivation

To estimate the area under opium poppy cultivation in Thailand, ONCB conducts annual surveys combining the use of satellite imagery with helicopter surveys and ground surveys when accessibility and security permit. The aerial survey is supported by helicopter units from the Royal Thai Police Aviation Division and the Royal Thai Army. The aerial survey covered all 76 potential highland target areas. GPS, satellite image maps, digital cameras and video cameras are important tools and equipment in the operation. All data were analysed in a geographic information system.

In 2008, the opium survey estimated that 288.06 hectares of opium poppy were cultivated in the North of Thailand compared to 231 ha in 2007. Opium poppy cultivation was found in 8 provinces. A total of 2,426 fields were registered with an average of 0.12 ha per field.

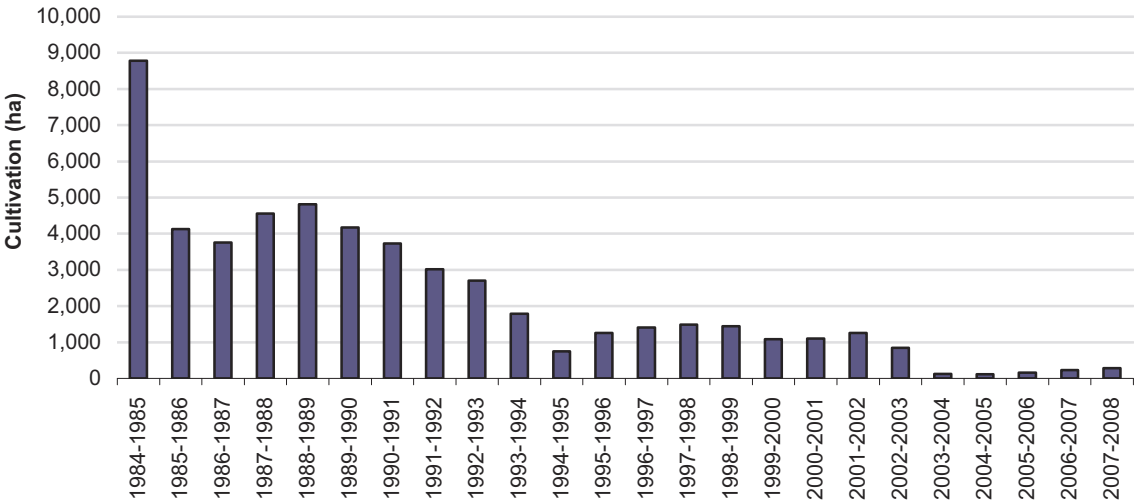
Opium poppy cultivation has been decreasing almost every year since 1984 when an estimated 8,777 ha were cultivated in Northern Thailand, and remains at a negligible level.

Table 1: Opium poppy cultivation by Province in Thailand 2007-2008

Province	2007	2008	2008 % of total area under opium poppy cultivation
Chiang Mai	157	213.45	74.1
Tak	26	30.82	10.7
Mae Hon son	5	17.97	6.24
Chiang Rai	22	8.87	3.08
Lampang	11	7.62	2.65
Nan	6	4.92	1.71
Kampaengphet	3	3.93	1.36
Phayao	1	0.48	0.17
Phrae	0.1	0	0
Phetchabun	0.3	0	0
Phitsanulok	0.1	0	0
Total	**231**	**288.06**	**100%**

Fertile opium poppy field

Figure 1: Opium poppy cultivation in Thailand (ha), 1985-2008



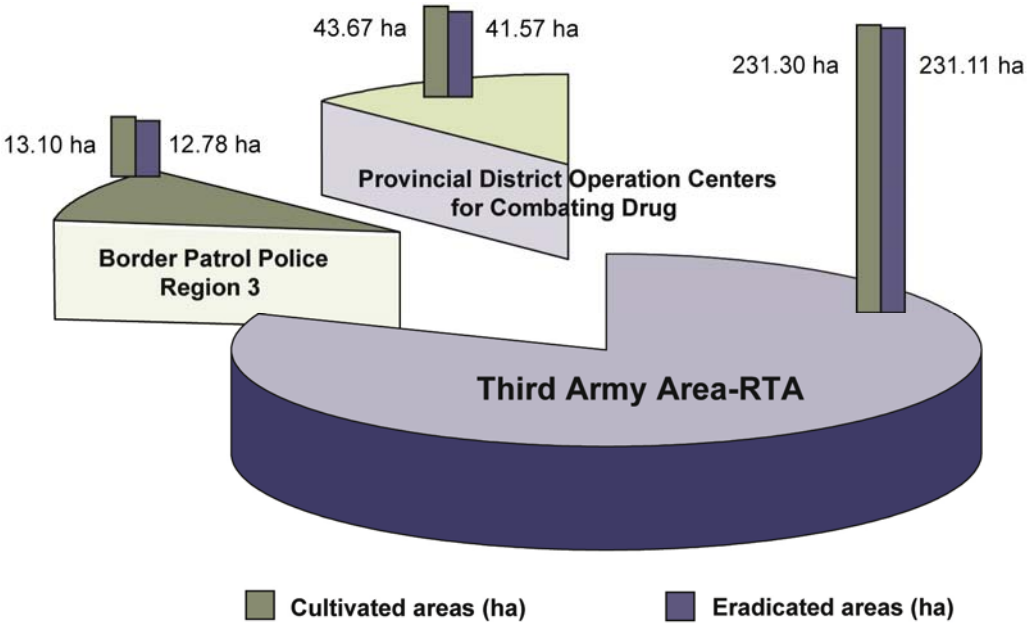
2.2 Opium poppy eradication

Opium poppy eradication is part of the narcotics crop control measures of the Royal Thai Government. Areas of responsibility are shared by various Royal Thai Government entities as follows:

Table 2: Eradication by government entities (hectares), 2008

Eradication Units	Cultivated area (ha)	Eradicated area (ha)
Third Army Area -RTA	231.30	230.11
Border Patrol Police Region 3	13.10	12.78
Provincial/District Operation Centres for Combating Drugs	43.67	41.51
Total	**288.06**	**284.46**

Figure 2: Eradication by government entities (hectares), 2008



A total of 2,426 fields were registered and eradicated this year. The average size of opium fields was 0.118 ha. Chiang Mai provinces had 1,929 fields recorded and the largest number of fields followed by Tak with 163 fields and Mae Hong Son with 108. Other provinces had a much lower number of fields with only 82 fields in Chiang Rai, 79 in Lampang, 47 in Nan, 15 in Kampaengphet and 3 in Phayao.

Eradication increased by 29.46% in 2008 compared to 2007. Net opium poppy cultivation after eradication was estimated at only 3.61 hectares. Since 2002, more than 90% of the opium poppy crop surveyed was reported eradicated in Thailand and 98.75 % was eradicated in 2008.

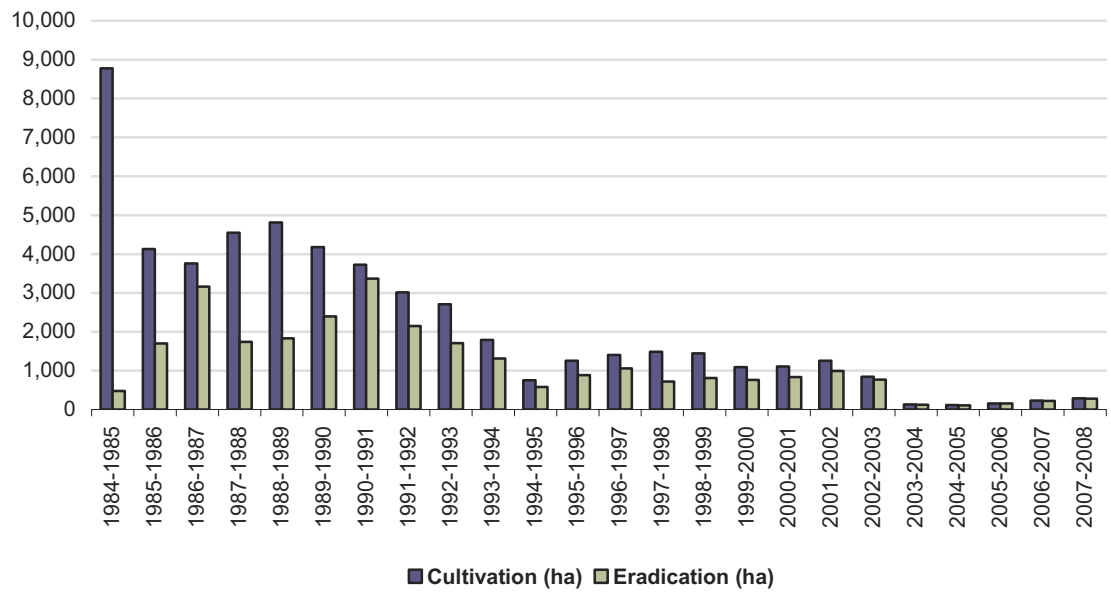
Opium poppy eradication

2.3 Opium yield and production

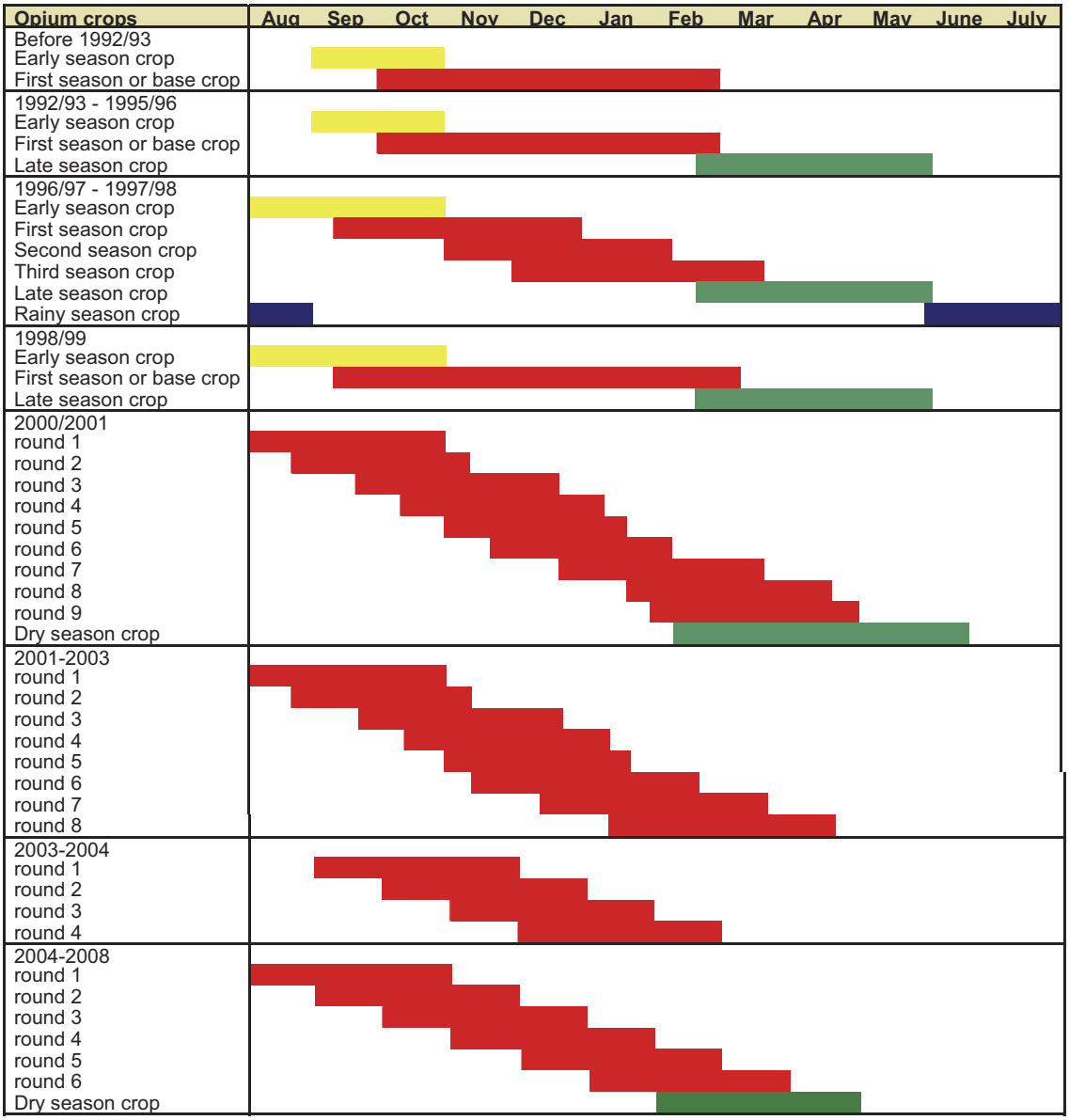
Similar to 2007, the average opium yield at the national level was estimated at 15.65 kg/ha, based on capsule measurement in the field. Good rainfall, use of irrigation and fertilizer contributed to obtain a comparatively high yield. Multiple cropping of opium poppy is practiced in Thailand and has increased from three crops a year in 1995 to six crops a year in more recent years. Multiple cropping is often practiced by farmers to avoid eradication. Based on the extent of opium poppy cultivation surveyed before eradication and average opium yield an estimated 4.5 metric tons of opium could potentially be produced in 2008. The net opium production after accounting for eradication was estimated at 56.35 kg.

Irrigated opium poppy field, northern Thailand

Figure 3: Opium poppy eradication Thailand, 1985-2008



Opium cultivation calendar in Thailand



2.4 Opium farm-gate and retail prices

The average farm-gate prices for opium were the highest in the region at US$ 1,250/kg and indicated no major change in local currency value (Thai Baht) compared with the previous year. The price of opium in Thailand is not related to supply and demand but rather controlled by middleman and "drug financiers". It appears that opium poppy farmers are more and more often identified as young people or even teenagers who engage in cultivation as a quick way to acquire modern equipment such as telephones and other electronics, or motorbikes. Since 2003, opium prices remained the same in spite of a high demand for opium. "Traditional" opium poppy farmers rely little on opium income for their livelihood as they seldom get wholesale price from middle man or drug financiers who sponsor the cultivation and provide them with other incentive like rice, clothes, fertilizer and sometimes cash.

Retail prices of opium can fetch up to US$ 2,158.27 per kg. The opium is mainly purchased by local addicts.

3 METHODOLOGY

The 2008 opium cultivation survey took place from August 2007 to May 2008. A total of 76 potential opium growing areas were targeted using both ground and aerial survey .

Ground survey

Only high density areas were surveyed through this method due to the difficult terrain. Ground survey team also collected information on opium poppy cultivation techniques, opium prices and opium yields through interviews with farmers and other key informants. After reaching the opium fields, the survey teams collected information on the location by comparing GPS data with topographic maps. The information was later transferred to the survey database system for verification by aerial survey.

Aerial survey

The aerial survey was supported by helicopter units from the Royal Thai Police Aviation Division and the Royal Thai Army with a total of 136 hours in 68 flights. The aerial survey covered all 76 potential highland target areas with an emphasis on areas with high density opium poppy cultivation. For each aerial survey flight, the database from the image processing system (combining QuickBird, Spot and Landsat imagery) were compared with still and video photo images taken from helicopter. Upon return to the ONCB computer centre in Chiang Mai, the image processing system processed the data, which was used to plot the locations and size of the opium poppy fields. Calculations were then loaded into a geographic information system for analysis.


Thailand
Remote sensing
Helicopter survey
Ground survey