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Office of the Narcotics
Control Board

Opium Poppy Cultivation in the Golden Triangle

Lao PDR, Myanmar, Thailand



data collection

data transfer

data transfer

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PREFACE

The Golden Triangle – where Lao PDR, Thailand and Myanmar meet – has long been synonymous with opium production and drug trafficking. Those days may soon be over.

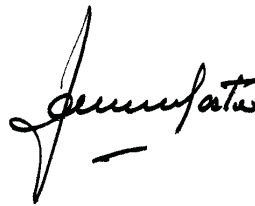
Since 1998, opium poppy cultivation in the region decreased from an estimated 157,900 hectares to only 24,160 hectares in 2006. The Golden Triangle's share of world opium poppy cultivation has fallen from 66% in 1998 to only 12% in 2006. Laos and Thailand are almost opium free.

That said, Myanmar remains the world's second largest opium poppy grower after Afghanistan. More progress is needed, especially by local authorities in the Kachin and Shan States where opium poppy cultivation is concentrated.

It is also essential to ensure that the remarkable progress that has been made in the region is maintained. That will require greater investment in poor and often remote rural communities that have been affected by the elimination of opium poppy crops. Farmers need to feel confident that alternative livelihoods are sustainable. Otherwise the temptation to return to opium poppy farming will be too great.

We therefore stand at a significant yet fragile threshold where major development assistance and the resolve of the states concerned can enable the Golden Triangle to turn its back on opium.

If the current trend continues, there will soon be only one heroin producing country left in the world – Afghanistan. And it could learn some important lessons from the Golden Triangle.



Antonio Maria Costa
Executive Director
UNODC

FACT SHEET - GOLDEN TRIANGLE OPIUM SURVEYS 2006

	2005	2006	Variation
Opium poppy cultivation ¹	34,719 ha	24,157 ha	-29%
Of which			
Lao PDR	1,800 ha	2,500 ha	+39%
Thailand ²	119 ha	157 ha	+34%
Myanmar	32,800 ha	21,500 ha	-34%
Weighted average opium yield			
Lao PDR	8 kg / ha	8 kg / ha	0%
Thailand	15.6 kg / ha	15.6 kg / ha	0%
Myanmar	9.5 kg / ha	14.7 kg / ha	+55%
Potential production of opium ¹	328 mt	337 mt	+ 3%
Of which			
Lao PDR	14.4 mt	20 mt	+40%
Thailand	1.8 mt	2.4 mt	+33%
Myanmar	312 mt	315 mt	+1%
Opium poppy eradication	6,592 ha	5,641 ha	-14%
Of which			
Lao PDR	2,575 ha	1,518 ha	-41%
Thailand	110 ha	153 ha	39%
Myanmar	3,907 ha	3,970 ha	+2%
Average farm gate price of opium			
Lao PDR	US\$ 521 / kg	US\$ 550 / kg	+6%
Thailand	US\$ 1000 / kg	US\$ 1015 / kg	+2%
Myanmar	US\$ 187 / kg	US\$ 230 / kg	+22%
Total potential value of opium production	US\$ 65.4 millions	US\$ 85.4 millions	+31%
Of which			
Lao PDR	US\$ 7.4 million	US\$ 11 million	+49%
Thailand	US\$ 1.8 million	US\$ 2.4 million	+33%
Myanmar	US\$ 58 million	US\$ 72 million	+24%
Households involved in opium poppy cultivation	200,190	133,600	-33%
Of which			
Lao PDR	6,200	5,800	-6%
Thailand	990	1,300	+32%
Myanmar	193,000	126,500	-34%
Yearly income in opium production households			
Lao PDR	US\$ 139	n/a	
Thailand	US\$ 300	US\$ 300	0%
Myanmar	US\$ 292	US\$ 437	+50%
Of which from opium sale			
Lao PDR	US\$ 14	n/a	
Thailand	US\$ 30	US\$30	0%
Myanmar	US\$ 152	US\$ 217	+43%
Addiction rate in opium poppy growing regions ³			
Lao PDR	1%	0.58%	
Thailand	n/a	n/a	
Myanmar	0.57%	0.60%	

¹ These figures differ slightly from those published in the World Drug Report 2006, which subsumes Thailand under the category of "other countries".

² As reported by the Government of Thailand.

³ Surveyed areas of 2005 and 2006 are not comparable.

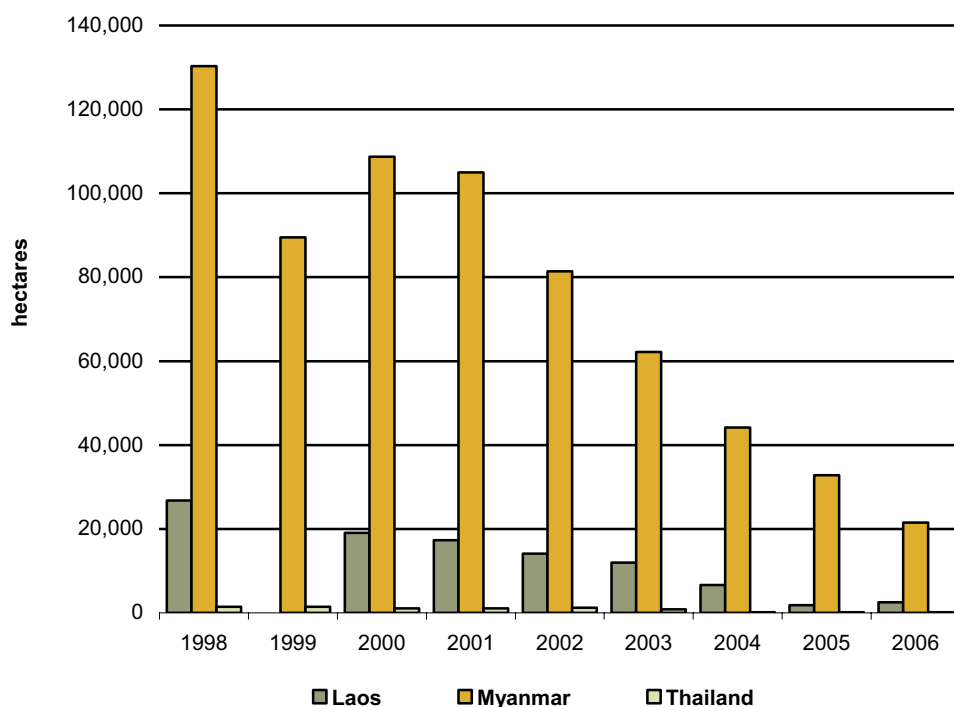
EXECUTIVE SUMMARY

The Golden Triangle region in Southeast Asia, which comprises parts of Lao PDR, Myanmar and Thailand, was once notorious for its high opium production. 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 Laos since 1992 and Myanmar since 2002, whereas Thailand has established its own monitoring system. This reports contains the results of the UNODC supported opium poppy cultivation surveys in Laos 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 the Golden Triangle

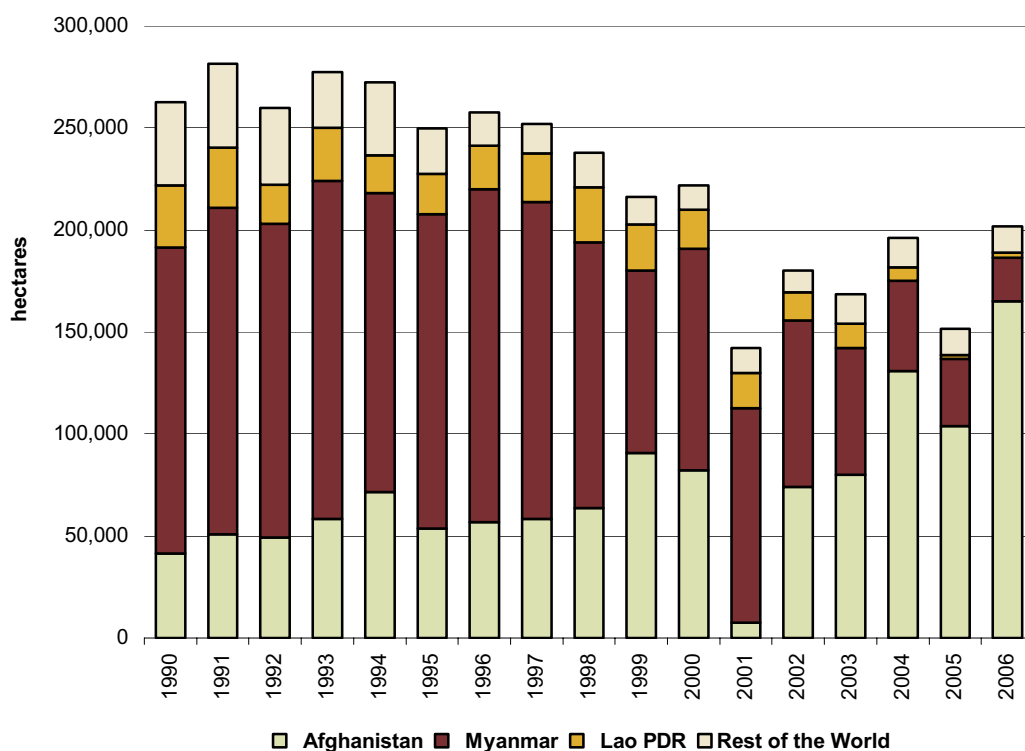
Opium poppy cultivation in the Golden Triangle region decreased from a total estimated 157,900 hectares⁴ cultivated in 1998, the year of the United Nations General Assembly Session on Drugs, to only 24,160 hectares in 2006, which corresponds to a reduction by 85% in only eight years. This is a remarkable 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 the Golden Triangle (hectares), 1998 - 2006



The largest reduction in absolute terms took place in Myanmar where opium poppy cultivation decreased from 130,300 ha in 1998 to 81,400 in 2002 and only 21,500 ha in 2006 (minus 83% from 1998-2006). In Laos, the area under opium poppy decreased from 26,800 ha in 1998 to 14,100 ha in 2002 and to only 2,500 ha in 2006. This is a reduction by 93% between 1998 and 2006, the largest proportional reduction among the three countries. Thailand reports a reduction of its opium poppy cultivation area from 1,486 ha in 1998 to only 157 ha in 2006 (minus 89%), thereby almost matching Laos' reduction rate in relative terms. Laos and Thailand have both reached such low levels of opium poppy cultivation that they do no longer produce for the international opium market.

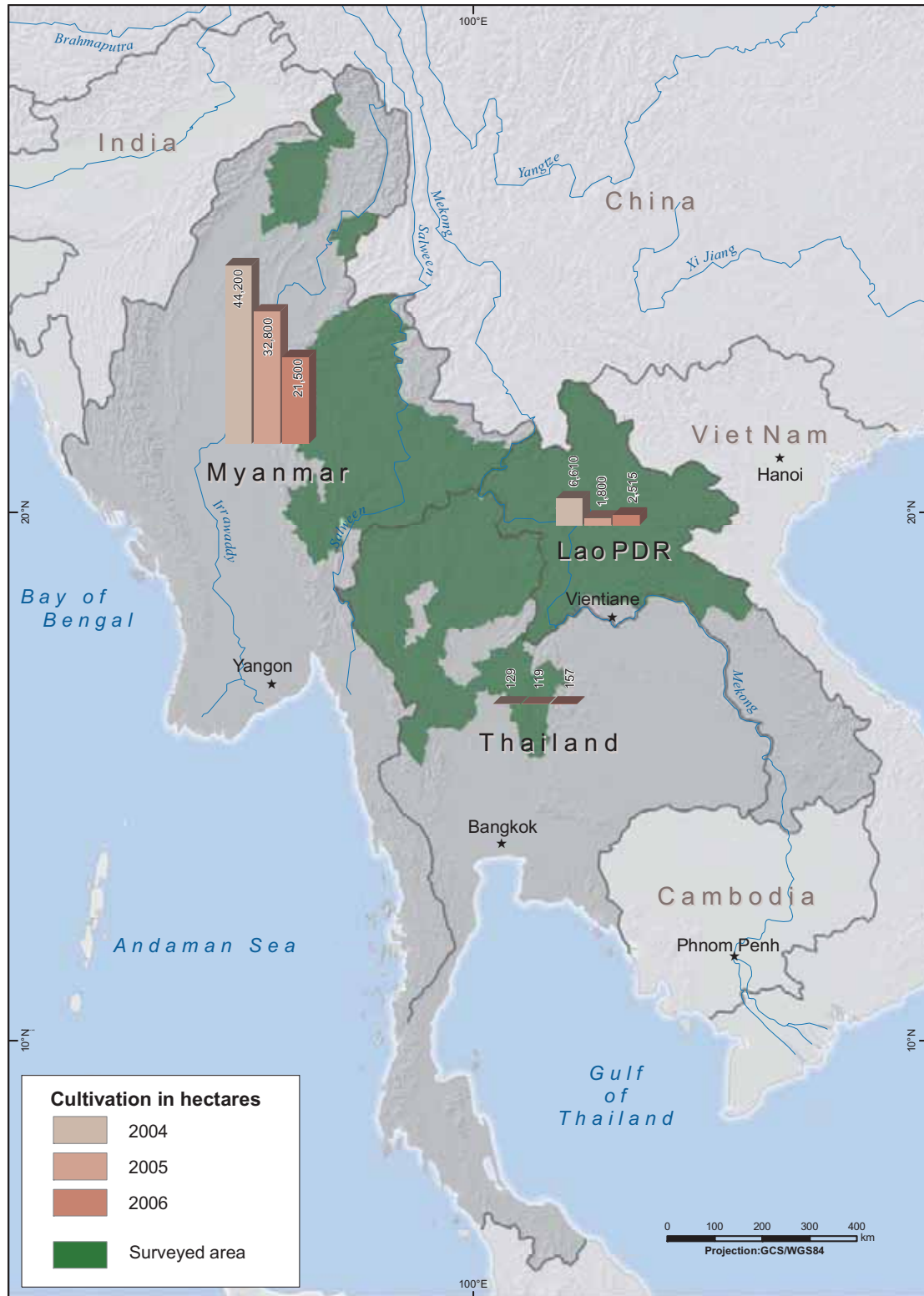
⁴ Source: World Drug Report 2006.

Figure 2: Global opium poppy cultivation (hectares), 1990 - 2006*

* Data for 2006 for Rest of the World are based on preliminary estimates.

Despite years of decreases, Myanmar still is the second largest opium poppy grower in the world after Afghanistan. However, its share of the world opium poppy cultivation fell from 63% in 1998 to only 11% in 2006. This large proportional decrease was caused by a decrease of opium poppy cultivation in Myanmar in combination with a large increase in Afghanistan. Laos, which in 1998 still had a share of 11% of the world opium cultivation, now accounts for only about 1%. The Golden Triangle has clearly ceased to be the largest opium poppy cultivating region. Its share of the world opium cultivation fell from 66% in 1998 to only 12% in 2006.

Map 1: Opium poppy cultivation in Golden Triangle (hectares), 2004 - 2006



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

Opium poppy farmers in Laos, 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 and Shan States in Myanmar, in the six northern-most provinces of Laos 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 government of Laos, Myanmar and Thailand made the commitment to end opium cultivation in these areas by the year 2000 for Thailand, by 2006 for Laos and by 2014 for Myanmar.

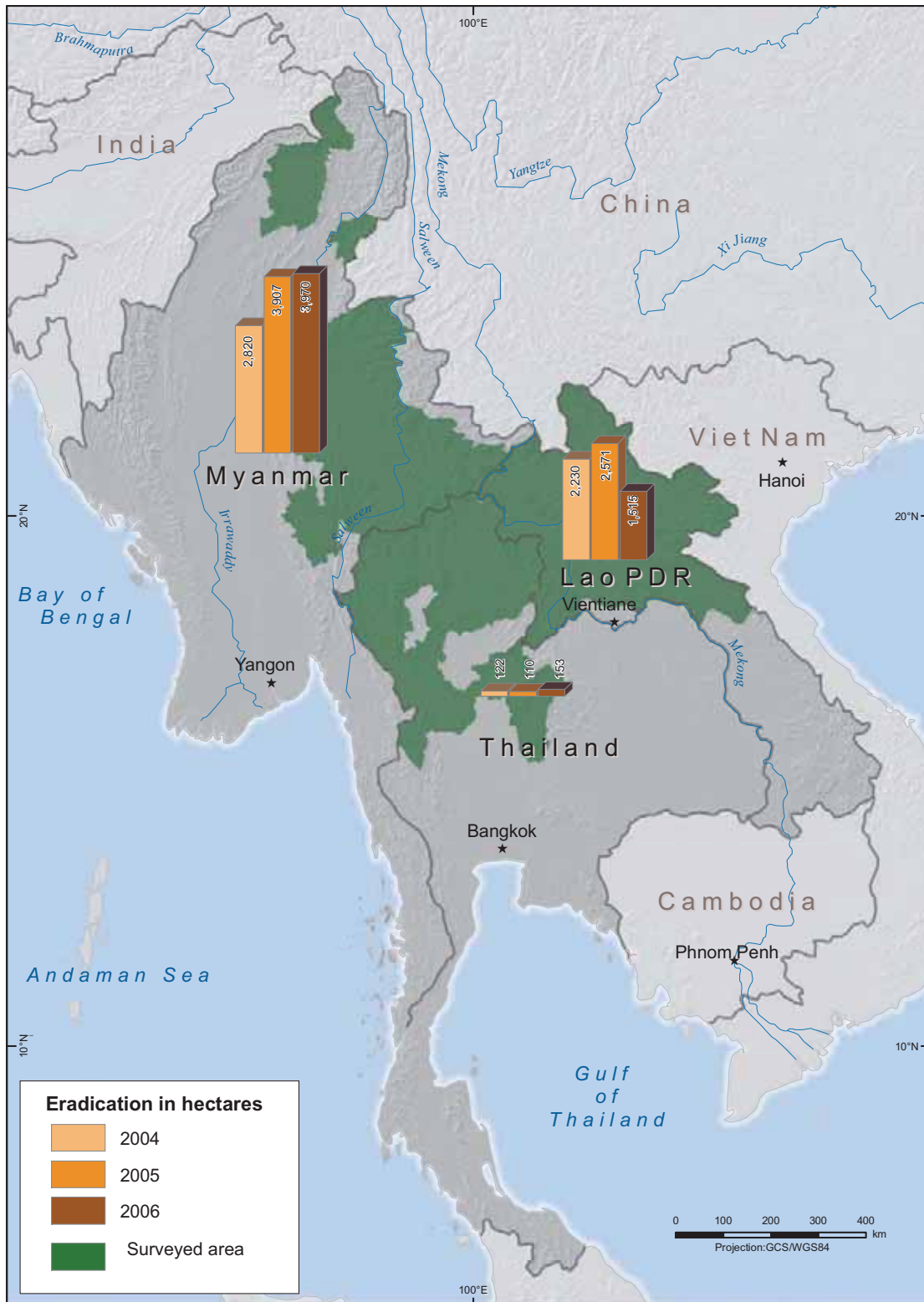
Eradication

Official reports from the Governments of Laos, Myanmar and Thailand indicate that a total of 5,641 hectares of opium poppy were eradicated in 2006. This is a 14% decrease compared to 2005 when 6,592 ha were eradicated. A total of 1,518 ha were eradicated in Laos (84% of cultivated opium poppy), 3,970 ha in Myanmar and 110 ha in Thailand.

Opium poppy planted in contour lines in Kachin State, Myanmar



Map 2: Opium poppy eradication in the Golden Triangle (hectares), 2004 - 2006



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 2006, opium yields were estimated at 9.5 kg/ha in Laos, 14.6 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 1998⁵ to only 337 mt in 2006. This is a decrease of 77%. South East Asia's Golden Triangle, which was producing 33% of the world opium production in 1998, is now producing only about 5%. The Golden Triangle, once notorious for being the world's largest opium producing region, has ceased to play a major role as an opium production area.

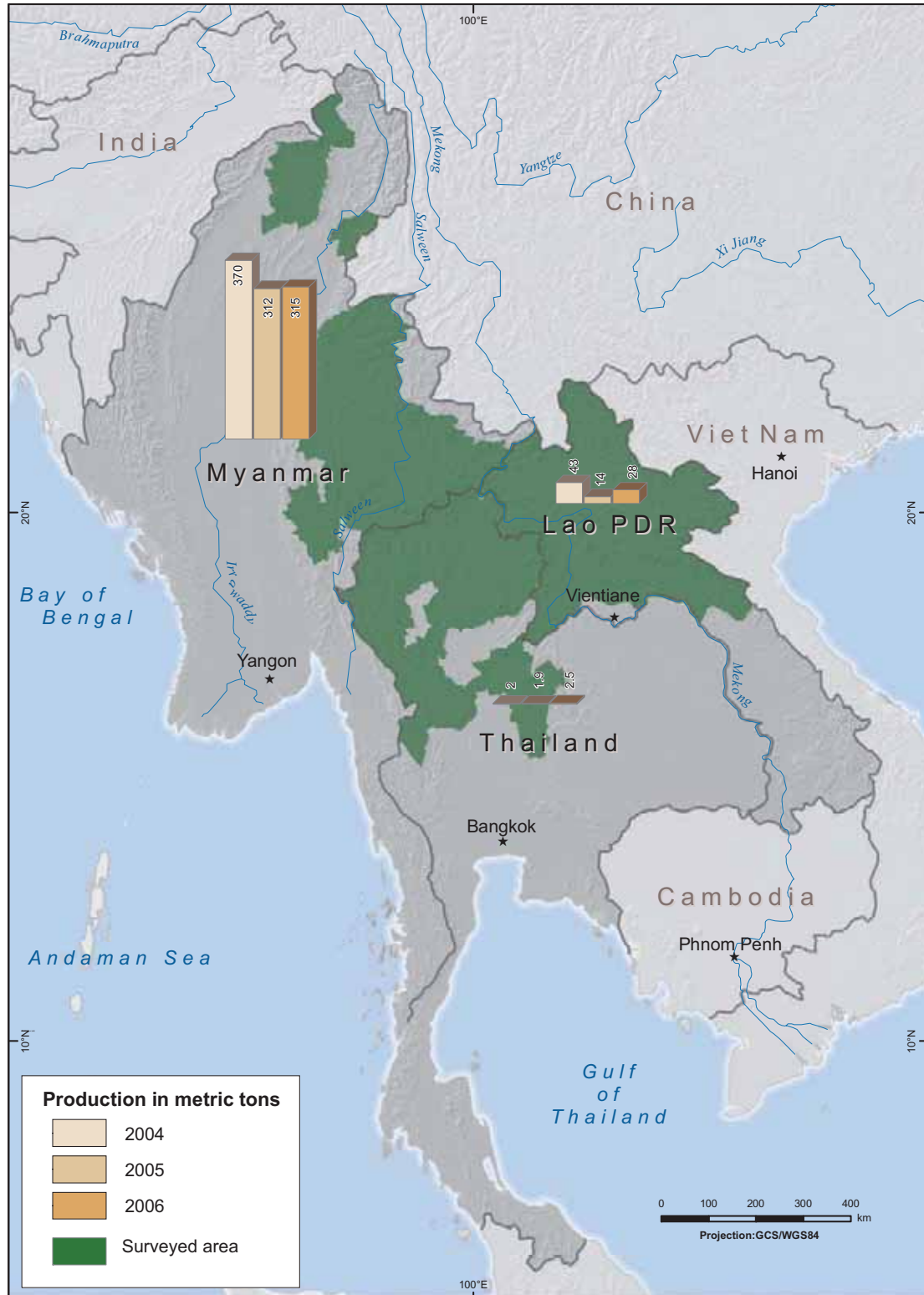
In 2006, total potential opium production in the Golden Triangle has remained at the same level as in 2005. This is due to increases in opium poppy cultivation in Laos (+39%) and Thailand (+34%), and higher opium yields in Myanmar, which offset the reduction in area under cultivation in the latter. Myanmar 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 2006.

Opium yield survey in Kachin, Myanmar



⁵ Source: World Drug Report 2006.

Map 3: Opium production in the Golden Triangle (metric tons), 2004 - 2006



Sources: Governments of Lao PDR, Myanmar and Thailand, national monitoring systems supported by UNODC in Lao PDR and Myanmar
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Figure 3: Opium production in the Golden Triangle (metric tons), 1998 - 2006

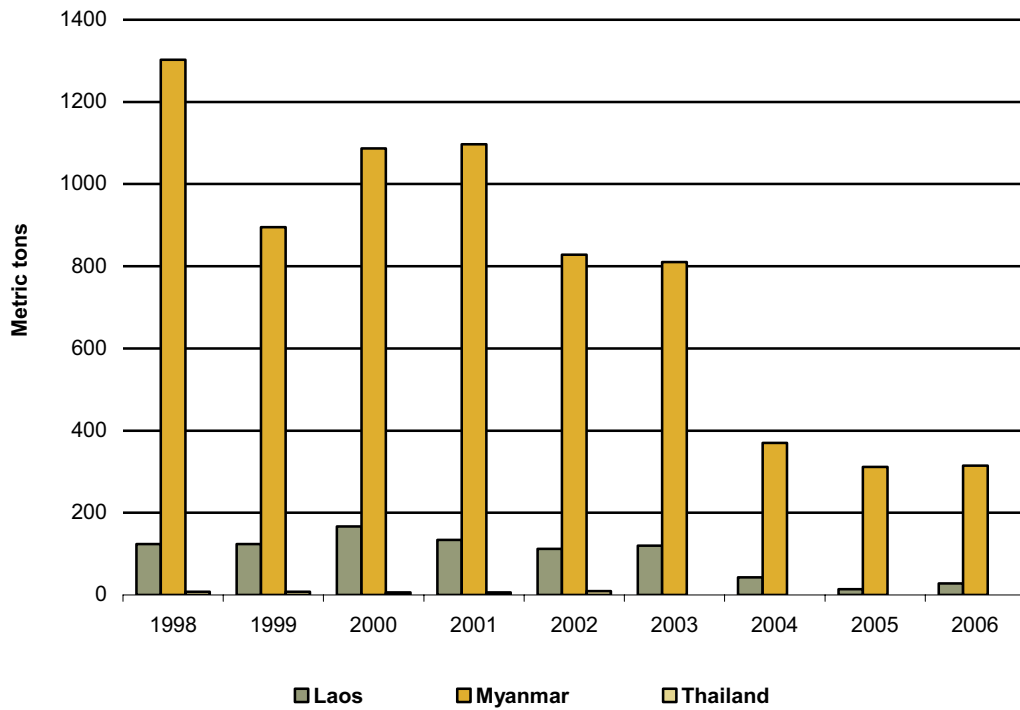
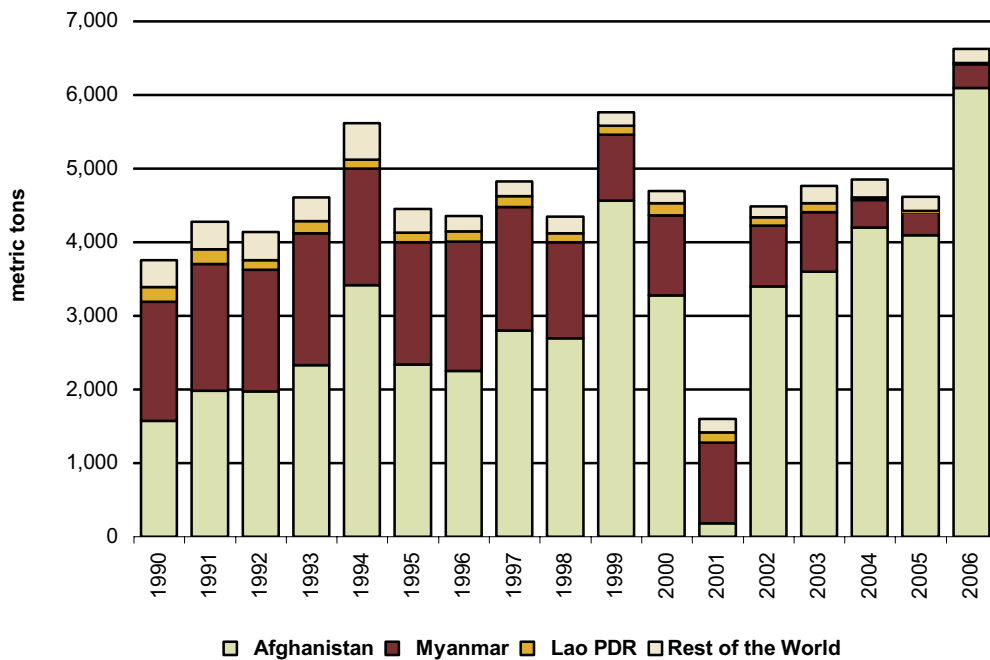


Figure 4: Global opium production (metric tons), 1990 - 2006*



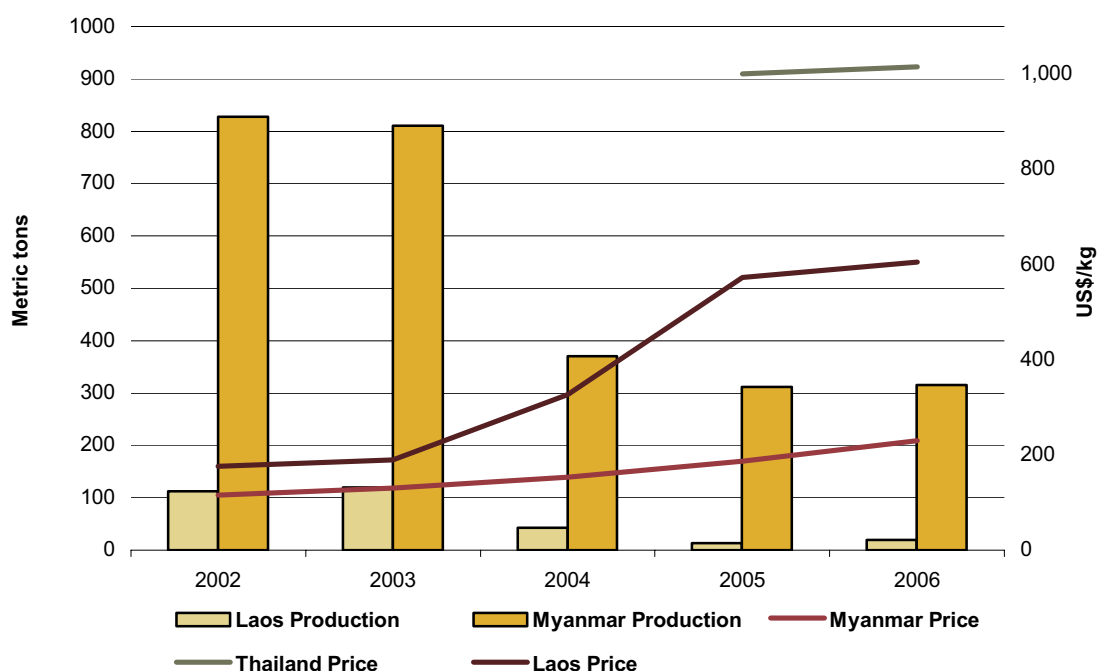
* Data for 2006 for Rest of the World are based on preliminary estimates.

Farm-gate prices

Opium prices in the Golden Triangle have increased over the past years. However, there are pronounced price differences between countries as well as between regions in countries. In 2006, the average farm-gate price for one kilogramme of opium at harvest time was highest in Thailand (US\$1015), second highest in Laos (US\$550), and lowest in Myanmar (US\$230).

The steep price upsurge in Laos by 240% between 2002 and 2006 reflects the scarcity of opium in the country, which turned from an opium exporter to a net importer within a few years. In Myanmar, by far the largest producer, prices rose as well but much slower. Here, the opium price doubled from US\$115/kg to US\$230/kg in the same period. Prices in Thailand remained for a second year at a comparatively high level of over US\$1000/kg.

Figure 5: Opium production and price in Lao PDR and Myanmar, 2002 - 2006

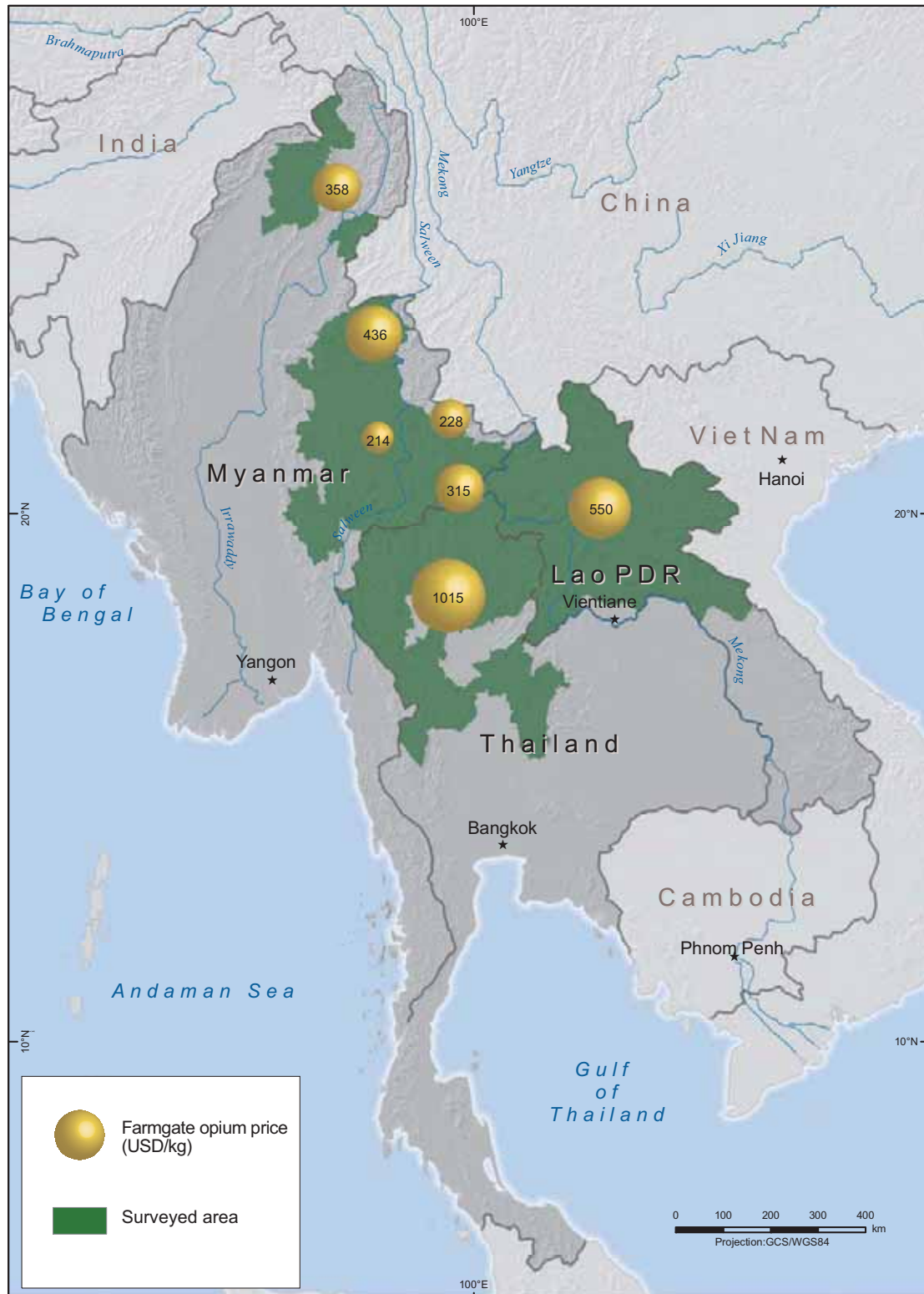


Household income from opium

The contribution of opium sales to the household income of farmers varies considerably. In Myanmar, opium sales constitute about half of the annual household cash income and is mainly used to cover food shortages. In comparison, in Laos and Thailand income from opium represents only 10% of total cash income.

Higher opium prices in 2006 pushed incomes of opium poppy farmers up by 50% compared to the previous year. In Myanmar, 43% of the average yearly household income (US\$437) of opium cultivating households was derived from opium sales in 2006 in contrast with 10% of US\$300 annual cash income in Thailand. Since a large proportion of the household cash income is generated by opium, farmers in Myanmar are vulnerable to opium price fluctuations and possible decreases in production, whether caused by drought, disease or law enforcement. Such changes can have a serious and immediate impact on household food security. In Special Region 2 (Wa) in Myanmar where local authorities enforced an opium ban in 2005, farmers have lost up to 70% of their cash income. In Laos, where opium cultivation was at lower levels 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: Farm-gate opium prices in the Golden Triangle (USD/kg), 2006



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 Southeast Asia, opium addiction is mostly found in places where opium poppy is cultivated. Since opium cultivation has declined rapidly in the last five years, the cost of opium has increased greatly. This has encouraged many users to try to stop, either by self-treatment or through treatment programmes. The number of opium addicts in Lao PDR has declined from 20,160 in 2005 to only 11,201 addicts in 2006, a reduction of over 50%. The addiction rate decreased similarly from 1% to 0.58%. In Myanmar, opium addiction remains high in places of opium production, ranging from 0.60% of the total adult population in Shan State to 0.72% in Kachin States and up to 0.83% in the Wa region, which was the main area of opium production in the country up to 2005. In Thailand, opium and heroin addiction has become mainly an urban problem with very few opiates abusers being reported by the government.

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 cash crop. Negative impacts include shortage of food and cash, increased debt, and stress. To cope with food shortages, some households had to borrow rice, consume less preferred and less nutritious food, and reduce food intake.

Households, which are especially vulnerable to poverty include those with opium addicts, those that lack land, labour, or access to markets and credit, and those who have been resettled without adequate support. These households experience an erosion of household livelihood assets, resulting among others in poor health and reduced education levels (school drop-outs). As a result, resumption of opium poppy cultivation and migration of family members for labour may occur.

A survey on coping strategies in Laos and Myanmar found that households have adopted certain strategies in response to the opium poppy reduction:

- *Expansion of area of upland farmed:* Nearly all households are expanding the area of upland rice and/or corn, but even so, not all households are able to achieve food security.
- *Collection of non-timber forest products:* This is one of the most widespread coping strategies, but the level of income varies. Some villages have successfully increased income while others have not.
- *Sale of livestock:* This strategy is especially important in Laos, but to a lesser extent also in the Wa region, Myanmar.
- *Increased work as unskilled daily wage labourer:* Wage labour is increasingly important as an income source in Wa (Myanmar), where it is the major annual income source for some households; but less so in Laos.
- *Agricultural diversification:* Is successful under certain conditions that include access to: markets and transportation, capital, materials and technology, and land. Most households in the opium poppy regions, however, lack several of these assets.

Emergency, rehabilitation and development assistance is urgently needed, especially in those areas, where opium poppy as a source of rural income was reduced within a short period of time. This assistance should provide food aid, promote agricultural improvements, and target specifically those households with a high degree of vulnerability. Comprehensive development assistance, with long-term commitments, is necessary to sustain achievements in livelihood security.

PART 1. INTRODUCTION

INTRODUCTION

The Golden Triangle is known throughout the world as an important centre where opium poppy has been cultivated and marketed for centuries. The town of Sop Ruak, at the Lao-Myanmar-Thai border, along the Mekong River, is thought to be the centre of the region and known informally as the Golden Triangle. Often, the Golden Triangle is perceived as a lawless area where warlord gangs fight with each other over caravan routes and markets.

Opium poppy fields in Phongsaly, Laos



Almost everything about this image is false. While parts of the Golden Triangle might be beyond the effective control of national Governments, most of the people in the area are not drug traffickers but poor farmers who cannot grow enough food to support themselves. Sop Ruak has only been called the “Golden Triangle” since the 1980s.

Some thirty years have elapsed since the term “Golden Triangle” was reportedly first used by Marshall Green, United States Assistant Secretary of State. At a press conference in July 1971, Green said that drugs were spreading through a “golden triangle” encompassing Laos, Burma (Myanmar), and Thailand. By referring to this region as a triangle, Green implicitly recognized the absence of opium cultivation and use in China.

At that time, United States and Thai leaders were planning the implementation of a crop replacement project in northern Thailand. When the Crop Replacement and Community Development Project started operations in 1971, it became the first such activity of the then newly created United Nations Fund for Drug Abuse Control (UNFDAC), a predecessor organization to UNODC.

By the 1970s, intensive cash-cropping of opium poppy was little more than a century old. Before that time, opium was not a cash crop and mostly grown in backyard gardens, for use as a medicinal substance in treating pain, dysentery, cough, and the symptoms of malaria.

This changed after British gunboats attacked Chinese coastal towns in the mid-nineteenth century to force China to open the country to the sale of opium that it had banned because opium addiction among the Chinese population had reached problematic levels. Once gaining access to this potentially huge Chinese market, British merchants hoped to sell opium grown in British-controlled Bengal for huge profits. Both because China's Ching Dynasty was weakening at this time and because of superior British gunboat firepower, the Chinese could not resist. The so-called Opium Wars of 1839-1842 and 1856-1860 ended with the legalization of the opium trade in China. However, British hopes of exporting Bengal opium to China did not fully materialize. Chinese entrepreneurs realized that opium was already being grown in the hills of southern provinces of China and promoted opium poppy cultivation by the ethnic minorities as a cash crop for export elsewhere in China.

Eventually, many people living in southern China migrated southwards into British Burma, Thailand, and French Indochina as unrest spread in the late nineteenth, early twentieth century. As they moved, so did the opium trade. Colonial and Thai administrators generally welcomed the income that could be derived from this trade to administer their respective countries. The move of opium cultivation southwards accelerated after 1949. Several campaigns in the early-1950s eliminated opium cultivation in southern China, leading to large-scale crop displacement from southern China to some provinces in Burma as well as Laos, Viet Nam, and Thailand.

The move of opium cultivation southwards accelerated after 1949. Several campaigns in the early-1950s eliminated opium cultivation in southern China, leading to large-scale crop displacement from southern China to some provinces in Burma as well as Laos, Viet Nam, and Thailand.

Only then did the Golden Triangle take shape as a major centre of opium cash cropping. In this region there were several major cultivation centres. In Myanmar, these were the Wa Region and Kokang, both along the China border in Shan State. In Laos, opium poppy was cultivated in the northernmost province of Phongsaly and the eastern provinces of Xieng Khouang, particularly Nonghet District and Xam Neua, as well as in adjacent areas in Viet Nam. Major growing areas in Thailand were in Chiang Rai Province around two mountains, Doi Tung and Doi Mae Salong. Large poppy fields were also cultivated in some villages just west and northwest of Chiang Mai city.

For decades, there were no systematic estimates on opium poppy cultivation. This began to change after the opium cultivation ban in Thailand which went into effect in 1958. In 1965/1966, the Public Welfare Department of Thailand carried out a socio-economic survey of hill people in opium poppy growing areas and in 1967, the United Nations Commission on Narcotic Drugs financed a survey on socio-economic needs. The latter survey estimated cultivation of opium poppy in Thailand to cover 18,500 hectares with a yield of 145 tons. Soon, alternative development projects were implemented by the government as well as by international agencies including UNFDAC. This and the strong political commitment of the Government of Thailand resulted in significant reductions in cultivation levels. By 1984, Thailand had become a net importer of opium.

Civil unrest and warfare in the other poppy growing countries of the Golden Triangle prevented opium surveys and development work until the late 1980s. However, from then on, increased political will as well as the implementation of various development projects contributed to the reduction of opium cultivation in Laos and Myanmar. Although opium poppy is still cultivated in the Golden Triangle, other trades are overtaking the opium business and its reputation is slowly changing for the better.

PART 2. COPING WITH CHANGE

COPING WITH CHANGE IN THE GOLDEN TRIANGLE - THE IMPACT OF OPIUM POPPY ELIMINATION ON RURAL LIVELIHOODS

Most opium poppy farmers of Myanmar and Lao PDR live in remote mountainous terrain, cultivating thin soils on steep hills. With traditional farming methods in these difficult conditions, yields of rice and corn are not enough to sustain annual food needs of most households. Thus, households have until recently depended on high-value and easily-transportable opium to increase their food security. Yet, even with income from opium, opium poppy farmers stayed poor. In the six northern provinces of Lao PDR, the average annual income of an opium poppy-growing household in 2005 was only US\$139, compared to US\$231 for those households that did not cultivate opium poppy.

Those families in the Golden Triangle that relied on opium poppy are now even more vulnerable to food and livelihood insecurity. On the other hand, new opportunities are slowly opening up in some locations. This chapter summarizes recent field research on the impact of the opium poppy reduction and the changes rural households in Myanmar and Laos have to face as a consequence. This chapter also presents an analysis of how former opium poppy farmers cope with change and identifies characteristics of vulnerable households.

Socio-economic survey in Shan State, Myanmar



Methodology and data sources

The findings presented here are an abridged version of the full report "Coping with Change – Poppy growers of Myanmar and Lao", commissioned by the UNODC Regional Centre for Asia and the Pacific. The study synthesizes the results of a number of recent UNODC surveys and studies, and enriches them with findings from a rapid field assessments conducted in Myanmar and Laos in early 2006.

UNODC-supported socio-economic studies

Six reports constitute the bulk of the data, on which the coping strategies study is based. Data relevant to coping strategies were extracted and analysed from these documents, and some case examples selected and refined. These reports include:

Table 1: Key reports analysed

Reference	Contents
<i>Naung Khit Township Baseline Survey Report.</i> UNODC/Wa Project., Myanmar. Draft March 2006.	A quantitative survey documenting household status in sectors including livelihood, education and health.
<i>Laos Opium Survey 2005.</i> UNODC Lao PDR and LCDC. June 2005.	Includes a section on socio-economic survey results which covers the six northernmost provinces ⁶ of Laos
<i>2005 Lao Opium Survey Socio-economic Study Annexes.</i> UNODC Lao PDR. 2005.	Comprehensive results of qualitative surveys in 24 villages of 5 provinces, organized by village profiles
<i>Myanmar Farmers' Intention Survey 2005.</i> UNODC Myanmar and CCDAC. October 2005.	Quantitative survey of 46 villages in Wa Region as farmers decided what to cultivate in the first post-ban poppy season
<i>Myanmar Opium Survey 2005</i> UNODC Myanmar and CCDAC. November 2005.	Includes a section on household socio-economic status
<i>Impact Assessment Report 1999-2005.</i> Eberhardt, Karin. UNODC/Wa Project. November 2005.	Assesses impact of the UNODC/Wa Project in sectors of livelihood, education, health, including case examples.

Field assessment of coping strategies

The rapid assessment used semi-structured group discussions and household interviews to investigate the impact of the opium ban and how households cope. The fieldwork was conducted in January and February 2006 in a total of 9 villages in Myanmar's Special Region 2 Wa and Oudomxay Province in Lao PDR, with one-half to one day in each village (see table below). Households interviewed were chosen from well-being categories (poor, average, better-off) to provide examples across the economic spectrum in the village, with an emphasis on poorer households. Households with current or former addicts were also selected.

In the Wa Region, the study was conducted in conjunction with fieldwork for a baseline survey of Naung Khit Township. The villages were selected to represent three kinds of vulnerabilities (low income, low land availability, high dependence on opium poppy income) as determined by a village vulnerability ranking on the basis of the quantitative baseline survey results. The field study results were first presented in the Naung Khit Baseline Survey Report as village profiles and a summary.

⁶ Luangnamtha, Oudomxay, Phongsaly, Luangprabang, Houaphanh, and Xiengkhouang.

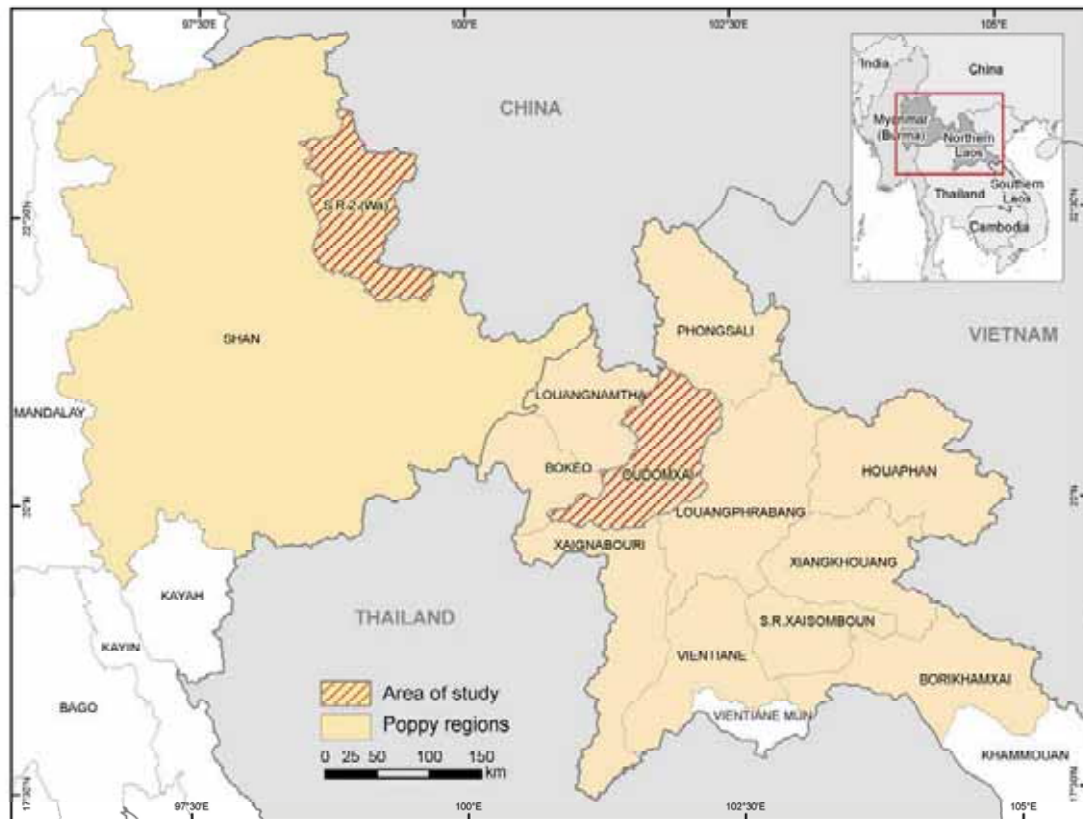
In Laos, villages were selected to represent those near and far from the road, as well as different ethnic groups (Khmu, Akha and Hmong). Altogether six villages were visited over a period of five days.

Table 2: Villages visited for the rapid assessment

Special Region 2 Wa, Myanmar	Oudomxay Province, Lao PDR	
Naung Khit Township: Sa Pyan Yaung Khaung Lahu Yaung Khaung Wa	La District: Ban Houan Chay Ban Soon Ban Mai	Huon District: Ban Khieu Pa Ban Hua Nam Mao Ban Hai

Opium poppy-growing village in Oudomxay, Laos



Map 5: Study areas in Myanmar and Laos

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Changes since the opium reduction

Upland households in the opium poppy regions of Laos and Myanmar have experienced both positive and negative changes related to the reduction or complete elimination of opium poppy. Positive impacts have been the rehabilitation of opium addicts, some lightening of workloads (especially for women), and the opportunity to diversify crops. On the other hand, since the opium poppy reductions, many households now lack food, cash, and livelihood security.

Opium and addiction

In Lao PDR, a survey in 1999 showed that 63,000 persons, representing 2.26% of the adult population, used opium in the northern provinces. This was the second-highest national rate of opium addiction in the world at that time. The situation in the Wa Region, Myanmar, was even more acute, with an estimated 6% of the adult population of Mong Pawk District being addicted, or at least one addict in 16% of all households⁷. Yet, as a result of a decade of rehabilitation programmes launched by regional governments and international agencies, the number of addicts in Lao PDR in 2006 is less than one fifth of the 1999 estimate.

Box 1

Those addicts who detoxified over the last few years ... have changed their attitudes and work hard for their families. Some addicts who have never had a shelter are now able to build a new house, raise some animals and extend farmland for their families. The villagers are really impressed with the detoxification program.' Respondent, Hah Da Village, Special Region 2 Wa, Myanmar (UNODC/Wa Project, November 2005).

⁷ Wa Area Development Project (WADP). 1999 Baseline Survey Report. Draft. UNODC Myanmar. 2000, p. 3.

Most opium addicts are men who became addicted when they used opium as medicine to relieve symptoms of an illness, or through social use. When the male head of household becomes addicted, he is usually no longer able to work hard. Consequently, women bear the burden of feeding the family as well as the opium addiction, and the livelihood of the entire household is at risk. The rehabilitation of large numbers of addicts throughout the region has contributed to increased household productivity and food security, lightened women's workloads, and, as many respondents observed, brought back harmony to family life.

Opium and household livelihoods

Opium poppy is a labour-intensive, high-risk crop and some households welcome the fact that they now have more time to concentrate on more reliable livelihood activities such as raising small livestock, doing handicrafts and cultivating other crops⁸. However, opium reduction has resulted in a serious lack of cash, lack of food, and increased debt for many households. Farmers in Wa's Naung Khit Township, for example, consistently report that families are now unable to purchase not only rice, but also basic household necessities such as cooking oil, salt and clothing. In the Naung Khit town market, about half of the shops have recently closed due to lack of customers, which is a clear indication of the lack of cash that is evident throughout the northern Wa Region.

One-third of all households in the Wa Region were in debt last year, and most of these farmers expect to be unable to repay that debt without opium income⁹. Without the security of opium, farmers have no loan collateral and are unable to access capital to invest in alternate income-generation activities.

Poor opium poppy farmer in Kachin, Myanmar



⁸ UNODC and LCDC. *Laos Opium Survey 2005*. UNODC Lao PDR. June 2005, p. 32.

⁹ UNODC and CCDAC. *Myanmar Farmers' Intention Survey 2005*. UNODC Myanmar. October 2005, p.11.

Opium and food insecurity

In the year 2005, 57% of villages in northern Lao PDR faced a rice deficit, while in the Wa Region, 90% of all villages experienced food insecurity. The average household in Wa is able to produce only enough rice for four to six months worth of food for the family, and those in the most difficult situation only enough for one to three months. Farmers in Wa are thus extremely vulnerable to the loss of opium income to make up for food shortages.

Box 2

'Because of the food shortage, we have to search for forest products for family consumption. We have to reduce meal times and sometimes we only have rice gruel to eat.' Respondent, Sa Pyan Village, Wa Special Region 2, Myanmar.

A lack of food forces households to use negative coping mechanisms such as consuming less preferred (and often less nutritious) food, rationing food, borrowing food, purchasing food on credit, and gathering or hunting wild foods. In times of food shortages, households face a daily struggle for food. Households in Naung Khit Township gave the following responses to the question of what they have done over the last year when there was no food available¹⁰:

Table 3: Coping mechanisms for food insecurity in Naung Khit Township¹¹

Coping mechanism employed over last year	% of households*
Engaged in casual labor	55%
Borrowed rice	47%
Mixed corn with rice	31%
Advanced labor for food	28%
Reduced number of meals per day	25%
Increased consumption of forest food	25%
Consumed rice gruel	14%
Bought rice	12%
Sold animals	10%
Sold household goods or land	6%
Migrated out for labor (temporary)	3%

* n=326 households

Good health is a critical household asset: without strength, labourers cannot work productively, and children cannot grow and learn. Yet when family members fall ill, the household must decide how much scarce time and money can be spared to care for the sick. When family members ration food to conserve it, or eat less nutritious foods, then malnutrition and related diseases become worse. In the Wa region, malnutrition rates are already among the highest in Myanmar, with 58% of children stunted, and 26% of children severely stunted¹².

Households in the Special Region 2 Wa were much more dependent on opium income for food than those in Lao PDR, where opium constituted only 10% of the total household income Tlast

¹⁰ UNODC/Wa Project. *Naung Khit Township Baseline Survey Report*. Draft. UNODC TCU, Pang Kham, Myanmar. March 2006, p. 26.

¹¹ The survey was conducted in November and December of 2005, during the first opium poppy season, in which cultivation was completely banned. Many of the households were just beginning to feel the impact of the ban, and stated that these coping mechanisms would surely be more widely practiced in the May-November food-short season of 2006 - and if no solutions were found, then in the years to follow.

¹² World Food Programme, *Nutrition Survey 2005*. World Food Programme, Myanmar. 2005. p. 11.

year. In the Wa Region, 82% of the farmers cultivated opium to ensure food security, and opium accounted for 73% of the total household income last year before the opium ban. Therefore, in 2006, annual household income in Wa dropped considerably, with potentially serious consequences for food security.

Worries and stress

The loss of the principal cash crop and related shortage of food and cash has caused worry and stress, especially in the Wa Region where the reduction has been so rapid and widespread. Since they had been cultivating opium for so many generations to meet food needs, many villagers did not believe a ban would be enacted - and when it happened, they did not know how to feed their families.

Case Example 1: Yaung Khaung Wa Village, Special Region 2 Wa, Myanmar

This case illustrates the situation and perspectives of farmers after a recent and sudden opium elimination in Special Region 2 (Wa), Myanmar:

Yaung Khaung Wa is a village of 249 ethnic Wa in 41 households. At only USD 61.5, the average annual household income is less than a quarter of the township average. In 2005, the year of the opium ban in this region, unskilled labour (including work in opium fields) provided 72% of the household income, while opium contributed only 23%.

Most families are only able to harvest enough rice from their upland field for a 4-6 month supply of food. In the past, even with income from opium, most households still lacked food for several months. When households lack food they look for work in nearby towns, where they can carry rocks and sand for roads or construction for about USD1.25 per day, but jobs are not always available. Sometimes labourers must return from the town empty-handed.

Villagers reported that the main impact of the opium ban had been a complete lack of cash to buy rice and basic household needs such as salt, cooking oil, or clothing. During the season in past years, villagers would be working as gum collectors in opium fields, but now nearly all households were collecting forest products. As an alternative, they would like to plant winter crops to improve their livelihoods, but lack enough seeds, land and technology. They planned to establish a tea plantation, for which the township authorities would provide seedlings. They also planned to increase the cultivated area of upland, but were aware that this would not be sustainable as pressure on the available land was already high.

Box 3

'Some people are staying home with nothing to do, but most are collecting forest products. What we are collecting now will last only a short time, by next year it will be gone. And since we have to cut down the trees to strip the bark, it causes deforestation. It is very hard work. No one wants to do it. We would rather not collect forest products, but we have no choice. Our children must eat.' Village leader, Yaung Khaung Wa Village, Wa, Myanmar.

Vulnerabilities: Households at high risk of poverty

Some households are less able than others to cope with the stresses of the opium ban. When households cannot cope, they are forced to reduce expenditures on food, health and education, increasing the likelihood of poor health or school drop-outs. When households no longer have any material assets such as livestock or land to cash in, and their food supply is diminished, they are left with few choices. These households may resort to migration for labour, or resume cultivation of opium. Indicators of household vulnerability to such an erosion of livelihood security are presented below:

Terraced rice field replacing opium poppy field



Opium addiction

Although opium addiction has dramatically declined, many families of rehabilitated addicts are still poorer than their neighbours, due to decades of using livelihood assets to "finance" the addiction. Households with addicts are the most vulnerable as they must use scarce resources to buy opium, which has become more costly since the reduction of the opium poppy cultivation.

Lack of land

Access to land, perhaps more than any other factor, determines whether a household can find alternatives to growing opium poppy. Households that lack land usually depend on unreliable income sources such as collection of non-timber forest products and casual wage labour. Yet the amount and quality of available land varies widely within the (former) opium poppy regions. In the Wa Region, for example, average land holdings range from a minimum of 0.13 ha/household to a maximum of 3.6 ha¹³. Moreover, the average landholding of 1.13 ha per household in Wa is only half of the national average in Myanmar.

Lack of access to markets and credit

Ban Hai village (see case example no. 3) illustrates the quandary of those villages that have plenty of land, labor, and potential for livestock, but lack access to market and to credit. Because of its remote location and lack of ability to sell licit products, this village is at risk of renewed opium cultivation. Ban Hai's situation in terms of accessibility is similar to the majority of villages in the opium poppy regions. About half of all villages in Lao PDR lack road access.

¹³ UNODC and CCDAC. *Myanmar Farmers' Intention Survey 2005*. UNODC Myanmar. October 2005, p. 5.

Resettlement and reliance on food aid

Resettlement, both spontaneous and forced, is linked to opium reduction and poverty alleviation programs in the opium poppy regions. Governments and local authorities consider that concentrating populations in lowland areas near roads will help them access to social services. A significant number of households are affected. For example, in 2000 and 2001, several thousand persons were moved from northern to southern Wa in Myanmar; and in Oudomxay Province, Laos, the number of villages decreased from 803 to 587 over the last decade¹⁴. While relocation can help farmers under certain conditions, it can also lead to an erosion of household assets if the relocation is forced and unsupported, and if the concentration of populations increases competition for land and other productive resources in the resettlement zones.

Case Example 2: Mr. Lao Ya's household

Ban Keo Pha, Muong Huon, Oudomxay Province, Lao PDR

The following case illustrate the ability of farmers to use opportunities if conditions allow:

Mr. Lao Ya, a rehabilitated opium addict, is 35 years old and lives with his wife and three children in a small bamboo and thatch house. The family moved to this resettled village about four years ago. In the days before the resettlement and opium reduction, their upland rice field yielded only enough for one month family consumption. Their opium yield was also very low, and not even sufficient for his use. In order to meet family food needs, and opium needs, he and his wife worked for relatives for rice and opium.

Since the household stopped cultivating opium poppy in 2003, they grow corn as well as upland rice. Their rice yield is higher because the new land is more fertile, and now their rice yield lasts the family about two months. To make up the remaining ten months, he and his wife still work for rice from relatives, as well as growing corn, which last year they sold for US\$62 (620,000 kip) and collecting timber logs for the traders, which earned about US\$100 (1,000,000 kip) this year.

Mr. Lao Ya reports that he was rehabilitated just last year through the community-based detoxification program run by the district with support of UNODC. He detoxified because opium is now illegal, and has become expensive and difficult to find. Since detoxification his health is better, but he still doesn't work as hard as his wife and sometimes stays home to take care of the baby.

The couple agrees that life is now better than before. Lao Ya's wife says that her workload has decreased. They estimate that they have about twice as much cash now than in the past when they grew and consumed opium. Despite these small improvements, they still cannot afford many household goods, and are just able to make ends meet. The couple is not sure how they will improve their livelihoods, but will try to double the area of upland rice and corn that they cultivate. They would also like to raise pigs, as they have none at present.

Case Example 3: Ban Hai, Muong Huon District, Oudomxay Province, Lao PDR

The following case example illustrates the enormous difficulties rural households in remote areas have in finding alternative income opportunities for the banned opium poppy:

'Everything that we can produce to sell is too heavy to carry; how can we carry corn like we carried opium?'

Ban Hai, a Hmong village of 258 persons in 38 households, is at a 2.5 hour/eight kilometer walk over steep and rocky terrain from the nearest access road. This village began to eliminate opium cultivation in 2003 and is continuing to eliminate up to now. All households now cultivate more rice than they did before the opium ban, but they yields are still not enough for food sufficiency for all households. Families now grow rice, corn, and some fruit and vegetables and raise pigs and

¹⁴ National Statistic Centre. *Population and Housing Census Report*. Government Publishing, Lao PDR. 2005.

other livestock. Although they are able to grow more corn, households in Ban Hai cannot sell corn like other villages do, because they lack road access.

Opium poppy growing village in Oudomxay, Laos



Nyein Su's household income is about average for the village. His household has altogether 11 members, but many of them are young children, with only three main labourers. He harvested ½ ton of corn last year, all of which he fed to the pigs. He was able to sell USD 60 worth of onion, but it was very difficult to transport. First he had to carry it three hours to the road on his back, and then take public transport to the town. He had to sleep in the district town overnight, as it is too far to go and come back within one day. Last year he also sold two pigs, totalling USD 40, at the road. If they were able to transport goods to market easily, his family would grow and sell much more corn and onions. His annual cash income now is less than half what it was in the past, when opium sales earned his family US\$200 to 300 per year.

The villagers repeatedly expressed that they have become poorer as a result of opium elimination. In the past, six or seven households ate the less favoured corn a few months of the year; and now more than 20 households eat corn for at least some parts of the year. Two women reported that this year for the first time ever they had to borrow money to send the children to school. Because of the transport difficulties, few households have the confidence to raise cash crops like corn and onions. And they lack credit for livestock, though their environment is favourable for pigs, cattle and buffalo.

Coping strategies: how upland farmers make a living in the post-opium poppy environment

Farmers have adopted several strategies to strive for livelihood security, though not all are sustainable in the difficult conditions of the Golden Triangle. Strategies used include:

- Expansion of area of upland farmed
- Collection of non-timber forest products
- Sale of livestock
- Increased work as unskilled daily wage labour
- Agricultural diversification

Expansion of area of upland farmed

Most households are increasing the area of upland they cultivate each year in a bid to achieve food security without opium income. However, the rotating fallow system, also called shifting cultivation or swidden farming, which prevails in the hills of the region, requires extensive areas of land to ensure that fallow periods are sufficiently long to restore soil fertility for the next cultivation cycle. The traditional fallow period of 15 years is considered to be sustainable, but in some areas of Myanmar and Lao PDR, population pressure has caused land shortage, and the fallow period declined to an unsustainable three years, leading to soil erosion, land degradation, and reduced yields. For these reasons, many families will not be able to meet annual food needs by expanding the area cultivated.

Collection of non-timber forest products (NTFPs)

Although upland households have always collected wild forest products for food and for cash, this activity has greatly intensified in recent years. In Wa's Naung Khit Township, for example, virtually all households were collecting NTFPs instead of cultivating opium poppy during the first season of the opium ban, in a scramble to access even a small amount of cash (see Yaung Khaung Village case example). The market for saleable products such as orchids, bamboo shoots, rattan, medicinal roots, leaves and bark, and starchy tubers has been facilitated by recent improvements in roads and communications that enabled an extensive NTFP trade network to reach from China into Myanmar and Lao PDR. But the market for specific products is variable, and forests can become quickly depleted. The market for NTFPs is much more developed in Laos than in the Wa Region, and high-value products such as sapanwood and sticklac¹⁵ are now being cultivated in a promising development for both household income generation and forest protection.

Casual wage labour

In Laos and Myanmar, most casual labourers work in or near their villages in agricultural activities or in construction and road-building if they are near towns and roads. For example in Naung Khit Township, Wa region, 55% of the households have increased casual labour in response to food insecurity¹⁶. But the labour market is seasonal and highly variable, and work is not always available. In Yaung Khaung Wa (see case example) households are more dependent on labour than on other sources of income. With competition for labour increasing since the opium ban, and an end to high-paying labour opportunities in opium poppy fields, Yaung Khaung Wa is in an especially vulnerable position.

Sale of livestock

About one-quarter of the households in opium poppy regions of Lao PDR had sold livestock to generate income during the transition from opium to other source of income. Since opium poppy-growing households are generally poorer than other households, they tend to own fewer livestock. Therefore, livestock sales are likely to represent an erosion of the household assets. In 2005,

¹⁵ Sticklac is a resinous substance secreted on trees by the insect *Tachardia lacca*. Lac is used in industry and for crafts.

¹⁶ UNODC/Wa Project. *Naung Khit Township Baseline Survey Report*. Draft. UNODC TCU, Pang Kham, Myanmar. March 2006, p. 14.

livestock sales in the Laos' opium poppy region constituted 63% of the annual household income for those villages still growing opium, but only 35% in non-opium poppy growing villages. Farmers in Special Region 2 Wa derive much less of their annual income from livestock¹⁷, ranging from 23% to only 10%. In Special Region 2 Wa, only 'better-off' households sell pigs and cattle, while households 'in difficulty' derive income from casual labour and forest products. Despite these regional differences, a common feature throughout the (former) opium poppy regions is that farmers would like to develop livestock as a post-opium poppy income-generating activity, but lack credit and in some cases animal husbandry technologies.

Agricultural diversification

Crops such as canola, sweet pea, and sesame have recently been introduced to the opium poppy regions for their cash potential, while soybean and peanut are promoted for improved household nutrition. A favourite cash crop is the hybrid or high-yield variety corn that sells well to the China livestock feed market. Of the villages visited in Oudomxay Province, all those with road access are now selling hybrid corn to China as a result of access to traders, who provide credit and supplies. Ban Soon Village, for example, was able to easily diversify out of poppy cultivation because the access road and trade network enabled traders to come to the village and encourage corn, NTFPs and livestock. Unfortunately, few villages in the (former) opium poppy regions meet all the basic conditions for a successful agricultural diversification. Most lack access to one or even several of these critical conditions, which include:

- Access to market (market and road access exists, ability to transport)
- Availability of fertile land to cultivate the crop
- Material inputs: seed, credit
- Technical ability: training and extension

Box 4

'The project provided chickpea, mustard, faba bean, canola and coriander to the whole village to cultivate. The yields were good and the trial successful, especially for canola and coriander, which we sold for more than one silver coin(3 USD) per one pong (10.5kg). Most of the villagers planted coriander more than other crops because it earns more income. We also plant soybean and peanut for home consumption.' Respondent, Yan Mai Village, Special Region 2 Wa, Myanmar. (UNODC/Wa Project, November 2005)

Case Example 4: Ban Soon Village, Muong La District, Oudomxay Province, Lao PDR

A successful example of a farmer coping with change:

Ban Soon, a Khmu village of 23 households, was resettled to this location after the war about 30 years ago and now has a dirt access road to the sealed road to town. Before the year 2000, all families grew opium poppy to help make up for the rice shortage, along with cassava, banana, and collecting NTFPs. In those days households harvested about six months supply of rice from their upland fields. Since the opium ban in 2000, although rice cultivation is still the main activity, households also sell pigs and chicken, non-timber forest products, and high-yield corn and sesame. In the past, each household would raise about four to five pigs, but they never grew very well; now some households have up to 18 pigs, and all are fattened on the new high-yield corn. Households began cultivating galangal, a ginger variety, this year in their upland fields and in the forest, and some plan to plant sappanwood as they have seen farmers in a nearby village do. Traders supply the planting material and technical assistance.

Mr. Kham Seng is the head of the most affluent household in the village, and since last year his household is one of the two households that no longer cultivate rice. Instead, they raise livestock and cultivate more valuable crops, with the income of which they then are able to buy rice. Last year, Mr. Seng's household income included US\$240 from pig sales, US\$50 from chicken sales,

¹⁷ UNODC/Wa Project, November 2005 and UNODC/Wa Project, March 2006.

US\$100 from sticklac (an NTFP), and US\$20 from sesame. He expects an additional US\$20-30 from selling of chilli.

Villagers report that life after the opium ban became easier fairly quickly. Opium cultivation was very demanding on labour, and now the women have time to collect NTFPs and grow corn as well as other crops. Now, they are able to eat rice as their staple food all year long, while in the past they had to rely on less preferred foods of corn and cassava for some of the time. Their cash income is also more reliable now.

Targeting vulnerable households

The 2005 socio-economic survey in Lao PDR found evidence that poor households are being marginalized within the village¹⁸, for example through exclusion from rice banks and other credit schemes or from village groups. Conditions indicating a high degree of vulnerability include:

- Existing opium addicts or recent addiction cases in the household
- Lack of land
- Less than six months worth of food needs produced from own land
- High dependency on opium income for food sufficiency

However, comprehensive information on many of these issues is lacking, and proper targeting will therefore require baseline surveys *and* rapid assessments to identify vulnerable households and villages.

Future risks and challenges

The current amount and scope of development assistance is clearly insufficient to help all vulnerable former opium poppy households in Myanmar and Laos achieve food and livelihood security. In Lao PDR, for example, only half of the former opium poppy-growing communities have received some external assistance related to opium elimination^{19 20}. In Myanmar's Special Region 2 (Wa), less than US\$20 millions were spent on development assistance since 1998 or less than US\$3 per person per year in that region. Yet farmers in the Wa Region have reduced cultivation from 20,000 ha in 2003 to 12,900 ha in 2005, and to virtually zero in 2006. In contrast in Thailand, the much larger amount of US\$250 millions was spent over the last 25 years to reduce the much smaller initial area of only 9,000 hectares of opium poppy in the 1980's to around a hundred hectares today.

There is an imminent danger that without a timely effort on the part of governments, donors and aid agencies, the gains achieved over the last decade in terms of poverty alleviation and opium poppy reduction will be lost.

¹⁸ UNODC Lao PDR, Socio-economic Study Annexes, 2005. p. 34.

¹⁹ UNODC Lao PDR. *UNODC Strategic Program Framework, Lao PDR 2006-2000*. UNODC Lao PDR. January 2006.

²⁰ Renard, Ronald D. *Opium Reduction in Thailand 1970-2000: A Thirty-year Journey*. Chiangmai: Silkworm. 2001.

PART 3. LAOS

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ABBREVIATIONS

UNODC	United Nation Office on Drug and Crime
GoL	Government of Laos
ICMP	Illicit Crop Monitoring Programme
LCDC	Lao Commission for Drug Control and Supervision
PCDC	Provincial Committee for Drug Control
DCDC	District Committee for Drug Control
NTFP	Non-Timber Forest Products
PFU	Programme Facilitation Unit
RAS	Research and Analysis Section (UNODC)

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PREFACE

On 14 February 2006, Laos declared to the world that it was virtually opium free. Opium poppy cultivation has declined to just 1,800 hectares in 2005, down from 26,870 hectares in 1998, a 93 per cent decline. Moreover, domestic opium consumption has been reduced by over 68 per cent over the same period.

In 2006, for the second consecutive year - in spite of a slight increase in area cultivated to 2,500 hectares - Laos has been able to maintain opium poppy cultivation at an insignificant level. This successful achievement is also recognized for the knockdown effect it has in the cross border battle against drugs in the subregion.

The Lao Government is to be praised for its efforts but it also needs much in terms of sustained support and help. Socio-economic studies indicate that about 50 per cent of the 2,056 villages that used to grow opium poppy still require development assistance and could revert back to opium for lack of alternatives. Many former opium poppy farmers are just coping. Others, like Mrs. Mai Ya, a Hmong farmer from Oudomxay, have been able to get 50 times more income from peaches, pineapples, peas, poultry and pigs than she had ever received from opium poppies.

It is time now to increase assistance to Laos and help its poor opium poppy farmers develop alternative livelihoods. With lessons learned from past projects in Laos and the region, investments could reap more rapid impacts and results.

The Lao Government, neighbouring countries and the international community must get together in a joint coordinated effort to provide the assistance that is urgently required and help make this most recent victory against drugs a lasting one.



Leik Boonwaat
Representative
UNODC Lao PDR

FACT SHEET - LAOS OPIUM SURVEY 2006

	2005	2006	Variation on 2005
Opium poppy cultivation	1,800 ha	2,500 ha	+40%
Average opium yield	8 kg	8 kg	0%
Potential production of opium	14.4 metric tons	20 metric tons	+40%
Number of villages growing opium poppy	270	n/a	
Number of households cultivating opium poppy	6200	5800 ¹	-6%
Average farm gate price of opium	US\$ 521/kg	US\$ 550/kg	+6%
Total potential value of opium production	US\$ 7.4 million	US\$ 11 million	+49%
Average annual cash income of opium growing households	1,457,000 kip (US\$ 139)	n/a	
Opium growing households with rice deficit	57%	n/a	
Average annual cash income of households not cultivating opium poppy	2,418,000 kip (US\$ 231)	n/a	
Eradication ²	2,575 ha	1,518 ha	-41%
Number of opium addicts ³	20,160	11,200	
Average drug prevalence rate (based on 8 northern provinces in 2005 and 6 in 2006) ³	1%	0.58%	

¹ Source: LCDC, provincial authorities survey.

² Source: LCDC.

³ Source: LCDC. Survey areas of 2005 and 2006 are not comparable.

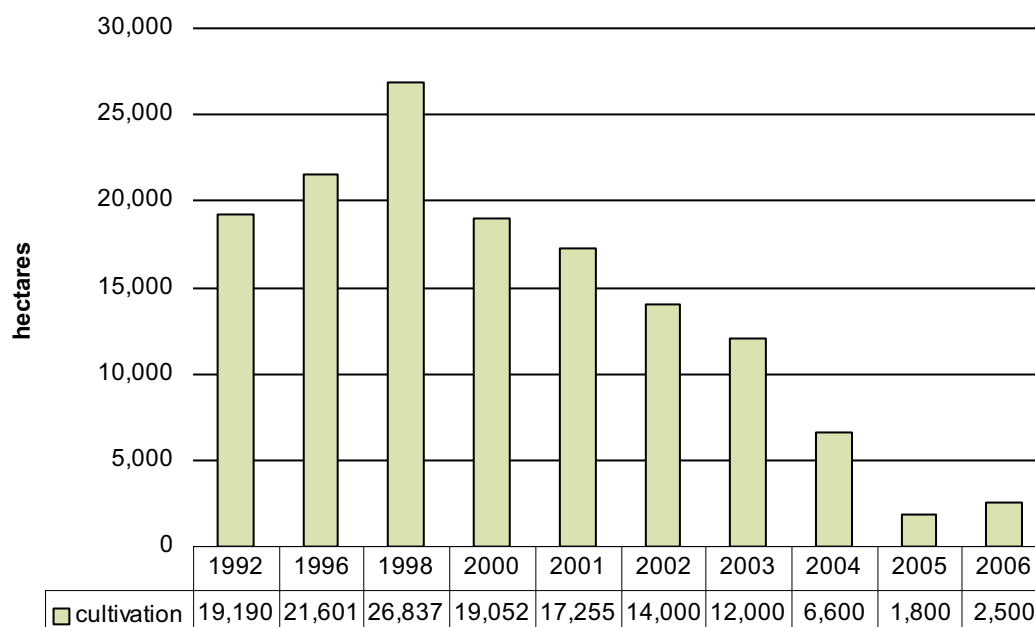
EXECUTIVE SUMMARY

The 2006 opium poppy survey in the Lao PDR was conducted jointly by the Lao Government and UNODC across seven provinces of northern Laos. As in 2005, the methodology consisted of an aerial survey by helicopter over sample sites. This year, due to stronger enforcement of the opium ban, it was not possible to conduct a socio-economic survey among opium farmers. However, a more limited study, assessing the coping strategies of farmers abandoning opium cultivation in Oudomxay province, was conducted by UNODC.

Opium poppy cultivation

The total area under opium poppy cultivation in the Lao PDR in 2006 was estimated at 2,500 hectares. This is an increase of 39% compared to 2005 (1,800 ha). However, the level of opium poppy cultivation in Laos remains at a very low level compared to 1998 when it culminated at 26,600 ha. Although opium cultivation has virtually been eliminated, more work is needed to sustain this achievement, since poor farmers who abandoned opium poppy cultivation need alternative livelihood options.

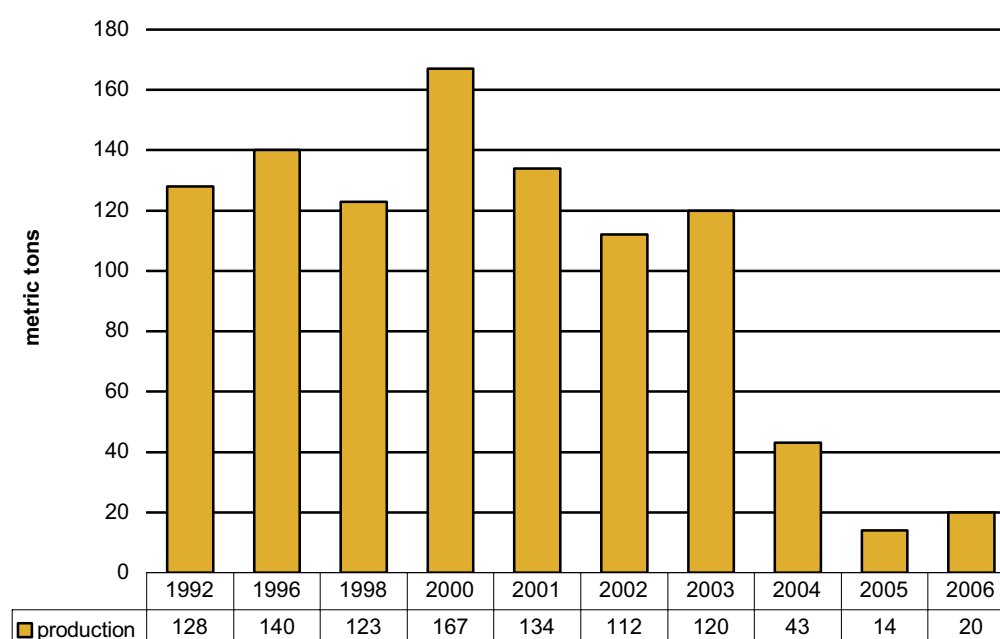
Figure 1: Estimated area under opium poppy cultivation in Laos PDR, 1992 - 2006



Opium yield and production

The average national opium yield potential for 2006 was estimated at 8 kg/ha. Since it was not possible to conduct a full yield survey in 2006, the yield estimate was based on a three-year average of the 2003-2005 yield estimates. In 2006, similarly to 2005, weather conditions were favourable for opium poppy cultivation and field assessments of standing opium fields revealed that crop vigour was similar to previous years. Based on the estimated area under cultivation, the potential production of opium for the year 2006 was 20 mt, which is a 40% increase with respect to 2005. However, opium production in 2006 remained low and was only 12% of the potential opium production in 2000.

Figure 2: Potential opium production (metric tons), 1992 - 2006



Opium prices

Due to stronger enforcement of the opium ban, it was not possible to collect farm-gate prices of opium during the time of the survey this year. However opium prices have been collected at provincial level by the local authorities soon after the 2006 opium harvest. Like in 2005, there was no clear distinction between wholesale and retail prices, since opium was mainly bought and consumed by local addicts and only limited amounts were destined for markets outside the province. Opium prices remained high with a mean value estimated at US\$550 per kg, representing an increase of 5% compared to prices during the same time in the previous season. The strong opium prices make it more attractive for farmers to revert to opium production, especially if no alternative sources of income are available. It is therefore of paramount importance to provide relief and development assistance to the most affected population in the region.

1 INTRODUCTION

This report presents the results of the seventh consecutive opium survey, conducted annually in Laos by the Lao National Commission for Drug Control and Supervision (LCDC), with the support and participation of UNODC. UNODC started to carry out extensive yearly surveys since 1992, based on an inventory of all known opium producing villages. Similar surveys were conducted in 1996, 1998 and then annually since 2000.

In 1999 the Government of Lao PDR and UNODC developed the programme strategy “Balanced approach to opium elimination in the Lao PDR”. This was backed up in November 2000 by the Prime Minister Order fourteen, stipulating measures against cultivation and abuse. In 2001 the 7th National party Congress called for opium production and use which was linked with poverty reduction to be eliminated by 2005. A National Campaign against Drugs was launched in October 2001 to mobilize and convince communities to give up opium production. The government has increased the momentum of this campaign during the last two years and Laos is now on the verge of becoming opium poppy free.

Flowering opium poppy field in a forest clearing



Close monitoring of the remaining opium cultivation is necessary not only to sustain the elimination effort but also to prevent any possible resumption. In neighbouring Thailand, which was declared opium poppy-free in 2002, monitoring continues under similar conditions, and a few hundreds hectares of opium poppy are discovered every year.

In 2006, a helicopter was used to survey seven provinces⁴ of Northern Lao where opium poppy used to be cultivated and where the probability to find some cultivation is still high. This methodology was already successfully implemented in 2005, when it proved to be cost effective and reliable in areas where opium poppy cultivation is limited, dispersed and moving into remote (hilly) areas. In addition, a study the coping strategies of farmers who stopped cultivating opium poppy was implemented. This study revealed how important it is to understand the coping strategies of ex-opium poppy farmers in order to facilitate the transition towards a licit economy.

⁴ In 2006, districts of the Special Region Xaisomboun were merged with other provinces (Vientiane and Xiengkhouang Province). However, the annual survey was designed before the merger and Special Region Xaisomboun is recorded as a separate province in this report.

2 FINDINGS

The helicopter survey implemented by UNODC, in coordination with the Ministry of Defence of Lao PDR, covered the seven northern provinces of Lao PDR. It aimed at estimating the remaining opium cultivation in the country. The survey covered a distance of approximately 2,000 km over the provinces of Phongsaly, Luang Namtha, Oudomxay, Luangprabang, Xiengkhouang, Houphanh and Xaisomboune Special Region during more than 25 flight hours. The aerial survey covered 70 randomly sampled segments of 5 by 5 km each.

Data on opium yield and cultivation practices were collected by two teams of ground surveyors who visited opium poppy fields identified during the helicopter survey.

Opium poppy fields, Phongsaly Province



2.1 Area under opium poppy cultivation

The aerial survey revealed the existence of opium poppy cultivation in seven provinces in Northern Laos (Phongsaly, Luang Namtha, Oudomxay, Luangprabang, Xiengkhouang, Houphanh and Xaisomboune Special Region).

In 2006, the area under opium cultivation was estimated at 2,500 hectares, with a confidence interval ranging from 2,040 - 2,990 hectares at 90% probability. This was a 39% increase compared with 2005 (1,800 ha), but still 91% lower than in 1998 (26,800 ha). It can be assumed that the actual area harvested was smaller due to the vigorous eradication efforts by the government, part of which took place after the aerial survey.

Map 1: Sample segments surveyed by helicopter, Northern Laos, 2006

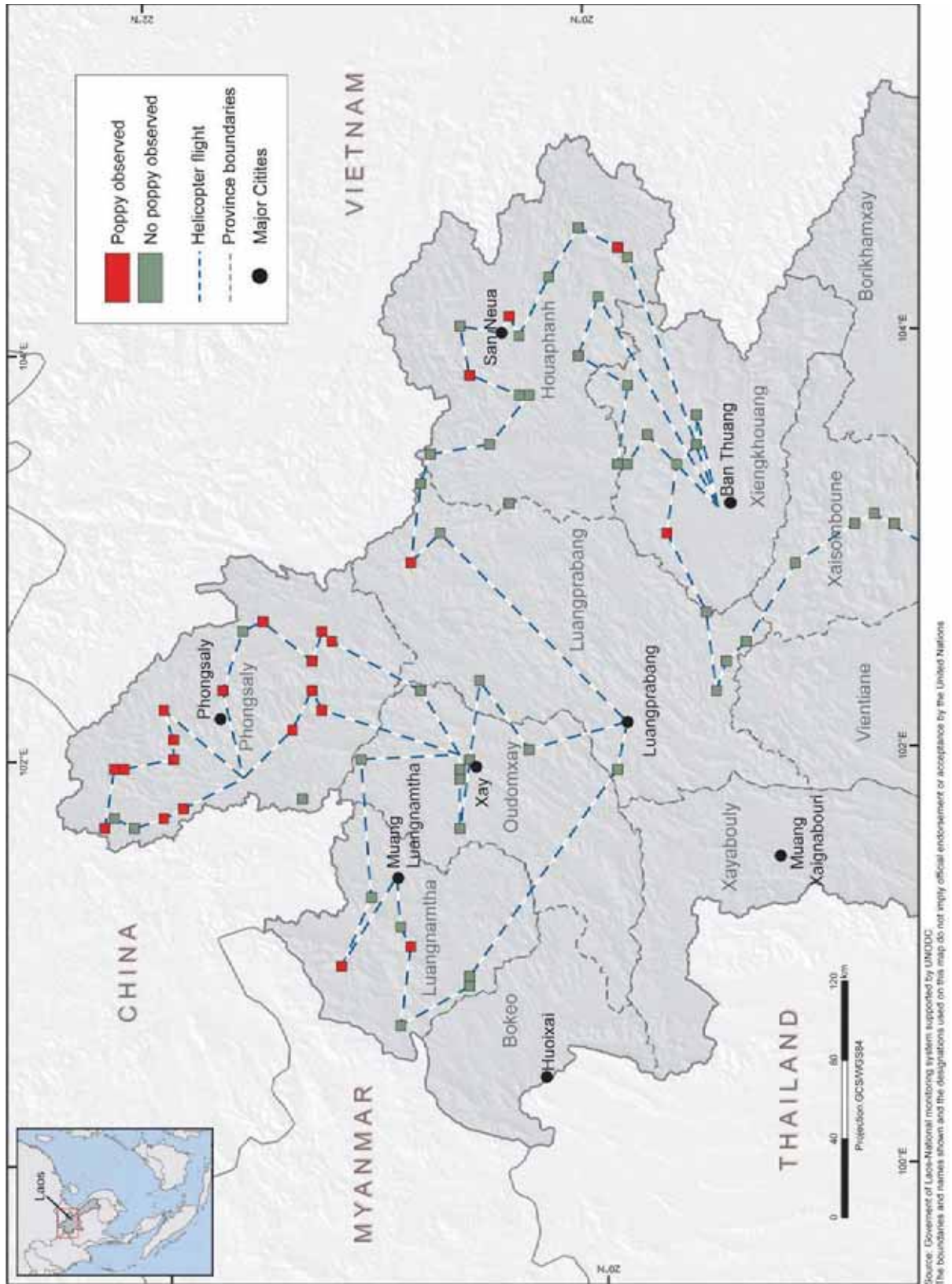
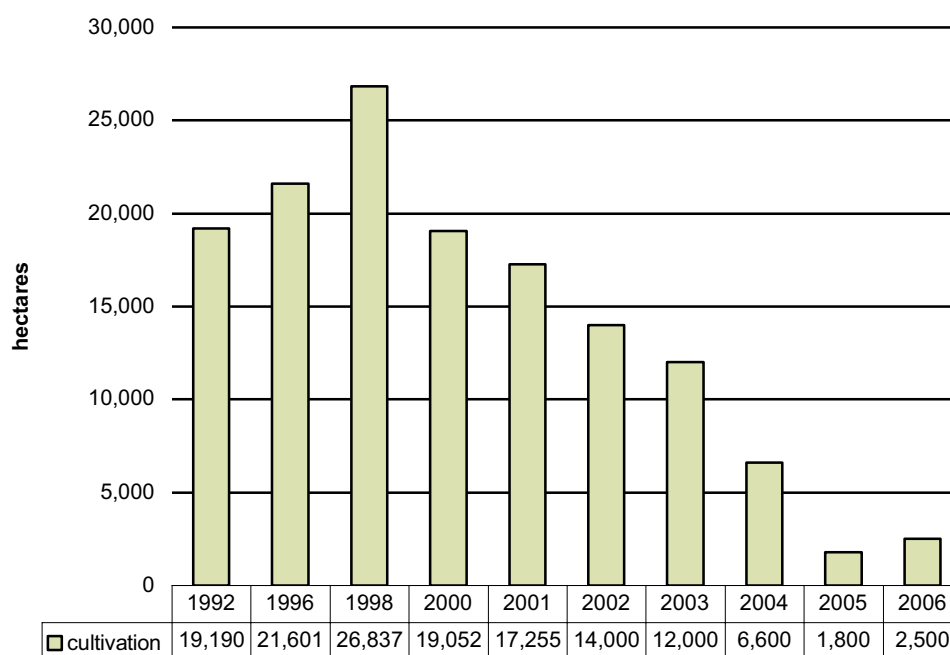


Figure 3: Estimated area under opium poppy cultivation (hectares), 1992 – 2006

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, Luangprabang, Houaphanh, Xiengkhouang, and Special Region Xaisomboune. It is assumed that opium poppy cultivation outside this area is negligible. An accuracy assessment was performed based on field measurements through ground surveyors in order to verify the size of the fields found on the randomly selected segments.

Opium poppy fields were found in 24 out of 65 randomly selected grids. Five grids out of 70 were not surveyed due to logistical problems. The average land under opium poppy cultivation was 2.9 hectares per grid, with some grids having as much as 12 hectares of opium poppy.

Opium poppy fields in a remote area of Phongsaly province



The helicopter survey also found a significant difference between the proportion of opium poppy planted close to the village and further away. Most opium poppy fields were in the vicinity of the villages (within a radius of 2.5 km), where labour is easily available. However, opium poppy fields were also found outside this area, possibly to reduce the risk of eradication. In those few cases, temporary camps (shacks) could be observed next to the fields, which allow labourers to stay overnight during harvest time.

Shacks on opium poppy fields far from the next village, Phongsaly Province



The number of opium poppy cultivating households in 2006 was 5,800, as reported by the Government of Lao PDR at the provincial level. This number is not directly comparable to previous year estimates, which were based on the annual village survey. It seems that only a few households have abandoned opium poppy cultivation this year compared to previous years. Reasons for continuing opium poppy cultivation in spite of the ban could be the lack of alternative livelihood options but also the increased opium prices.

Table 1: Estimated no. of opium poppy cultivating villages and households, 2002 - 2006

Year	Villages	Households
2002	1,610	38,000
2003	1,537	40,000
2004	846	22,800
2005	270	6,200
2006	N/a	5,800*

Opium poppy growing on small plots in a village, Phongsaly province



2.2 Cultivation practices and crop calendar

Opium poppy cultivation in Laos has become rare over the last few years. The main area of cultivation and production is found in Phongsaly province, and only some pockets of cultivation remain in the other six northern provinces. The Lao Government has implemented targeted eradication campaigns over the last years, aiming at total eradication in 2006. To avoid eradication, farmers are moving illicit cultivation to more remote locations, in some cases far away from villages. Another strategy is to cultivate a smaller area of opium poppy, but on better soils with improved cultivation practices. Several opium poppy fields were found near rivers and streams with good irrigation. Ground survey teams also witnessed multi-stage cropping (different growing stages on the same field). Farmers reportedly planted opium poppy at different stages to avoid eradication of the entire harvest, since eradication teams hardly ever return to the same field in the same year.

Observations done during the helicopter survey showed no major changes in the crop calendar compared to previous years. The ground survey team confirmed that harvesting of opium started at the end of January and was completed by mid March at the latest. The peak of harvesting was in early February.

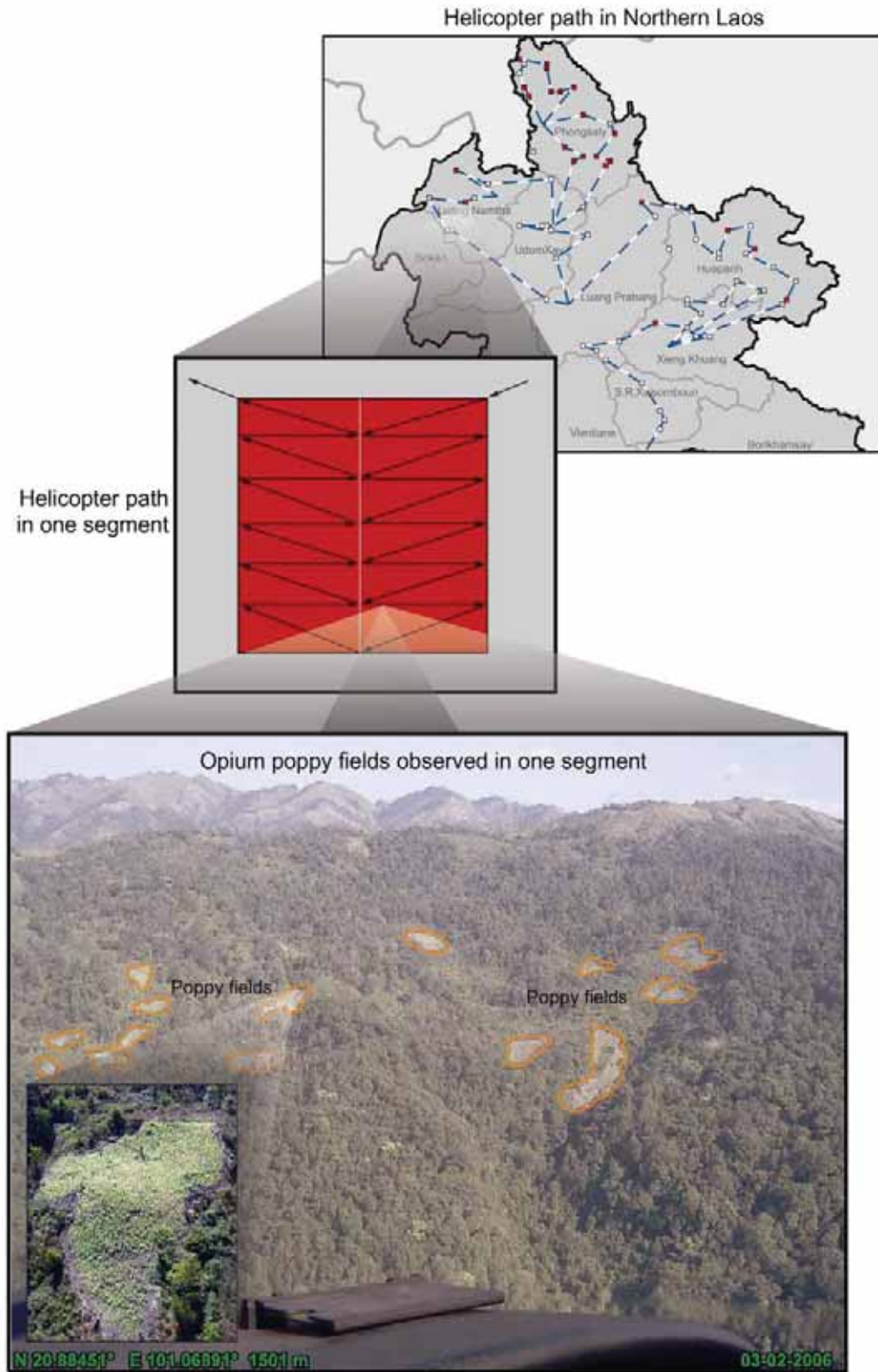
Table 2: Crop calendar of opium poppy

	Field preparation	Sowing	Harvest
Time of the year	Mid sept – end October	Early October – mid November	End January – Mid March

Fenced opium poppy field close to a village, Phongsaly province



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



Source: Government of Laos-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 Yield and production

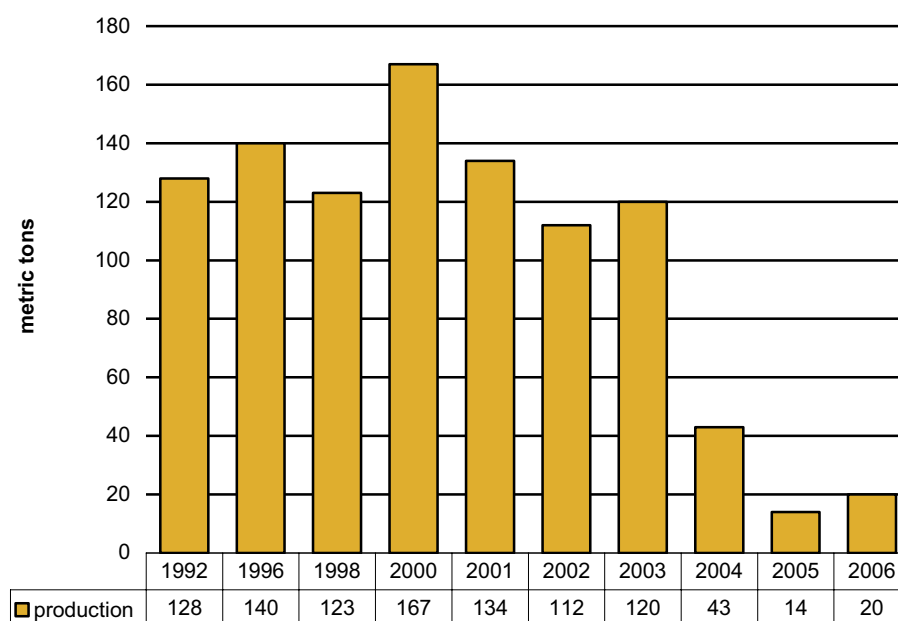
The average national opium yield potential for 2006 was estimated at 8 kg/ha. Since it was not possible to conduct a full yield survey with capsule measurements in 2006 due to security and logistical reasons, the yield estimate was based on a three-year average of the 2003 - 2005 yield estimates. In 2006, similarly to 2005, weather conditions were favourable for opium poppy cultivation and field assessments of standing opium fields revealed that crop vigour was similar to previous years.

Based on the estimated area under cultivation, the potential production of opium for the year 2006 was 20 mt, which is a 40% increase with respect to 2005. However, opium production in 2006 remains low and is only 12 % of the potential opium production in 2000 (167 mt).

Table 3: Opium yield (kg/ha), 1992 - 2006

	1992	1996	1998	2000	2001	2002	2003	2004	2005	2006
Potential Opium Yield in kg/ha	6.6	6.4	4.6	8.7	7.2	8	10	6.5	8	8

Figure 4: Potential opium production (metric tons), 1992 - 2006



3 METHODOLOGY

3.1 Helicopter survey

Under its global Illicit Crop Monitoring Programme, the United Nations Office for Drugs and Crime (UNODC) has established methodologies for data collection and analysis, to increase the capacity of member states to monitor illicit crops, and to assist the international community in monitoring the extent and evolution of illicit crops.

Due to the small size and the limited accessibility of the area under opium poppy cultivation in Laos, coupled with the relative scarcity of the target crop, the aerial survey by helicopter was chosen as a feasible way to estimate the extent of opium poppy cultivation in Lao PDR.

Photo documentation of opium poppy fields with a GPS-enabled camera



(Courtesy Alessandro Scotti)

3.2 Sampling frame

As in any type of survey, 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. Thus, building the sampling frame to collect data to verify the existence of opium poppy fields and to estimate the extent of the opium poppy cultivation in this country is a major challenge, particularly given the changing conditions of the cultivation of this crop.

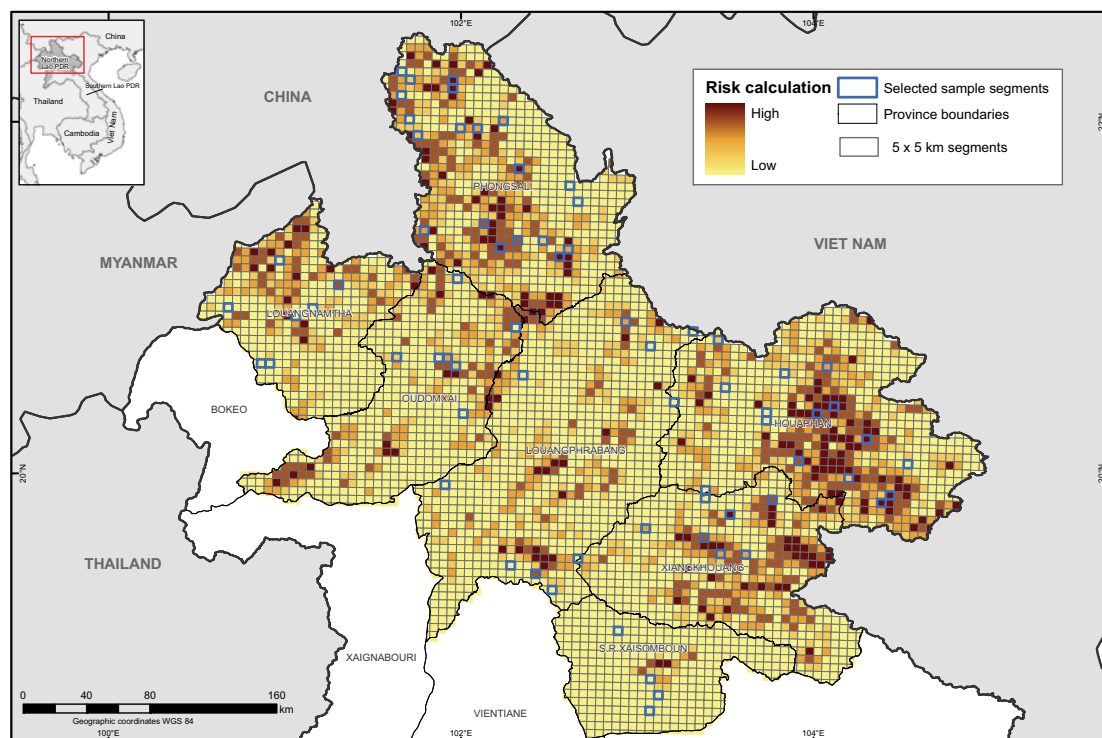
The sampling frame for the area estimation in 2006 was established by defining the potential land available for opium poppy cultivation in Northern Laos (Phongsaly, Luang Namtha, Oudomxay, Luangprabang, Huaphanh, Xiengkhouang, and Special Region Xaisomboun), from which a sample of segments was selected.

The places where opium poppy is grown in Northern Laos are mainly found in mountainous areas avoiding large, plane, developed areas, which are located at the lower altitudes. Former surveys revealed that 80% of the opium poppy-growing villages are situated above 800 meters altitude or

at slopes of more than 10%. These topographic characteristics were used to limit the sampling frame area. This calculation was performed with the help of a Geographic Information System where a digital elevation model (with 90 meter pixels) and its derived slope map were used and to delineate the areas that are either above 800 meters altitude or that have slopes of more than 10%. The resulting sampling frame was divided into a set of rectangular grids of 5 km by 5 km.

Limiting the sampling frame area, however, carries the risk of missing portions of the crop; therefore it should be taken into account that the resulting estimated area under cultivation refers only to the area as defined above.

Map 3: Sampling frame and selected segments for the helicopter survey, Northern Laos, 2006



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

3.3 Stratification

Previous sample designs and data analysis experience in the region have shown the existence of sharp differences in the distribution of the opium poppy cultivation across the entire area under research. Therefore, in this aerial survey, with the view to achieve a reliable level of precision, auxiliary data collected during previous surveys has been used to reinforce the structure of the sampling frame.

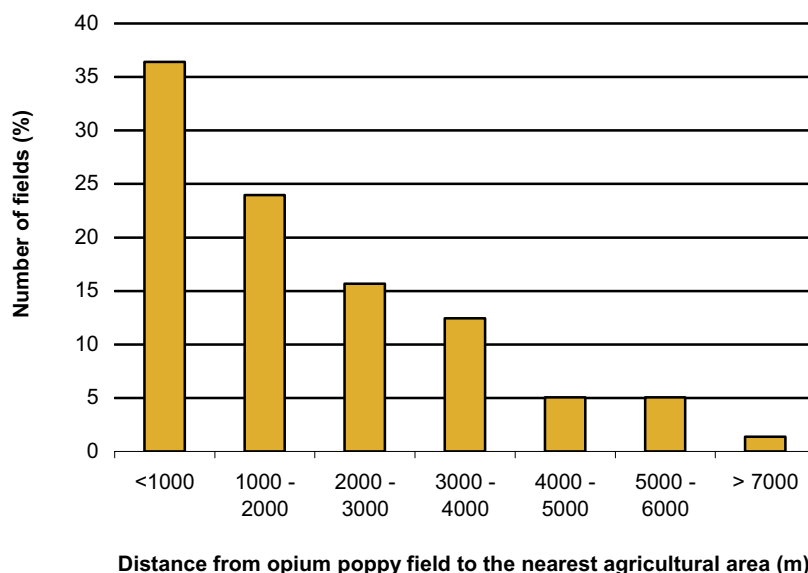
Information on the historical opium poppy growing status was used in the stratification of the sample selection. In the period 2000-2003, extensive surveys⁵ were performed at the village level, which were used to divide the villages in opium poppy-growing villages (growing opium poppy at least once in the 2000-2003 period) versus non-growing villages. Circular areas (buffers) with 2.5 km radius were built around each opium poppy growing village. These buffers were identified as areas with the highest likelihood to find opium poppy cultivation.

The validity of this criteria is illustrated by the GPS points that were taken during the surveys 2000-2003 where 70% of the fields were located at less than 2.5 km distance from a village. The

⁵ UNODC, Laos Opium Survey 2000; UNODC Laos Opium Survey 2001; UNODC Laos Opium Survey 2002; UNODC Laos Opium Survey 2003.

locations of the opium poppy fields were further analyzed with the help of a land use map of 2003 (source: the Government of the Lao PDR's National Geographic Department). When calculating the distance of the opium poppy fields to the nearest agricultural areas in the map it becomes clear that the expansion of the opium poppy cultivation takes place from the existing agricultural plots, since the new fields are mostly found in the neighbourhood of these areas.

Figure 5: Distance from opium poppy fields to agricultural area



The buffer calculation was performed in a Geographic Information System and resulted in two risk strata. The resulting strata are:

- Stratum 1. Areas with high risk of opium poppy cultivation, close to a poppy growing village, altitude above 800 meters and with slopes greater than 10%.
- Stratum 2. Areas with medium risk of opium poppy cultivation. The areas are not close to any opium poppy-growing village but the topographical conditions (altitude above 800 meters and with slopes greater than 10%) are favourable for opium poppy growing.

The final sampling frame consisted of 40,464 km² distributed in 3,638 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.

3.4 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 33 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, aeromedical, 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 it can carry loads of up to 750 kg.

To determine the maximum number of sample segments, a compromise between a sampling ration of 5% of the total potential area and the maximum total of segments has been taken.

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

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

Where:

TEDWs = Total expected surveillance distance travelled 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,

Where:

Potential Land = Total potential land for opium poppy cultivation in Laos

or

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

Finally,

or $n = \text{Min}(65, 80)$

Table 4: Final Sample Size

Sample Size	Grids	Area Sq Km
High Risk	38	950
Medium Risk	27	675
Total	65	1625

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 25km²-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.

Opium poppy plants at an early stage of growth



3.5 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:

$$\bar{p}_k = \sum_{j=1}^t \frac{\text{Poppy_in_segment_j}}{\text{Potential_land_in_segment_j}} \quad k=1,2 \text{ and } j=1,\dots,28, \text{ or } 37$$

b. Average proportion of Opium cultivation in Northern Laos.

or

W_h = relative weight for each stratum

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

$$\text{Var}(\bar{p}_{st}) = \frac{1}{N^2} * \sum_1^3 \frac{N_h^2(N_h - n_h)}{N_h - 1} * \frac{P_h * Q_h}{n_h}$$

The second term on the right represents the reduction due to the finite population correction⁶.

The results for the two strata were refined by the bootstrap method⁷. Bootstrapping is recommended⁸ for cases when the sample observations have different sizes, which was the case of the northern provinces of Laos, where the potential land suitable for opium poppy cultivation within the selected grids was very different from one grid to another. The bootstrap method does not have a significance influence on the mean estimation. However, 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 65 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.

Yield survey

Practical field procedures used to collect data (number, height and diameter of opium poppy capsules) to estimate opium yield are based on the “Guidelines for Yield Assessment of Opium Gum and Coca Leaf From Brief Field Visits” prepared by UNODC. The guidelines provide for practical field procedures and for options to calculate yield from capsule volume using a linear correlation between capsule volume per one square meter (cm^3/m^2) and oven dry gum yield (kg/ha)

During helicopter survey, the team could land in two separate areas where several opium poppy fields under harvest were monitored. Size of fields, density and some capsules data were collected. To complement this, a team of ground surveyors was sent to Phongsaly province to survey additional 35 fields identified during the helicopter survey. Out of 35 fields, yield data could only be collected in 22 fields, since other fields were either eradicated or already harvested at the time of visit. Those data alone were consequently not sufficient to get a valid estimate for 2006. Instead it was decided to use the average of the last three years.

⁶ Cochran, W.G.; Sampling techniques, Third edition; Wiley Eds. 1977.

⁷ Resampling Stats. Stand alone Version 5.0 with 100,000 iterations.

⁸ Resampling methods, a practical guide to data analysis; Good, P. Birkhauser 2006.

PART 4. MYANMAR

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ABBREVIATIONS

CCDAC:	Central Committee for Drug Abuse Control
GOUN:	Government of the Union of Myanmar
ICMP:	Illicit Crop Monitoring Programme
INGO:	International Non-Governmental Organization
KOWI:	UNODC Kokang and Wa Initiative
SR:	Special Region
UNODC:	United Nations Office on Drugs and Crime
USG:	Government of the United States of America
Wa Project:	UNODC Wa Project

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PREFACE

Opium cultivation in Myanmar continues to decline. The decrease from 130,000 hectares in 1998 to 21,000 hectares in 2006, equivalent to 83 per cent, is encouraging. A remarkable development has been observed in the Wa region, where no opium poppy cultivation was reported in 2006, while the region contributed 30 per cent of the national opium poppy cultivation in 2005.

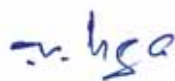
The trend of continuing decrease in the opium poppy cultivation is positive but it also poses serious challenges. Although, fewer areas are now under cultivation and the balloon effect is still limited, the increased yield in Southern Shan State offset a further decrease in production in 2006. Weather conditions and improved cultivation practices have contributed to this phenomenon. This is a cause for concern as it may confirm the apprehensions of more sophisticated criminal activity, cross border networking and transfer of new and improved cultivation techniques.

On the other hand, opium poppy cultivation is associated with marginal socio-economic conditions typical for remote and inaccessible mountainous areas where most of the opium poppy is grown. The decrease in opium cultivation, whether caused by drought, disease, opium bans or law enforcement, and consequently the loss of opium income have a serious, immediate and devastating impact on household food security, survival and livelihoods of the poor and marginalized opium poppy-farming families. Some of the coping strategies former opium poppy farmers use to make up for the loss of opium income, such as selling assets and livestock, taking loans and drop out of school, are an alarming signal of the growing misery, deprivation and vulnerability of these families. Men, women and children are entering a downward spiral of pauperization, un- and underemployment, malnutrition, disease and poor health status.

The United Nations Office on Drugs and Crime emphasizes the urgent need to provide for basic human needs and alternative means of livelihoods for those affected by opium reduction through coordinated and comprehensive interventions and programmes. The fight against drugs is also a fight against poverty. The international community should harbour no doubts about it.

Today, efforts to reduce opium poppy cultivation face a renewed but predictable challenge in Myanmar. Higher opium prices in 2006 resulted in a 49 per cent increase in farmers' incomes, a development that makes opium producing farmers more dependent on opium poppy cultivation, and thus makes it more difficult for them to abandon it.

The Government and its development assistance partners have to ensure that food security and alternative livelihood programmes are strengthened and expanded to support those farmers who decided to abandon opium poppy cultivation. It is necessary to create an appropriate environment to encourage those who have not yet made this decision in combination with measures to reduce and eradicate opium cultivation in a sustainable way. Failing to do so may lead to a humanitarian disaster and human misery in Myanmar.



Shariq Bin Raza
Representative
UNODC Myanmar

FACT SHEET - MYANMAR OPIUM SURVEY 2006

	Year 2005	Year 2006	Variation on 2005
Opium poppy cultivation in the Union of Myanmar ¹	32,800 ha	21,500 ha	-34%
Opium poppy planted area in Shan State	30,800 ha	20,500 ha	-33%
Opium yield weighted (by area)	9.5 kg/ha	14.6 kg/ha	54%
Potential production of opium in the whole of the Union of Myanmar (including the Shan State)	312 mt	315 mt	+1%
Opium poppy eradication in the Union of Myanmar ²	3,907 ha	3,970 ha	+ 2%
Average farm-gate price of opium ³	US\$ 187/ kg	US\$ 230/kg	+23%
Total potential value of opium production	US\$ 58 million	US\$ 72 million	+25%
Estimated number of households involved in opium poppy cultivation in Myanmar	193,000	126,500	-34%
Number of persons involved in opium poppy cultivation in Myanmar	965,000	632,500	-34%
Estimated number of households involved in opium poppy cultivation in the Shan State	181,000	120,000	-34%
Household average yearly income in opium producing household (Shan State)	US\$ 292	US\$ 437	+50%
Of which from opium sale	US\$ 152 (or 52%)	US\$217 (or 50 %)	+ 43%
Per capita income in opium producing households (Shan State)	US\$ 58	US\$ 87,4	
Household average yearly income in non-opium poppy producing household (Shan State)	US\$ 364	US\$ 318	-12%
Per capita income in non-opium producing households (Shan State)	US\$ 73	US\$ 64	
Addiction rate in Shan State and Kachin (Population aged 15 and above)	0.57% (including Wa)	0.60% (excluding Wa)	

¹ In 2006, an additional 4 townships in Kachin State and 2 in Kayah State were included into the survey.

² Source: CCDAC.

³ For 2005: 12 months average; for 2006: price at harvest time.

EXECUTIVE SUMMARY

The 2006 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). An extensive survey, combining the use of satellite images and ground verification, was conducted in Shan State where most of the opium poppy cultivation takes place. A rapid ground survey was conducted in Special Region 2 (Wa) to certify its opium free status. Limited ground surveys were also conducted in townships of Kachin and Kayah States to assess the level of cultivation in these areas and monitor possible displacement of opium poppy cultivation.

Opium poppy cultivation

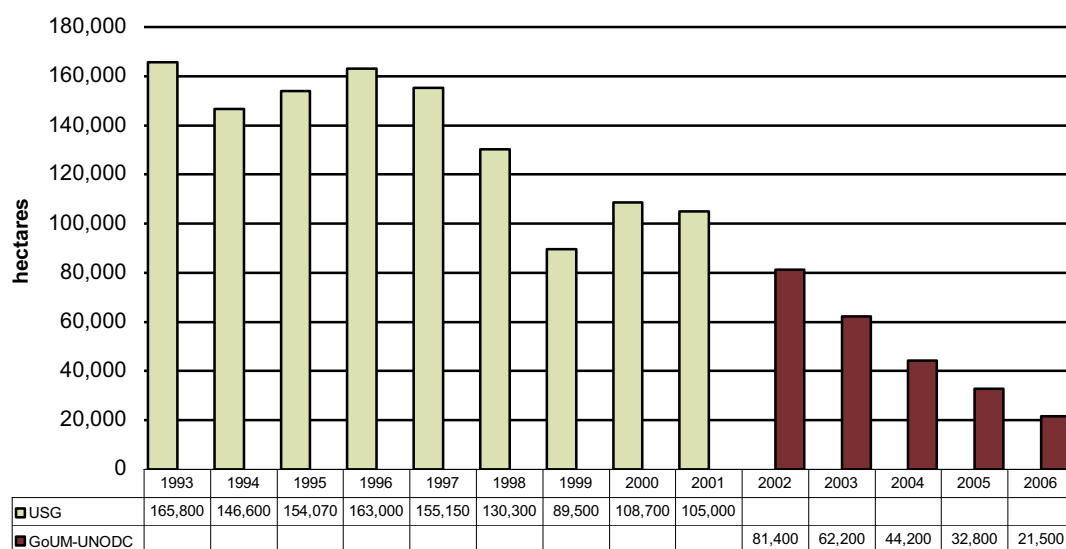
In 2006, the total area under opium poppy cultivation in Myanmar was estimated at 21,500 hectares, representing a decrease of 34% compared to 2005 (32,800 hectares). The largest cultivation areas were found in South Shan where 72% of the national cultivation took place. 21% was cultivated in East Shan State. In North Shan State cultivation continued to decrease and reached a negligible level. In Kayah State, which was surveyed for first time this year, only a few hectares could be found. In 2006, there was also some limited cultivation in Kachin accounting for 5% of the total opium poppy cultivation in Myanmar. The most remarkable change was recorded in Special Region 2 (Wa), where there was no opium poppy cultivation this year, while in 2005 this region represented 30% of the national opium poppy cultivation.

Opium poppy cultivation in Myanmar has been decreasing continuously over the last years. Since 1998, the year of the United Nations Special Session on Drugs, the area under opium poppy decreased by 83% from 130,000 ha to 21,500 ha. Since 2002, the year of the first joint GoUM /UNODC survey, opium poppy cultivation fell by 73%.

Table 1: Opium poppy cultivation by state (ha), 2005 - 2006

Administrative unit	2005 Opium poppy cultivation (ha)	2006 Opium poppy cultivation (ha)	2006 % of total area under opium cultivation
Shan State	30,800	20,450	95%
Kachin State	2,000	1,020	5%
Kayah State	n.a	15	0%
National Total	32,800	21,485	n/a
Rounded Total	32,800	21,500	100%

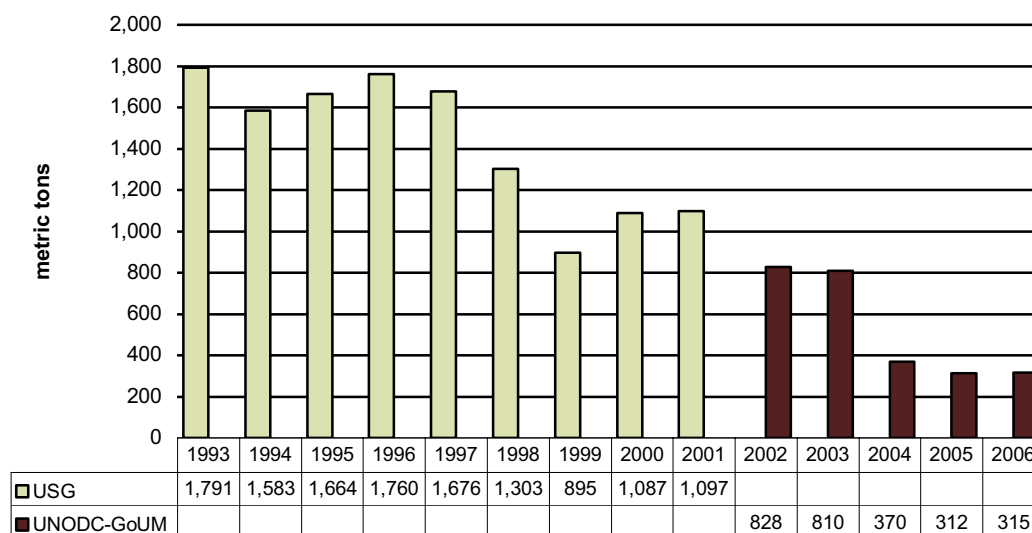
Figure 1: Opium poppy cultivation (hectares), 1993 - 2006



Opium yield and production

The weighted national average opium yield for 2006 was estimated at 14.6 kg/ha (against 9.5 kg/ha in 2005). Yields ranged from only 8.9 kg/ha in East Shan State over 16.6 kg/ha in South Shan State up to 21.4 kg/ha on the best irrigated fields in Kachin State. In general, weather conditions were favourable for opium production (sufficient and timely rainfall). In addition, irrigation of opium poppy fields and multistage cropping contributed to yield increases. The considerable yield increase in 2006 offset the decrease in the cultivation area. In 2006, the potential production of opium remained with 315 metric tons almost at the level of 2005 (312 metric tons). The survey results show that the largest increase in production took place in South Shan State. Overall opium production in Myanmar has decreased by 75% since 1998 but the downward trend of recent years has come to a halt due to the production increases in East and South Shan State in 2006.

Figure 2: Opium production in Myanmar (metric tons), 1993 - 2006



Opium prices

The average farm-gate price of opium at harvest time was estimated at 230 US\$/kg. This represents an increase of 22% compared to the average price reported by farmers for the year 2005. Regional price differences were pronounced with the highest prices in Kachin and North Shan State and the lowest prices in East and South Shan State. The highest opium price increases compared to last year could be observed in North Shan and Kachin State whereas in South Shan and East Shan States price increases were moderate. The price differences reflect well the scarcity or availability of opium in different regions as well as the fragmentation of the opium market.

Household income from opium

The average annual cash income of an opium poppy cultivating household was estimated at US\$437. The average annual income of non-opium poppy cultivating household was estimated at US\$318, which is, unlike in previous years, lower than growing households. This year, a much smaller number of households (-34%) produced the same amount of opium (315 mt) due to higher yields and sold it for a much higher price (+23%) compared to 2005. As a consequence, the total value of the national opium production, which increased considerably (+25%), was distributed among fewer households. This concentration led to an unusually high average household income in opium poppy growing villages, which increased by 50% compared to last year.

The 2006 survey results confirm that the average income of households in villages that never grew opium poppy is higher than in villages, which stopped opium poppy cultivation. The findings also show that households in villages, which gave up opium poppy cultivation, could find no adequate way of substituting the lost income from opium. They simply got poorer, and they will need assistance to cope with this difficult situation.

Addiction

In the Shan State (excluding Special Region 2 Wa), opium addiction affected 0.60% of the adult population in 2006. Within the survey area the average level of addiction was 2.16% in villages with opium poppy cultivation. This rate is significantly higher than in villages where opium is not cultivated, which have an addiction rate of just 0.25%. Opium addiction in Kayah state is close to nil whereas it is comparatively high in Kachin (0.72%). As a comparison, opium addiction recorded in Special Region 2 (Wa) last year was 0.83%. ATS addiction was reported mainly from East Shan State, while heroin addiction prevailed in Kachin and North Shan State.

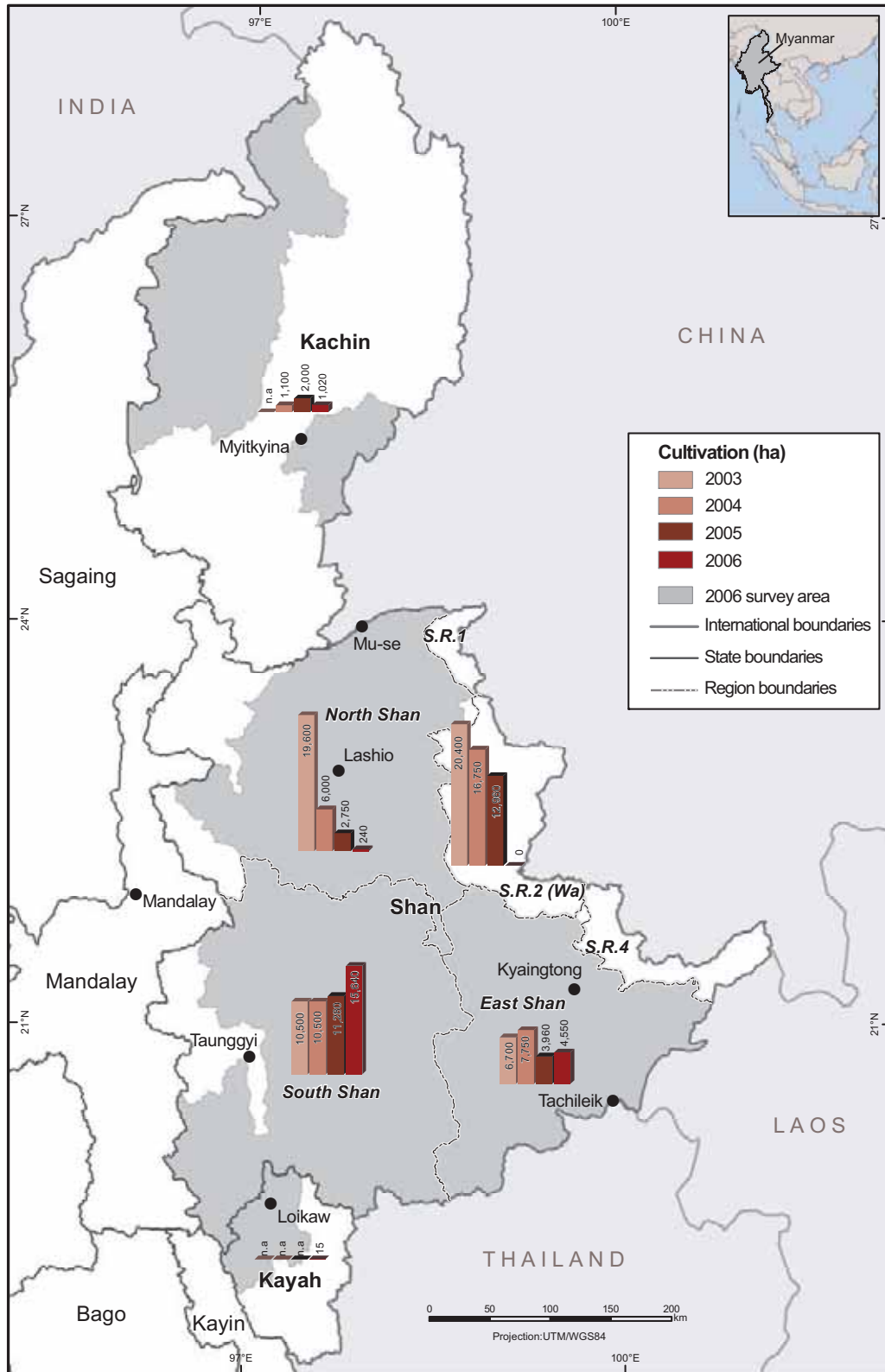
Eradication

Official reports from the Myanmar Government indicate that 3,970 ha of opium poppy were eradicated in 2006, which is similar to last year. The level of eradication has however increased by 29% in entire Shan State and more specifically by 163% in South Shan State reflecting an increase in government efforts to control opium poppy cultivation in this State. Eradication was less intense in Kachin State this year. However, despite a 50 % decrease in the area eradicated, cultivation remained at a low level.

Food security and coping strategies

The survey showed that villages reporting opium poppy cultivation have a significantly lower food security compared to opium poppy-free villages. Villages with access to paddy land tend to cultivate less opium poppy since they can achieve a high level of food security with rice cultivation. Villages growing opium poppy show a significantly higher intensity of shifting cultivation, both in terms of acreage of forest cut and duration of fallow periods compared to non-growing villages. The most common coping strategy for farmers who have stopped opium poppy cultivation is to grow more rice and maize and sell livestock. No migration was reported in the places where opium cultivation has been abandoned.

Map 1: Opium poppy cultivation in Kachin, Kayah, and Shan States, Myanmar, 2006



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 fifth consecutive year by the Central Committee for Drug Abuse Control (CCDAC) of Myanmar, with the support and participation of UNODC. Within the framework of its Illicit Crop Monitoring Programme (ICMP), UNODC has collected statistical information on illicit crop cultivation in Myanmar since 2001. ICMP works with 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 a ground survey to determine the extent of opium poppy cultivation in the country and to collect socio-economic data 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 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 raw opium and processed 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 the own household, is sold to alleviate food shortages, as most households are not food self-sufficient.

Irrigated lowland opium poppy field interspersed with garlic in Hsihseng township, South Shan State



In the 1980s, Myanmar was the world's largest producer of illicit opium, with an average annual production of about 700 metric tons of opium between 1981 and 1987. Opium production in Myanmar continued to increase until 1996, reaching annual production levels of some 1,600 metric tons. However, 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 until 2003.

The surrender of the notorious drug trafficker Khun Sa, leader of the Mong Tai Army, in 1996 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 in Shan State, which has been playing a major role in opium production in the past, declared a ban on opium cultivation in June 2005. No significant opium poppy production has been observed in Kokang and in Special Region 4 since 2003.

Annual opium surveys remain essential to assess the extent of opium poppy cultivation within the country, shifts in cultivation and are useful tools in gauging the effectiveness of opium bans and their implications for the local communities. The present survey examines how farmers are coping with change in the areas affected by the opium ban. Such information is key in developing strategies to sustain the transition from an illicit economy to a licit economy.

2 FINDINGS

2.1 Opium poppy cultivation

In previous years, Myanmar Opium Surveys have covered three regions of Shan State (North, East, and South Shan) and Special Region 2 of the Wa region. This year, as an opium ban was enforced in the Special Region 2 (Wa), the survey team confirmed the implementation of the opium-ban by conducting rapid assessment surveys in this area. Further, the Myanmar Opium Survey 2006 has extended its remit to include Kayah State and Kachin State areas as well, to monitor possible displacement of opium poppy cultivation.

The total area under opium poppy cultivation in Myanmar was estimated at 21,500 ha in 2006. This corresponds to a reduction of 34% from the 32,800 ha in 2005 and indicates a continuation of the decrease in cultivation that has been observed during the last 5 years.

The overwhelming majority of the total opium poppy cultivation in Myanmar took place in South Shan (72%) and East Shan State (21%). In North Shan State the level of opium poppy cultivation continued to decrease and was almost negligible. Only a few pockets of opium poppy cultivation were found in Kachin, and cultivation was close to nil in Kayah State. The expectation that opium poppy cultivation could be displaced from Wa into Kayah was not confirmed by the survey.

Figure 3: Opium poppy cultivation in Myanmar (ha), 1990 - 2006

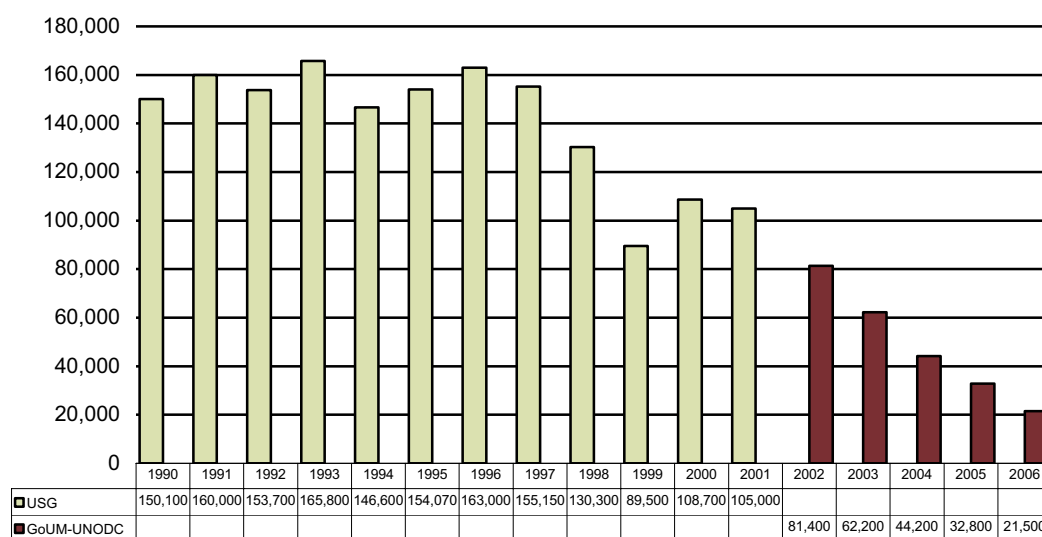


Table 2: Opium poppy cultivation by state (ha), 2005 - 2006

Administrative unit	2005 Opium poppy cultivation (ha)	2006 Opium poppy cultivation (ha)	2006 % of total area under opium cultivation
Shan State	30,800	20,450	95%
Kachin State	2,000	1,020	5%
Kayah State	n.a	15	0%
National Total	32,800	21,485	100%
Rounded Total	32,800	21,500	100%

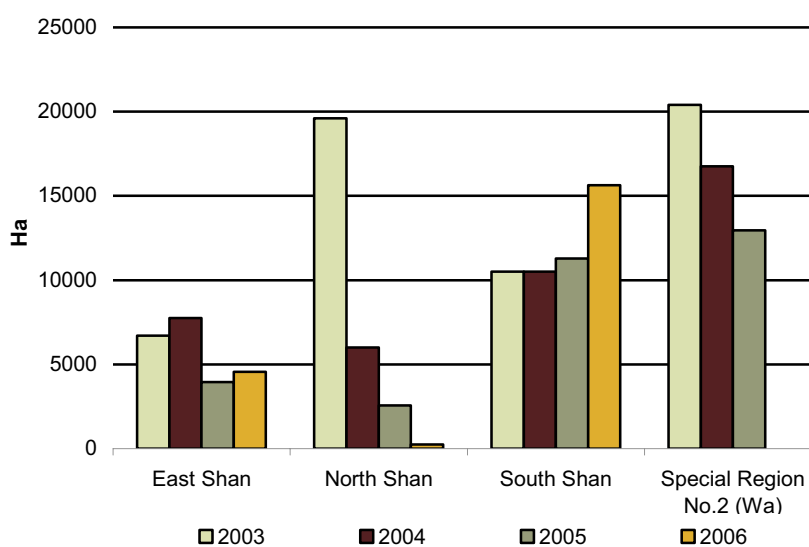
Table 3: Opium poppy cultivation in the Shan State (ha), 2005 - 2006

Administrative unit	2005 Estimated planted area (ha)	2006 Estimated planted area (ha)	Variation (%)
East Shan	3,960	4,550	15%
North Shan	2,570	240	-91%
South Shan	11,280	15,660	39%
Special Region No.2 (Wa)	12,960	0	-100%
Total (rounded)	30,800	20,450	-34%

Opium poppy plantation in Ei-ngan valley in Pekhon township, South Shan State



Figure 4: Opium poppy cultivation in the Shan State (ha), 2003 - 2006



The most remarkable decrease in opium poppy cultivation was observed in Special Region 2 (Wa) where no opium poppy cultivation was found in 2006. In North Shan State, opium poppy cultivation continued to decrease and became negligible with only a few pockets left in Namkhan and Manton areas. In East Shan State, cultivation increased by 15% and in South Shan State even more significantly by 39%.

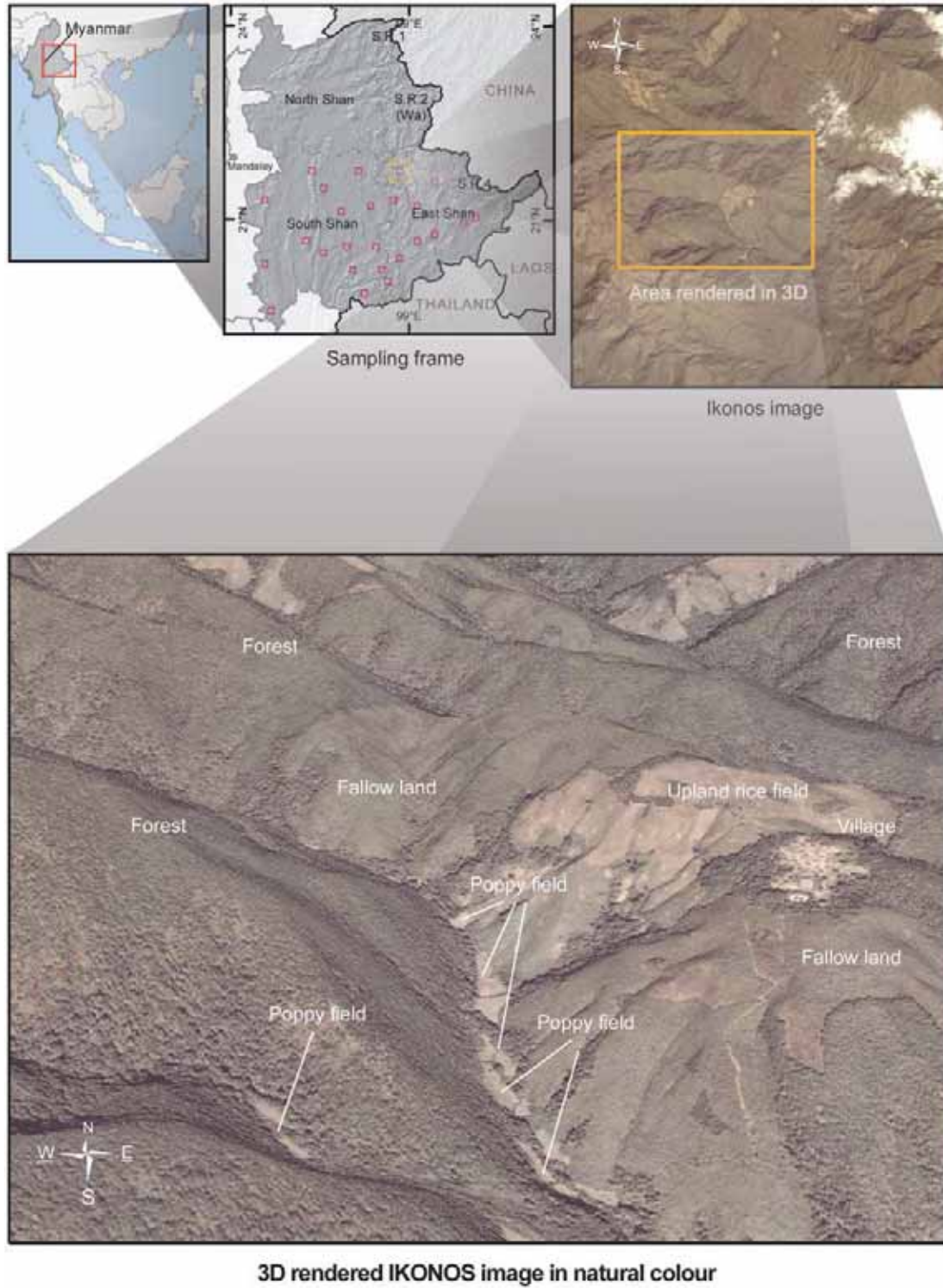
Table 4: Opium poppy cultivation in Myanmar (ha), 2005 - 2006

Administrative unit	2005 Estimated planted area (ha)	2006 Estimated planted area (ha)	Variation (%)
Kachin State	2,000	1,020	-49%
Kayah State	n.a	15	
Shan State	30,770	20,430	-34%
Total	32,770	21,465	
Total (rounded)	32,800	21,500	-34%

Opium poppy field in Tanai township, Kachin State



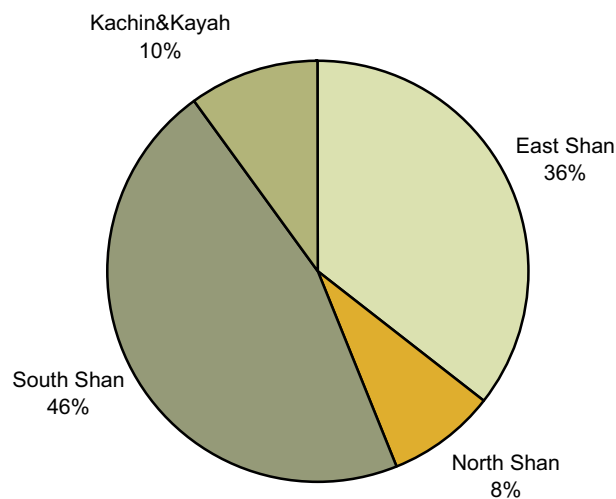
Map 2: Three dimensional view of opium poppy fields on a satellite image acquired in January 2006



Villages and farmers involved in opium poppy cultivation

Base on an estimated average area under cultivation of 0.17 ha per household and a total cultivation of 21,500 ha, an estimated 126,500 households were involved in opium poppy cultivation in Myanmar in 2006. The number of opium poppy cultivating households decreased by 54,500 compared to 2005. This decrease is entirely due to the opium ban in Special Region 2 (Wa) where 76,000 households abandoned opium cultivation after the ban in 2005. The ground survey revealed that opium cultivation took place in 8% of all villages in Shan states with the highest concentrations found in East Shan State (14%) and South Shan State (10%). A high concentration of villages cultivating was also found in two townships out of four surveyed in Kachin State (30% of all villages). Since not all townships were surveyed in Kachin this figure is only indicative for those 2 townships. In Kayah and North Shan State the percentage of villages cultivating opium poppy is very low (2%).

Figure 5: Regional distribution of villages growing opium poppy in Kachin, Kayah and Shan States, 2006



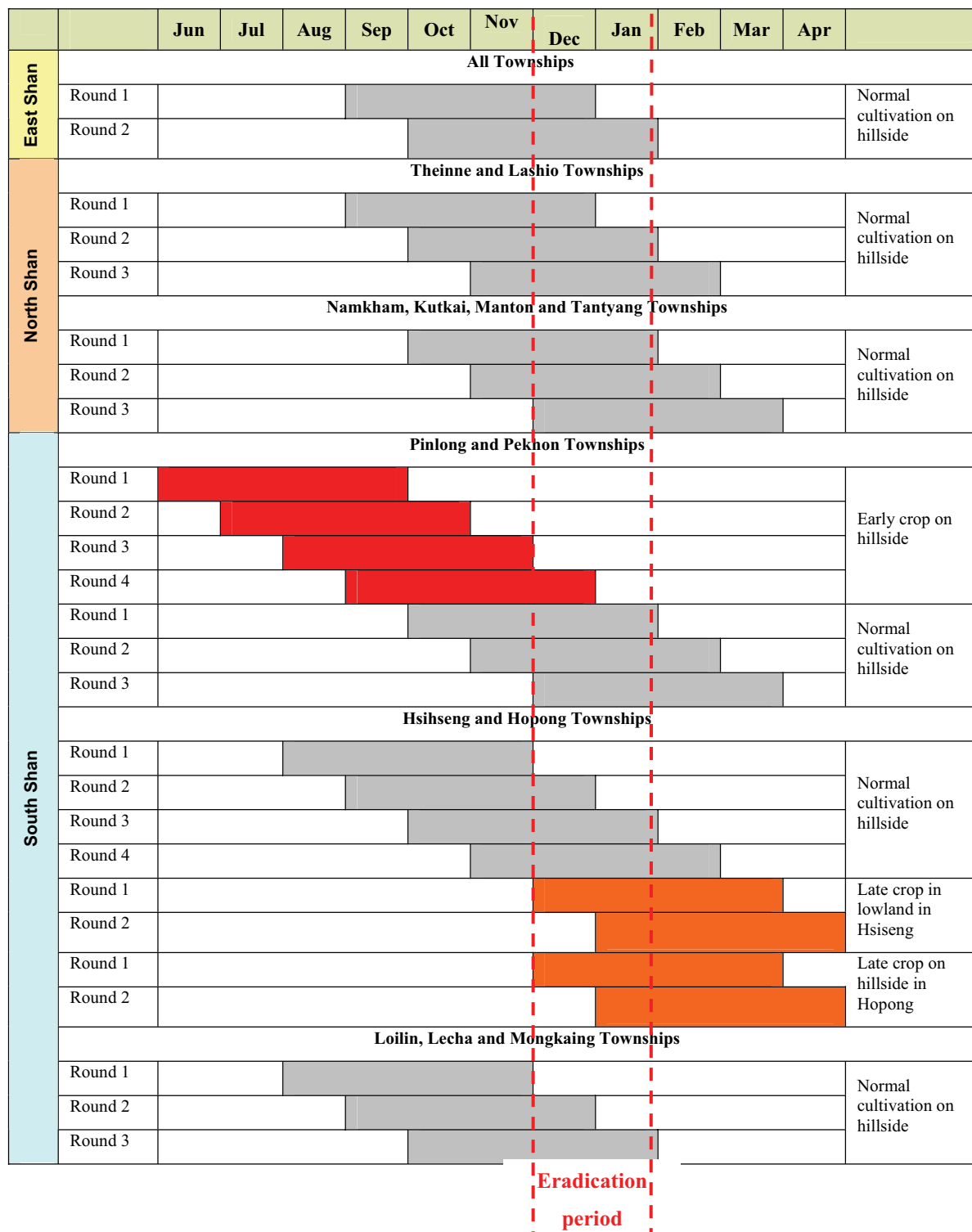
Irrigated opium poppy field inter-cropped with faba beans



Cultivation practices in Shan State

Opium poppy cultivation traditionally takes place between October and February in Shan State but can be extended up to April in higher altitudes. A similar situation has been found at higher latitudes in Kachin State where the climate is cooler. The survey found that farmers are changing their cultivation practices, possibly to counter the effects of eradication activities. This is particularly true in South Shan State as described below.

Figure 6: Opium poppy crop calendar in Shan State



Early cultivation during the monsoon season

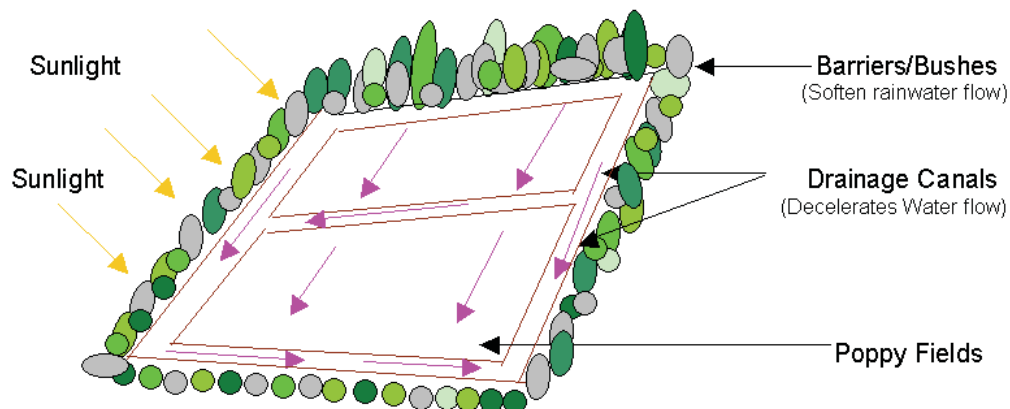
It has been a common view that cultivating opium poppy during the monsoon season is impossible. The underlying rationale is that, at the time of sowing, opium poppy seeds may easily be dislodged by rainwater, and that rain at harvest time makes opium gum collection extremely difficult.

However, during the rainy season, there are some favourable conditions, which promote the growth of opium poppy. Principal conditions to facilitate opium cultivation are rainwater irrigation as well as a warm and humid climate. Furthermore, the earlier cultivation takes place, the earlier the crop can be harvested.

With regard to the collection of opium gum in rainy conditions, an officer from the Land Records and Survey Department of Mongnea indicated that some farmers have been attempting to cap the lanced capsules with small plastic bags to avoid the impact of rain. Similar practices have been observed by opium survey teams in Thailand in recent years.

The monsoon opium poppy is typically cultivated on hillsides, where the field benefits from full exposure to sunlight. Bushes or large rocks usually demarcating the top of the hillside fields and help breaking the erosive force of rainwater flowing downhill. To restrict and decelerate the rapid flow of rainwater through the field, farmers dig drainage canals along the field's borders and across its centre, thus allowing the opium poppy seedlings to grow with limited environmental disturbance.

Figure 7: Monsoon opium poppy field on hillside



In order to avoid opium poppy eradication, attempts are made to cultivate the crop as early as possible, in June or July, to ensure that the opium gum can be harvested in September-October, prior to the commencement of eradication activities. The flowers of the monsoon crops are opening late in the monsoon and the capsules are fully developed in the first week of September, after which it is possible to start the gum collection process.

The practice of multistage cropping

Multistage cropping is often practised in opium poppy fields where significant eradication campaigns have taken place. The following photos show examples of multi-cropping. Opium poppy seeds are broadcasted two times in the same field with an interval of one or 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 broadcast are eradicated, the plants from second sowing have a change of surviving and yield a successful harvest, thus compensating for the loss. The practice of

multistage-cropping has been widely applied throughout South Shan State. Farmers can expect a good harvest from the same field since past experiences have shown that eradication measures are not conducted on the same area of land twice. Therefore, multistage cropping helps farmers to cope with losses caused by eradication campaigns.

Moreover, farmers use staggered planting - broadcasting opium poppy seeds on different fields at the different times - to spread the harvest over a longer period. Since the opium poppy plants are growing at different stages, at the time of gum collection in the first field, the second fields will not yet be at flowering stage. Therefore labour needs are better distributed.

Ad-hoc action for rapid replacement with new plants

Opium poppy farmers further employ another tactic to cope with the effects of eradication. Immediately following the eradication of an opium poppy field, iodized salt (normal table salt - NaCl₂ – treated with iodine) is spread over the field to accelerate the rotting of plant residues. Three to five days later, new opium poppy seeds can be sown in the field, together with urea fertilizers. This practice promotes vigorous plant growth, due to the presence of both the urea fertilizer and organic fertilizers from plant residues, and enhances early maturation of the crops. It has been used in areas where the soil is moist, most typically in Pinlaung and Hopong. It should be noted that some remnants of the eradicated plants remain and may also continue to grow under these conditions.

Example of opium poppy cultivation practice on mountains

In the East Shan State, most opium poppy farmers sow their crop seed in mid-September. However, further heavy rain between the end of September and the beginning of October as well as in the last week of December, forced some farmers to sow seeds on as many as three separate occasions. As a result, the opium poppy crops occupying these fields were at different stages of development (between 7 and 15 cm during the survey visit) and many died well in advance of the field being ready for harvest.

Opium poppy fields at different stages of growth covering the Maenai Range in Hopong township, South Shan State



In the Hopong and Hsihseng areas of South Shan, farmers are practicing a systematic multiple cropping technique. Farmers traditionally sow opium poppy seeds between August and October, and harvest opium between November and January. Some fields are then used to cultivate a second crop during December and January. A second crop on lowland fields was observed in January 2006 in Narthan, Narkhite, Sawsar and Loiput villages. At the same time, some fields were being harvested on mountain slopes. In some places of the Loimaw range, opium poppy fields had replaced cheroot-leaf plantations.

Opium poppy plants interspersed with cheroot-leaf trees



Example of opium poppy cultivation practices on lowlands

Pinlaung farmers habitually cultivated the first opium poppy crop in June, July, August and September. Harvesting would then take place between September and December and they could then cultivate a second crop between October and December, on the more remote hillsides of the mountain ranges. However, in 2005, some opium poppy fields were discovered and eradicated in the month of May, which suggests the possibility for a third crop. The possibility of a third crop was also discussed with a farmer in Loiput village who asserted that, as long as the climatic conditions remained favourable and water was available for irrigation, he would grow a third crop.

In Pinlaung and Pekhonn, alternative crops such as lowland paddy, highland paddy, corn, potato and pigeon pea are cultivated in the monsoon season. In the winter season, garlic, mustard, niger and wheat are cultivated. In particular, garlic cultivation in Pekhonn is extensive, whereas potato is a key produce of Pinlaung. Moreover, pigeon pea has recently been introduced to the region, however, due to its lengthy growth period it contributes only minimally to farmers' cultivation of staple food crops. Where pigeon pea is cultivated, it is interspersed with other crops.

During a monitoring trip to Hsihseng Township in the second week of January 2006 several second crop opium poppy fields in lowland were found in the villages of Narthan, Narkhite, Sawsar and Loiput. At that time, the first crop, possibly sown in August and September, was still being harvested on mountain slopes as well as in some plain lowland fields. Usually, farmers prepare seedbeds in lowland fields where water is available for irrigation. Zigzag irrigation canals are then dug around the seedbeds and the opium poppy seeds are sown, together with mustard, garlic and faba bean. The seeds are covered with straw to minimize moisture loss. The garlic seedlings are the first to sprout and emerge over the straw, while the opium poppy seedlings continue to grow underneath the straw. The opium poppy seedlings, therefore, are not visible at this stage and fields used for their cultivation are fully camouflaged. After harvesting the garlic, the field is primarily covered with opium poppy.

Second crop opium poppy under straw cover



Second crop opium poppy after removal of straw cover in an irrigated field, Hsihseng township, South Shan State



A similar situation was found in Narthan and Sawsar, where opium poppy plants were found under straw cover, possibly planted in the second week of December. In Narthan, opium crops were even found being cultivated under cheroot-leaf trees as to limit the chances of detection. The plants had been adequately applied with farmyard manure and ash.

2.2 Yield and production

The average national opium yield was estimated at 11.3 kg/ha (simple average), based on capsule measurement in 181 fields. This is a 33% increase compared to last year. This increase can mainly be attributed to a very strong increase in opium yield in South Shan State with an average of 16.6 kg/ha. The national yield weighted by cultivation area is 14.6 kg/ha. In South Shan, on top of timely and additional rainfall during the growing of the opium poppy plants, farmers have also improved opium cultivation practices by introducing better irrigation, multistage cropping and application of fertilizer when available. This has resulted in a 24% opium yield increase in this region compared to last year's 13.4 kg/ha.

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

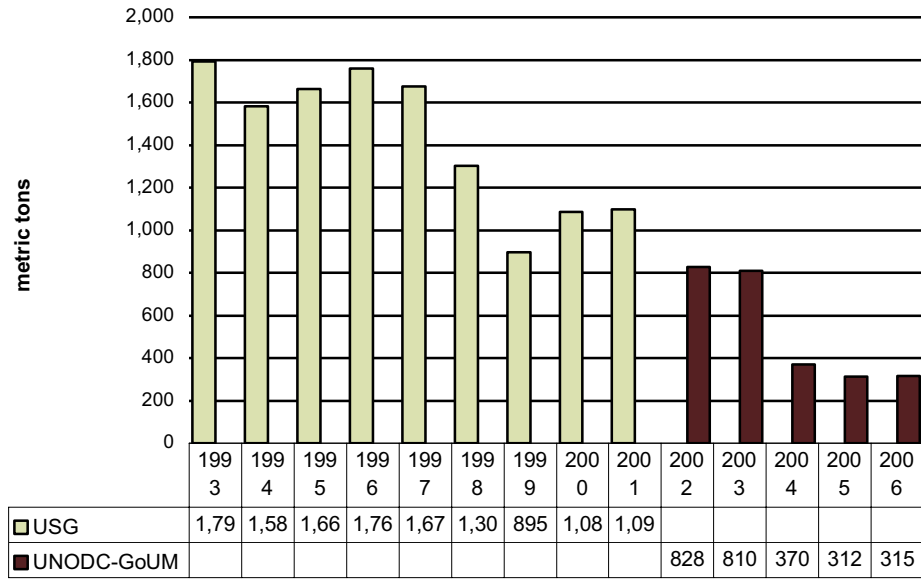
This year's yield survey was not designed to include off-season opium poppy crops. While off-season cultivation of opium poppy was a marginal phenomenon this year, this practice may spread and should definitely be taken into consideration for next year's yield survey.

Table 5: Opium yield and potential opium production by administrative region, 2006

Region	Yield (kg/ha)	Cultivation (ha)	Potential production (metric tons)
Kachin	11.7	1,020	11.9
Kayah	11.3	15	0.2
East Shan	8.9	4,550	40.5
North Shan	11.3	240	2.7
South Shan	16.6	15,660	260.0
National	14.6 (weighted)	21,500 (rounded)	315 (rounded)

In 2006, 315 metric tons of opium were potentially produced in Myanmar, which is a 1% increase compared to last year's estimate of 312 metric tons. The declining production trend observed since 2001 has stopped in spite of a total elimination of opium production in Special Region 2 (Wa), which represented 30% of national opium production in 2005. This is due to a very strong increase in cultivation in South Shan State, which has now by far the largest area under cultivation. Combined with the highest yields in the country, this region generates the bulk of Myanmar's total production (82%).

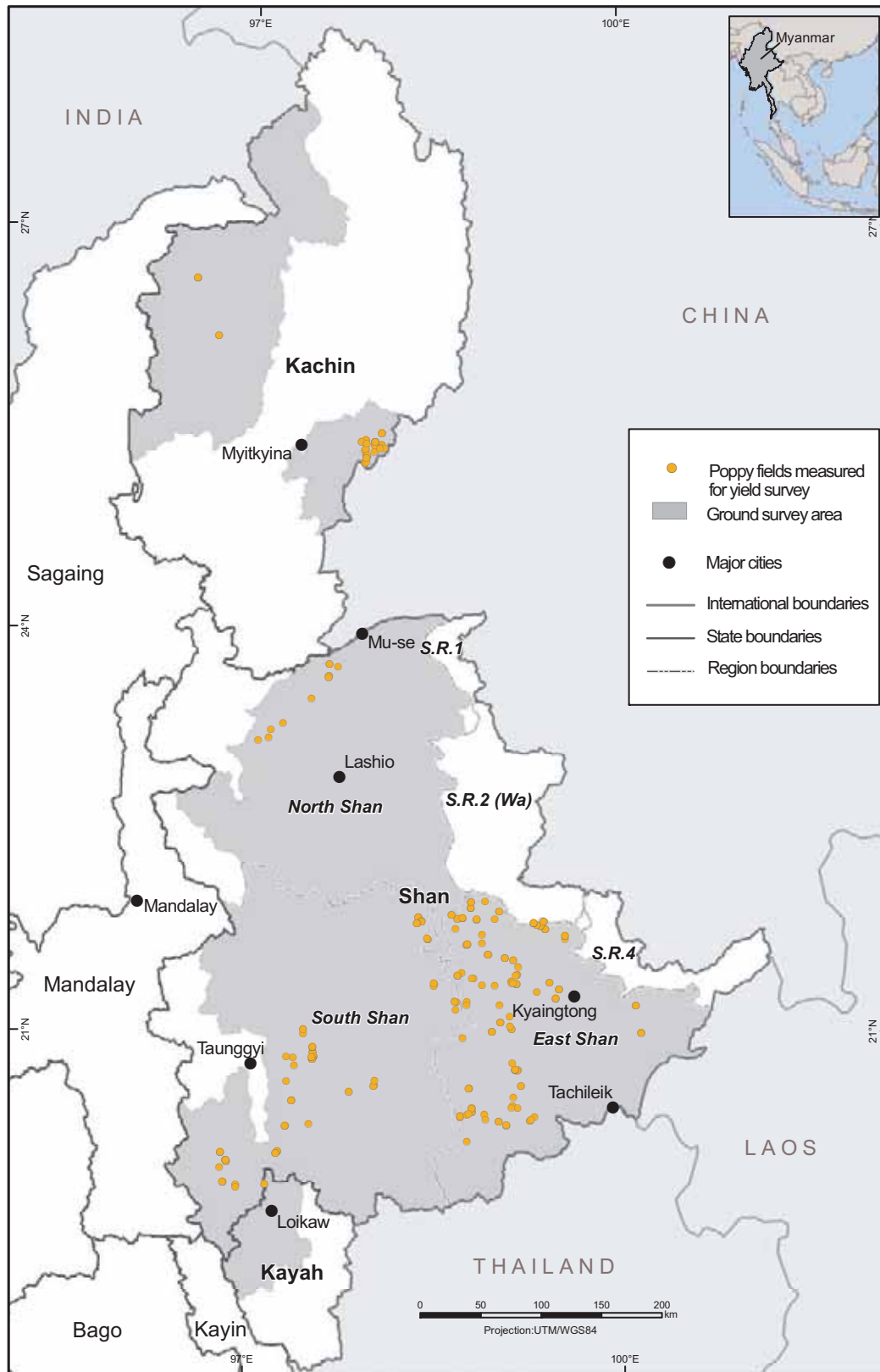
Figure 8: Potential opium production (metric tons), 1993 - 2006



Capsule measurement in an opium poppy field during the yield survey



Map 3: Location of opium yield measurements in Kachin and Shan States, Myanmar 2006



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 and cash income

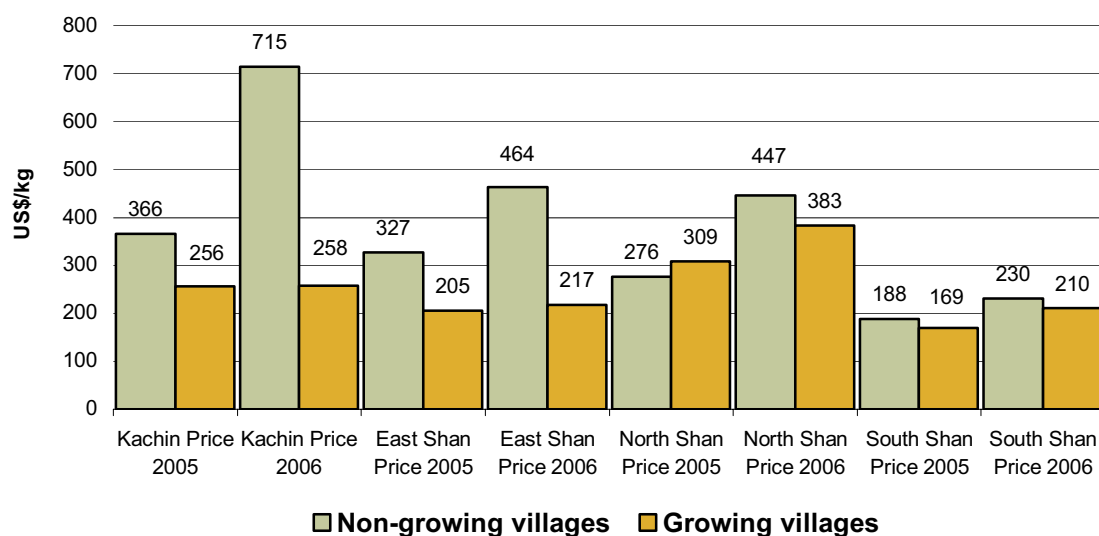
In 2006, the average farm-gate price of opium weighted by the estimated area under cultivation was US\$230, and increase of 22% with respect to 2005 (US\$187). Regional average farm-gate prices for the studied regions are: South Shan, US\$214, East Shan, US\$228, Kachin, US\$358 and North Shan, US\$436. The high price observed in North Shan State is probably due to the fact that opium bans have been introduced in more and more areas over the last years, leading to a scarcity of opium. The average opium price per region for 2005 was updated with information given by farmers in early 2006. This revised price is more accurate than prices reported in the 2005 survey, which only covered the first months of 2005.

Without exception, opium prices increased in all regions compared to last year. The increase was more pronounced in villages, which did not cultivate opium poppy in 2006. Prices increased drastically in those villages without opium poppy cultivation, located in regions where the area under opium poppy cultivation decreased, such as Kachin and North Shan. Regional price differences were also more distinct in 2006 compared to the year before. In 2005, the highest regional average price (US\$366 in Kachin) was only about two times (2.2) higher than the lowest average (US\$169 in South Shan). This year, the highest average price, found again in Kachin (US\$715), was 3.4 times the lowest prices, which came again from South Shan (US\$210). In general, the opium prices reflect to a large extent the local availability of opium rather than a national price level, which seems to indicate a fragmentation of the opium market.

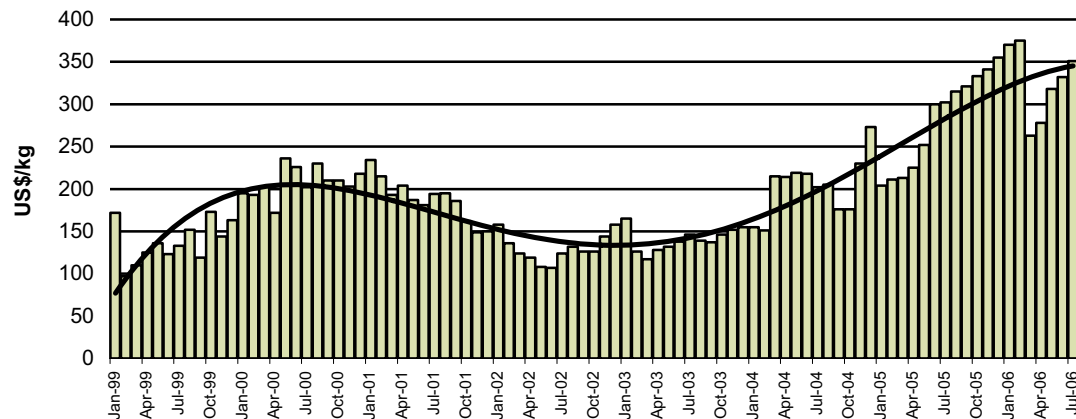
Table 6: Average opium poppy prices (US\$/kg) for 2005 and at harvest time in 2006

Region	In US\$/kg	Non Growing villages	Growing villages	All villages
Kachin	Price 2005	366	256	285
	Price 2006	715	258	358
East Shan	Price 2005	327	205	219
	Price 2006	464	217	228
North Shan	Price 2005	276	309	282
	Price 2006	447	383	436
South Shan	Price 2005	188	169	172
	Price 2006	230	210	214

Opium prices at Mong Pawk market in Special Region 2 (Wa) were higher compared to those in East Shan and South Shan State, which reflects the impact of the opium ban in this region. Opium sold in 2006 in the Wa region is old opium harvested in 2005 before the ban started in June 2005. This opium is sold to local addicts but also trafficked to other areas.

Figure 9: Average farm gate price of opium (US\$/kg), 2005 - 2006**Table 7: Opium prices in Shan State and Mong Pawk market (US\$/kg), 1999 - 2006**

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						327

Figure 10: Opium prices at Mong Pawk market (US\$/kg), 1999 - 2006

Household cash income

In 2006, the average annual cash income of an opium producing household was estimated at US\$437. The average annual cash income of non-opium cultivating households was estimated at US\$318, which is lower than the cash income of opium poppy growing households.

In past years, survey results showed that villages in opium poppy growing areas had a lower average household income compared to villages in opium poppy-free areas. This year's analysis of the survey data shows a more complex pattern. Besides the two groups of households, those in opium poppy growing areas and those in opium poppy-free areas, there is a third group of households living in those villages that have abandoned opium poppy cultivation in the more or less recent past. Within this third group, some households still have opium stocks from previous harvest, and they sell them, notwithstanding the fact that they did not cultivate opium poppy in the most recent growing season.

This year, a much smaller number of households (-34%) produced the same amount of opium as in 2005 (315 mt), due to higher yields, and sold it for a much higher price (+23%). As a consequence, the total value of the national opium production, which increased considerably (+25%), was distributed among fewer households. This concentration led to an unusually high average household income in opium poppy growing villages, which increased by 50% compared to last year. A reduced number of opium cultivators has therefore received a higher household income compared to households in opium poppy-free villages, and a much higher income than households in villages that gave up opium poppy cultivation.

This atypical income disparity could be a one-time effect caused by a unique combination of factors this year. There is also a danger that the windfall gains of opium poppy growing households this year could lead to a resumption of opium poppy cultivation among the poorest households, which could not identify alternative sources of income.

The 2006 survey results confirm in general that the average income of households in villages that never grew opium poppy is higher than in villages, which used to grow opium poppy. The findings also show that households in villages, which gave up opium poppy cultivation, could find no adequate way of substituting the lost income from opium. They simply got poorer.

Figure 11: Average household income (US\$/year), 2005

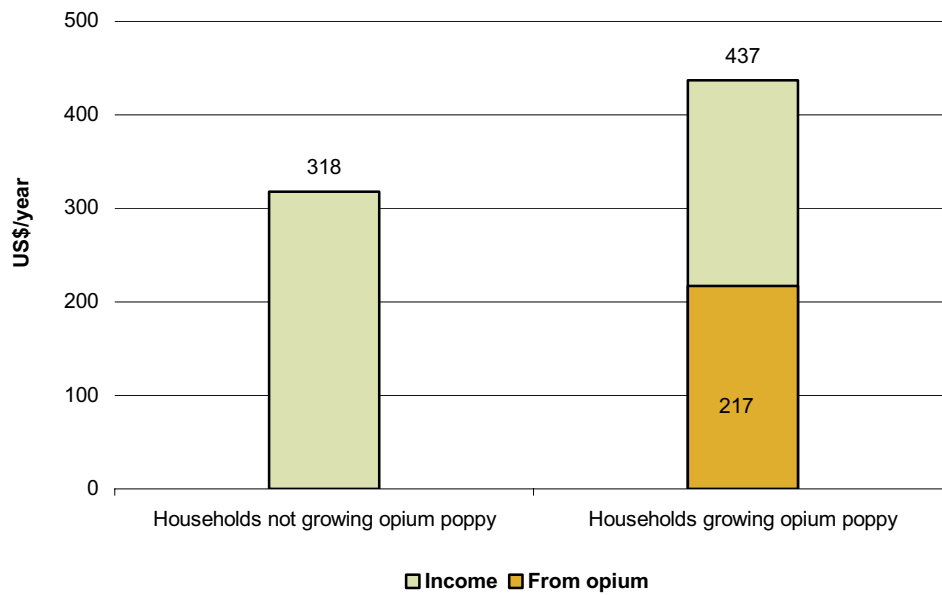
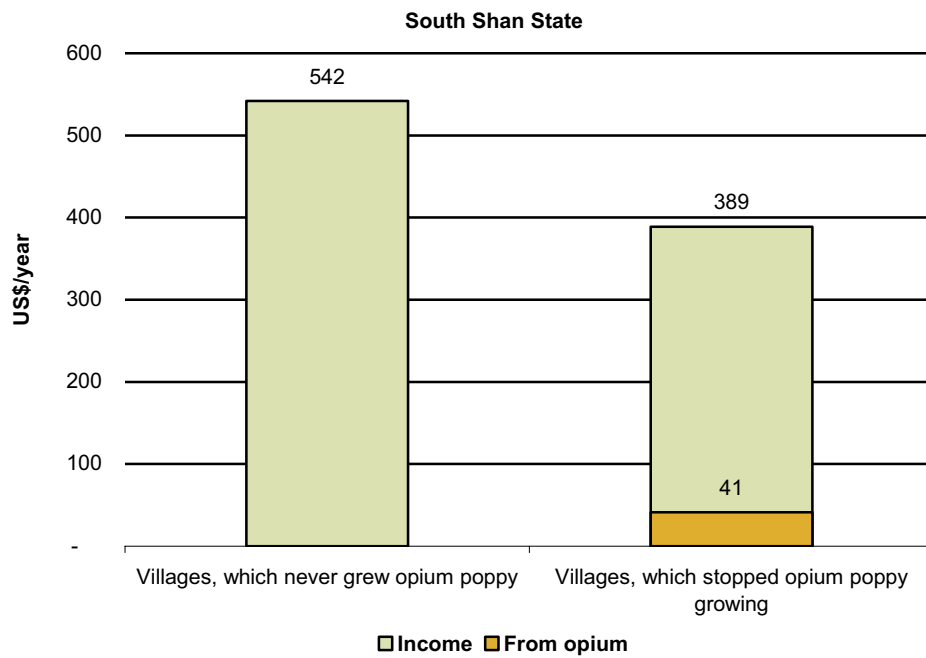
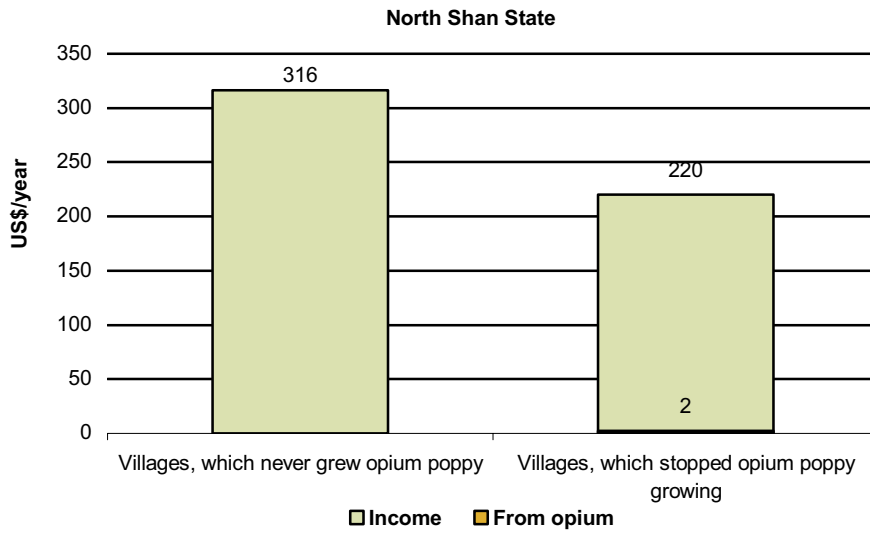
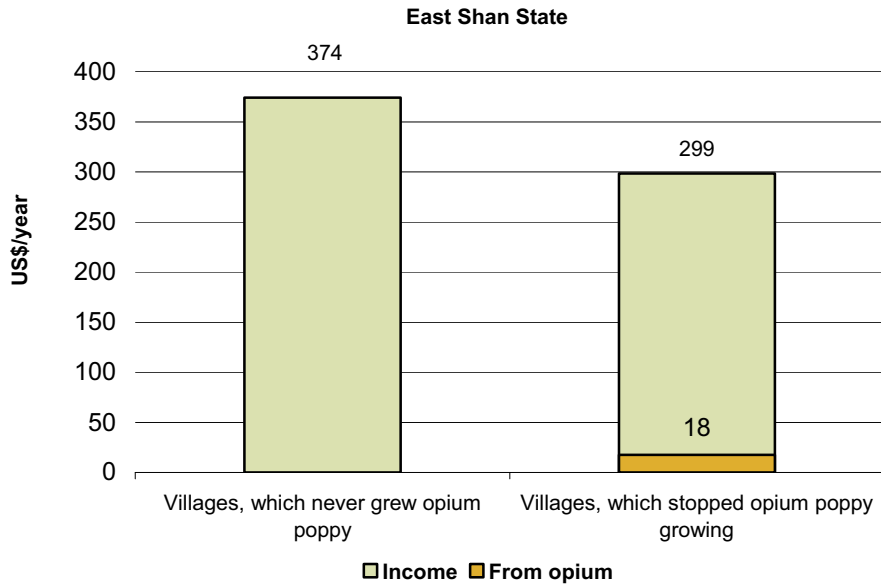


Figure 12: Average household income in non-opium poppy growing villages (US\$/year)





Lancing of opium poppy capsules



An analysis of the different sources of household income, including opium growing as well as non-opium growing households, shows that opium ranks rather low. Agricultural products such as rice and maize as well as livestock and poultry are among the most important sources of income in all surveyed villages. In East Shan State, opium sales ranked among the top five sources of income, and in South Shan just after wages, which are often obtained from working on opium poppy fields in this region. Everywhere else, opium sales are not considered anymore a significant source of livelihood. These results should be interpreted with caution, as there might be a reluctance of respondents to report income from opium in the context of the Government's efforts to curb it.

Table 8: Ranking of the different sources of income by region*

Rank	Kachin State	Kayah State
1	Cash crop: Fruit trees and beans in Putao, Machanbaw. Millet vegetables and sorghum in all townships	Cash crops: Vegetables, millet and sorghum in all townships
2	Trading and business	Rice sale
3	Livestock and poultry	Maize
4	Rice sale	Livestock and poultry
5	Maize	Salary and wages
6	Forest products	Trading and business
7	Salary and wages	Forest products
8	Opium sale	Remittance
9	Remittance	Opium sale

* Ranking by contribution of income source to household income in US\$ equivalents.

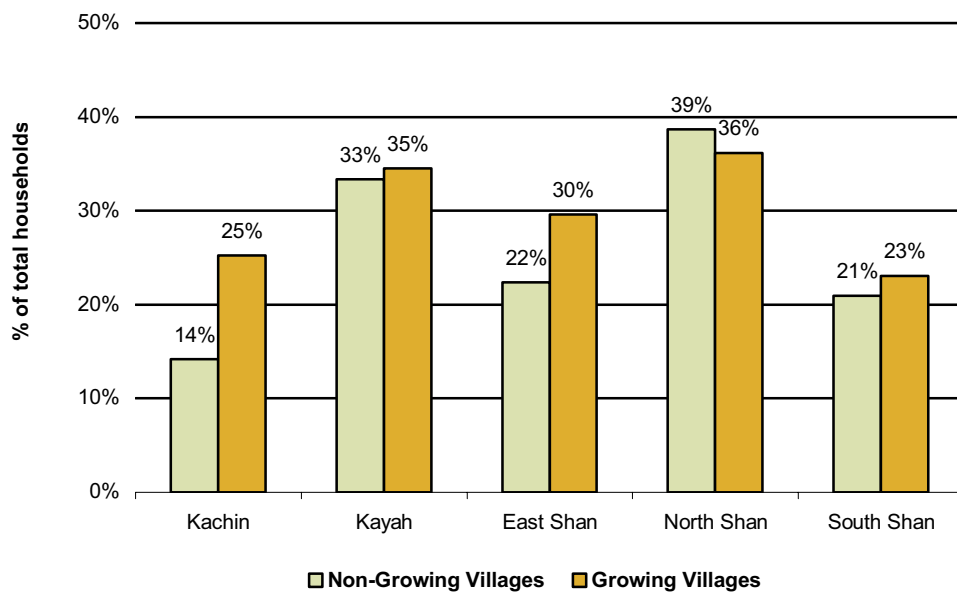
Rank	East Shan State	North Shan State	South Shan State
1	Rice sale	Cash crops: Tea in Naungcho, Kyaukme. Vegetables in Lashio and Thibaw. Groundnut in Tang Yang	Cash crops: Potatoes in Pinlaung, Garlic in Pekhon and Leacha. Cheroot leaf in Hopone and Hsihseng
2	Livestock and poultry	Livestock and poultry	Rice sale
3	Cash crops: Vegetables in Kengtong. Ginger, Garlic in Tachleik, Mong Tong, Mong Sat- Peas and beans in all townships	Rice sale	Maize
4	Opium sale	Maize	Trading and business
5	Forest products	Trading and business	Livestock and poultry
6	Maize	Forest products	Salary and wages
7	Salary and wages	Salary and wages	Opium sale
8	Trading and business	Remittance	Forest products
9	Remittance	Opium sale	Remittance

Loans

In East Shan and Kachin States, most of the loans were taken by farmers who cultivate opium poppy, whereas in Kayah and North Shan State, where opium cultivation is negligible, the corresponding proportion of loans was very low. In South Shan State where opium poppy

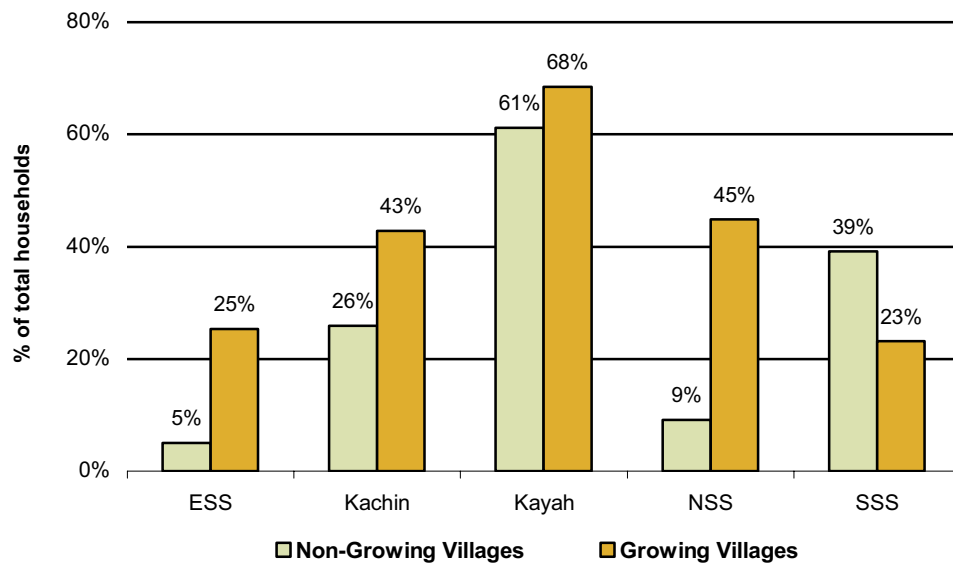
cultivation is high a fewer percentage of all households took loans, and about half of them were also cultivating opium poppy. This indicates that farmers in South Shan are less dependant on loans in general. Between one fourth and one third of all households in opium poppy growing as well as in non-growing villages had outstanding loans, with an significantly higher proportion of households with outstanding loans in growing villages.

Figure 13: Households with outstanding loans from 2005



More households in opium-growing villages compared to non-growing intended to take a loan in 2006. Both findings indicate that poverty is the driving force behind opium poppy cultivation. However, in South Shan State, only 23% of households in opium growing villages intended to take a loan in 2006 compared to 39% in non-growing villages. This exception to the general trend could be due to the fact that farmers received an unusually high income from opium this year.

Figure 14: Households planning to take a loan in 2006



Opium poppy farmer family



2.4 Addiction

Data on opium addiction, defined as daily use, with a breakdown by gender (for population aged 15 years and above) were collected during interviews with the headmen in the surveyed villages. The addicts themselves were not interviewed and no data on their level of consumption was collected.

In villages in Shan State where opium cultivation took place in 2006 the average level of addiction was 2.16% and thus significantly higher than in non-growing villages where the average of opium addiction was reported to be only 0.25%. Overall opium addiction rate in Shan State was 0.60% (excluding Wa) and remains almost the same as last year when it was 0.57% (including Wa).

The survey this year covered also some new areas in Kachin and Kayah. No addicts were identified in Kayah where opium cultivation can be found in only a small number of villages. The level of opium addiction found in Kachin was the second highest of all regions with a prevalence rate of 0.72%. All these results should be interpreted with caution, as there might be a reluctance of respondents to report opium addiction in the context of the Government's effort to curb it.

Table 9: Opium addiction in Shan State as reported by headmen, 2006

Type of village	Sampled villages	Opium Users	Population above 15 years old	% of addicts
Non-opium poppy growing	374	205	82,210	0.25%
Opium poppy growing	113	406	18,837	2.16%
Total	487	611	101,047	0.60%

Table 10: Opium addiction in Kachin State, 2006

Region	Population			Opium user 2006					
	Women	Men	Total	Women	Women%	Men	Men%	Total	Total %
Kachin	143,901	140,062	283,963	247	0.17%	1,807	1.29%	2,054	0.72%

The results for opium addiction, which was surveyed for the first time this year in Kachin, confirm last year's data from the Shan State where it was found to be mainly a male phenomenon (1.29% men compared to 0.17% women).

Table 11: Heroin and ATS addiction

Region	Prevalence rate of heroin users	Prevalence rate of ATS users
Kachin	0.12%	0.01%
Kayah	0.00%	0.00%
East Shan	0.00%	0.16%
North Shan	0.13%	0.06%
South Shan	0.03%	0.04%
Total Shan State	0.07%	0.07%
Total Shan State + Kachin	0.07%	0.07%

Heroin and amphetamine-type stimulants (ATS) addiction in Shan and Kachin States remains very low among the surveyed population, which are all living in rural areas. Both types of abuse are mainly an urban phenomenon in Myanmar. In the surveyed areas, heroin and ATS prevalence rates are at the same level at 0.07%. Heroin abuse is higher in Kachin and North Shan State whereas ATS abuse is higher in East Shan State.

2.5 Socio-economic characteristics of the survey 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

There is a significant difference in food security between households in villages growing opium poppy and those in non-growing villages. Generally, food security is considerably higher in villages that do not cultivate opium poppy. This finding stresses the link between opium poppy cultivation and a low food security.

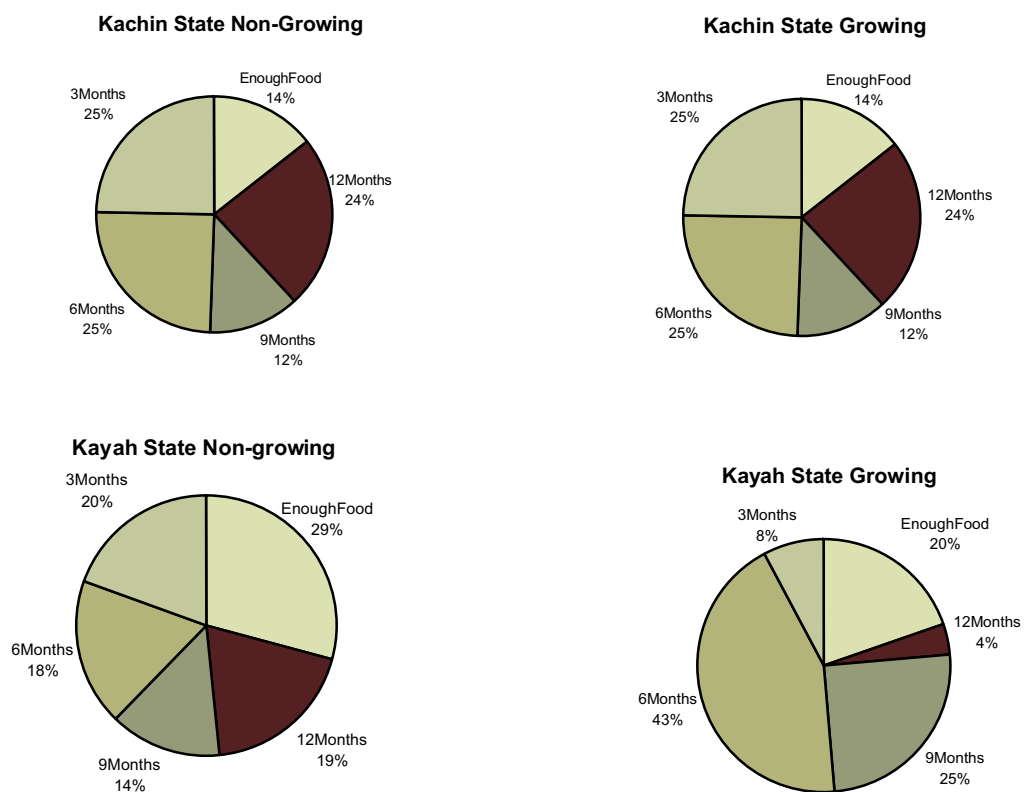
In East Shan State, 79% of households in non-growing villages reported to be food secure for 12 months as opposed to only 52% in growing villages. In North Shan, a vast majority (65%) of non-growing households is food secure for the entire year contrasting with only 11% for households in opium poppy-growing villages.

In Kachin State, 48% of households in non-growing villages have enough food for the year, whereas in opium-growing villages, only 14% of the households possess enough food for the year.

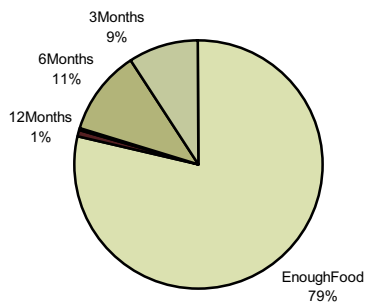
In Kayah, 29% of the households in non-growing villages have enough food for the year, while in villages growing opium poppy, only 20% possess enough food for the year.

In South Shan State, food sufficiency situation is similar in both opium poppy-growing and non-growing villages (54% and 53%). But the proportion of households with a rice deficit of 12 months is 9% in growing villages compared to 3% in non-growing villages.

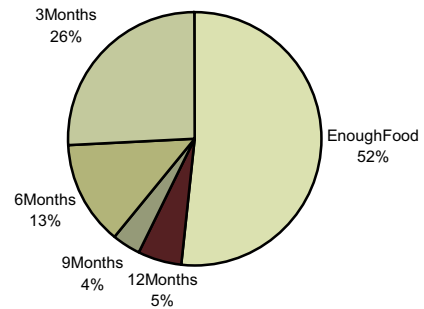
Figure 15: Percentage of households with food deficit in opium poppy growing and non-growing villages, 2006



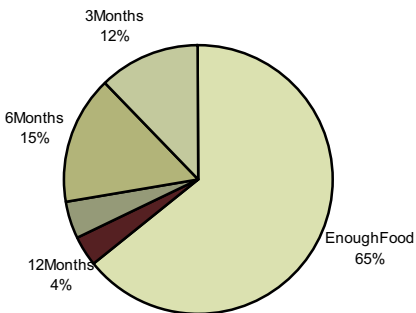
East Shan State Non-growing



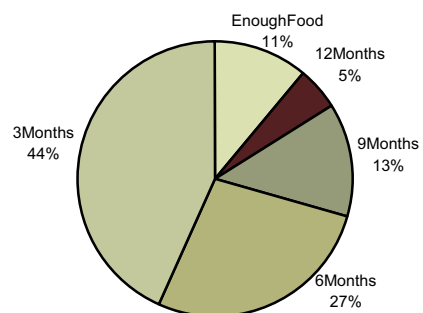
East Shan State Growing



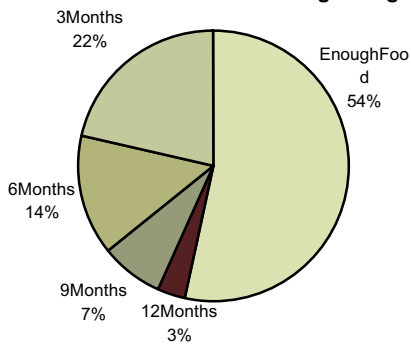
North Shan State Non-growing



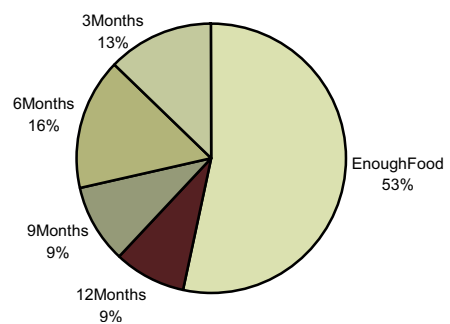
North Shan State Growing



South Shan State Non-growing



South Shan State Growing

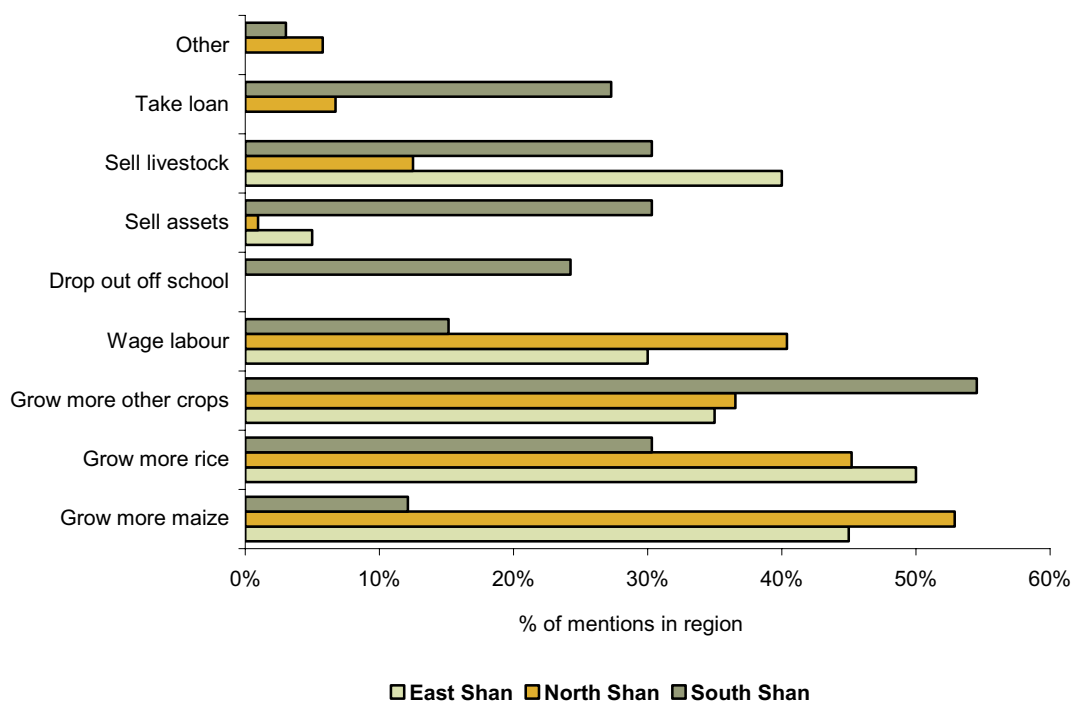


Coping strategies after stopping opium cultivation

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

households assets. It is worth noting that almost none of the surveyed villages turned to the rice bank⁴ to overcome their deficits.

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



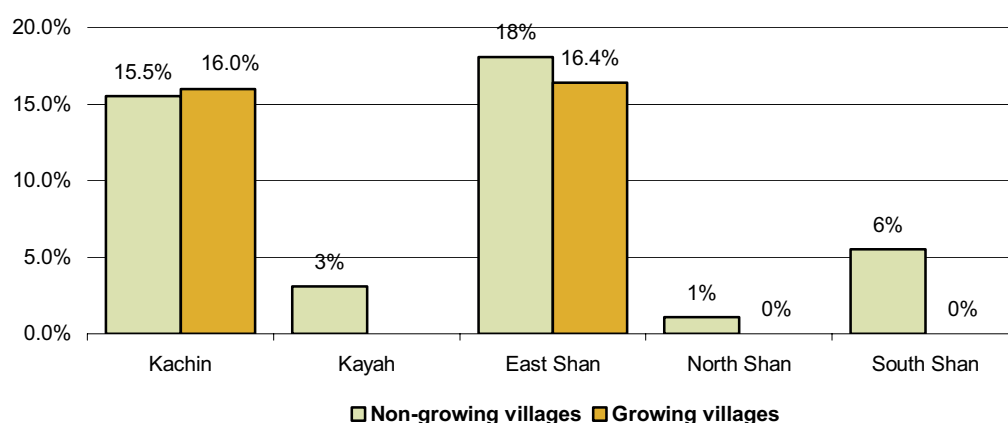
Paddy land availability

Access to paddy land is a good indicator for a high food security as irrigated lowland rice gives much higher yields compared to unirrigated upland rice. In general, less than half of the households in the surveyed villages own paddy land, and this percentage is even lower in opium poppy growing villages.

Table 12: Percentage of households with paddy land

% of households owning paddy land	Non-growing villages	Growing villages
Kachin	40.2%	30.0%
Kayah	37.1%	47.4%
East Shan	86.0%	42.2%
North Shan	24.3%	21.6%
South Shan	49.4%	19.2%

⁴ Rice Banks are village committees who, on behalf of member farmers, receive paddy or seeds from farmers and borrow it to other needy farmers at an appropriate interest rate. The collected interests are used as the village fund.

Figure 17: Proportion of villages increasing the amount of paddy by region

Some villages were able to increase the area of lowland paddy, which can in turn improve their food security. The highest rates were found in East Shan State and Kachin. The results support the findings of the food security analysis where it was found that East Shan State has the highest proportion of households with enough food (in East Shan State, 8 out of 10 households have enough food in the non-growing villages). Non-growing villages also have a much higher land holding of paddy per household compared to opium-growing villages. This is another possible reason why non-growers are more food secure.

Table 13: Area of lowland paddy per household by region

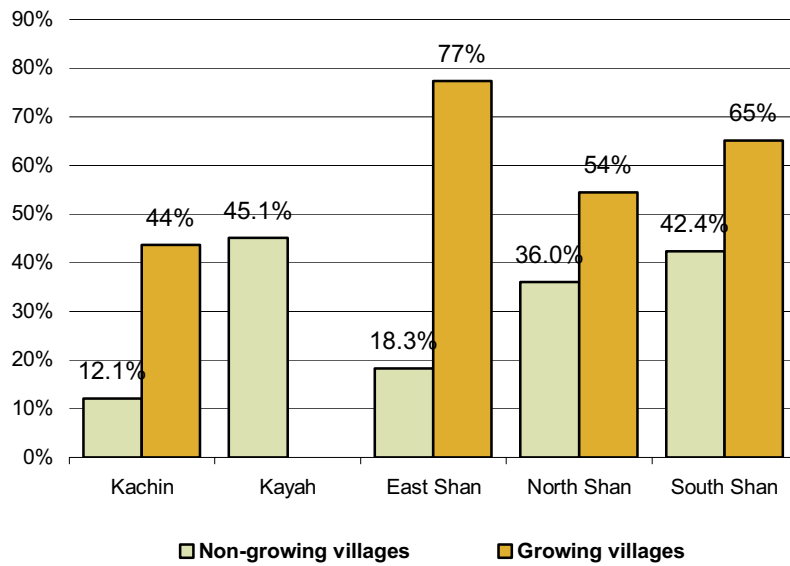
Region	Paddy land per household (ha)	
	Non-growing villages	Growing villages
East Shan	1.22	0.72
North Shan	0.96	0.27
South Shan	0.93	0.36
Kayah	1.00	1.16
Kachin	2.08	0.84
Average	1.24	0.67

Shifting Cultivation

Opium poppy growing households rely much more on shifting cultivation than non-growing households. This is due to the fact that opium poppy is cultivated on the hillsides where the climatic conditions are favourable. The slopes are usually covered by forest and scrubs, which farmers clear for opium poppy fields.

In mountainous regions such as East Shan and Kachin, the proportion of households practicing shifting cultivation in opium poppy-growing villages was double or even triple the proportion in non-growing villages. In South Shan State and North Shan State the difference is less pronounced. In Kayah, opium poppy cultivation is negligible but the practice of shifting cultivation is nevertheless widespread.

Figure 18: Percentage of households practising shifting cultivation



The average number of years fields are cultivated before being fallow is about two. No significant difference was found between villages growing and those not growing opium poppy. The shortest average duration of cultivation was found in villages in Kachin with 1.4 years and the longest in South Shan State with 2.4 years.

Differences between opium poppy growing and non-growing villages are more pronounced for the duration of the average fallow period. The number of fallow years is higher in growing villages. In non-growing villages there is a higher pressure on the land to grow rice each year or every two years except in Kachin where fields are left more than five years. This fast rotation on highland fields could affect crop productivity and lead to soil erosion.

Figure 19: Average number of years of cultivation before fallow

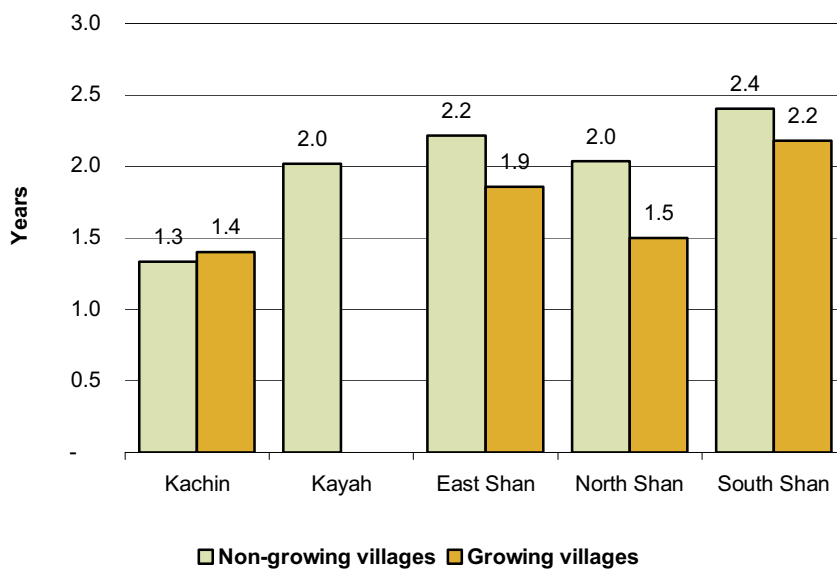
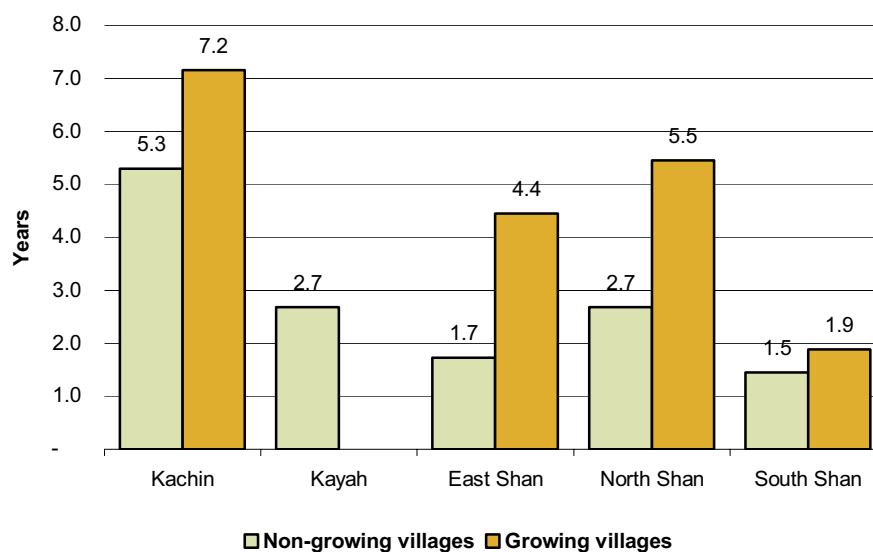


Figure 20: Average number of fallow years

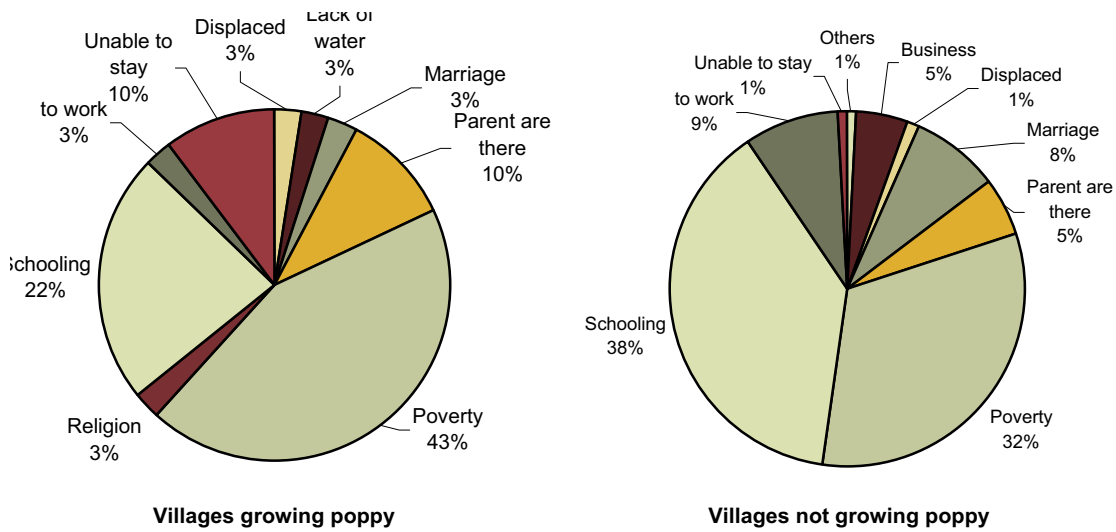
Migration

Permanent out-migration in the sample is low (1% of the surveyed population) and comparable to last year. The highest migration rate was reported from East Shan State with 1.6% and the lowest from Kayah with only 0.7%. There was no report of permanent out-migration in the Wa region following the opium ban in June 2005. The out-migration rate in opium poppy growing villages in East and North Shan State is three times higher than in non-growing villages. In opium poppy growing villages poverty is often cited as the main reason for households to move. Religion was also mentioned as a reason for migration as well as relocation organised by local authorities.

Table 14: Out-migration rates in the sample population, 2006

	In non-growing villages	In growing villages	Total
Kachin	0.9%	0.6%	0.8%
Kayah	0.7%	0.5%	0.7%
East Shan	0.9%	3.0%	1.6%
North Shan	0.8%	2.8%	0.9%
South Shan	1.1%	1.1%	1.1%
Total	0.9%	1.5%	1.0%

Figure 21: Reasons for leaving the village



Migration in poppy growing villages in the surveyed area is directly related to poverty: 43 % of farmers migrated because of lack of food and/or lack of income. The second reason for leaving is schooling, 22%.

In non-opium poppy growing villages, schooling (38%) was a main reason followed by poverty (32%) for leaving the village.

2.6 Reported eradication

According to government reports, eradication took place on 3,970 hectares during 2005-2006 season, an increase of only 1.6% over the 3,907 hectares eradicated in 2004 - 2005 season.⁵

In Shan State, eradication took place mainly in South Shan State where it has increased by 164% compared to last year, and included some ‘voluntary’ abandonment of opium poppy cultivation. In Kachin State, eradication was 50% of the 2005 level. In Kayah State, where cultivation was negligible, no eradication was reported in 2006. Only 9 ha were eradicated in Mandalay and less than 1 ha in Sagaing Division in 2006, and both eradication events took place close to the border with Kachin and Shan State.

Under the cease-fire agreements, ethnic groups have a certain degree of autonomy and self-governance. In the main opium poppy cultivation areas, the government was able to assert to some degree of control, and local authorities agreed to phase out opium poppy cultivation. However, in most of these areas there are no alternative sources of income and local authorities have been reluctant to increase eradication activities, since no aid is yet in place to support farmers who abandon opium poppy cultivation.

⁵ This opium survey was not designed to monitor or validate the results of the eradication campaigns carried out by the Government.

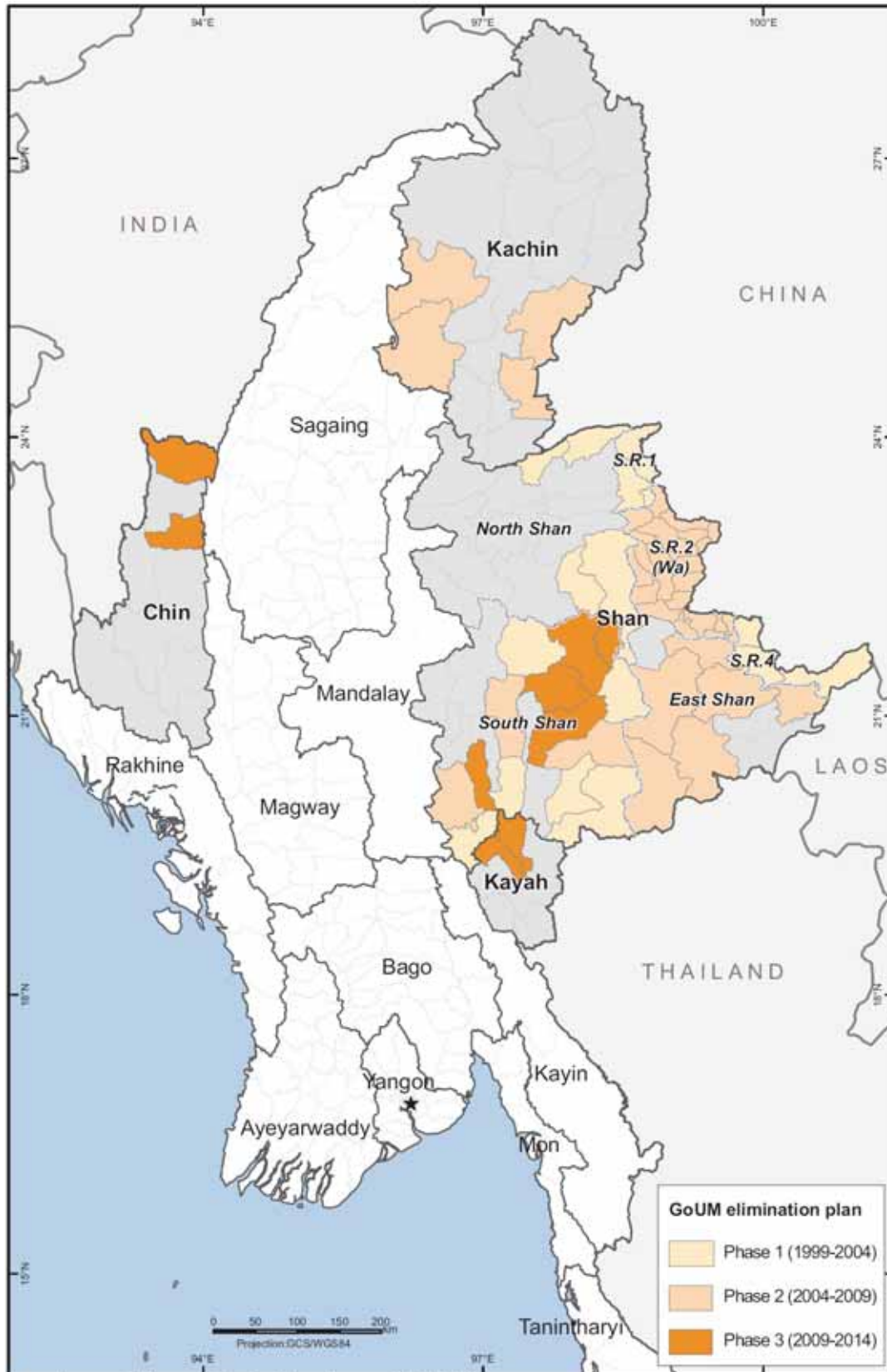
Eradication



Table 15: Eradication by region (ha), 2004 - 2006

Region	2004	2005	2006
North Shan State	172	1,211	76
South Shan State	2170	1,203	3,175
East Shan State	195	124	32
Total Shan State	2,537	2,538	3,283
Kachin	126	1,341	678
Kayah	83	8	0
Other States	74	20	9
National Total	2,820	3,907	3,970

Map 4: The 15-years opium poppy elimination plan in Myanmar



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.

2.7 Impact of the opium ban in Special Region 2 (Wa)

In 2005, 94% of opium cultivation took place in Shan State, of which 42%, or 39.5% of the national cultivation, took place in Wa Special Region 2. These figures confirmed the area's status as major producer of opium in the country up to June 2005, when the Wa authorities declared a total ban on opium cultivation.

A farmers' intention survey was conducted by ICMP/UNODC in October 2005, prior to the annual opium survey, to assess the impact of the ban on opium farmers. The two datasets together provide a good overview of the situation farmers are facing in Wa.

- 91% of the villages surveyed reported to have cultivated opium poppy in the past and 100% reported they would abandon opium poppy cultivation this year. In fact, not a single opium poppy field was found at the time of the survey and a following rapid assessment in January and February 2006.
- It was estimated that the ban resulted in the cessation of opium poppy cultivation on 12,960 ha of land. This represents a reduction of 96 metric tons of opium (31% of Myanmar's total production in 2005), valued at US\$17.9 million.
- Surveyed farmers indicated that opium poppy was seven times more profitable than highland rice and two times more profitable than lowland rice.
- Farmers expected that without opium, household income would decline to 31% of that generated in 2005 as the revenue from opium, formerly 72% of the annual total would be lost. Loss of income from opium can only be partially be replaced by income from other crops.
- All villages surveyed reported that the production of food for self-consumption would only be sufficient for 6 months of the year, after which a period severe food shortages would be experienced if no external assistance was made available.
- 33% of the farmers reported they were in debt, 95% of them indicated that they would continue to be in debt in 2006 and that it would be very difficult for them to generate the income necessary to repay the amount owed. Farmers also reported that they did not expect to obtain further extensions on the loans made in 2006.
- With no additional income for investment, the diversification of farms will not be possible.
- In past years, farmers facing food shortages had the possibility of generating extra income by working as casual labourers in the region's opium fields. With no opium cultivation following the ban, this is no longer an option and such wages will not be available.
- None of the farmers interviewed believe they would migrate from the Wa region to other areas, however, if a balloon effect of opium cultivation takes place in other parts of Shan and Kachin States, a significant migratory wave could occur as desperate communities look for work, income and food. The survey results indicate this has not happened so far.
- Although farmers have expressed their intention to adopt alternative income strategies, they are hardly in a position to do so without the income necessary for new investment.
- The assistance currently provided by UN agencies and NGOs is significant, but remains insufficient in the face of the magnitude of vulnerability of the affected population. The World Food Programme estimates the number of food insecure people at 230,000, out of which it could support only 100,000 or 42%.

It can therefore be assumed that the vast majority of families in the region will be affected by food insecurity and debt as no adequate alternative livelihood strategies are yet available.

Former opium poppy farmer, Wa region



3 METHODOLOGY

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

The pattern of opium poppy cultivation is rapidly changing in Myanmar: Some areas are getting opium free when others are increasing their level of cultivation. In South Shan State the opium poppy crop calendar is changing and new patterns such as multi-cropping emerge. Opium fields generally move further away from the villages and, in certain regions, are being subject to eradication activities. In addition, cultivation is possibly shifting to areas once considered opium poppy free or climatically less favourable. In 2006, all of these considerations, combined with reduced accessibility and the expected change in cropping pattern, influenced the survey methodology and the sampling procedures for the estimation of the planted area and other socio-economic indicators.

Considerable efforts have been made over the last years to improve on a number of 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 2006 opium poppy survey is composed of three parallel components:

1. A planted area estimation survey throughout three regions of the Shan State (North, South, East) and Kayah State and Kachin State. This 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 other regions estimate of planted area are derived from the sampled socio economic survey described below.
2. An opium poppy yield estimation survey in the three regions of the Shan State and Kachin for the description and measurement of opium field that were researched within a random set of sample sites.
3. A socioeconomic survey in 810 villages randomly selected over Shan State, Kayah State, and Kachin State based on interviews with village headmen and heads of households of the villages selected.

3.1 Sampling procedure for the village survey

The planning of the surveys started with the definition of the sampling frame. The sampling frame is composed by the complete village listing provided by the Central Committee of Drug Abuse Control in Myanmar. The village listing includes name of villages, regions, township names and codes, village track codes and growing opium poppy history (only in some cases). 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 economic or logistical.

It was agreed that the socio-economic survey would be conducted on sample of 810 villages. This is approximately 5% sampling of the 16,075 villages listed by the Myanmar's Forest Department.

Taking into account the potential source of bias from the village database, as well as considering that the database may not be as accurate as desired (because some villages may not exist anymore, some may have moved, some others may have changed names or have merged with other villages), a contingency plan had to be developed at the time of sample selection. Therefore, in case a village identified in the survey listing could not be found, an alternative village was selected to replace it. Although the sample size had to be reduced as in several cases neither the originally

sampled village nor the replacement village could be identified on the ground, the stratification structure of the sample was kept intact.

Finally, a total of 487 villages in the Shan State, 99 villages in Kayah State and 83 villages in Kachin State were selected, including more than 44,543 households and a population of 252,531. The information covered in this sample was thus equivalent to approximately 5% of the total estimated population of 5,690,820 in the Shan State, Kayah State and Kachin State.

Table 16: Composition of the socio-economic survey sample

Particulars	North Shan	South Shan	East Shan	Kayah	Kachin	Total
Projected no. of villages to be surveyed	199	205	170	120	90	784
Actual no. of villages surveyed	194	145	150	99	83	667

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 region surveyed. In East Shan State 50% surveyed were Shan, in South Shan State 72% were Shan and Paoh. In North Shan State, where more ethnic groups are present, Shan represent 46% of the population surveyed, with the remained comprising a number of ethnic groups.

3.2 Survey organization

The survey campaigns 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 collect opium yield and socio-economic data were supervised and implemented by the Myanmar CCDAC, while the UNODC/ICMP provided technical support, coordination and supervision throughout the survey. The rapid assessment survey as well as the assessment of the opium ban in Wa Special region 2 was implemented directly by UNODC/ICMP, though still in close collaboration with CCDAC and Wa authorities that participated in field supervision. The area estimation campaign was conducted in collaboration with the remote sensing and GIS section of the Ministry of Forestry.

Three separate teams, each comprising two surveyors from the Remote Sensing and GIS Section of the Department of Forestry, visited the field with print outs of the satellite images. Once they reached the area represented in each single scene, they proceeded to annotate the print with the land use classes and relative boundaries, proceeding along specific transect itineraries.

Field operations started the second week of December 2005 and continued until mid February for Shan and Kayah States and up to March 2006 for Kachin State. Due to a worsening of the security situation in East and particularly in South Shan 22% of the sampled villages in South Shan and some in East Shan could not be visited by ground surveyors. At 19 out of 20 satellite image locations ground truth data could be collected, although in some cases only partially.

3.3 Field operations

For the socio-economic and yield estimation campaign, 153 surveyors carried out the fieldwork from 13 December 2005 to mid-February 2006. In Kachin State where opium is harvested later the date was extended up to middle of March. They were organized in 51 teams (17 teams for SSS, 16 for NSS, 10 for ESS, 3 for Kayah State and 5 for Kachin State). In each team there was one surveyor from the Police Force, one from the General Administration Department and one from the Land Record Department or the Myanmar Agriculture Service. Work was coordinated by a head supervisor based in Taunggyi who relied on the work of four local supervisors, one each for the five Regions (North, South, East Shan, Kayah and Kachin). The survey teams were all

involved in interviews with village headmen and heads of household, as well as field measurements for the collection of yield estimation variables.

Each survey team was assigned to a township. Four townships with a heavier workload were assigned two-survey teams each (Lashio, Thibaw, Tangyang and Kengtong townships). The fieldwork survey started on December 13, 2005 in the South Shan and Kayah by 20 teams, and all the 60 trainees were in the field by December 15. The teams in Kachin State (15 teams) started survey on February 12, 2006 and worked in the fields until March 15. The supervision teams met all the teams during the field survey to assess the progress of the survey and ensure quality control. The duration of the ground survey was 8 weeks and operations were wrapped up by the second week of March.

As the majority of opium gum collection takes place between early September and late December, it is of vital importance that surveyors commence their work as early as possible, in order for them not to miss the opportunity for measuring the crops' fruits.

Table 17: Opium poppy yield estimation and socio-economic survey fact sheet

	North Shan	South Shan	East Shan	Kayah	Kachin
Start date	03-01-2006	13-12-2005	30-12-2005	13-12-2005	12-02-2006
End date	28-01-2006	15-02-2006	15-02-2006	15-02-2006	15-03-2006
Survey Teams	16	17	10	3	5
Targeted Village Tract	143	106	116	53	53
Surveyed Village Tract	143	72	92	44	44
Targeted Villages	199	205	170	120	90
Villages Surveyed	159	141	150	99	83

Some inconsistencies or missing data were found in 7 questionnaires from South Shan State and were consequently disregarded. Another 81 villages questionnaires were missing due to non-existing villages or non-accessibility due to the security situation.

3.4 Procedures for the opium poppy area estimate

The area estimate for South and East Shan is based on 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 is 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 20 selected locations, Ikonos images with 1-meter resolution (pan-sharpened, 4 bands) images were acquired. The number of images was limited due to budget restrictions. 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 satellite image locations selection

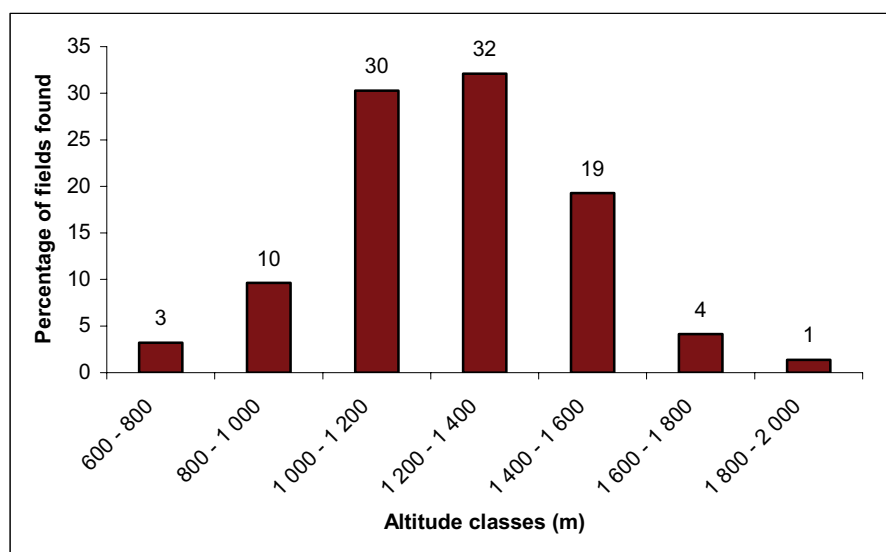
To select the sample locations of the satellite images, a sampling frame was designed. The sampling frame was developed by the combination of the following factors:

- 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. The other land use classes were considered as potential for opium poppy growing.

Altitude was taken as factor since former surveys had revealed that 95% of the opium poppy was cultivated at altitudes between 800-1800 meter. A 90-meter resolution Digital Elevation Model (DEM) was used to extract the area that meets these altitude conditions.

Figure 22: Altitude distribution of opium poppy fields in South and East Shan, 2005

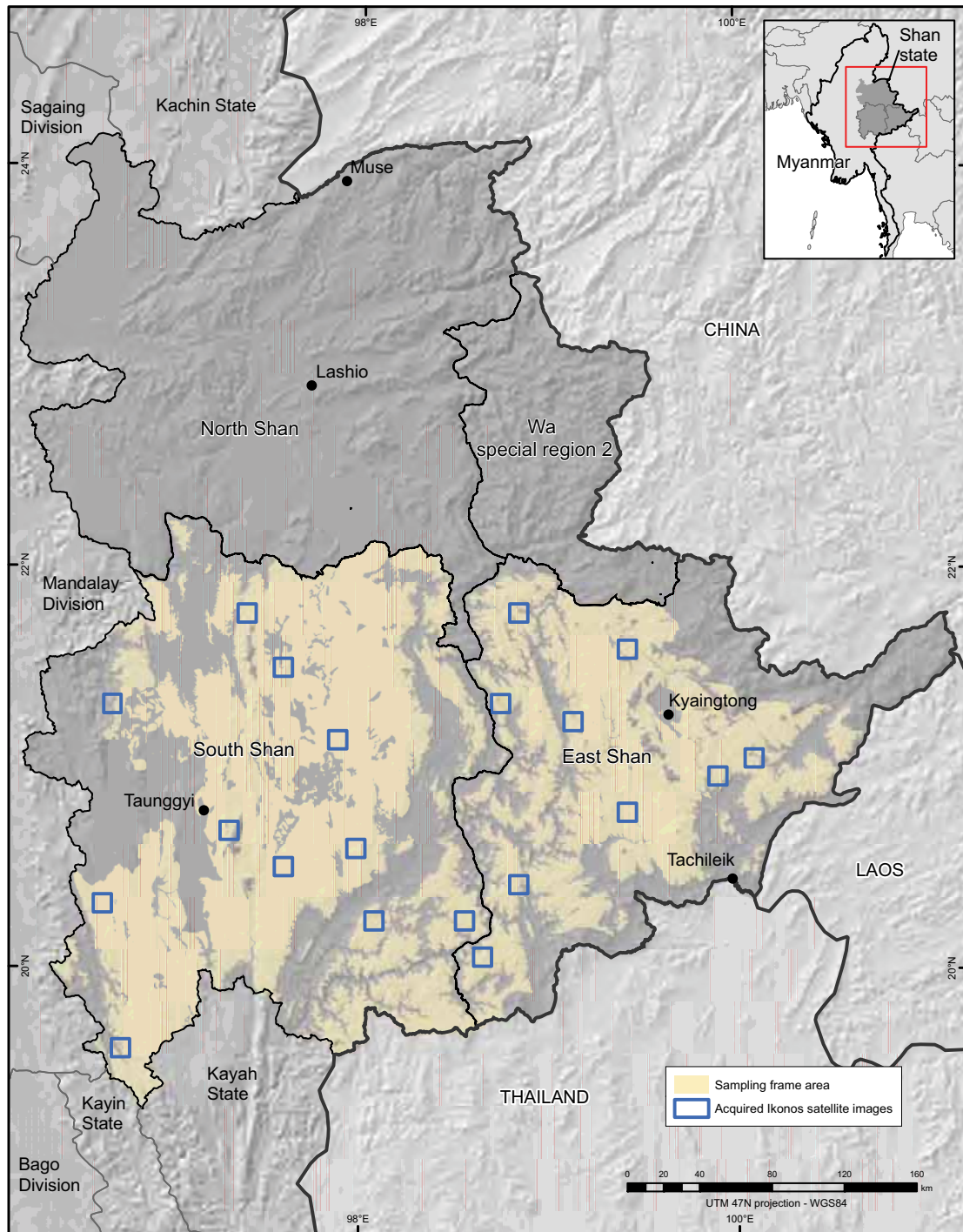


Slope. From the DEM, a slope map was derived and used to exclude areas with less than 5% slope, since these are the large, highly accessible areas with little potential to hide the opium poppy.

From information on the ground, several *opium poppy free areas* were identified: Special Region 4 and the townships Mongyang, Tachileik, 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. A grid with 10 by 10 kilometers was put on top of this sampling frame to select the image locations. Locations that were sampled last year were selected again, if they matched the selection criteria (8 locations). The rest of the images were selected randomly within the sampling area. In total 25 locations were selected in this way but due to climatic conditions only the images at 20 locations could successfully be acquired.

Map 5: Sampling frame area and Ikonos satellite image acquisitions, Myanmar 2006



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

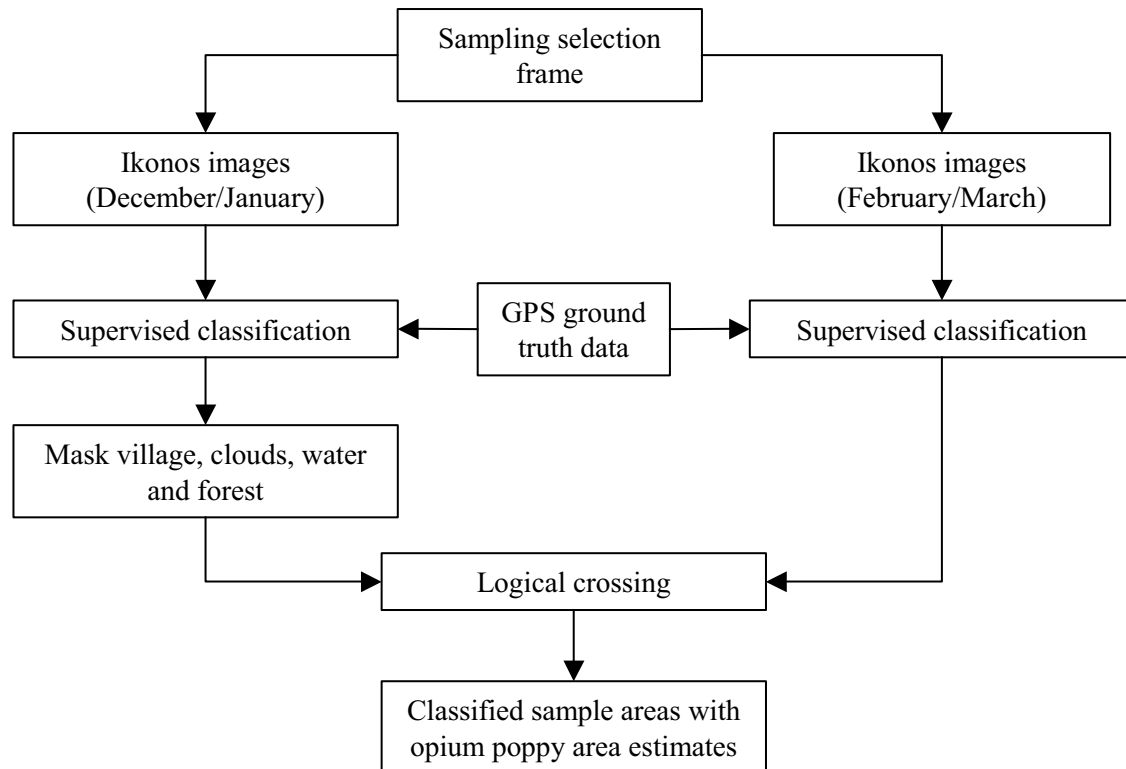
Table 18: Sampling frame area of the South and East Shan

Strata	Area (km ²)	Area (%)
Opium poppy free area	40 719	43
Opium poppy risk area	53 432	57
Total	94 151	100

Processing of the satellite images

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

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



The satellite images were classified with the groundtruth 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, after which applying logical rules combined the two resulting maps. 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.

Statistical procedures for the area estimate

Information about the number of households involved in opium cultivation was collected during the village survey for all regions. Based on the available sampling frame, results were extrapolated using an average area under opium poppy cultivation per household, and an estimate of the total area under cultivation was derived. For Kachin, Kayah and North Shan, the area estimates from the village survey were used, while for South and East Shan, the results of the remote sensing were used. For South and East Shan, the area estimates from the village survey could be compared with the estimates from the satellite image interpretation. Bearing in mind that farmers tend to underestimate the extent of the area under opium poppy cultivation, both estimates were found to be statistically significantly close.

In order to calculate confidence intervals for the estimates and given the small number of segments of East and South Shan State, the skewed distributions of the proportion of opium poppy found on East and South Shan State were merged together and subsequently refined by the bootstrap method. Bootstrap is recommended when the sample observations have different sizes,

which was the case during this survey. Because the total agricultural land differs in each selected segments, the standard formulae for confidence intervals calculation cannot be applied.

Bootstrap with 100,000 iterations revealed that there is a 90% probability that the extent of the opium poppy cultivation estimated in East and South Shan State from satellite imagery lies between 9,700 hectares to 29,700 hectares.

3.6 Description of opium poppy cultivation intensity by township in Shan State

Based on the results from the socio-economic and remote sensing surveys of the last years and field observations during several field survey campaigns this year, the townships of Shan State were divided into opium-poppy free, low intensity and high intensity opium poppy cultivation townships. This information is potentially useful to improve the sampling procedure of future surveys. The following categorisation of townships in Shan State by cultivation intensity level is a contribution towards this end.

Opium poppy-free are those townships, which do not have any trace of opium poppy cultivation in 2006, according to the information available.

For **low intensity opium poppy cultivation townships**, there is evidence of opium poppy cultivation. However, the fields are not easy to detect, often far from roads and villages, and only a few villages are involved.

In **high intensity opium poppy cultivation townships**, a large number of villages is 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.

Shan State is comprised of 50 townships and Special Region 2. 21 townships are in South Shan State, 19 in North Shan State and 10 in East Shan State. In townships where armed ethnic groups retain control and in areas where the government has negotiated a ceasefire, opium poppy cultivation has often become a predominant form of livelihood. Conversely, in most townships under full government control, no evidence of cultivation exists.

Opium poppy-free townships

19 out of 50 townships (38 %) in Shan State are opium poppy-free.

Table 19: Opium poppy-free townships

East Shan		North Shan		South Shan	
1	Mongyang	1	Naungcho	1	Kalaw
2	Tachileik	2	Moemeik	2	Pindaya
		3	Mabein	3	Ywangan
		4	Muse	4	Taunggyi
		5	Kongkyan		
		6	Laukkaing		
		7	Kunlon		
		8	Hopang		
		9	Namsang (N)		
		10	Mongyai		
		11	Thibaw		
		12	Namtu		
		13	Kyaukme		
2		13		4	

East Shan State

The East Shan State is comprised of 10 townships. 2 townships (Mongyang and Tachileik) were found to be entirely free of opium poppy:

Half of Mongyang Township is located in Special Region 4 of Shan State, which has been opium-free since 1997. The other half of Mongyang Township is located in Wa Special Region 2 where an opium ban was imposed in 2005. 12 villages in the vicinity of Mongyang are under the control of the Government of the Union of Myanmar (GOUM) and these are also opium-free.

In 2006, survey teams had the opportunity to visit a greater part of the Tachileik Township area. The Loi Daw Kham village tract, located on the Thai border and notorious for opium poppy cultivation before control was transferred from the Ah Kar Peoples' Militia Group to the GOUM, was found to be entirely free of opium cultivation.

North Shan State

5 townships (Namsang (N), Mongyai, Thibaw, Namtu, and Kyaukme) were found to be opium poppy free in 2005.

In addition another 8 townships as described below are confirmed to be opium poppy-free in 2006:

In Naungcho, Moemeik and Mabein no opium poppy cultivation or eradication has been reported to occur in any of these townships in the last two years.

No opium poppy cultivation has been reported in Muse since last year. The majority of land upon which opium poppy was previously grown is located parallel and in close proximity to the Chinese border. A potential primary factor in determining why the area has remained opium poppy-free is the absence of any active armed group in Muse.

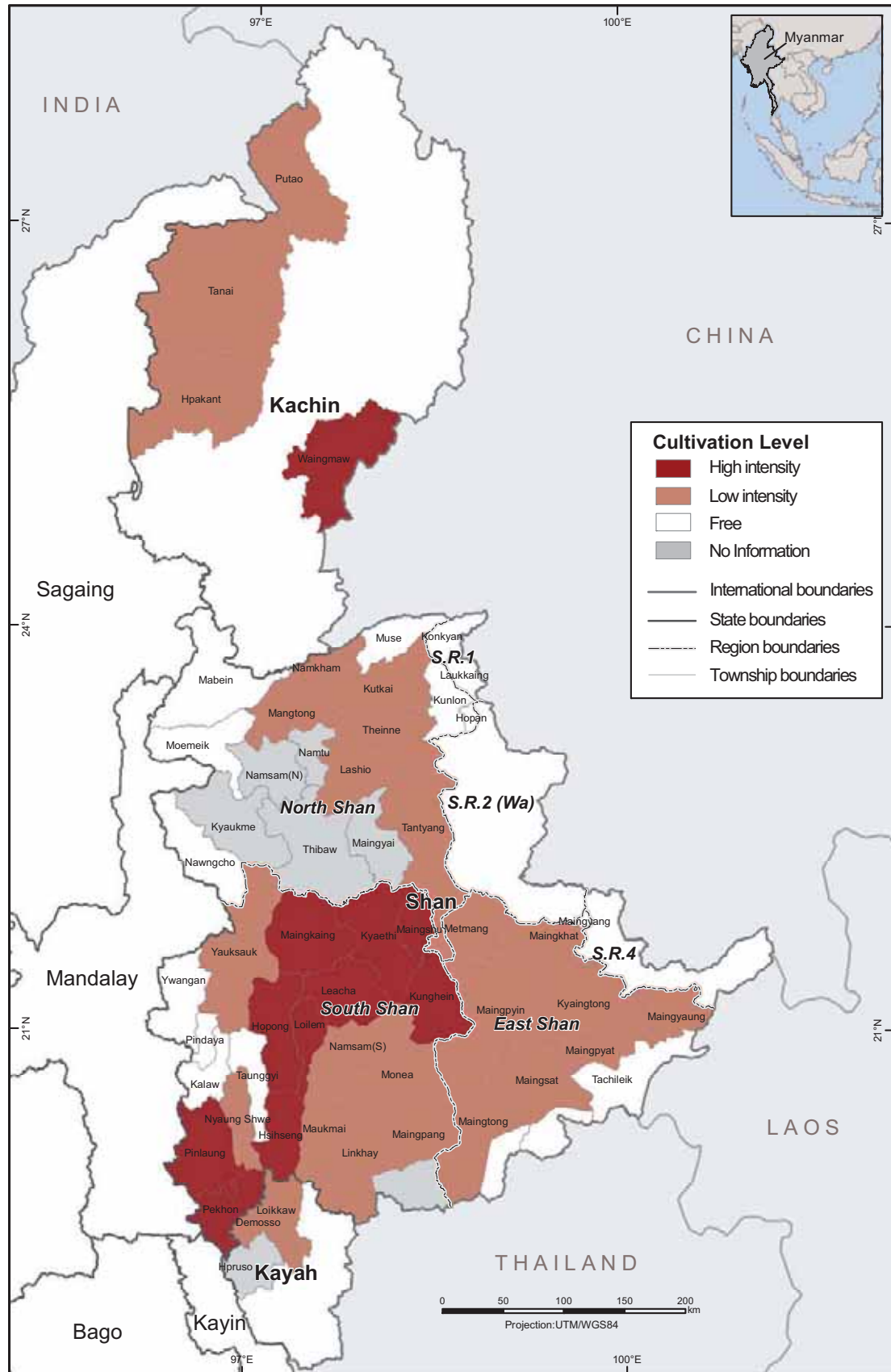
Laukkaing and Kongkyan townships are located in Kokang Special Region 1, an area that has, officially, remained opium-free since 2003. Laukkaing and Kongkyan were surveyed in 2005 and the official postulation was confirmed as neither opium cultivation nor opium production was detected. Similarly, a brief assessment in the 2006 survey reconfirmed the status of Kokang Special Region 1 as opium poppy-free.

Kunlon and Hopan Townships are located close to Kokang Special Region 1 and Special Region 2 (Wa). A monitoring trip was carried out in 2006 with the intention to scrutinize whether the opium ban imposed throughout the Wa in June 2005 would result in a "balloon effect" in terms of prompting the resumption of cultivation here. No opium cultivation or significant in-migration was observed. Kunlon Township banned the opium poppy over two years ago, while Hopan (the majority of which is located in Special Region 2 (Wa) has been free of the illicit crop since 2000.

South Shan State

The four townships of Kalaw, Pindaya, Ywangan and Taunggyi were found to be entirely free of opium poppy cultivation. No evidence of opium poppy cultivation in those townships was discovered over two consecutive years of surveying.

Map 6: Opium poppy cultivation in Shan State, Myanmar, 2006



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.

Low intensity opium cultivating townships

A low level of opium poppy cultivation was detected in 21 townships out of 50, which amounts to 42%.

Table 20: Low intensity opium cultivating townships

East Shan		North Shan		South Shan	
1	Mongsat	1	Tang Yang	1	Mongnea
2	Mongtong	2	Lashio	2	Mongpan
3	Metmang	3	Manton	3	Linkhay
4	Mongkhat	4	Namkham	4	Maukmai
5	Kyaington	5	Kutkai	5	Nyaungshwe
6	Mongpyin	6	Theinne	6	Lawk Sawk
7	Mongpyat			7	Namsang (S)
8	Mong Yaung				

East Shan State

Opium cultivation continued to take place in 8 townships (Mongsat, Mongtong, Metmang, Mongkhat, Kyaington, Mongpyin, Mongpyat, and Mongyaung), as reported by both field surveyors and government eradication teams. However, the extent is limited, occurring in only a few villages in each township. In the cultivating villages, opium poppy fields are typically located in remote places.

Mongsat and Mongtong Townships

Mongsat and Mongtong Townships are located in the southern part of East Shan State. In most parts, the area is of low elevation, with mountain ranges in the north and south. In 2005, a UNODC team conducted a Rapid Assessment Survey of the southern parts of both townships, which are under the control of the Wa authorities, and found them to be opium poppy-free. Some opium poppy cultivation still persists in the northern areas.

Metmang, Mongkhat, Kyaington and Mongpyin Townships

These townships are located in the central part of East Shan State. The area is of high elevation, and although a number of main roads link each town. Most villages, however, remain isolated and without road access. Climatic conditions in the area render multiple cropping of the opium poppy unfeasible and no such cases were observed in villages visited by the survey team.

A number of particularly remote villages in certain village tracts of those townships are notorious for opium cultivation. These include:

Kyaington:	Pan Mat, Mongpan, Monginn, Mongkun
Tong Tar (Sub-Tsp):	Mongshun, Phar War
Mongpyin:	Tar Kor, Sin Moug, Pyat Kan, Mongshan, Wan Mat Lone
Mongkhat:	Mongnyne, Monghair
Metmang:	Wansalaung Yaung Ou

Mongpyat and Mongyaung Townships

A very limited number of villages in the Mongpyat and Mongyaung Townships continue to cultivate opium poppy. Most of the land is of a notably low elevation and the temperature tends to be high all year, a fact that creates sub-optimal conditions for opium poppy cultivation. The area under opium cultivation in these townships was found to be at lower altitudes compared to any other areas surveyed.

North Shan State

In Tangyang, Lashio, Manton, Namkham, Kutkai and Theinne Townships, opium poppy cultivation has continued to take place, as reported by both field surveyors and government eradication teams. However, the extent of cultivation is very limited in relation to the rest of the Shan State, occurring only in a small number of villages in each township. Previously, those areas were notorious for commercialized cultivation. However, in places where law enforcement has tightened up, opium poppy cultivation has declined considerably.

Loi Tauk and Loi Pwi Ranges in Theinne and Lashio Townships

The Loi Tauk mountain range borders both the Theinne and Lashio Townships, while Loi Pwi is located within Lashio. Both are controlled by two armed ethnic groups (KDA and Manpan Militia) who returned to the legal fold. Approximately 500 hectares of opium poppy fields were eradicated on the Loi Tauk range during the 2004-2005 growing season. Only a small number of opium poppy fields were observed this year. A government military out-post in this area reported that 8 ha of cultivated opium was eradicated by the KDA and the Manpan Militia. Another estimated 40 ha were already earmarked for eradication.

Pansae Range in Namkham, Kutkai and Manton Townships

The Pansae range stretches along the border between Namkham, Kutkai and Manton Townships, and reaches as high as 2,300 meters altitude in some places. The Pansae armed ethnic group controls the mountain range and a significant number of opium poppy fields were observed on its slopes during the 2005 survey.

Survey interviewees reported that land is prepared for opium poppy cultivation each year in the hope that local authorities will continue to overlook the practice. There is a high probability that without intervention opium poppy fields will emerge along the range once more. However, the frequency, with which the authorities have ordered and enforced the cessation of cultivation, is increasing. As a consequence, many fields prepared for opium poppy were left uncultivated. Such fields are typically located along or near roads where the risk of detection and eradication is high. Authorities in Namkham reported that eradication of approximately 7 ha of opium poppy along the Pansae range in January 2006. Nevertheless, local anecdotal information has indicated that opium poppy fields continue to be cultivated in those valleys, which remain largely out of sight from the roads on Pansae range.

Isolated field in Miako area, Tanyang township



Maikao in Southern Tanyang Township

Maikao is located 25 km from Tang Yang's centre and it occupies the southern part of the township territory. This area is remote with only limited opium poppy cultivation.

South Shan State

Limited opium poppy cultivation can be found in seven townships of South Shan State with some more notorious village tracts.

Monea:	Haing Nwe, Naung Laing
Maingpan:	Mikepote
Linkhay:	Pantawi
Nyaungshwe:	Tiwamu
Namsang South:	Tone Hone, Narpwe, Wannaung and Mongseik
Maukmai	(southern-most area)
Yaukshauk	

High intensity opium poppy cultivating townships

Ten townships in South Shan State are notorious for their high level of opium poppy cultivation. This is 20% of the 50 townships in Shan State.

Table 21: Commercially opium poppy growing townships

South Shan	
1	Pinlaung
2	Pekhon
3	Hsihseng
4	Hopong
5	Loilin
6	Leacha
7	Mongkaing
8	Kyaethi
9	Kunhein
10	Mongshu

South Shan State

The 10 townships are located in highlands and mountains between elevations of 900 to 2,000 meters. The mountain ranges typically run north to south, which ensures that their eastern and western slopes are fully exposed to sunlight. The climate is cool and the average monthly precipitation during the period of vegetative growth of opium poppy crops is 250 to 300 mm. Precipitation levels fall during the gum collection period in the winter season. The environment therefore is highly favourable for the cultivation of opium poppy.

Pinlaung and Pekhon Townships

Pinlaung Township is situated on the west bank of Inle Lake, between Nyaung Shwe and Kalaw Townships. Its elevation ranges from 1,329 m at Lonepyin village to 1,654 m at Pintahle village.

The topographic and climatic conditions make Pinlaung a site favourable to opium poppy cultivation. The opium poppy is cultivated commercially on the remote mountain ranges in Pinlaung, particularly those bordering Nyaungshwe. Police sources report that a total of 404

hectares of opium poppy were eradicated in 2006. The Paoh National Organization (PNO), a ceasefire group, controls the entire township.

Pekhon is located to the south of Pinlaung Township. Topographic and climatic conditions vary widely within Pekhon Township. Most of Pekhon is situated at the elevation of 900 meters, whereas the western part of the township is mountainous at elevations of 1,300 to 1,400 meters. Western Pekhon shares similar conditions with Pinlaung. The Kayan National Liberation Army (KNLA) controls the area, and over 280 hectares of eradicated opium poppy were reported there this year.

Opium poppy plantation in Ei-ngan valley in Pekhon township, South Shan State



Hsihseng and Hopong Townships

Hsihseng and Hopong Townships are located to the southeast of Taunggyi. Hopong is located at an elevation of 1,060 meters and Hsihseng at 969 meters, and the eastern parts of both townships are dominated by high mountain ranges. The Maenai Range in Hopong (elevation: 2,211 m) and the Loimaw Range in Hsihseng (elevation: 2,036 m) are the highest peaks, which remain the most notorious for opium cultivation.

At the foot of Maenai Range, elevation is high, which renders the entire area favourable to the cultivation of opium poppy. Examples of opium cultivating villages in Hopong are Sanphu village (1,590 m), Kyaukkachar village (1,643 m), Laikon (1,538 m), and Namhu village (1,415 m). At the foot of Loimaw range, Htanyang (1,452 m), Htikham (1,426 m), Pin-aun (1,471 m) are also known to cultivate opium poppy. Climatic conditions are highly favourable for opium poppy cultivation in these areas.

The Maenai Range in Hopong Township is the most notorious opium cultivating area in the entire region. Opium cultivation has increased considerably in 2006 and hundreds of opium fields can be seen on top of the mountain range. Traditionally, opium poppy fields covered the entire summit of the Maenai Range in Hopong Township. In contrast to the situation last, this year surveyors observed vast fields in all directions and on surrounding mountain ranges. It is very difficult to

estimate the total size of the opium cultivation area through a ground survey since it is covering entire slopes along the mountain range.

Opium poppy plantation in a valley in Pinlaung township, South Shan State



Opium cultivation has a long history in the Hopong and Hsihseng areas. These areas are under the control of the Paoh National Organization (PNO) and the Shan Nationalities Peoples' Liberation Army (SNPLA). In 2006, around 1,100 hectares of opium poppy have been eradicated in Hopong Township, and 285 hectares in Hsihseng Township. Nevertheless, PNO (Paoh National Organization) launched a substantial campaign for total eradication of opium poppy in January 2006. Effective eradication has taken place by organizing large groups comprising of PNO members, local authorities, armed personnel and local villagers. All the opium poppy fields found were uprooted. When survey team visited this area again in late January, there was no evidence of opium poppy in all fields. According to the PNO authorities, the total area eradicated in their territory (covering Pinlaung, Taunggyi, Nyaung Shwe, Pindaya, Loilin, eastern Hopong and western Hsihseng) may exceed 4,000 hectares. This figure is, however, very unlikely since it is more than the total national figure for eradication as reported by the CCDAC, which is 3,970 hectares.

Loimaw Range

The Loimaw Range is located in the eastern part of Hsihseng Township and is controlled by the Shan Nationalities Peoples' Liberation Army (SNPLA). At the time of visit, most of opium poppy fields on Loimaw range close to the road were already eradicated. However, one area where extensive opium cultivation was identified by the survey team in 2006 was left uneradicated. Opium poppy fields can be found in abundance along the hillside between Pin-aun Village and Naung-ei village.

This place is quite remote and probably out of reach of the authorities. Large-scale cultivation was found on both the hillsides and along roads. The fields were very dense and plants were very vigorous. Behind the mountain range, vast fields of opium poppy were discovered.

Opium poppy fields on Loimaw Range in Hsihseng Township, South Shan State



Loilin, Leacha, Mongkaing, Kyaethi, Kunhein, and Mongshu Townships

These townships are close to each other with the average elevation of 1000 m. A mountain range, running north to south, is situated in the western parts of the Loilin, Leacha and Mongkaing townships. Opium cultivation is prominent along the slopes of this range.

Vast opium poppy cultivation can be observed on the Hsanin-Hsahaung Range in Loilin, Pangsang Range in Leacha and Mongkaing Townships.

The Myanmar government has launched a large opium poppy eradication campaign in this area and reported the eradication of around 500 hectares in January 2006.

Hsanin-Hsahaung Range

Except Loilin and Namsam (S), the entire area is controlled by insurgent groups. No civilians can gain access to the area without a security escort. In this area, the Hsanin-Hsahaung Range is the most notorious for opium poppy cultivation. It stretches north to south in Loilin Township. In this area, Hsanin village, Hsahaung village and Wanyein villages are notorious for large-scale opium production. During an official visit to Taunggyi in last May, Taunggyi Anti-narcotic Task Force has reported that they have seized a refinery with 343 kg of brown opium powder near Wanyein village.

Pangsang Range

Pangsang Range extends north to south in Leacha and Mongkaing Townships. It is also known for its vast opium poppy fields. Since it is situated in an insurgent area, no sources of information were available.

Opium poppy fields on Pangsangang range in Lecha and Mongkaingh townships, South Shan State



Hillside near Kyu Yone village

Opium poppy fields are also found in abundance near Kyu Yone village just two to three miles away from Pinlon Town. All opium poppy fields in the area are growing vigorously and bearing flowers at the time of visit. However, the survey team leader (Loilin) reported that they could not believe this scene since they had eradicated the very same fields two months earlier.

Opium poppy fields near Kyu Yone villages in Loilin township, South Shan State



While in Mongshu, the UNODC surveyors visited three opium poppy fields on the outskirts of the town. Two fields were situated on a hillside, while the third was at the foot of the hill. At the time of the visit the crops were about to flower, which suggested that the seeds were most probably sown in the second week of November. Although the third field was adjacent to the road and in very close proximity, the farmer did not appear to be concerned by the visit.

PART 5. THAILAND

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ABBREVIATIONS

ONCB	Office of the Narcotics Control Board
NCSMI	Narcotic Crops Survey and Monitoring Institute
BPP	Border Patrol Police

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The following persons contributed to this report:

Police Lt. General Krisna Polanata	Secretary General, Narcotics Control Board
Pipop Chamnivikaipong	Director, Narcotic Crops Survey and Monitoring Institute

UNODC does not provide support for opium poppy monitoring activities in Thailand. The findings of this report are entirely those of the institutions acknowledged above.

PREFACE

Opium poppy cultivation remains a serious problem in Thailand although the opium poppy cultivation is only found in the mountainous area of eleven provinces of the north and one province in the northeast. The main opium poppy cultivation areas are located in Chiang Mai, Tak and Chiang Rai provinces.

In 2005-2006, the opium poppy cultivation situation has been under control, even though the result of the survey pointed out that the opium poppy cultivation area increased to 157.44 hectares (+32% compared to last year). The Office of the Narcotics Control Board (ONCB), which has conducted annual opium poppy cultivation surveys since 1979, continues to monitor the opium poppy cultivation situation with the objective to confirm these results and the accuracy of the survey, which will be used for an effective opium poppy eradication campaign in accordance with the overall opium poppy cultivation control strategy.

The ONCB would like to express its appreciation to the Narcotics Affairs Section (NAS) of the US Embassy in Bangkok, the Government of France, the Royal Thai Army Region 3, 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 (TICA) and also the Geo-Informatics and Space Technology Development Agency (public organisation) for their cooperation and assistance in the endeavour. I hope this report will serve as a useful tool in broadening the understanding on the seriousness of problems caused by illicit opium poppy cultivation.



Police Lieutenant General Krisna Polananta
Secretary-General
Narcotics Control Board
Thailand

FACT SHEET - THAILAND OPIUM SURVEY 2006

	2005	2006	Variation on 2005
Opium poppy cultivation	119 ha	157 ha	+32%
Average opium yield	15.6 kg/ha	15.6 kg/ha	0%
Potential production of opium	1.86 mt	2.4 mt	+29%
Opium poppy eradication	110 ha	153 ha	+39%
Average farm-gate price of opium	US\$1,000/kg	US\$1,015/kg	+1%
Total potential value of opium production	US\$1.8 million	US\$2.4 million	+33%
Estimated no. of households involved in opium poppy cultivation	990	1,300	+32%
Number of persons involved in opium poppy cultivation	4,900	6,500	32%
Average yearly household income of opium poppy cultivating household	US\$300	US\$300	0%
Of which from opium sale	10%	10%	0%
Estimated number of opiates abusers	2,000 ¹	N/a	

¹ Opium and heroin addicts as reported by ONCB in 2003.

1 INTRODUCTION

When in 1967 a United Nations team conducted the first opium survey in Thailand that included field checks, it estimated the total 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 then began to consider drug control a priority.

In 1969, Thai efforts were pioneered by King Bhumibol Adulyadej who introduced a crop replacement project after the establishment of his new Phuping Palace in Chiang Mai adjacent to a 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 initiated a supply reduction project in northern Thailand that adopted a crop replacement approach. In this and several subsequent projects for the next decade, this approach was adapted to the northern Thai highlands and the ethnic minorities growing opium poppy there. The projects devised agricultural techniques that could be introduced to find alternatives to opium production and eventually reduced opium poppy cultivation.

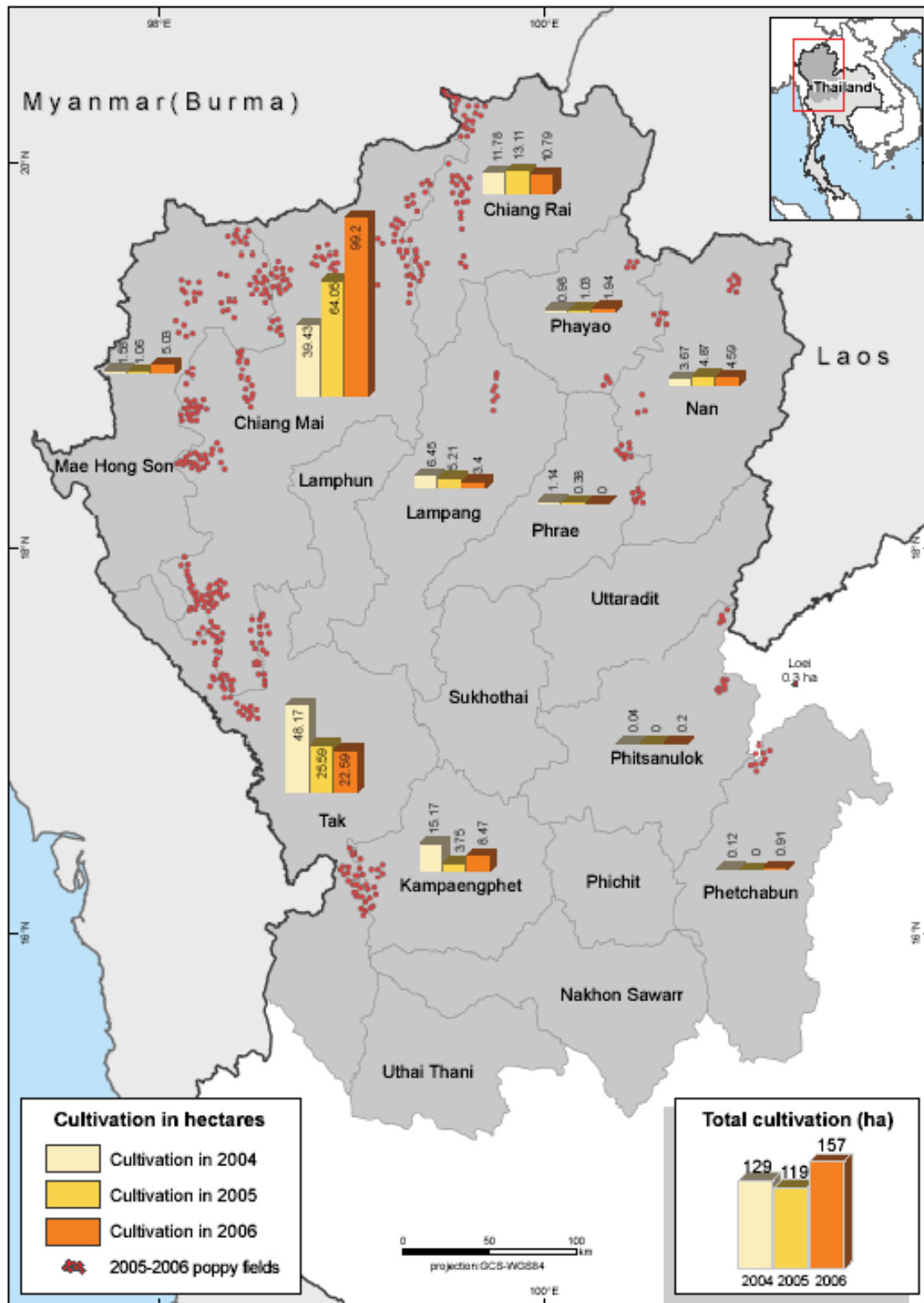
The Thai government consolidated drug control agencies in the Office of Narcotics Control Board (ONCB) that was established in 1976. In 1978, and with help over the years from the United Nations and the United States of America, it began conducting surveys of opium cultivation. The increasingly sophisticated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

By 1984, Thai and United Nations officials had become convinced that sufficient alternatives to opium cultivation existed in villages where projects had started over a decade earlier. Also, although Thai government agencies were not yet 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 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, 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 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 120 hectares in 2004-2005, following eradication efforts. ONCB estimated that the production following eradication was less than 140 kilograms.

Map 1: Opium poppy cultivation in Thailand, 2004 - 2006



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 present their findings.

2.1 Opium poppy cultivation

To estimate the area under opium poppy cultivation in Thailand, the ONCB conducts annual surveys combining the interpretation of satellite imagery with a helicopter survey. The aerial survey is supported by helicopter units from the Royal Thai Police Aviation Division and the Royal Thai Army. The 2006 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 2006, the opium survey estimated that 157 hectares of opium was still cultivated in North of Thailand, compared to 119 ha in 2005. Opium poppy cultivation was found in 10 northern provinces. Opium poppy cultivation has been decreasing since 1984 when there was an estimated 8,777 ha cultivated in Northern Thailand.

Figure 1: Opium poppy cultivation in Thailand (hectares), 1985 - 2006

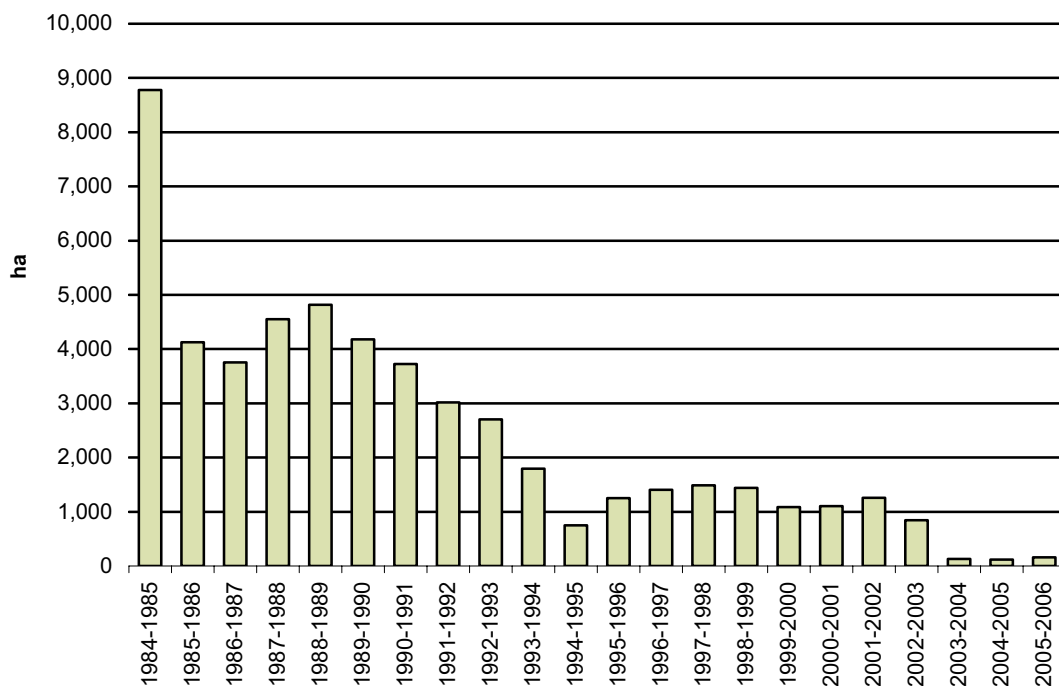


Table 1: Opium poppy cultivation by province in Thailand (hectares), 2005 - 2006

Province	2005	2006	2006 % of total area under opium poppy cultivation
Chiang Mai	64	99	63
Tak	26	23	15
Chiang rai	13	11	7
Kampaengphet	4	8	5
Mae Hon son	1	5	3
Nan	5	5	3
Lampang	5	3	2
Phayao	1	2	1
Phrae	0.4	0	0
Phetchabun	0	1	0.7
Phitsanulok	0	0.2	0.1
Loei	0	0.3	0.2
Total	119	157	100%

Opium poppy and cabbage on a hillside, Chiang Mai province

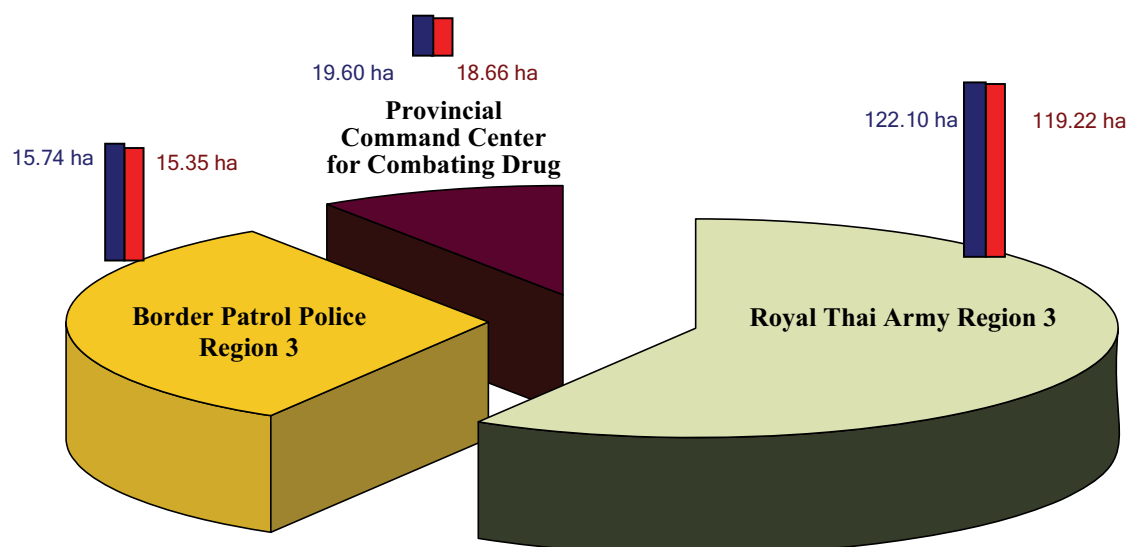
2.2 Opium poppy eradication

Opium poppy eradication is part of the narcotic crops control measures of the Royal Thai Government. The areas of responsibility are shared by various Royal Thai government entities as follow:

Table 2: Eradication by government entities (hectares), 2006

Eradiation Units	Cultivated areas (ha)	Opium eradicated (ha)
Royal Thai Army Region 3	122.10	119.22
Border Patrol Police Region 3	15.74	15.35
Provincial Command Center for Combating Drug	19.60	18.66
Total	157.44	153.23

Figure 2: Eradication by government entities (hectares), 2006

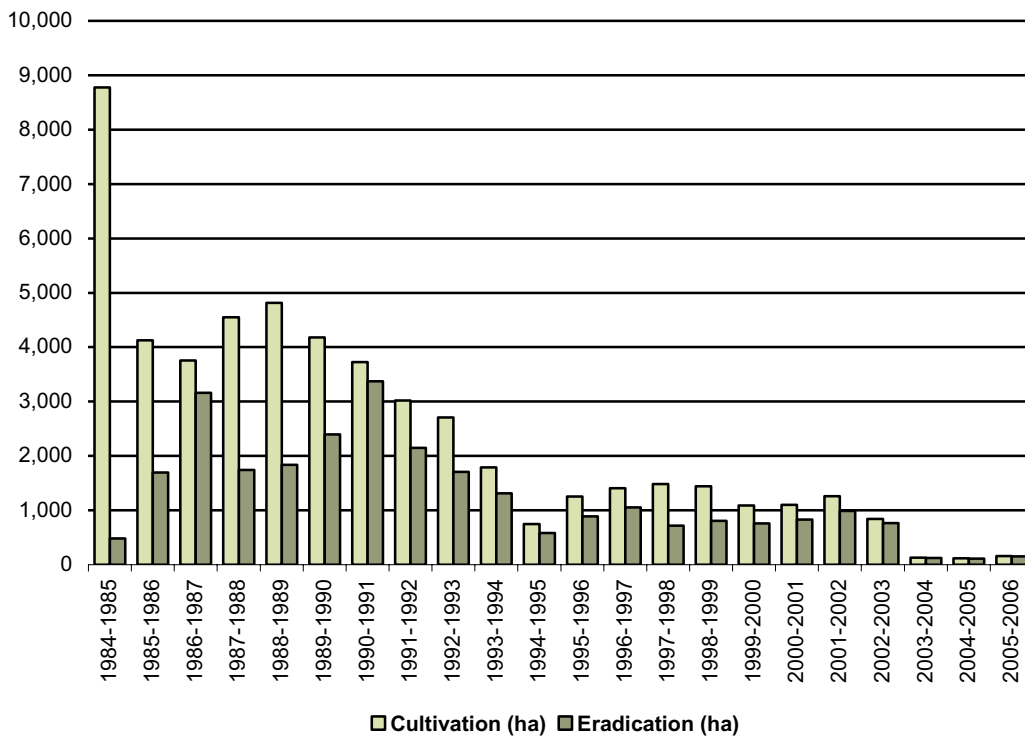


Eradiation increased by 40 % in 2006 compared to 2005 and net cultivation after eradication decrease by 52% to only 4 hectares. Since 2002, more than 90% of the opium poppy crop surveyed was reported to be eradicated and 97% were eradicated in 2006.

Opium poppy eradication



Figure 3: Opium poppy eradication in Thailand (hectares), 1985 - 2006



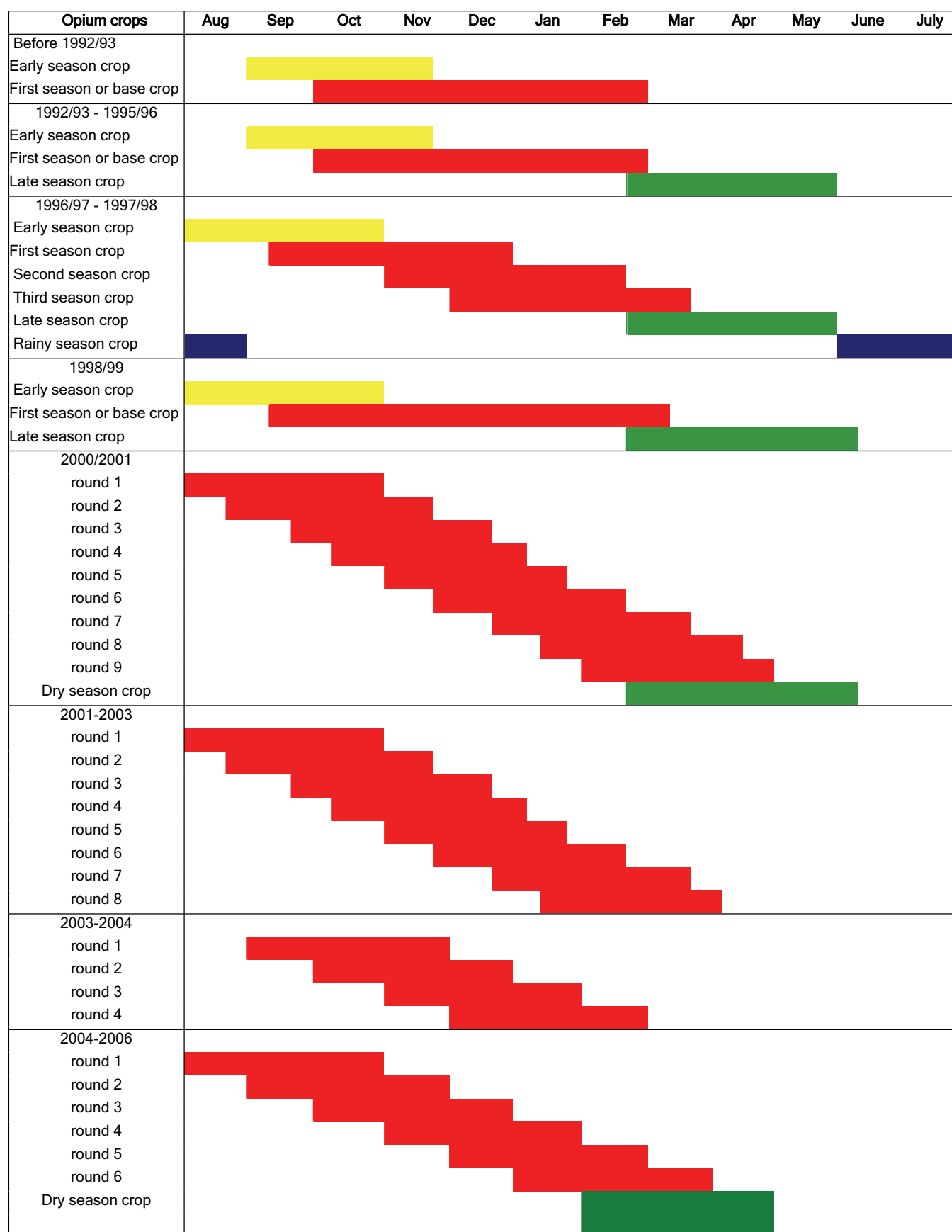
2.3 Opium yield and potential production

The national opium yield was estimated at 15.65 kg/ha, based on capsule measurement in the field. Good rainfall, use of irrigation and fertilizer contribute to obtain the best opium yield in the region. 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 2006. Multiple cropping is often practiced by farmers to avoid eradication. Based on the extent of opium poppy cultivation surveyed before eradication and the average opium yield, an estimate of 2.4 metric tons of opium could potentially be produced in 2006.

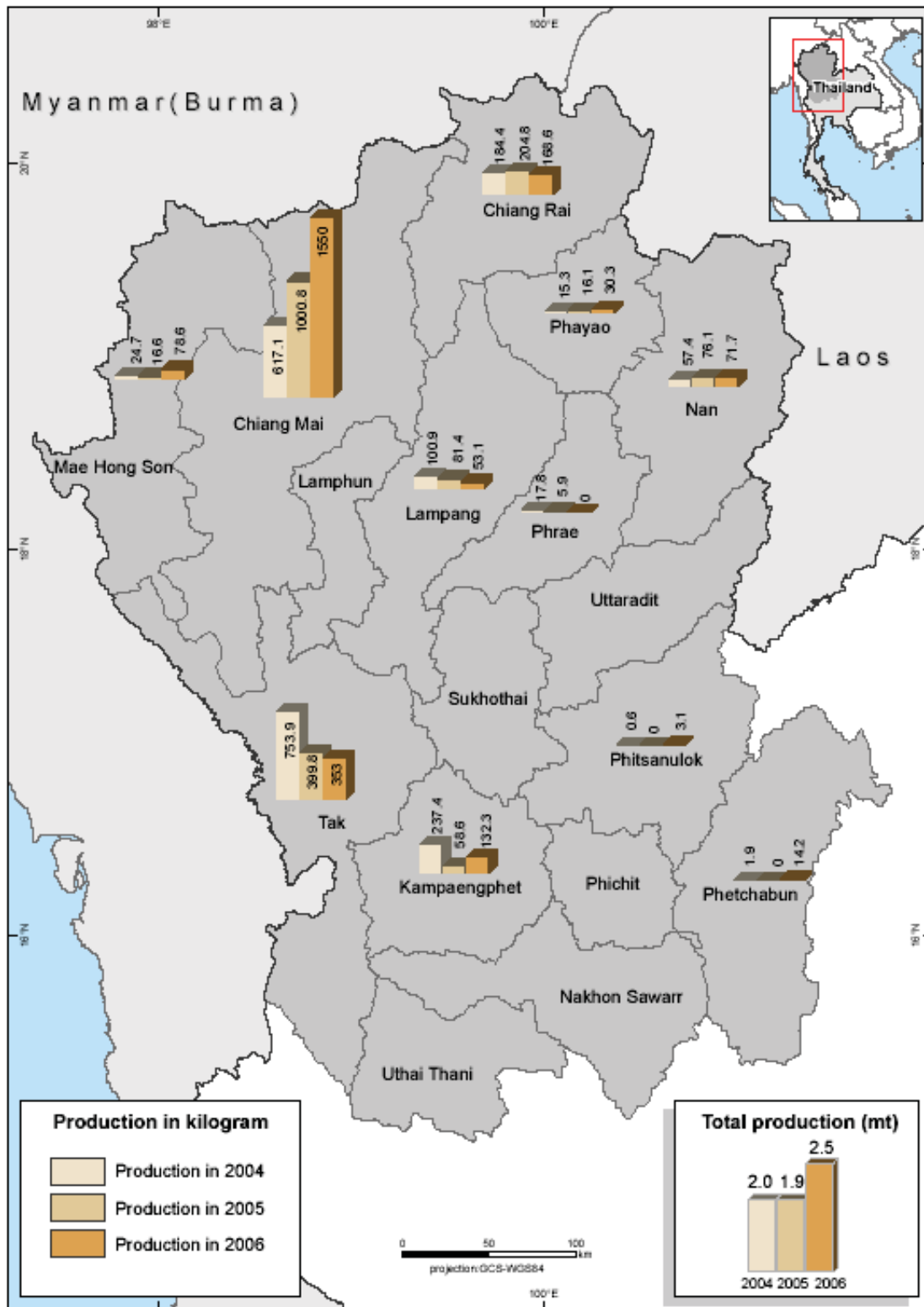
Irrigated opium poppy field, northern Thailand



Figure 4: Changes in the opium poppy crop calendar in Thailand, 1992 - 2006



Map 2: Potential opium production by province in Thailand (kg), 2004 - 2006



2.4 Opium farm-gate and retail prices

Average opium farm-gate prices in Thailand are the highest in the Golden Triangle region. At US\$1050 per kilogramme, the price is relatively stable. This is due to the fact that in Thailand the price of opium is controlled by middleman and “drug financiers”, who sponsor the cultivation, rather than by the effects of market supply and demand. This explains why opium prices remained at the same level since 2003 in spite of a high demand for opium. Opium poppy farmers rely relatively little on opium income for their livelihood as they seldom get the full amount in cash from middle man or drug financiers who provide them with other incentive such as rice, clothes, and fertilizer. Opium can fetch up to US\$2,100 per kg in retail and is mainly purchased by local addicts.

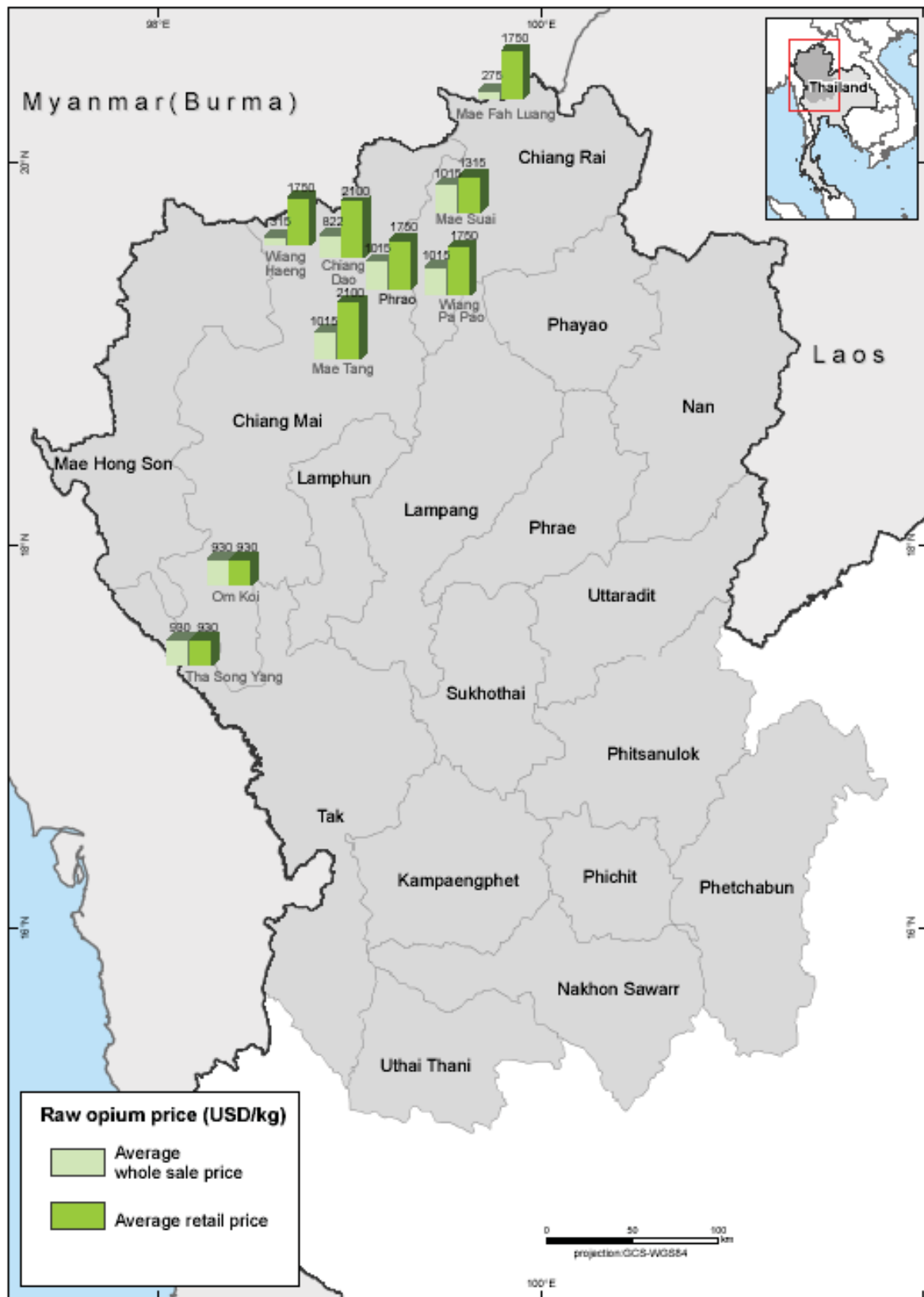
2.5 Opiates abuse

Opium consumption is closely linked to opium production, which is very limited in North Thailand. Opiates addiction is more a urban problem than a rural problem in Northern Thailand. In 2003, 600 opiate and 1400 heroin abusers were reported. The data provided on registered number of opium addicts should be interpreted with caution as there might be reluctance of addict to register into national programmes. There is no indication of changes in those figures in 2006.

Four stages of opium poppy on a single field



Map 3: Opium prices in Thailand (US\$), 2006



3 METHODOLOGY

The 2006 opium cultivation survey took place from August 2005 until April 2006. A total of 76 potential opium growing areas were targeted using both ground and aerial survey techniques.

Ground survey

Only high density areas were surveyed through this method due to the difficult terrain. Ground survey team also collected information on cultivation technique, price and yield through interviews with farmers and other key informants. After reaching an opium poppy field, the survey team collected information on location 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 Royal Thai police Aviation Division and the Royal Thai Army with a total of 126 hours in 63 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, satellite imagery (both SPOT and Landsat images) were compared with still and video photo images taken from the 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. All data were analysed in the geographic information system.

Helicopter survey

