PART 3. MYANMAR

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ABBREVIATIONS

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

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FACT SHEET - MYANMAR OPIUM SURVEY 2010

	Year 2009	Year 2010	Change from 2009
Opium poppy cultivation in Myanmar	31,700 ha (24,000 to 42,900)	38,100 ha (23,200 to 53,900)	+20 %
Opium poppy cultivation in Shan State	30,000 ha (24,000 to 40,000)	35,000 ha (22,700 to 50,100)	+17 %
Average opium yield (weighted by area)	10.4 kg/ha	15.2 kg/ha	+46%
Potential production of dry opium in Myanmar (including the Shan State)	330 mt (214 to 447)	580 (350 to 820)	+76%
Opium poppy eradication in Myanmar[1]	4,087 ha	8,268 ha	+102 %
Average farm-gate price of opium[2]	US$ 317/kg	US$ 305/kg	-4 %
Total potential farm-gate value of opium production[3]	US$ 105 million (68 to 142)	US$ 177 million (107 to 250)	+68 %
Estimated number of households involved in opium poppy cultivation in Myanmar[4]	192 thousand (160 thousand to 225 thousand)	224 thousand (102 thousand to 342 thousand)	+17 %
Number of persons involved in opium poppy cultivation in Myanmar	1.1 million (0.9 million to 1.3 million)	1.2 million (0.5 million to 1.8 million)	+9 %
Estimated number of households involved in opium poppy cultivation in the Shan State	177 thousand (141 thousand to 235 thousand)	206 thousand (134 thousand to 295 thousand)	+17 %
Opium producing households in Shan State Average yearly household income Income from opium sales Per capita income	 US$ 700 US$ 160 US$ 125	 US$ 830 US$ 360 US$ 155	 +19 %[5] +125 % +19 %
Non-opium poppy producing households in Shan State Household average yearly income Per capita income	 US$ 750 US$ 133	 US$ 850 US$ 155	 +13 %[6] +17 %

[1] Source: CCDAC.

[2]. At harvest time, for both 2009 and 2010.

[3] The farm-gate value should be calculated with the price of dry opium. However, the price of dry opium is difficult to establish in Myanmar because of the selling and storing practices of the farmers. The farm-gate value here is calculated with the price of fresh opium. This results in a lower estimate.

[4] The estimated number of households involved in the cultivation of poppy is calculated according to the estimated area cultivated by region divided by the average area of opium poppy cultivated by household.

[5] This is equivalent to a 10% increase in constant 2009 Kyats.

[6] This is equivalent to a 5% increase in constant 2009 Kyats.

EXECUTIVE SUMMARY

The Government of the Union of Myanmar (GOUM) and the United Nations Office on Drugs and Crime (UNODC) jointly conducted the 2010 Opium Survey in Myanmar. Through satellite imagery and village and field surveys, information was gathered to determine the extent of opium poppy cultivation and production, as well as the socio-economic status of farmers.

While current levels of opium cultivation remain below the alarming levels of the mid-90s and increases measured in the last three years are still modest, there are two worrying changes: farmers' incomes remain distressingly low and food security has worsened. Given the high price of opium in Myanmar, this situation makes the growing of opium more attractive. In fact, as a proportion of total income, opium income has increased among opium growing farmers. Between 2003 and 2009, the income generated by opium had a diminishing impact on opium-growing farmers' total cash income (i.e. the proportion of their income that came from opium fell from 70% to about 20%). In 2010, this trend reversed. Opium poppy is now by far the most lucrative crop for farmers that illicitly cultivate it. With the cultivation of one hectare of opium earning 6.5 times more than that earned from rice cultivation in low lands, and 13 times more than rice cultivated in uplands, the income proportion from opium increased to more than 43%. This makes it difficult to convince farmers to abandon opium and switch to other crops. Nonetheless, this survey provides important information to target alternative livelihood programmes and identifies what crops farmers would be willing to cultivate instead of opium.

Opium farmers in Myanmar remain poorer than non-opium farmers. The great majority of farmers who cultivate opium do so to buy food. For them, opium cultivation remains a subsistence exercise. Tellingly, many farmers who stopped cultivating opium, had to purchase food on credit or borrow food and rely on relatives and friends.

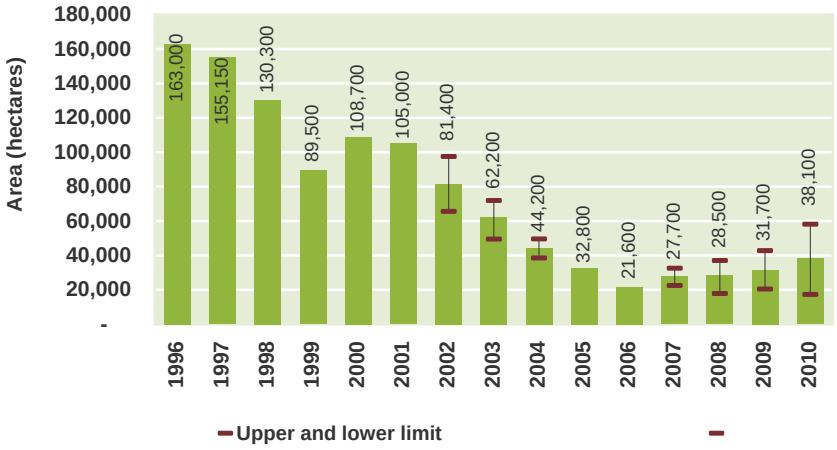
The pattern of opium poppy cultivation is also changing: some areas became opium-free while others increased their level of cultivation. In South Shan State, farmers introduced new practices such as multi-cropping. Generally, opium fields moved further away from villages and, in certain regions, were subject to eradication. In addition, cultivation shifted to areas previously considered opium-free or to climatically less favourable regions. All these considerations, combined with reduced accessibility and the expected change in cropping pattern, influenced the 2010 survey methodology.

Table 1: Opium poppy cultivation areas by region, 2008-2010

	2008	2009	2010	% of total area of opium poppy cultivation
East Shan	9,300 (6,800 to 11,800)	11,900 (8,100 to 15,000)	12,100 (6,200 to 19,000)	32%
North Shan	800 (400 to 1,200)	1,600 (390 to 2,900)	3,700 (1,500 to 6,700)	10%
South Shan	15,500 (9,500 to 21,500)	16,500 (10,900 to 22,600)	19,200 (9,400 to 31,500)	50%
Shan State Total	**25,300**	**30,000 (24,000 to 40,000)**	**35,000 (22,700 to 50,100)**	**92%**
Kachin	1,500 (1,100 to 1,900)	1,400 (1,100 to 1,700)	3,000 (500 to 3,800)	8%
Kayah	1,800 (1,800 to 2,500)	300[7] (60 to 700)	100	0.3%
National Total (rounded)	**28,500 (17,900 to 37,000)**	**31,700 (20,500 to 42,800)**	**38,100 (23,200 to 53,900)**	**100%**

[7] The estimates in Kayah for 2008 and 2009 are not directly comparable due to a change in methodology.

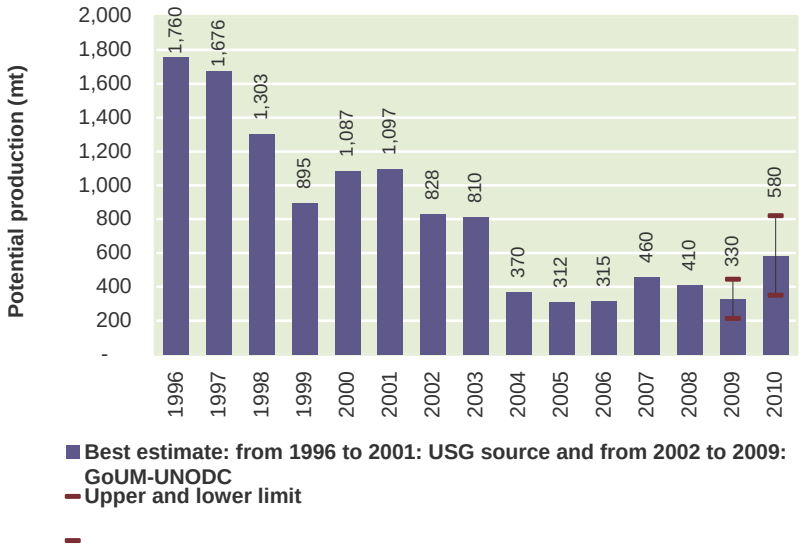
Figure 1: Opium poppy cultivation (ha), 1996-2010



Opium Poppy Cultivation

For the fourth year in a row, opium poppy cultivation increased in Myanmar. In 2010, the total area under opium poppy cultivation was estimated at 38,100 ha, an increase of 20% compared to 2009 (31,700 ha). This upward trend started slowly in 2007 after six years of decline (2001 to 2006). Shan State accounts for 92% of opium production in Myanmar, and most of the increase in total cultivation took place in North Shan (131%) and South Shan (16%). Most opium poppy cultivation outside of Shan State took place in Kachin State.

Figure 2: Potential opium production (metric tons), 1996-2010



Opium yield and production

The 2010 opium yield estimate for Myanmar was based on capsule measurements in 224 fields, 90 fields more than last year. The national opium yield was estimated at 15.1 kg per hectare, an increase of 46% compared to last year's yield. This increase is mainly due to larger poppy capsules and a larger number of yielding capsules than last year. The increased cultivation combined with the increased yield resulted in an increase in opium production of 76% (580 tons of opium up from 330 tons in 2009). While significant, this year yield increase, does not represent an exceptional year when compared to the 10-year trends (2003 is still the highest yield year measured in Myanmar).

Opium prices

In keeping with the increase in production, opium prices decreased in Myanmar in 2010 but only by 4%. The average farm-gate price of opium weighted by the estimated area under cultivation was US$ 305/kg, down slightly from US$ 317/kg in 2009. Opium prices in Myanmar continue to remain very high. Between 2002 and 2009, the opium price increased, reaching a record level of US$317 in 2009.

Household income from opium

The average annual cash income of opium-producing households increased by almost 20%, from US$ 700 in 2009 to US$ 830. For non-opium cultivating households, including those that never cultivated or had stopped opium poppy cultivation, the average annual cash income was slightly higher at US$ 850. On average, income from opium accounts for more than 43% of total cash income among poppy-growing farmers. In South and East Shan, opium accounts for close to half of their total income. One hectare of opium poppy can generate an income of US$ 4,600 gross, an amount significantly comparable to one hectare of poppy in Afghanistan, which in 2010 yielded a gross income of US$ 4,900.

Addiction

Data on opium and other drug addiction was collected via interviews with village headmen. Headmen were asked about the number of daily opium users and the number of regular users of other drugs without specifying frequency of use. According to the headmen, daily opium use in Shan State, in Kachin and Kayah affects 0.8% of the population aged 15 years and above. This rate is slightly higher than the 0.7% calculated last year. As in previous years, the prevalence rate was higher in opium-growing villages (1.7%) than in non-opium-growing villages (0.6%). Although the number of amphetamine type stimulant (ATS) users is increasing, the prevalence rate was still very low, affecting just 0.25% of the population in opium-growing risk areas. Heroin use is also reported to be very low, affecting 0.18% of the population aged 15 and above. Information on drug use, however, must be interpreted with caution, as respondents may have been reluctant to report opium, heroin and ATS consumption in the context of the Government's efforts to curb such addiction.

Reported Eradication

This survey does not monitor or validate the results of the eradication campaign carried out by the Government of Myanmar. According to the Government of Myanmar, a total of 8,268 ha were eradicated in the 2009-2010 opium season. This is twice the area eradicated in 2008-2009. Most of the eradication continued to take place in Shan State (65% of the total), notably in South Shan (38%).

Food security and coping strategies

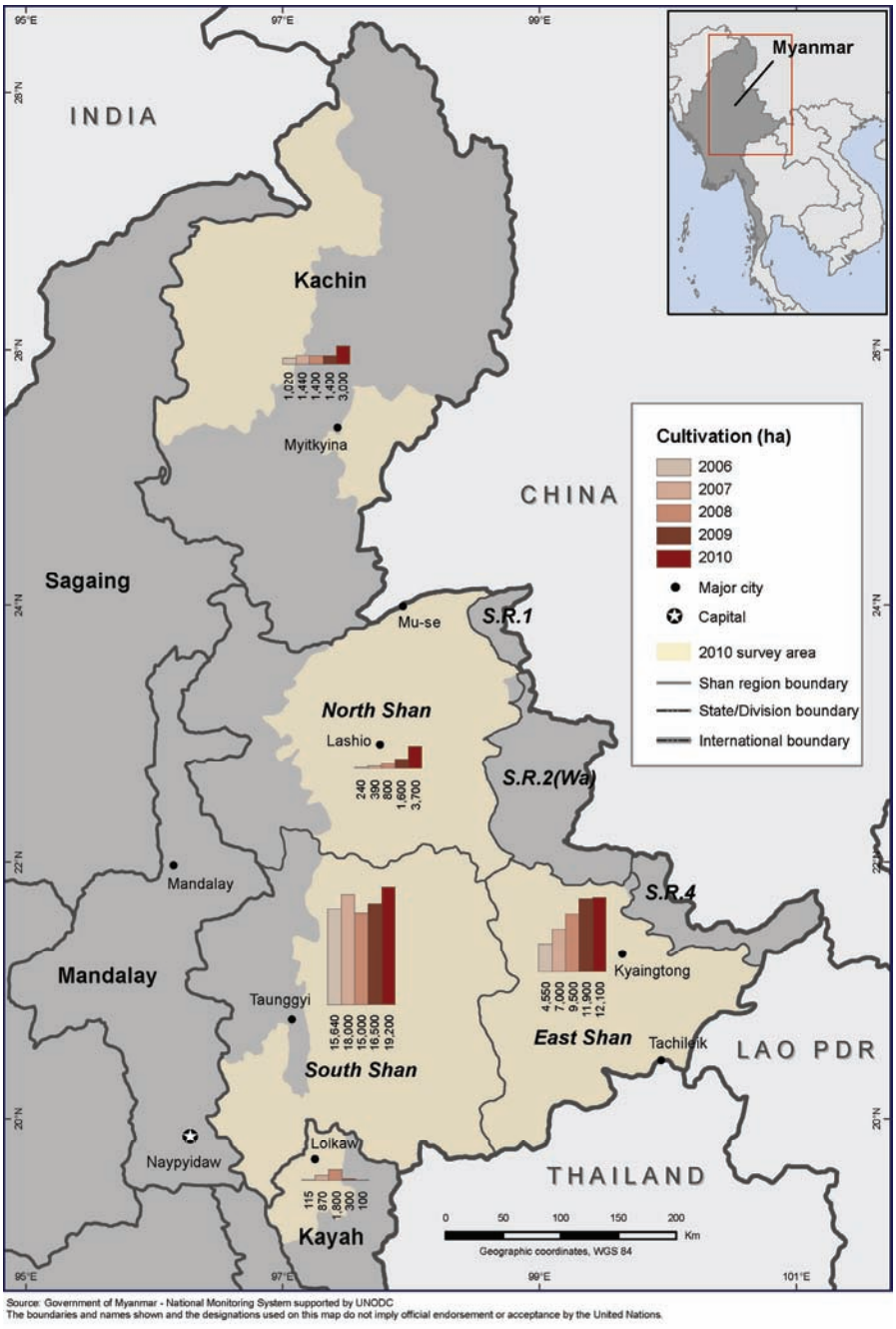
Food security has deteriorated in almost all regions where the survey took place. This is the case for both poppy-growing and non-poppy-growing villages, and is particularly worrisome in North Shan, which likely suffered from bad weather conditions that impoverished yields of most crops. The erosion of food security is of particular concern because it could trigger a further increase in opium cultivation.

In order to overcome the lack of food, households across all regions most frequently sought assistance from friends and loans for food.

Upland rice growing on recently deforested land.

Chilies drying in the sun.

Map 1: Opium poppy cultivation in Kachin, Kayah and Shan States, Myanmar 2006-2010



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 ninth annual opium survey in Myanmar. It was conducted by the Central Committee for Drug Abuse Control (CCDAC) of Myanmar, with the support and participation of UNODC. Since 2001, UNODC has collected statistical information on illicit crop cultivation in Myanmar, within the framework of its Illicit Crop Monitoring Programme (ICMP). ICMP works with national governments to increase their capacity to monitor illicit crops and supports the international community in monitoring the extent and evolution of illicit crops in the context of the plan of action adopted by the United Nations (the 53rd session of the Commission on Narcotic Drugs in March 2009). The survey methodology combines satellite imagery with field and village surveys. In combination, these three survey methods provide the information used to determine the extent of opium poppy cultivation and production, and the socio-economic situation of farmers in Myanmar.

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. 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.

In the 1980s, Myanmar was the world's largest producer of illicit opium. Between 1981 and 1987, it had an average annual production of about 700 metric tons. Opium production in Myanmar continued to increase until 1996, reaching annual production levels of some 1,600 metric tons. In 1991, Afghanistan replaced Myanmar as the world's largest producer of opium, primarily due to its higher opium yield per hectare. For another decade, that is until 2002, the area under cultivation remained larger in Myanmar than in Afghanistan.

In 1996, the surrender of the notorious drug trafficker Khun Sa, leader of the Mong Tai Army, resulted in the collapse of armed resistance movements and led to the negotiation of a series of truce agreements with most break-away factions. This paved the way for control by the government 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 engaged in a 15-year plan to eliminate the illicit crop by the year 2014. Since then, there has been a considerable decrease in the area under cultivation and a strong decline in potential opium production in Myanmar.

Opium poppy has been confined almost entirely to the Shan State with a few pockets of cultivation in other states. The Wa Region of Shan State played a major role in opium production in the past. After a ban on opium cultivation was declared in June 2005, the Wa Region remained poppy-free. Similarly, no significant opium poppy production has been observed in Kokang and in Special Region 4 since 2003. Nonetheless, after reaching a minimum level in 2006, opium cultivation began to increase again in 2007.

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

The annual opium surveys remain essential to assess the extent of opium poppy cultivation within the country and shifts in cultivation. It is also a useful tool for gauging the effectiveness of opium bans and their implications. It also examines the cultivation techniques and alternative crops. Such information is essential for developing effective strategies to sustain the transition from an illicit economy to a licit economy.

2 FINDINGS

2.1 Opium poppy cultivation

In 2010, the annual opium survey in Myanmar covered the Shan State (North, East, and South Shan), Kachin and Kayah States, i.e. the main regions of Myanmar where opium poppy is cultivated. Information from law enforcement agencies and local authorities confirmed that the Special Regions in Shan (Wa Special Region 2, Kokang Special Region 1 and Special Region 4) are retaining their poppy-free status.

In 2010, the total area under opium poppy cultivation in Myanmar was estimated at 38,100 ha, representing an increase of 20% compared to 31,700 ha in 2009. This upward trend started slowly in 2007 after six years of decline (2001 to 2006).

Figure 3: Opium poppy cultivation (ha), 1996-2010

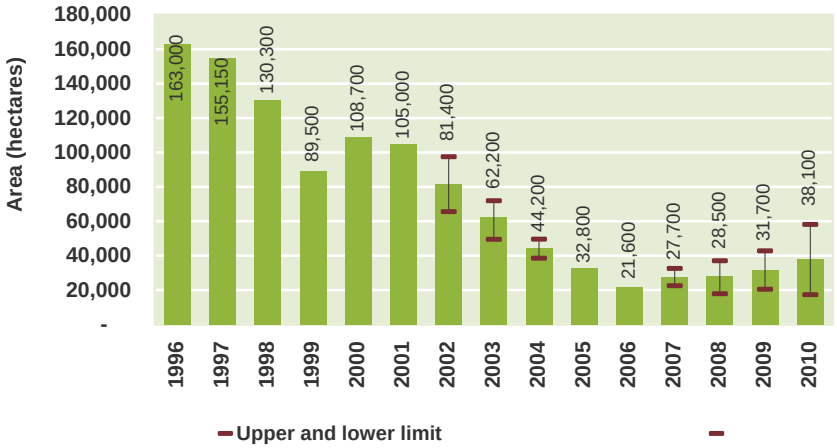
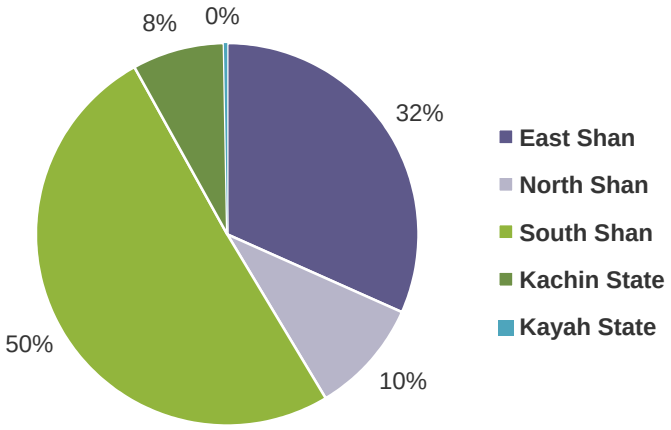


Table 2: Opium poppy cultivation (ha), 2002-2010*

Estimate	2002	2003	2004	2005	2006	2007	2008	2009	2010
upper	97,500	71,900	49,600			32,600	37,000	42,800	53,900
lower	65,600	49,500	38,500			22,500	17,900	20,500	23,200
Mean	**81,400**	**62,200**	**44,200**	**32,800**	**21,600**	**27,700**	**28,500**	**31,700**	**38,100**

** In 2005 and 2006 upper and lower estimates could not be calculated.*

Figure 4: Opium poppy cultivation shares by state in 2010



The vast majority of the opium poppy cultivation in Myanmar continued to take place in South Shan (50%) and East Shan State (32%). In North Shan State, the level of opium poppy cultivation accounted for 10% of the total area. The overall area under poppy cultivation in the Shan State accounted for 92% of total opium poppy cultivation in Myanmar. Most of the opium poppy cultivation outside of Shan State took place in Kachin State, where poppy is cultivated in the areas of Tanai and Waingmaw. Some information indicates that poppy was also grown in Putao township. Small pockets of poppy were found in the northern part of Kayah.

In 2010, South Shan recorded the most important increase (2,700 ha or 16% increase). In the East Shan State, which represents one third of total cultivation, poppy cultivation increased by 2%. There were significant increases in North Shan State (131%) and Kachin (114%), however the magnitude of cultivation in both regions remained modest compared to other regions (10% and 8% respectively of the total opium poppy area).

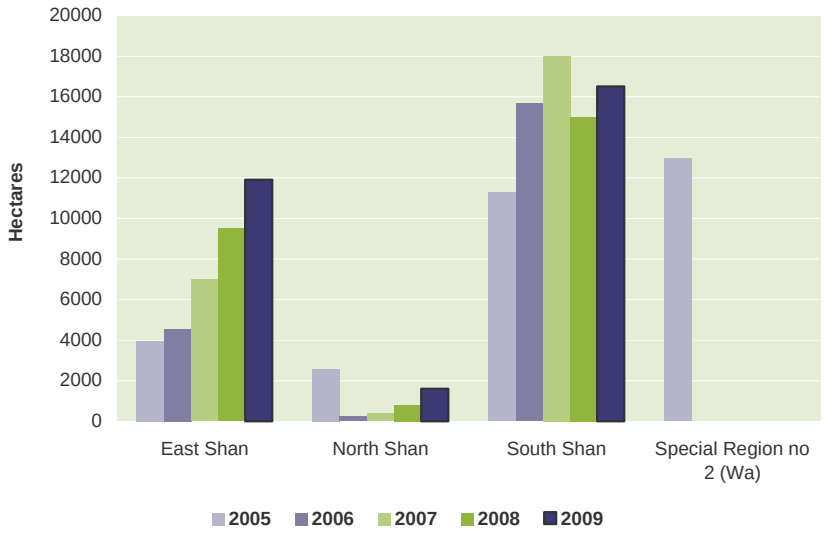
Table 3: Opium poppy cultivation by State, 2009-2010

Administrative unit	2009 Opium poppy cultivation (ha)	2010 Opium poppy cultivation (ha)	2010 % of total area of opium cultivation	Variation 2009-2010 (%)
Shan State	30,000	35,000	92%	17%
Kachin State	1,400	3,000	8%	114%
Kayah State	300	100	0.3%	-67%
Rounded Total	**31,700**	**38,100**	**100 %**	**20 %**

Table 4: Opium poppy cultivation in the Shan State, 2009-2010

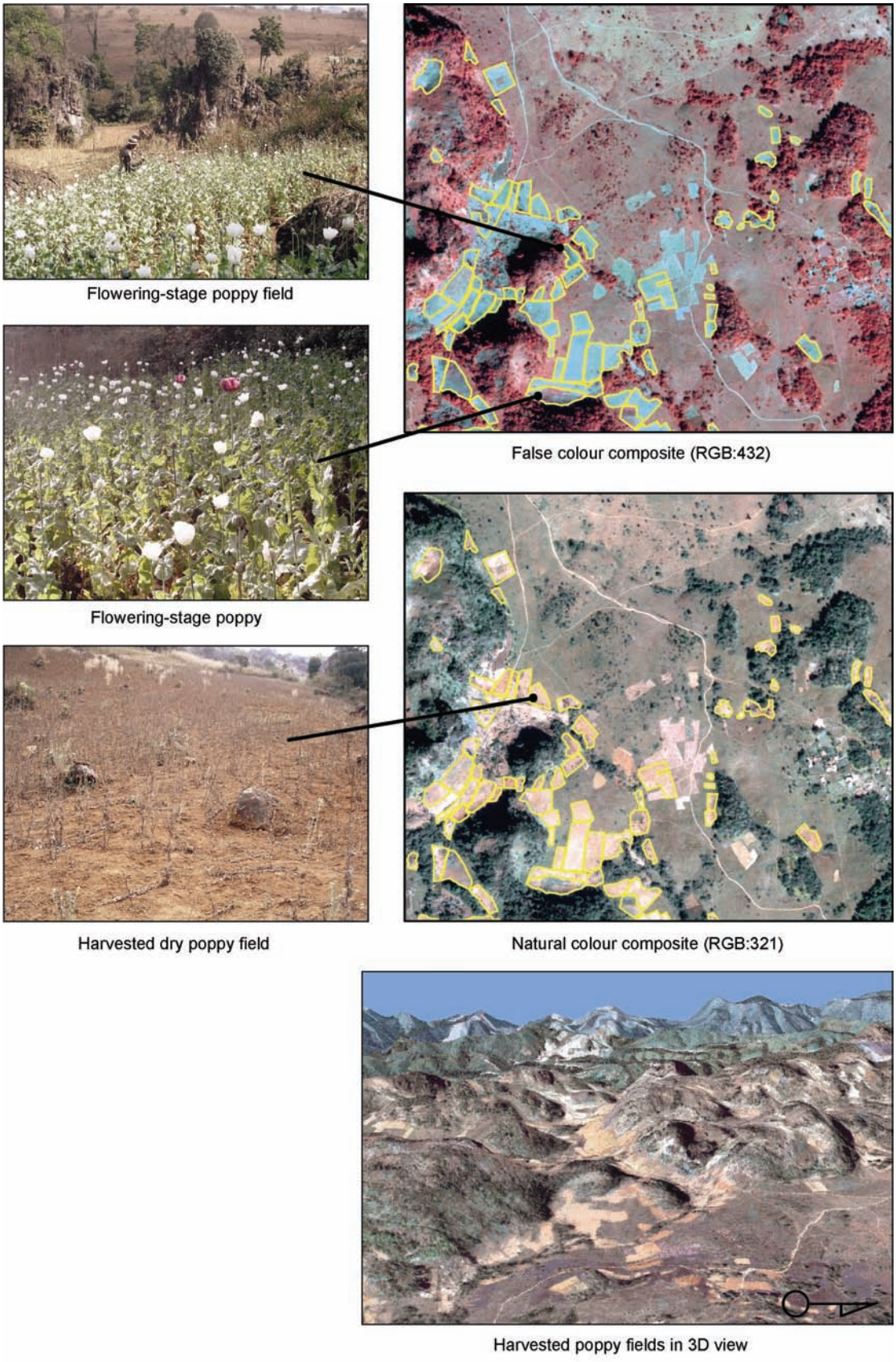
Administrative unit	2009 Opium poppy cultivation (ha)	2010 Opium poppy cultivation (ha)	Variation 2009-2010 (%)
East Shan	11,900	12,100	2%
North Shan	1,600	3,700	131%
South Shan	16,500	19,200	16%
Total (rounded)	**30,000**	**35,000**	**17%**

Figure 5: Opium poppy cultivation in the Shan State (ha), 1995-2010



A poppy field at an early growing stage with irrigation made with a bamboo pipeline (South Shan State)

Figure 6: Poppy identification in a very high resolution satellite image applying different visualization options



Villages and farmers involved in opium poppy cultivation

It is estimated that a total of 224,000 households (from 102,000 to 342,000) were involved in opium poppy cultivation in Myanmar in 2010. The area under cultivation was 0.17 ha per household, calculated from data obtained during the socio-economic survey. These are rather small numbers, compared to Afghanistan, where,in 2010, the average area under poppy cultivation was 0.5 ha per household.

The village survey revealed that opium cultivation took place in 29% of villages in the areas of Shan State, with high concentrations in East Shan State (41%) and South Shan State (41%).

Map 2: Surveyed villages and their opium poppy cultivating status, 2010

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.

Growing seasons for opium poppy cultivation

Observations made during the implementation of the socio-economic survey in the opium growing risky areas showed that farmers spread opium poppy cultivation over time to distribute the workload, to avoid the risk of crop loss due to unfavourable weather during germination or harvest, and to minimize the negative factors that may affect their fields. The main opium poppy growing season is from September to March, which is the end of the rainy season and start of the dry season. Opium poppy cultivation in the monsoon season occurs only in the southern parts of the Shan state (Pinlaung, Pekhon, Sisaing) but earlier surveys showed that this area is very limited (about 500 hectares in 2009) and with very low yields.

Poppy cultivation follows specific calendars for each region; however, poppy in one field can be grown within different time frames, a practice called multi-stage cropping. Multi-stage cropping is often employed in opium poppy fields where significant eradication campaigns have taken place or where there is a shortage of labour. During multi-stage cropping, opium poppy seeds are sown twice in the same field within an interval of several weeks. Hence, plants of two different sizes are growing in the same field at the same time.

The practice of multi-stage cropping is increasingly applied in the poppy growing regions. Past experience has shown that eradication measures are not conducted on the same land twice. Therefore, by using multi-stage cropping techniques, opium farmers can compensate for some of the eradication losses.

Typical poppy field in Tanai (Kachin) growing in clearings of a banana forest. The size of the field is usually one to three hectares.

Poppy capsules affected by larvae

Field destroyed by bad weather

Poppy growing in harvested paddy land

Figure 7: Perception of farmers on opium poppy cultivation trends from 2009-2010

In the surveyed areas, half of the farmers perceived a stable poppy cultivation in 2010 as compared to 2009; 20% perceived an increase and only 28% a decrease. According to 77% of the interviewed farmers, poppy is grown to supplement the lack of food; 9% of the poppy is grown for the farmers' own consumption (addiction or to supplement the lack of medicines), 5% cannot grow other crops and 4% grow to get more cash.

Figure 8: Reasons for farmers to grow opium poppy

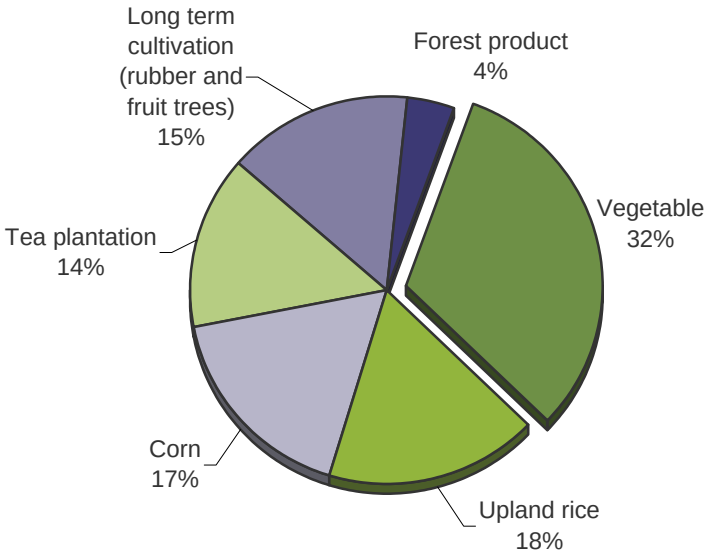
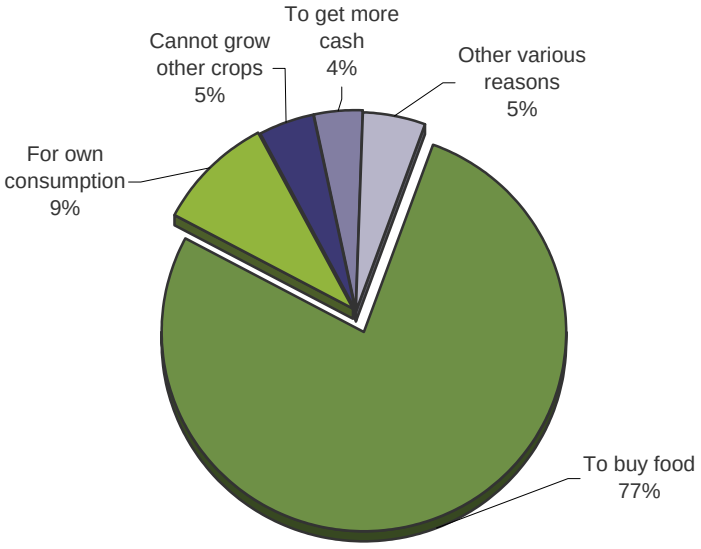


Figure 9: Farmers' opinion on crops that they would grow to substitute opium poppy

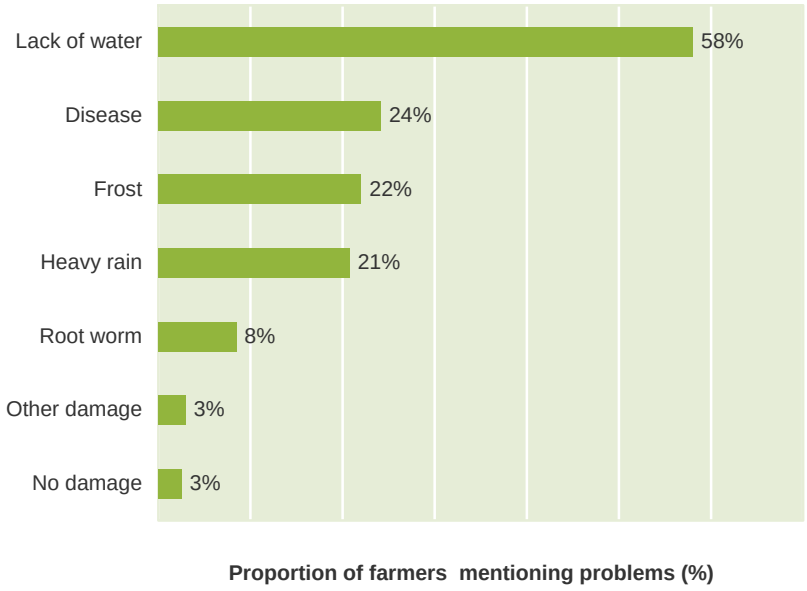


Thirty-two per cent of the farmers reported that they would cultivate more vegetables if they were to stop growing poppy; 18% would increase their rice crops; 17% would grow more corn; 15% would invest in products with long term benefits such as rubber trees; 14% would cultivate tea; and 4% would collect and sell more forest products.

2.2 Yield and opium production

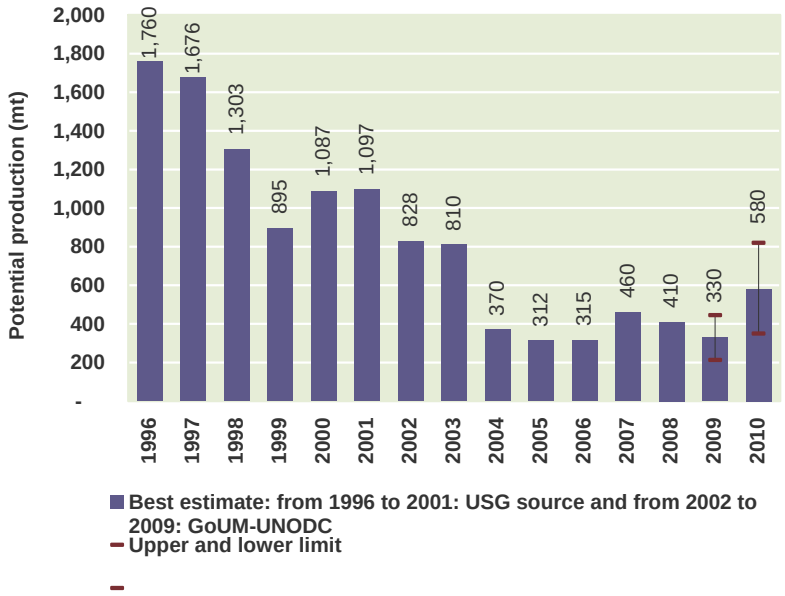
As in Afghanistan, many farmers who grew poppy in 2010 complained about disease infections of their poppy fields. In Shan State, out of the 207 surveyed villages, 57% reported that their fields were infected with a disease (52% in East Shan, 56% in North Shan and 61% in South Shan). Farmers are unable to define the origin of this disease. However, a lower percentage (24%) of disease-affected fields were reported from the yield measurements. The 2010 yield estimate for Myanmar was based on capsule measurements in 224 fields, 90 fields more than last year. The main problems reported to surveyors during the measurements were the lack of water, disease, frost and/or heavy rain.

Figure 10: Problems affecting poppy fields according to yield studies* (based on 224 fields)



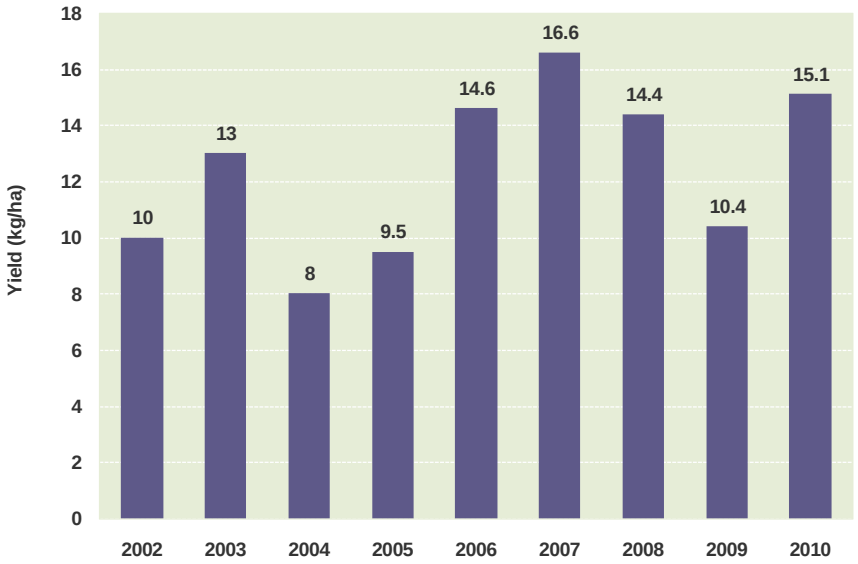
*The sum can be larger than 100% due to multiple answers.

Figure 11: Potential opium production (metric tons), 1996-2010



The national opium yield amounted to 15.1 kg per hectare, which represents an increase of 46% compared to last year's yield. This is mainly due to the larger capsules and the larger number of yielding capsules compared to last year. The 2010 yield is comparable to the yield reported for Thailand: 15.6 kg per hectare. However, the Myanmar yields are still far from the yields obtained in 2010 in Afghanistan i.e. 29.2 kg per hectare.

Figure 12: Opium yield (in kg per hectare) calculated during the surveys from 2002 to 2010



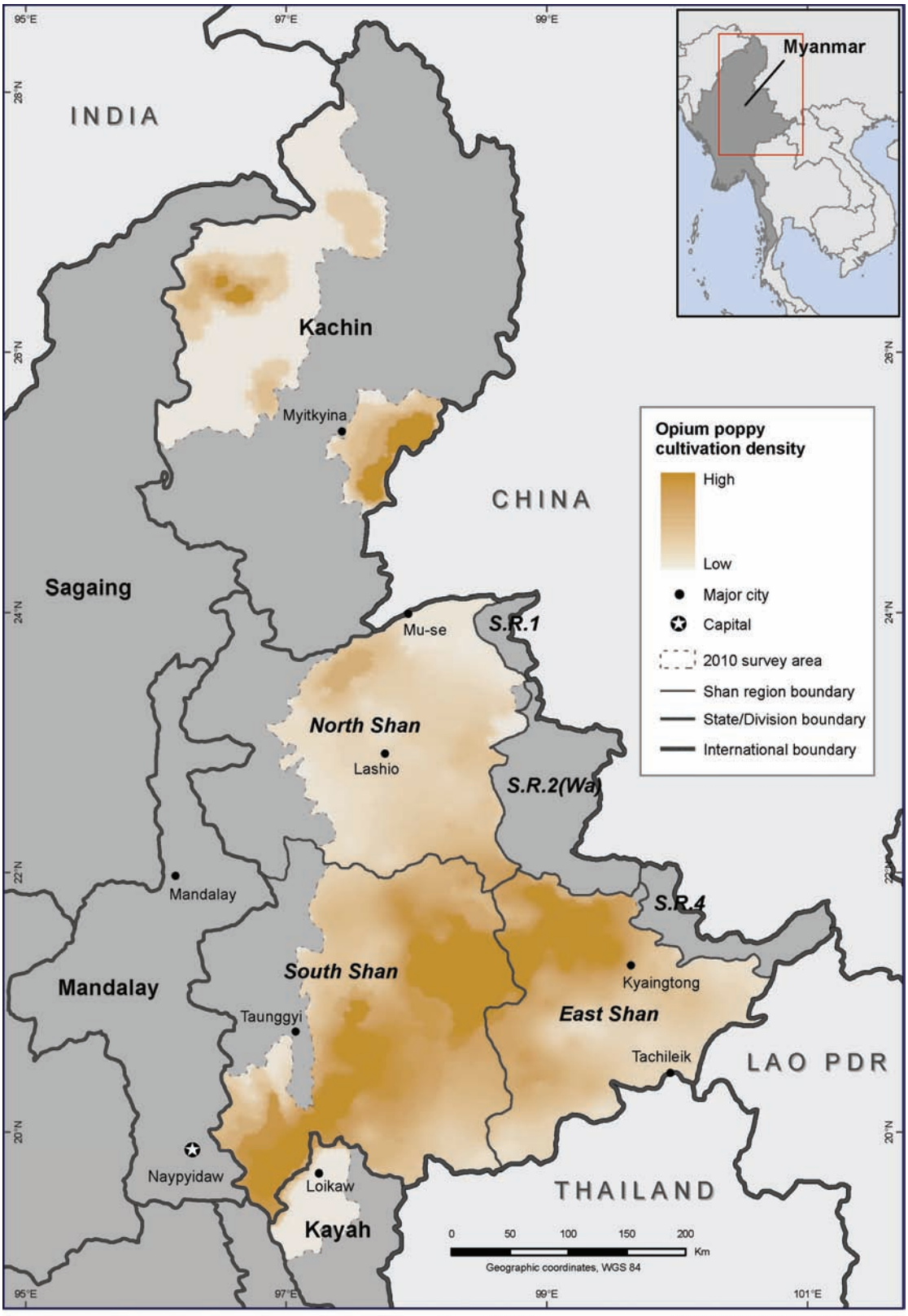
Applying the yield to the areas under poppy cultivation resulted in an output of 580 tons of opium (ranging from 350 to 820 mt), up from 330 tons in 2009. Opium production increased by 76% in 2010.The Shan State accounts for 92% of total opium production in Myanmar. Most of the opium production continues to take place in South Shan (292 tons) followed by East Shan (190 tons). This represents 16% of the total opium produced in Afghanistan in 2010.

Table 5: Potential opium production by region (mt), 2009-2010

Region	Potential production (mt) 2009	Potential production (mt) 2010	Share of production by state (%)
Kachin	14.6	45.6	8%
Kayah	3.1	1.5	0%
East Shan	123.8	183.9	32%
North Shan	16.7	56.2	10%
South Shan	171.6	291.8	50%
Total (rounded)	**330**	**580**	**100%**

In Tenai (Kachin State) opium latex is naturally very liquid. After harvesting it is diluted in water, spread on a piece of cloth and finally dried under the sun. The piece of cloth will be sold to traffickers.

Map 3: Cultivation density map, Kachin and Shan States, Myanmar 2010



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

In line with the increase in opium production, opium prices decreased in Myanmar in 2010. The average farm-gate price of opium weighted by the estimated area under cultivation was US$ 305/kg in 2010 (weighted average), which represents a 4% decrease from US$ 317/kg in 2009.

Fresh opium prices decreased after the harvest in South Shan (US$ 271/kg) and East Shan (US$ 377/kg) regions, the main opium poppy growing regions.

Figure 13: Farm-gate price (weighted average) of fresh opium in poppy growing villages (US$ equivalent/kg), 2002-2010

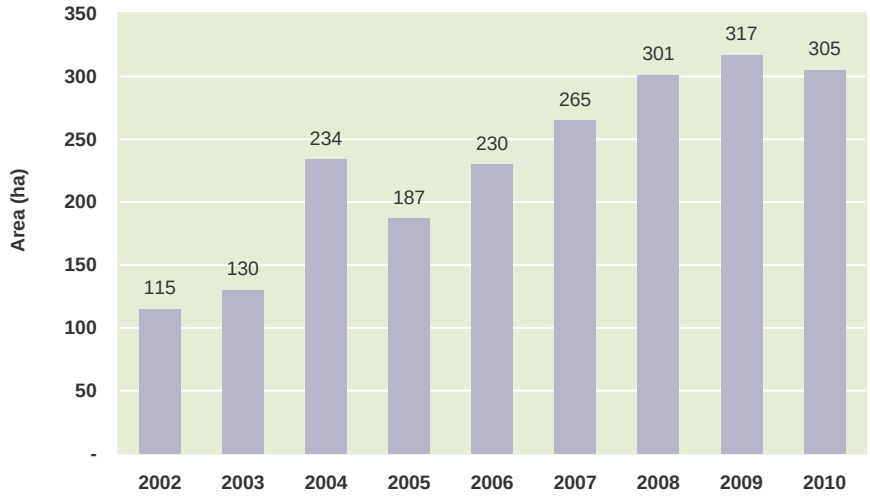
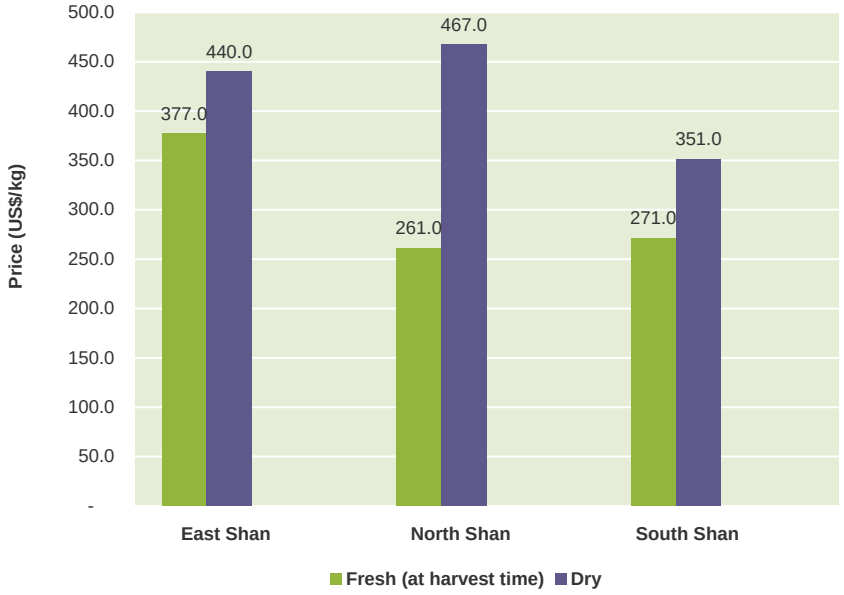
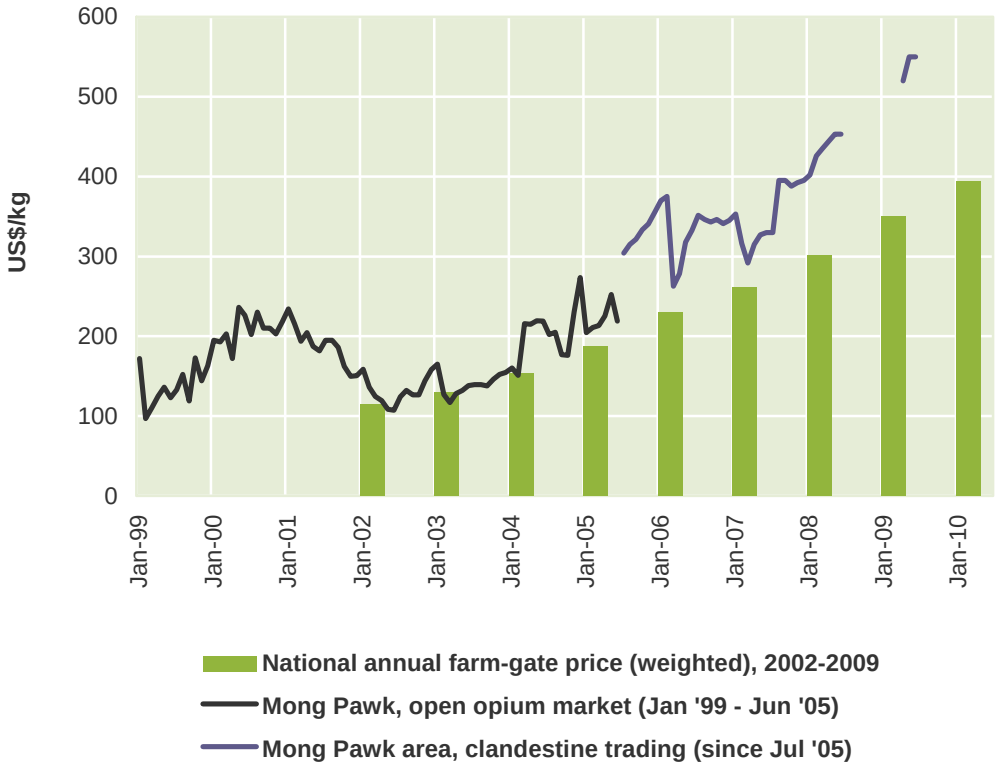


Figure 14: Farm-gate price of fresh (in 2010) and dry opium (in 2009) in US$ equivalent/kg



A good location to systematically monitor changes in wholesale opium prices was Mong Pawk in the Special Region 2 (Wa) where UNODC – for many years – has assisted authorities with an alternative development project. Unfortunately, the collection of prices in Mong Pawk was discontinued during 2009. The survey also collected data on dry opium kept by farmers after the harvest and sold during the year according to their needs. The average price of one kilogram of dry opium amounted to US$ 390. In the future, wholesale price collection will resume in South Shan State.

Figure 15: Monthly wholesale prices for dry opium at Mong Pawk, Wa Special region 2, Shan State (US$/kg), 1999-2010



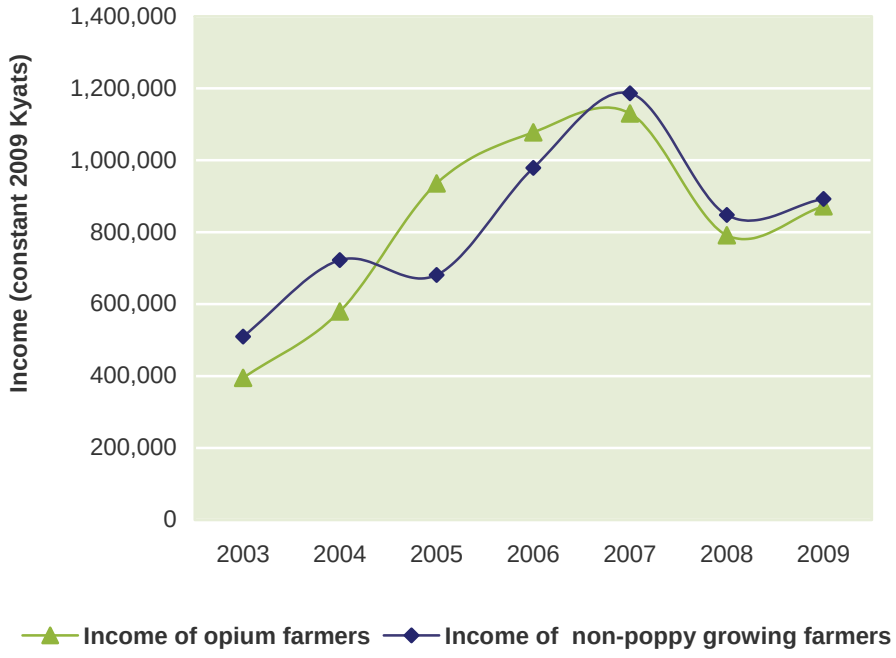
2.4 Household cash income in opium growing risk areas

With the increase in opium production, the average annual cash income of opium-producing households increased by 10% from last year[8]. This was calculated, on average, at 872,100 Kyats (US$ 830) per household, mainly reflecting the rise in production due to higher yields. The average annual cash income of non-opium cultivating households, including households that never cultivated and households that stopped opium poppy cultivation, was slightly higher at 892,620 Kyats (US$ 850).

On average, income from opium accounts for more than 43% of total cash income among poppy-growing farmers. In South and East Shan, opium accounts for close to half of their total income. This significant proportion of income from opium production fell in 2008 and 2009.

[8] Constant prices for 2009, corrected for inflation and exchange rates.

Figure 16: Total average income of households in the survey area, 2003-2009 (in constant 2009 Kyats)*



** adjusted for consumer prices changes*

Figure 17: Total average income of households in the Shan state (US$/year) asked for 2009

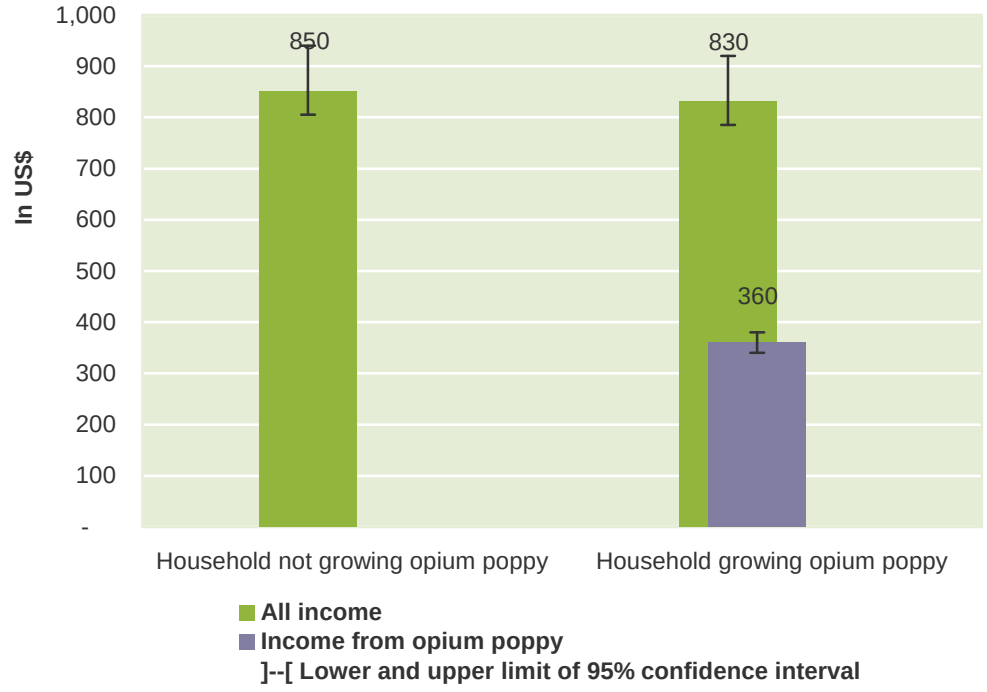
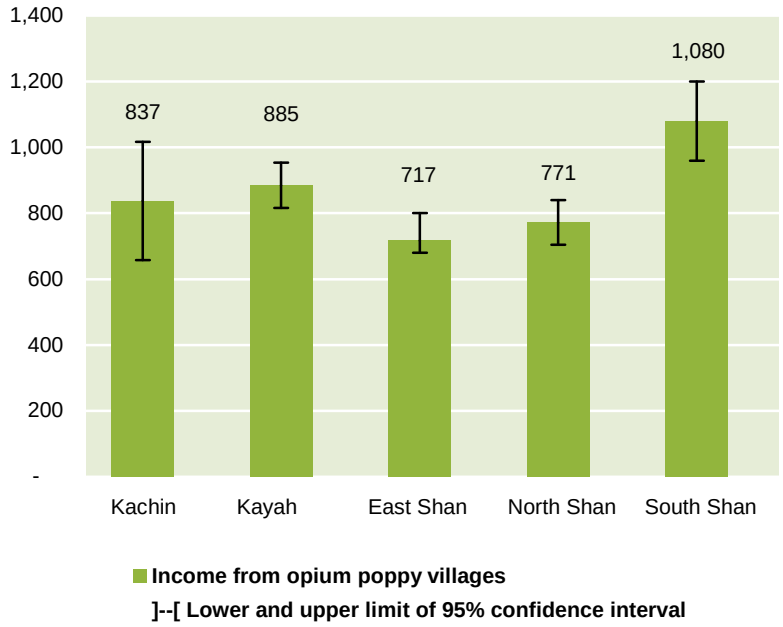


Figure 18: Average household income in non-opium poppy growing villages located in opium growing risk areas (US$/year) asked in 2010 for 2009



Source of income

Sales of rice and cattle represent the main sources of income for villages that do not grow poppy. These numbers are almost identical with those of the previous year. In contrast, villages that grow poppy depended less on rice cultivation for income. As a proportion of total income, opium income increased alarmingly. It is interesting to note that the ratio of income coming from opium in Myanmar - 43% - was the same as in Afghanistan in 2009.

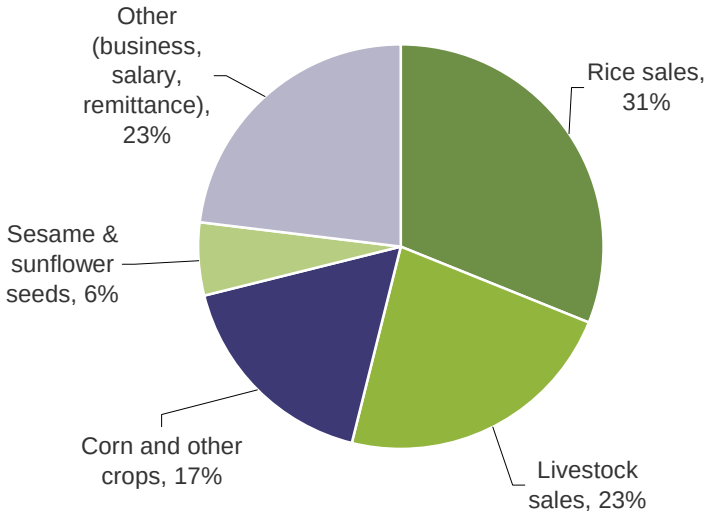
Almost one third of the villages that stopped growing poppy some years ago reported that their income decreased but 70% reported that their income remained stable.

Opium poppy is by far the most lucrative crop for farmers that illicitly cultivate it. One hectare can generate an income of US$ 4,600 gross. In comparison, one hectare of rice, cultivated in low lands, yields about 2.3 mt and is sold for about US$ 430 per ton, which would give a potential income of US$ 710 per hectare i.e. 6 ½ times less than opium. This ratio increases 13 fold for rice cultivated in the uplands. Significantly, in 2010, one hectare of poppy in Afghanistan yielded a gross income of US$ 4,900, which corresponds to the value of one hectare of poppy in Myanmar.[9]

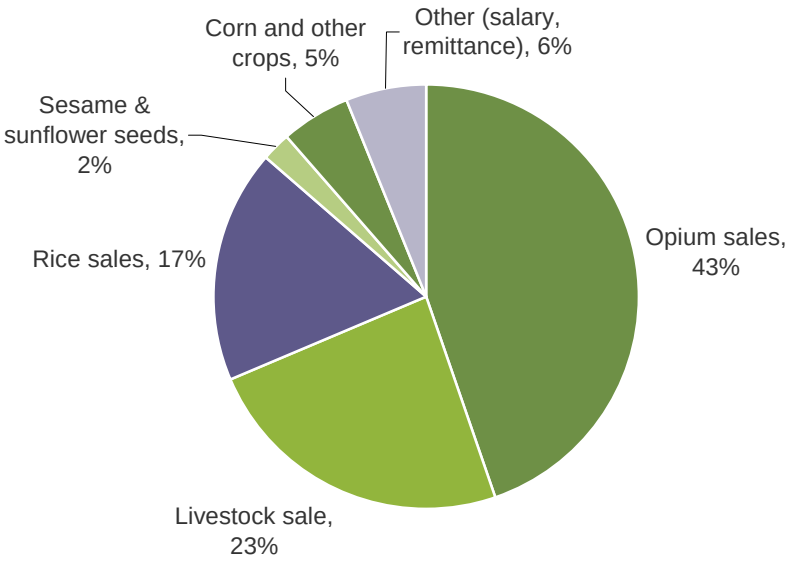
In many townships in Myanmar, poppy cultivation is owned by farmers. In poppy risk areas where the survey took place, large areas are not entirely controlled by the government but are controlled by armed groups, insurgents and militiamen who use cash income from opium to enforce their influence or to simply survive. The farmers in these regions act only as sharecroppers.

[9] In 2009, one hectare of poppy yielded a gross income of US$ 3,600 in Afghanistan and US$ 3,300 in Myanmar.

Figure 19: Sources of income in villages by opium poppy status in 2010



Sources of income in non-poppy-growing villages



Sources of income in poppy-growing villages

2.5 Opium use in opium-growing risk areas

Data on opium addiction was collected via interviews with village headmen. The headmen were asked to provide information on the number of drug users in their village. The addicts themselves were not interviewed and no data on their level of consumption was collected. Headmen were asked about the number of daily opium users and the number of regular users of other drugs without specifying the frequency of use.

According to the data reported by the headmen, daily opium use in Shan State, in Kachin and Kayah affects 0.8% of the population aged 15 years and above. This rate is slightly higher than the 0.7% calculated last year. As in previous years, the prevalence rate was higher in opium-growing villages (1.7%) compared to non-opium-growing villages (0.6%). The level of opium use found in East Shan State was the highest (1.8%), followed by the Kachin (1.6%) and North Shan (1.2%). Until a few years ago, opium production used to be highest in North Shan and the rate of addiction to opium remains high.

Heroin use affected 0.18% of the population aged 15 and above. Hence, heroin use is less widespread than opium addiction.

Although the number of amphetamine type stimulant (ATS) users is increasing, the prevalence rate was still very low, affecting just 0.25% of the population in the opium-growing risk areas. As noticed in previous surveys, this type of drug use is still at a low level in rural Myanmar. In urban areas, other sources indicate far higher rates of abuse.

In general, results on drug use must be interpreted with caution, as there may be reluctance on the part of respondents to report opium, heroin and ATS consumption in the context of the Government's efforts to curb such addiction.

Table 6: Opium, heroin and ATS addiction rates as reported by headmen in 2010 (population age 15 and above).

Description	Non-growing	Growing	Total
Opium addiction (men and women)	0.6%	1.7%	0.8%
Heroin addiction	0.19%	0.14%	0.18%
ATS addiction	0.25%	0.2%	0.25%

2.6 Socio-economic characteristics of the population living in opium-growing risk areas

Food security

Food security (for the purposes of this report defined as 'rice self sufficiency') has deteriorated in almost all regions where the survey took place, except for South Shan State where the situation has improved. This condition is particularly worrisome in North Shan which was probably caused by bad weather conditions which impoverished the yields of most crops. This overall situation is similar to villages that grow poppy and villages that are not growing poppy. In non-poppy growing villages, 65% of households reported having sufficient food over the last 12 months; in households growing opium poppy, the rate is slightly lower (61%). This is of particular concern because it assumes that households require other sources of income to meet their food needs which could be an incentive for cultivation of opium poppy. This food gap could be, *inter alia*, a cause for the increased poppy cultivation in 2010. Between 2008 and 2009, 35% of surveyed households in villages that grew poppy and almost 40% of households in surveyed villages that did not grow poppy did not have enough rice for 12 months. This deficit is strongly marked in North Shan State where nearly 50% of households did not have enough rice throughout the year. This is the case for both poppy-growing and non-poppy-growing villages.

Table 7: Food security (percent of households that had enough rice for 12 months*) in villages that did not grow opium poppy.

Region	In 2008	In 2009
Kachin	87%	85%
Kayah	84%	69%
East Shan	60%	79%
North Shan	73%	51%
South Shan	88%	69%
Total	**78%**	**65%**

**Asked for the former year.*

Table 8: Food security (in percent of households who had enough rice for 12 months*) in villages that grow opium poppy.

Region	In 2008	In 2009
Kachin	72%	83%
Kayah	49%	90%
East Shan	53%	60%
North Shan	64%	52%
South Shan	83%	60%
Total	**72%**	**61%**

**Asked for the former year.*

In order to overcome the lack of food, the most frequent strategies across all regions were assistance from friends and loans for food. Contrary to previous years, farmers were more inclined to utilize rice banks to overcome their food deficits. Rice banks are village committees that, on behalf of member farmers, receive paddy or seeds from farmers with surpluses and lend them to needy farmers at an appropriate interest rate. The collected interest is used as a village fund.

Dry poppy capsules after the seeds were collected

Figure 20: Coping strategies in households that stopped opium poppy cultivation asked in 2010

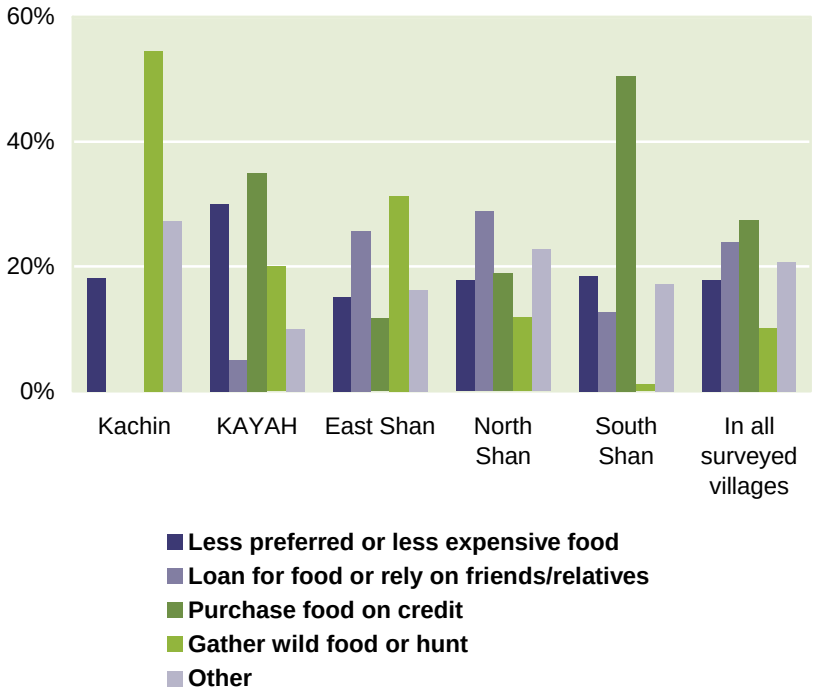


Table 9: Average cultivated land in the village per household in 2010 (in hectare)

Villages in surveyed area	Rice	Wheat and corn	Mustard and sunflower	Vegetable	Long term (rubber, fruit tree)	Other	Poppy	TOTAL
Not growing poppy	0.56	0.37	0.16	0.09	0.88	0.34		2.40
Growing poppy	0.48	0.17	0.09	0.06	-	0.18	0.17	1.14

The crops cultivated in the villages were found to be rather similar in villages cultivating and in those not cultivating opium poppy. Rice remains the most important crop in all villages. In villages growing poppy, the total cultivated land by household represents almost 50% less than in villages not growing poppy. Poppy represents 16% of the total area under cultivation while in villages not involved in poppy cultivation; almost one hectare of the total cultivated land is invested in long term cultivation like rubber tree plantations and fruit.

Irrigation

Land in opium-growing areas is not often irrigated. The equipment necessary to irrigate, such as sprinklers, is almost non-existent.

Only 16% of the total cultivated land was reported to be irrigated. This percentage is the same in villages cultivating poppy and in villages not cultivating poppy. Only 4% of the poppy cultivation is irrigated.

Assistance

The proportion of villages that received assistance was about 13% regardless of the status in opium poppy cultivation. The highest proportion of assistance was reported in villages in Kayah. Villages received health assistance, education and rice especially in Kachin and North Shan. Rice was distributed more in villages that cultivated poppy. The main aid that villages received were improved seeds except in Kayah were the majority of villages were given agricultural tools like "tolaji" which is a multi-usage motorized cultivator.

Table 10: Percentage of villages that received assistance in 2009-2010 (n = 844)

Region	Never received assistance	Received assistance
In villages not growing poppy		
Kachin	100%	-
Kayah	67%	33%
East Shan	82%	18%
North Shan	95%	5%
South Shan	94%	6%
Total in villages not growing poppy	**88%**	**12%**
In villages growing poppy		
Kachin	86%	14%
Kayah	33%	67%
East Shan	81%	19%
North Shan	91%	9%
South Shan	84%	16%
Total in villages growing poppy	**83%**	**17%**
Total in all surveyed villages	**87%**	**13%**

Table 11: Kind of assistance received in the village in 2009 (n = 102 villages)

Type of assistance	Kachin	Kayah	East Shan	North Shan	South Shan	All surveyed villages
In all surveyed villages						
Improved seeds	-	12%	73%	100%	75%	58%
Agricultural tools (like "tolaji")	-	76%	-	-	8%	26%
Fertilizers	100%	12%	13%	12%	21%	15%
Other	-	6%	27%	-	17%	14%

2.7 Reported eradication

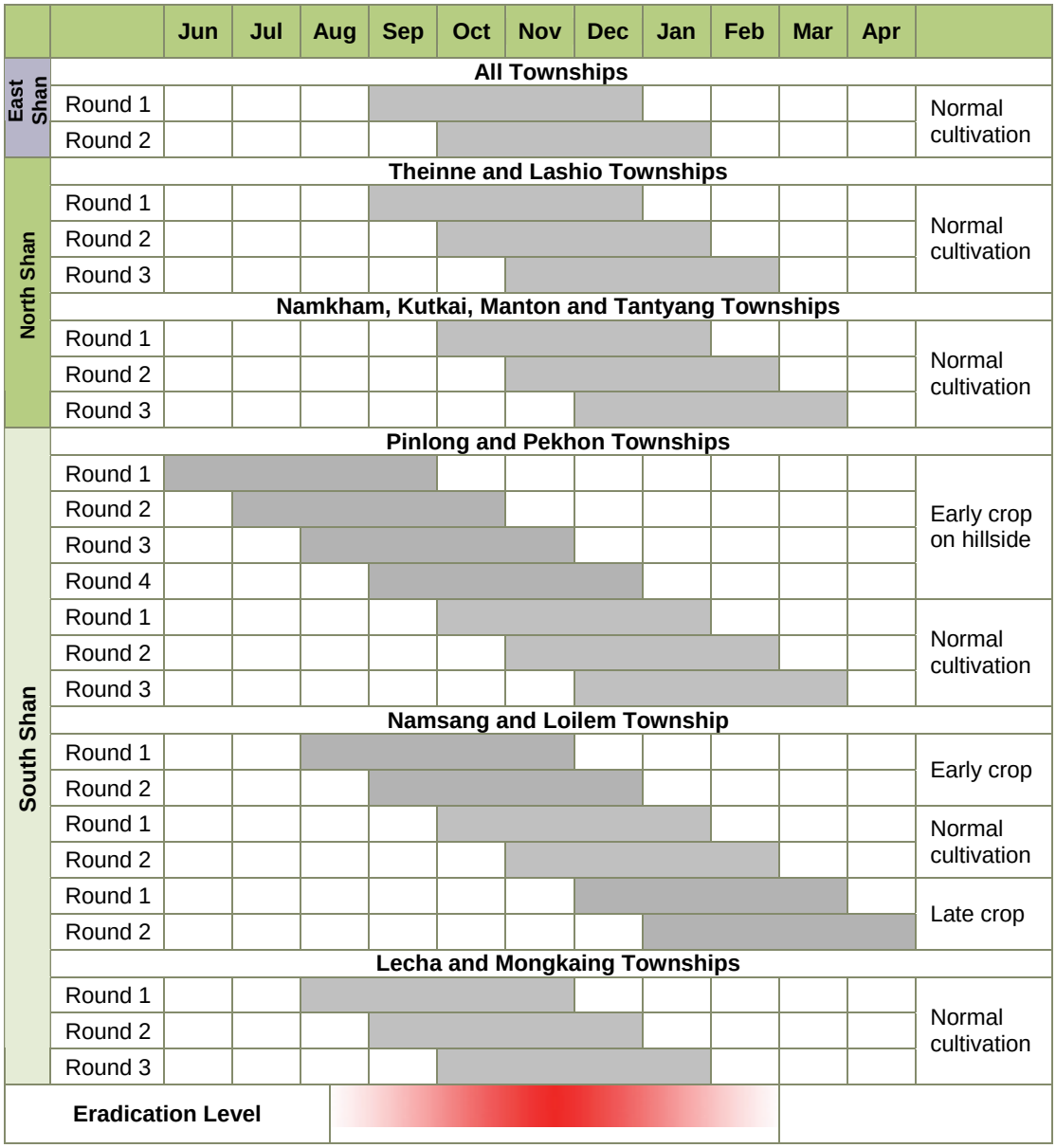
The opium survey does not monitor or validate the results of the eradication campaign carried out by the Government of Myanmar. According to the Government of Myanmar, a total of 8,268 ha were eradicated in the 2009-2010 opium season. This is twice the area eradicated in 2008-2009 when 4,088 hectares were reported. Most of the eradication continued to take place in Shan State (65% of the total), notably in South Shan (38%). Eradication amounted to 22% of the area under poppy cultivation in 2010, which was still a far higher proportion than in Afghanistan (2%).

Table 12: Eradication by region (in ha) from 2004 to 2010

Region	2004	2005	2006	2007	2008	2009	2010
East Shan	195	124	32	1,101	1,249	702	868
North Shan	172	1,211	76	916	932	546	1,309
South Shan	2,170	1,203	3,175	1,316	1,748	1,466	3,138
Shan State Total	**2,537**	**2,538**	**3,283**	**3,333**	**3,929**	**2,714**	**5,316**
Kachin	126	1,341	678	189	790	1,350	2,936
Kayah	83	8	0	12	12	14	13
Total within the surveyed area	**2,746**	**3,887**	**3,961**	**3,534**	**4,731**	**4,078**	**8,265**
Magwe	0	0	0	45	0	1	1
Chin	0	3	0	10	86	5	2
Mandalay	0	0	9	0	3	2	0
Sagaing	74	17	0	9	0	1	0
Other States	74	20	9	64	0	0	0
All surveyed villages	**2,820**	**3,907**	**3,970**	**3,598**	**4,820**	**4,087**	**8,268**

Manual eradication campaign.

Figure 21: Opium poppy cultivation calendar in Shan State



2.7 Clandestine laboratories and trafficking

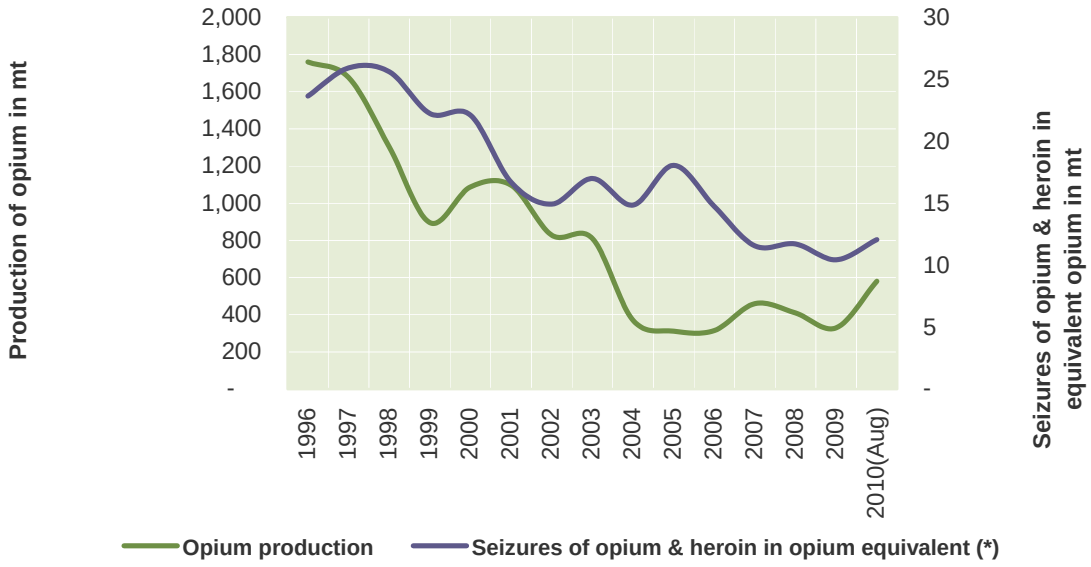
In Myanmar, opium is transformed into heroin inside clandestine laboratories hidden in the dense forests of the country. These laboratories are very difficult to find but a few are dismantled and destroyed every year by the law enforcement agencies in Myanmar. For the transformation of opium into heroin, chemicals are required such as ammonium chloride, acetic anhydride, sodium carbonate, acetone and hydrochloric acid. These chemicals come from neighbouring countries in the region and are smuggled across the hundreds of kilometres of borders that Myanmar shares with Laos and Thailand. Most of these laboratories are found in Shan State. Heroin is easier to transport and easier to hide. It also sells for considerably higher prices.

Heroin laboratories hidden in dense forest in Myanmar

Inside heroine laboratories

Tools and appliances to transform opium into heroin can easily be purchased at kitchen and hardware stores.

Figure 22: Production of opium versus seizures of opium and heroin in opium equivalent (1996 to 2010)*



* It is assumed that 10 kg opium are necessary to make 1 kg of heroin

Source: CCDAC/UNODC

In 2009, opium seizures in Myanmar accounted for 7.7% of global opium seizures. The level of opium seizures has become more effective over the last 15 years despite declining opium production. In the period 1996 – 2003, seizures amounted to an average of 1.8% of production but during the period 2004 – 2010 the level of seizures rose to an average of 3.6% of production (with seizures peaking at 5.8% of annual production in 2005). The equivalent figure for Afghanistan is around 2% of opium production.

Hills covered with opium poppy fields in Sadone area of Kachin state.

3 METHODOLOGY

3.1 Introduction

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

The pattern of opium poppy cultivation continued to change in Myanmar: Some areas became opium-free while others increased their level of cultivation. In South Shan State, the opium poppy crop calendar changed and new patterns such as multi-cropping were observed. Opium fields generally moved further away from the villages and, in certain regions, were subject to eradication. In addition, cultivation possibly shifted to areas already considered opium-free or to climatically less favourable regions. In 2010, all these considerations, combined with reduced accessibility and the expected change in cropping pattern, influenced the survey methodology and the sampling procedure for the estimation of the planted area and other socio-economic indicators.

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

The 2010 opium poppy survey was composed of three parallel components:

1. A cultivation estimation survey throughout the three regions of Shan State (North, South, East), Kayah State and Kachin State. The survey was based on the use of satellite remote sensing as the primary source of data for Shan State and Kachin State. In these two States, satellite remote sensing was supplemented by field surveys to provide ground truthing and to support the interpretation of opium poppy fields. In Kayah, the estimate of the planted area was derived from the socio-economic survey as described below;
2. An opium yield survey in the three regions of Shan State, and Kachin;
3. A socio-economic survey in 850 villages randomly selected in Shan State, Kayah State, and Kachin State based on interviews with village headmen and other people who play an independent role in the life of the villages.

Sampling procedure for village survey

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

From the sampling frame, villages are excluded from townships where there are known security issues or those that have been declared to be poppy-free on the basis of local expert knowledge.

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

The socio-economic survey was conducted with a sample size of 850 villages. This is approximately 9% of the 9,677 villages from the sampling frame. A total of 719 villages in Shan State, 100 villages in Kayah State and 31 villages in Kachin State were selected.

Table 13: Composition of the sample of the village survey

Particulars	North Shan	South Shan	East Shan	Kayah	Kachin	Total
Projected number of villages to be surveyed	291	247	181	100	31	850
Actual number of villages that were surveyed	291	241	181	100	31	844

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

3.2 Survey organization

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

The ground survey to measure opium yield and socio-economic indicators were supervised and implemented by CCDAC, while UNODC/ICMP provided technical support, coordination and supervision with national and international staff throughout the survey. No rapid assessment survey or assessment of the opium ban in Shan Special Region 2 (Wa) was implemented directly by UNODC/ICMP/CCDAC since Wa local authorities did not allow any authorisation. The other rapid assessment surveys in Shan Special Region 1 (Kokang), Shan Special Region 4 could not be carried out by UNODC/ICMP because of security reasons.

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

3.3 Field operations

Field operations for the village survey started in the third week of December 2009 and continued until mid-February 2010 for Shan and Kayah States and up to March 2010 for Kachin State. Field surveyors could not visit less than 1% of the villages.

A total 35 satellite image locations ground truth data out of 43 were collected. For the village and field surveys, 147 surveyors carried out the field work from 21 December, 2009 to mid-February, 2010. In Kachin State, where opium is harvested later, the date was extended to the end of March, 2010. The surveyors were organized in 49 teams (15 teams for North Shan, 16 teams for South Shan, 10 teams for East Shan, 4 teams for Kayah State and, 4 teams for Kachin State). In each team, there was one surveyor from the Myanmar Police Force, one from the General Administrative Department and one from the Settlement and Land Records Department or the Myanmar Agriculture Service from each township. A head supervisor and three regional national supervisors coordinated the work. Additionally, one UNODC international officer monitored the entire field work. The survey teams were all involved in

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

Two survey teams were assigned to each of the two townships with a heavier workload (Pinlaung in South Shan State and Waingmaw in Kachin State), and two teams were assigned to another five townships (Demosso in Kayah State, Lashio, Tant Yang and Thibaw in North Shan State, Kyaingtong in East Shan State). One survey team was assigned to each of the rest of the townships.

The supervision teams met with all teams during the field survey to assess the progress of the survey and ensure quality control. The duration of the main ground survey was 8 weeks, and operations were wrapped up with a debriefing by the end of March, 2010.

As the majority of opium gum collection takes place between early September and late December, it was of vital importance that surveyors commence their work as early as possible, so that they had the opportunity to measure the opium poppy capsules.

Table 14: Socio economic survey fact for the 2010 opium poppy survey

	North Shan	South Shan	East Shan	Kayah	Kachin	Total
Start Date	29-Dec 2009	17-Dec 2009	29-Dec 2009	17-Dec 2009	16-Feb 2010	17-Dec 2009
End Date	15-Feb 2010	15-Feb 2010	15-Feb 2010	15-Feb 2010	31-Mar 2010	31-Mar 2010
Survey Teams	15	16	10	4	4	49
Targeted Villages	290	250	181	100	31	850
Surveyed Villages	291	241	181	100	31	844
% of Villages	100%	96%	100%	100%	100%	99.3%
Households covered	13,853	14,611	5,773	7,577	3,093	44,907
Rual population covered	54109	68695	39581	75342	157867	395594
% of rural population/ households	13%	4%	2%	3%	5%	4%

3.4 Area estimation procedures

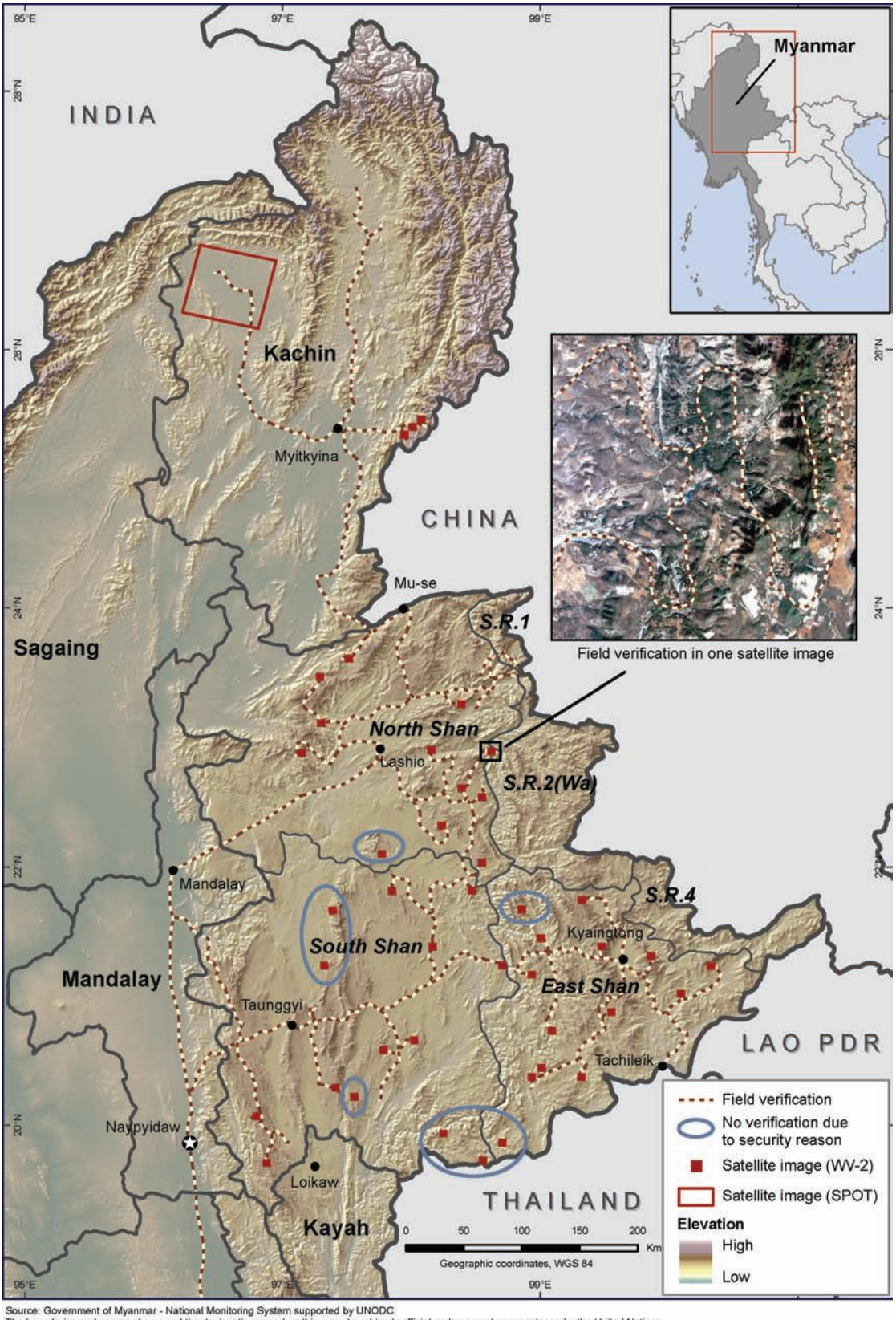
For the first time, Waingmaw township of Kachin State was also added to the area where the poppy cultivation estimate is performed with remote sensing techniques. In this region and in the South, North and East Shan very high-resolution satellite images were purchased after a random selection throughout the study area.

At 42 selected locations, very high-resolution images (Geoeye with 2-meter resolution (4 bands) and WorldView-2 images with 2-meter resolution (4 bands)) were acquired. The number of images was defined by the availability of the budget and the total area surveyed. For 2010, this was the highest number of sample locations of the last 4 surveys, mainly by reducing the size of the sample locations. For every location, images at two different dates were purchased with a 5 week interval (December/January and February/March). Two date images facilitated the identification of the opium poppy, taking into account the different crop calendars for every region obtained from the former surveys.

In Tanai township in Kachin, the area estimate was based on a targeted high resolution image (SPOT5, 10 meter resolution). In this township, the opium poppy cultivation was concentrated in one region that could be measured with the SPOT5 satellite image.

Kayah State required a different approach, as their level of opium poppy cultivation is much lower and therefore the acquisition of satellite images was not cost effective. Therefore in Kayah the area estimate was done on the basis of the village survey.

Map 4: Routes of field verification for the survey with satellite images, 2010



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.

Sampling frame for the selection of satellite image locations

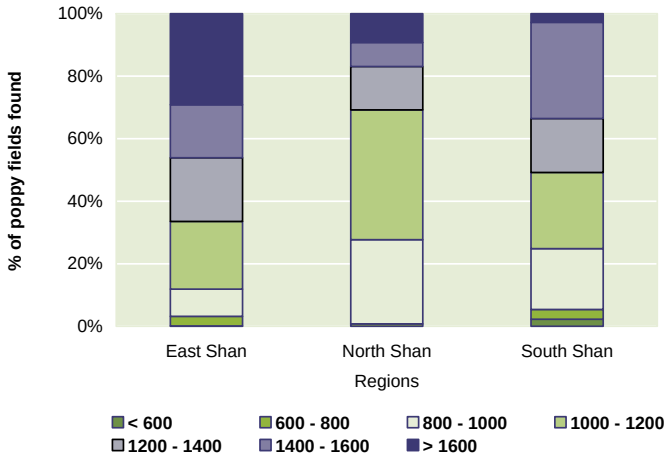
To select the sample locations of the satellite images, the sampling frame of last year's survey was improved and adjusted with new information. The sampling frame was developed by the combination of the following factors:

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

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

Altitude was taken as a factor since former surveys had revealed that 95% of the opium poppy was cultivated at altitudes between 800-1800 meters. However, for East Shan the lower altitude was adjusted to 600 meters based upon the former survey. Some large, flat areas were excluded, since the accessibility of these areas is very high, with a very low chance of finding poppy cultivation.

Table 15: Altitude ranges (meters) of the opium poppy fields found in the satellite images 2009

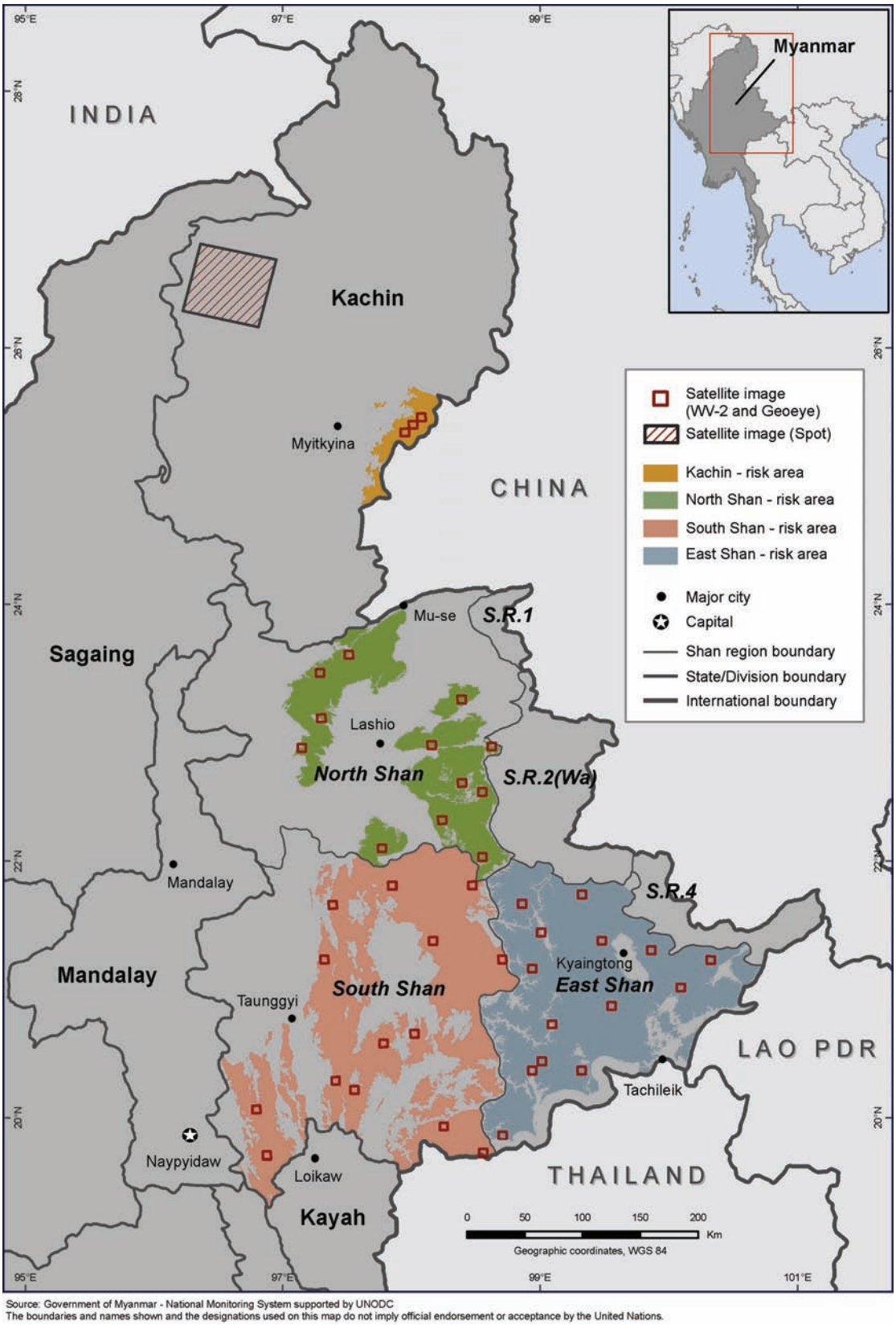


From information on the ground, several *opium poppy-free areas* were identified: Special Region 4 and the townships Maingyang, Kalaw, Pindaya, Taunggyi and Ywangan as well as a 10-km buffer zone along the border with Thailand. These areas were excluded from the sampling frame.

These factors were combined in a Geographic Information System to calculate the sampling frame. North, East and South Shan were analyzed separately. Every region in the area to be surveyed was stratified into poppy-risk class based upon ground information.

A grid with 6.5 by 6.5 kilometer cells was put on top of this sampling frame to select the image locations. The number of images in Shan state was determined according to the size of the risk area in each region. Half of the locations that were sampled last year were selected again, if they matched the selection criteria. The images were selected randomly and systematic within the sampling area, i.e. within determined clusters a random selection was made. In total, 42 locations were selected out of 1,193. Those locations represent 2.3% of the total risk area in the sampling frame. From the selected locations, 30 images were successfully acquired for both dates, and the rest were acquired with only one date.

Map 5: Sampling frame area and satellite image locations in Myanmar, 2010

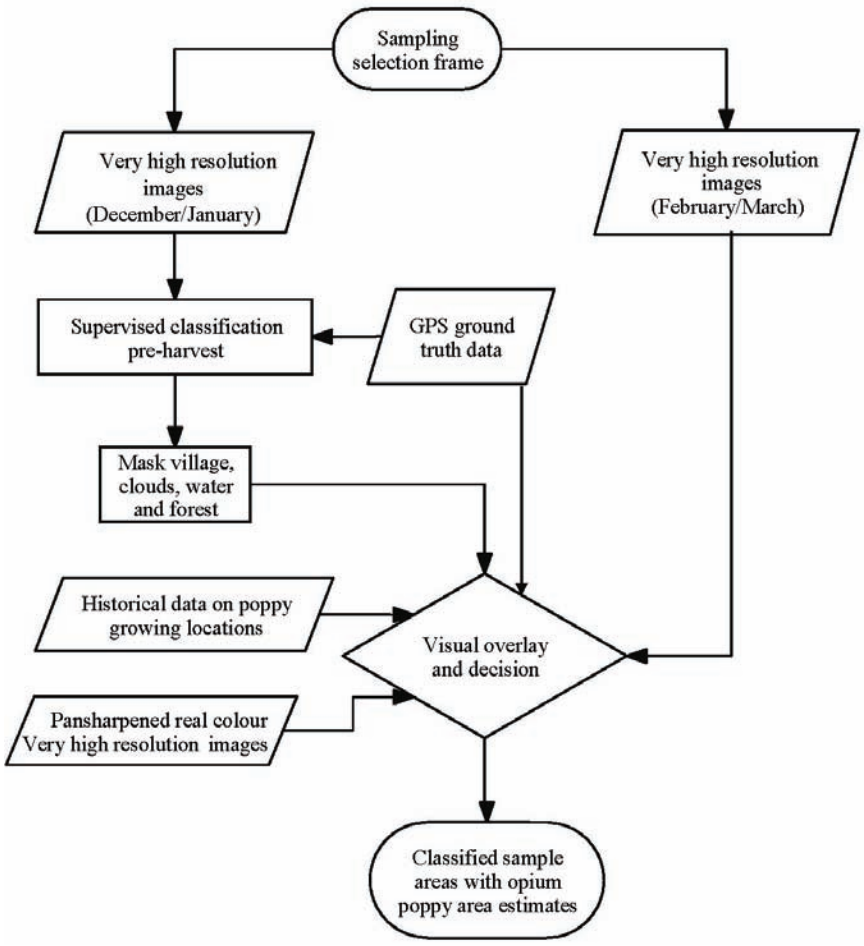


Source: Government of Myanmar - National Monitoring System supported by UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Processing of the satellite images

The classification procedure of the Very High Resolution images is illustrated in the following flow chart.

Figure 23: Flow chart of the satellite images processing steps in the Shan state and Kachin (Maingwaw township)



The satellite images were classified with the ground truth data collected by the ground control teams. For the first collected images, supervised classifications with maximum likelihood rules were applied to obtain maps that identified different land cover as forest, scrubs, grass, agricultural land and possible poppy areas. The second collection images were used to observe changes in the possible poppy areas. If there was an apparent change that corresponded to the harvesting of the poppy, it was used to confirm that the field was indeed a poppy field. This was done in a visual manner, since the images were not geometrically corrected and automation was not possible due to the displacements of the fields. The rules can vary by region and stage of the poppy crop, however the most commonly applied rule was that potential poppy in the first classification, when classified as bare soil in the second classification meant that it was opium poppy. Historical data on poppy cultivation and real colour, pansharpened (very high resolution images) visualization was used to facilitate the decision-making.

Area estimation formulae for satellite imagery

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

The estimation of the area under opium poppy cultivation was based on the information collected from the satellite imagery.

An estimate of the extent of the opium poppy cultivation was made using the equations described next page.

a. Average ratio of opium poppy cultivation within region, *k*:

$$\bar{y}_k = \frac{1}{n_k}\sum_{i=1}^{n_k} P_i / R_i$$

where n_k is the number of satellite image locations within the region, P_i is the area of poppy in segment *i* and R_i is the risk area in segment *i*.

b. Estimate of area of opium cultivation in each region, *k*:

$$A_k = \bar{y}_k R_k$$

where R_s is the total risk area in the sampling frame in region *k*.

The confidence intervals were calculated using the bootstrap method with 50,000 iterations. The 2010 area estimates and confidence intervals for Myanmar are presented in the table below. It should be noted that the upper and lower estimates do not lie symmetrically between the mean estimates because of the different statistical tools used to arrive at the most robust regional estimates.

Bootstrapping consists of sampling with replacement from the original sample with multiple iterations, composed in this case of the total poppy areas of the selected segments. After each iteration, a mean value is estimated and scored. At the end, a distribution of means can be observed, producing a mean estimate and a 95% confidence interval for the mean.

Area estimation formula for village ground survey data

Kayah State

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

Total area under opium poppy cultivation, *A*, was calculated using the following formula:

$$A = (T / N_s) \cdot N_f \cdot S \cdot c$$

where T is the total number of households growing popping in the sample

N_s is the number of villages in sample

(T / N_s) is the average number of households growing poppy per village

N_f is the total number of villages in the sampling frame

S is the average size of opium poppy fields

c = 3.0 is a correction factor for under-reporting of poppy area compared to satellite images in South, East and North Shan

Table 1: Area estimates with 95% confidence interval (in ha), 2010.

Region	Area estimate	Lowest estimate	Upper estimate
East Shan State	12,100	6,300	19,000
North Shan State	3,700	1,500	6,700
South Shan State	19,200	9,400	31,500
Kachin	3,000	500	3,800
Kayah	100		
Total	**38,100**	**23,200**	**53,900**

Opium poppy cultivation status by townships

The table below indicates the poppy-growing status according to different sources, either from the remote sensing analysis, or from the socio-economic survey or from the eradication campaign.

Table 16: Poppy growing status in 2010 by township and source

Region	In Satellite image location	During the socio-economic survey	Eradication campaign
East Shan			
Mong Yawng	X		X
Tachileik		X	X
Mongkhat	X	X	X
Mongpyat	X	X	X
Metmong	X	X	X
Mongpyin	X	X	X
Mongsat	X	X	X
Mong Tong	X	X	X
Kyaing Tong	X	X	X
Total	8	8	9
North Shan			
Kyaukme			
Lashio		X	X
Mongyai	X	X	X
Theinne	X		X
Thibaw	X	X	
Moemeik			X
Muse			
Naungcho			
Manton	X	X	X
Tant Yang	X	X	X
Kutkai		X	X
Namkham	X	X	X
Total	6	7	8
South Shan			
Kalaw			X
Maukmai	X		X
Mongpan	X	X	X
Hopong	X		
Kyaethi	X	X	X
Leacha		X	
Linkhe			

Kunhein	X	X	X
Loilem		X	X
Hsigseng	X	X	X
Namsang(S)		X	X
Pinlaung	X	X	X
Pekhon	X	X	X
Moegnea	X	X	X
Mong Kaing	X	X	
Mongshu	X	X	X
Nyaung Shwe		X	X
Total	10	13	13
Kayah			
Loikaw		X	X
Demosso			X
Fruso			
Total	0	1	2
Kachin			
Moenyin			X
Pharkant			X
Putao		X	X
Waing Maw	X	X	X
Tanai	X	X	X
Total	2	3	5
Grand total	26	22	37

Information on poppy cultivation in Special Region 1 (Kokang) and Special Region 4 (Monglar)

For various reasons, it was not possible to do a rapid assessment in these regions but information obtained from diverse sources indicates that there was no evidence of opium poppy cultivation in these areas this year. Special Region 4 has been opium poppy-free since 1997, Kokang since 2003, and Special Region 2 (Wa) since 2005.