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United Nations Office on Drugs and Crime



Southeast Asia Opium Survey 2023

Cultivation, Production, and Implications

UNODC supports Member States to develop and implement evidence-based rule of law, drug control and related criminal justice responses through the UNODC Regional Programme for Southeast Asia and the Pacific and aligned country programmes and projects. This study is undertaken by the Illicit Crop Monitoring Programme (ICMP) under the framework of the Mekong MOU on Drug Control, which UNODC actively supports through the Regional Programme, including the commitment to develop data and evidence as the basis for countries of the Mekong region to respond to the challenges of drug production, trafficking and use.

To assess the scope of opium poppy cultivation and opium production in Southeast Asia, UNODC has been conducting opium surveys in Lao People's Democratic Republic (Lao PDR) intermittently since 1992 and regularly in the Republic of the Union of Myanmar since 2002. The present report contains the results of the UNODC opium poppy cultivation surveys in Lao PDR and Myanmar covering the 2022/2023 poppy season.

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
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Overview

Southeast Asia continues to be an important region for the production of opium and heroin. In 2023, UNODC estimated opium poppy cultivation and opium production separately in Myanmar, which is monitored annually, and in Lao PDR, which had not been surveyed since 2015.

From these two surveys, important, diverging trends across the region stand out. Cultivation and production in Myanmar expanded for a third consecutive year, although poppy cultivation levels remain below historic highs. Estimates for Lao PDR are slightly down from when last surveyed in 2015. However, without more recent estimates, it is impossible to assess present trends.

Poppy cultivation in the Southeast Asia has generally been characterized by traditional practices of small-scale cultivation in poorly organized plots, often as a cash crop, but also for household use. Traditional means of cultivation appear to remain common practice in Lao PDR, which is characterized by sparse poppy plots and modest yield estimates. In contrast, for the last three years, poppy cultivation in Myanmar has become increasingly sophisticated and more productive. Sowing poppy in densely organized plots and use of other inputs, such as irrigation systems, and sometimes fertilizers, have recently boosted plot yields and total production estimates to historic levels. It is presently unclear why such developments are only seen in Myanmar and have not been found in neighbouring Lao PDR.

There are a variety of drivers behind illicit crop cultivation and drug production. Opium poppy cultivation in Southeast Asia is closely linked to poverty, lack of government services, challenging macroeconomic environments, instability, and insecurity.¹ Against the background of continued disruptions to social, political, and economic stability following the military takeover in early 2021, Myanmar's economy faced a series of external and domestic shocks in 2021 and 2022. Worsening stability and security since then have coincided with greater levels of poppy cultivation and opium production. Lao PDR's economy is also experiencing declining economic growth, high

levels of public debt relative to GDP, and extremely high inflation.² Such conditions could contribute to an environment that makes poppy cultivation attractive to rural communities.

Globally, other events may also be relevant to the future of poppy cultivation and opium production in Southeast Asia. In 2022, the de facto authority in Afghanistan reimposed a strict ban on poppy cultivation and opium production, resulting in a 95% decline in production estimates in 2023.³ This development, if sustained, could result in global shortages of opiates, including heroin, given Afghanistan's historically dominant role in illegal production of opium. A global shortage in opiates, including heroin, could result in upward pressure on the price of opium in the region, which would likely encourage more cultivation and production from Southeast Asia.

Developments in the region will need to be monitored in the coming years. Improving the economic situation and reducing insecurity and instability in the region will be critical to reverse a growing upward trend in drug production and trafficking in Southeast Asia.

1 UNODC, "Southeast Asia Opium Survey 2015," 2015, https://www.unodc.org/documents/crop-monitoring/sea/Southeast_Asia_Opium_Survey_2015_web.pdf.

2 Asian Development Bank, "Lao PDR's Growth Slower than Expected in 2023, Stable Outlook for 2024 — ADB," text, September 20, 2023, Lao People's Democratic Republic, <https://www.adb.org/news/lao-pdr-growth-slower-expected-2023-stable-outlook-2024-adb>.

3 UNODC, "Afghanistan Opium Survey 2023," November 2023, https://www.unodc.org/documents/crop-monitoring/Afghanistan/Afghanistan_opium_survey_2023.pdf.

Key Takeaways

The upward trend in poppy cultivation in Myanmar continues

In 2023, area under cultivation was estimated to be 18% more than in 2022, at 47,100 ha (estimated range 32,200 to 77,200 ha). Although the area under cultivation has not returned to historic peaks of nearly 58,000 ha cultivated in 2013, after three consecutive years of increases, poppy cultivation in Myanmar is expanding and becoming more productive.

Following several years of decline between 2014 and 2020, poppy cultivation in Myanmar reached a low of 29,500 hectares in 2020. While the trend ended in 2021 with a slight increase from the year before, the 2022 growing season – the first one following the military takeover in February 2021 – saw a large increase of about 33%, with cultivation estimates reaching just over 40,000 hectares.

Poppy farming in Myanmar continues to become more sophisticated and productive, leading to the highest opium production estimates since 2001

Historically, illicit poppy cultivation in Myanmar, and Southeast Asia in general, was typically associated with small, poorly organized, and generally sparse

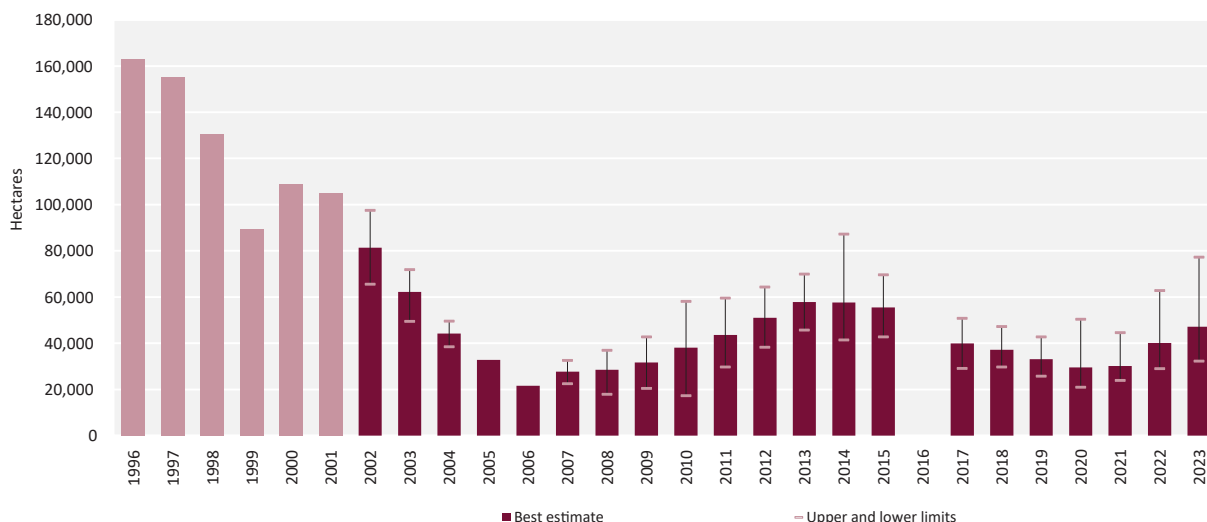
plots grown by rural households as part of the annual farming cycle. Field and ethnographic research point to longstanding traditions of small-scale poppy cultivation as a cash crop, but also for household use.

However, the trend of small-scale, poorly organized cultivation is changing, with reports from Myanmar pointing to increasingly sophisticated means of cultivation, including increased plot density, improved organization of plants, and enhanced practices, such as the use of irrigation systems and potentially fertilizers.

These changes are reflected in the yield estimates for Myanmar. Yield estimates from the 2022 survey indicated an average of 19.8kg of opium per hectare of poppy, a substantial increase in productivity from 14kg per hectare in the preceding year. In 2023, the national yield estimate rose slightly to 22.9 (95% confidence interval 21.6 to 24.4) kilograms of opium per hectare of poppy.

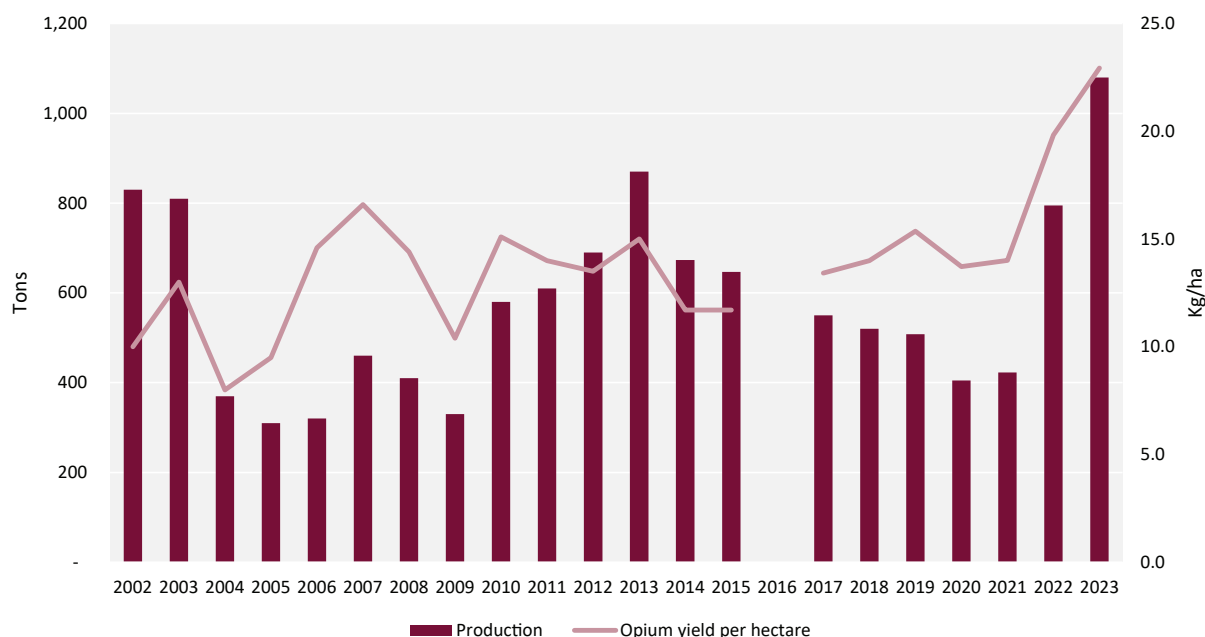
In 2023, the resulting estimate of potential dry opium production in Myanmar was 1,080 (760-1,720) metric tons, the highest since 2001 (1,100 tons of opium were estimated that year). This represents a substantial increase of 36% compared with the 2022 estimate.

Area under opium poppy cultivation in Myanmar



No survey was conducted in 2016. The error bars indicate the upper and lower limits of the confidence intervals of uncertainty in the sampling.

Opium production and yields in Myanmar



No survey was conducted in 2016.

The farmgate price of opium in Myanmar continues to increase

The average farmgate prices at harvest time of fresh and dry opium in 2023 were assessed at around US\$317 (590,000 Kyat) and US\$356 (662,000 Kyat) per kilogram, respectively.⁴ The farmgate price continued its upward trend that started in 2021. The 2023 nominal price per dried kilogram of opium was more than triple the 2021 estimate in Kyat.

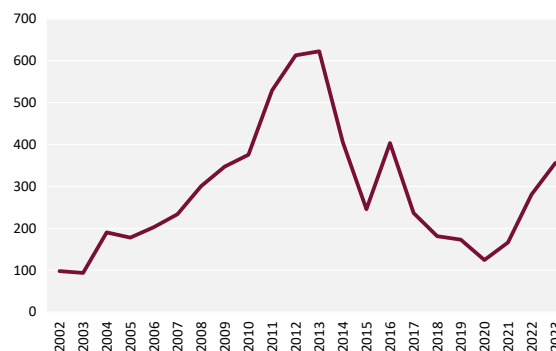
However, because of the small number of price data samples collected in 2021, it is difficult to pinpoint the exact reasons for rising prices given growing production. Prices of licit crops, such as rice, have been found to be increasing too, which has been attributed to conflict-related disruptions to markets, high prices of agricultural inputs, and transport costs.⁵ Another possibility is that opium production and prices in particular are linked to political and economic insecurity in Myanmar.⁶

4 Applied MMK/USD exchange rate is the 2022 DEC alternative conversion factor provided by the World Bank (<https://data.worldbank.org/indicator/PA.NUS.ATLS>).

5 FAO, "Country Brief on Myanmar -," June 14, 2023, <https://www.fao.org/giews/countrybrief/country.jsp?code=MMR&lang=FR>.

6 UNODC, "Southeast Asia Opium Survey 2015."

Nominal farm-gate prices of dry opium in villages with poppy cultivation, Myanmar, 2002-2023 (US\$ per kilogram)



Without adjustment for inflation.

As Myanmar's economy remains fragile, opiates gain importance

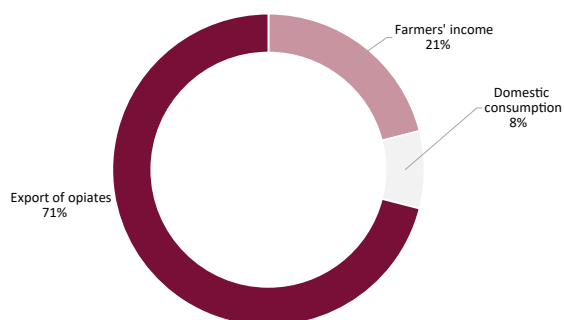
In 2023, the role of opiates in the Myanmar economy continued growing in importance. The farmgate value of opium is an important measure of the gross income of farmers generated by opium poppy cultivation. In 2023, it was estimated to range between US\$271 and 613 million, representing between 0.5 and 1% of the 2022 national GDP, and between 2 and 5% of the agricultural, forestry and fishing component of the 2022 GDP, which was estimated at US\$12 billion.⁷ Between 2022 and 2023, the farmgate price increased some 60%.

7 Source: The World Bank.

The most profitable activity in the opium economy is heroin production and trafficking. In 2023, it was estimated that 5.8 tons of heroin were consumed in Myanmar, with a value ranging between US\$104 and 197 million. Between 58 to 154 tons of heroin were exported, with a value between US\$835 million and 2.2 billion.

The gross value of the entire opiate economy – comprising both the value of domestic consumption and exports of opium and heroin – in Myanmar in 2023 was estimated to be between US\$1 and 2.5 billion, accounting for about 2-4% of the national GDP in 2022.

Myanmar opiate economy, by component (approximation)



Data confirm linkages between socio-economic and developmental factors, and involvement in the opium economy.

Opium poppy cultivation in Myanmar is concentrated in areas characterised by a combination of specific topographical conditions and challenging socio-economic, developmental and governance environments. Socioeconomic surveys with community leaders and households across several states in Myanmar in different years have consistently identified the absence of formalized property arrangements, suitable infrastructure, access to markets, and basic services as important correlates of illicit crop cultivation.

Households and villages in Myanmar that engage in poppy cultivation and the broader opium economy are in general located in more remote areas and have less access to markets. Households involved in opium cultivation were larger and had lower degrees of formal education. Data point to many

overlapping socio-developmental factors that relate to a household engaging in poppy cultivation in both the Kachin and Shan states, including less access to public services and infrastructure, such as schools and roads, and less annual income from licit sources. Challenging social and economic environments, including high inflation and political instability, continue to impact poppy cultivation in the region.

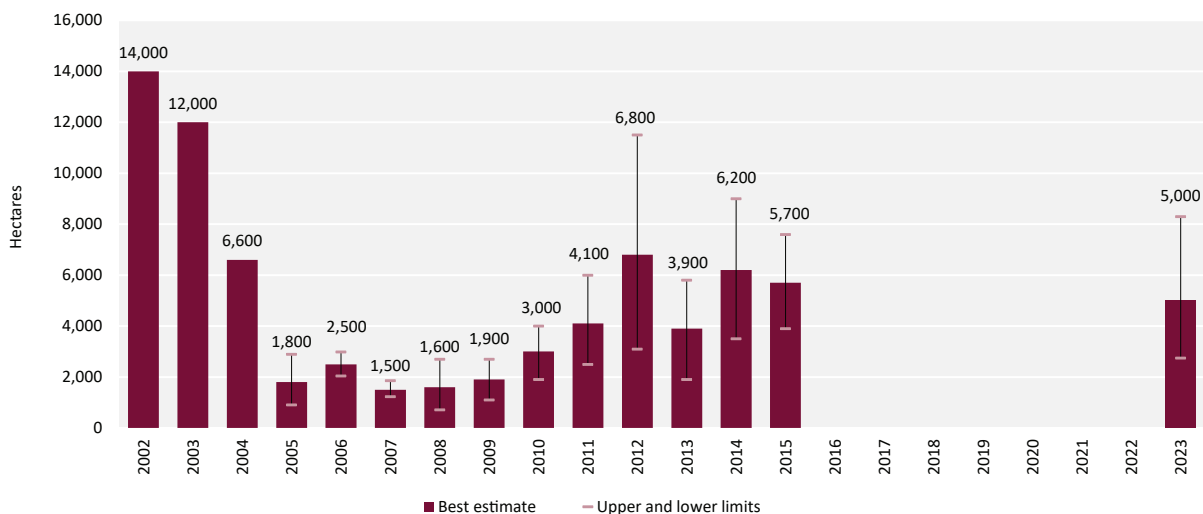
Households involved in poppy cultivation in Myanmar reported higher rates of opium use

In Kachin, households involved in poppy cultivation were more likely to have at least one household member who had used opium in the last month. Among households involved in poppy cultivation, on average, 8% of its members used opium in the last month compared to less than 1% of those in households not involved in poppy cultivation. In Shan, similar phenomenon of proximity or involvement with the opiate economy correlated with drug use. There, opium-involved households reported significantly greater shares of past-month use of opium use across two different survey years. In 2019, approximately 2% of members in non-poppy-involved households reported past-month opium use versus 13% for poppy-involved households. In 2022, the trend was similar with the share of non-poppy and poppy-involved households reporting past-month drug use at 2 and 20%, respectively.

Poppy cultivation in Lao PDR remains stable

In 2023, the area under opium poppy cultivation in Lao PDR was estimated at close to 5,000 ha (range of 2,700 to 8,300 ha), predominately concentrated in Phongsaly province. This represents a slight decline compared to the last area estimate in 2015, when 5,700 hectares of poppy were cultivated.

Area under opium poppy cultivation in Lao PDR



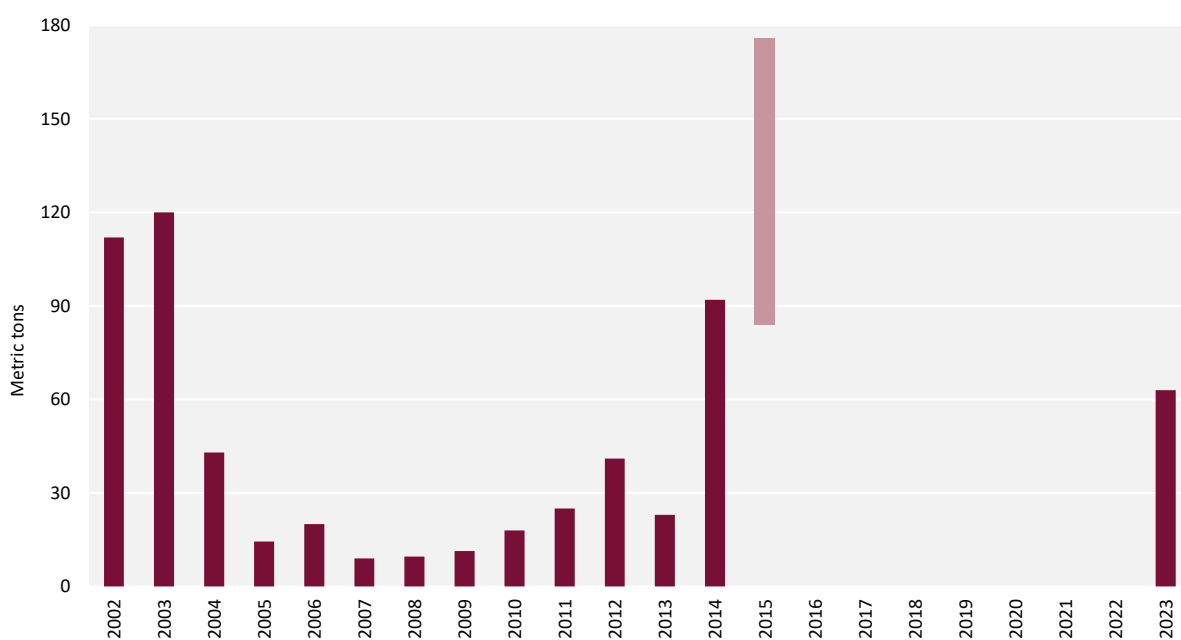
No surveys have been conducted between 2016 and 2022. The error bars are the upper and lower limits of the confidence intervals of the sampling uncertainty.

Cultivation practices in Lao PDR have not changed drastically since the last survey and yield estimates remain largely stable

In Lao PDR, visual observations of poppy fields suggest traditional cultivation practices with plots generally sparse and not well organized. Interviews and data collected from the field also noted that households which cultivated poppy often do so on small plots and generally extract small amounts of

opium and may intersperse the crop with other vegetables. Prior field surveys from 2007 reported a yield of 7kg of opium per hectare. In 2014, the last year for which comparable yield data was available, it was estimated that 14.7 (range of 12 to 17.4) kilograms of opium could be rendered from a hectare of poppy. In 2023, 12.7 (range of 9.5 to 15.9) kilograms per hectare were estimated, suggesting that yield estimates have changed little over the last decade.

Opium production in Lao PDR



No surveys were conducted between 2016 and 2022. In 2015, no point estimate for opium production was produced; a range between 84 and 176 metric tons was provided instead. The 2023 yield estimates are therefore best compared to 2014 yield estimates.

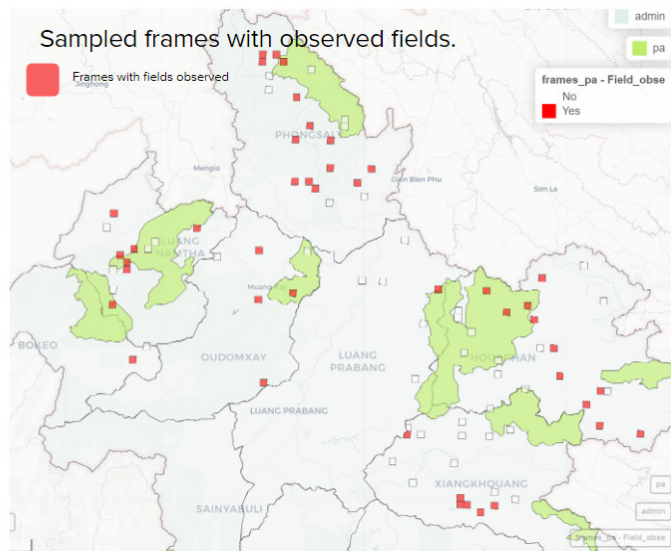
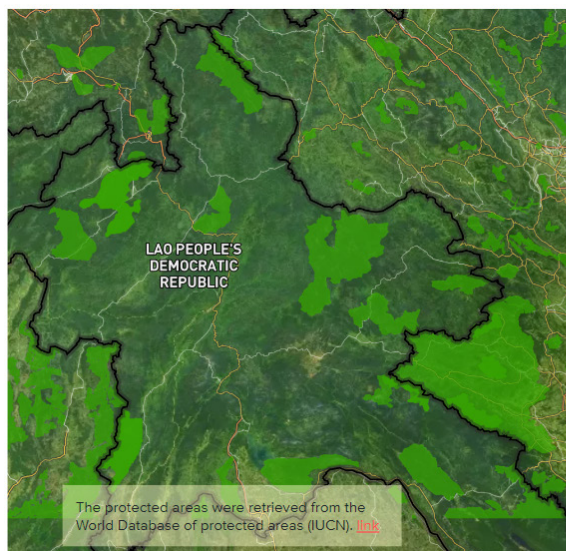
44% of opium plots in Lao PDR were found within 10km of protected areas

The remote nature of poppy cultivation in Lao PDR, as reported by interviewees, combined with the general clandestine nature of illicit crop cultivation in protected areas, such as national parks and reserves, presents a concern to preserving biodiverse areas. Analysis of poppy plots showed that most cultivation occurred outside of protected areas. However, the location of poppy plots often appeared in the periphery or proximity of protected areas. About 11% of plots were inside protected areas while another 33% were found within 10km distance from protected areas.

About half of the observed opium plots in Lao PDR involving deforestation were cleared within three years before harvest

Most poppy fields in Lao PDR are established in shifting cultivation in already integrated agricultural areas or mixed areas of crops and abandoned regenerated shrubs. Only about 10% of the total area of observed poppy had experienced deforestation over the past 20 years. However, half that deforested area was recently cleared within three years of the observed poppy harvest. This suggests that opium poppy cultivation is a small but acute driver of deforestation in Lao PDR.

Detection of poppy plots in protected areas in Lao PDR



Implications and regional context

Opium production in Southeast Asia increased in the 2022 and 2023 harvest, with Myanmar dominating regional estimates. The region has long supplied opium and heroin markets in Asia, Oceania, and, to a lesser extent, other parts of the world.⁸ Opium poppy cultivation in Southeast Asia is closely linked to multi-dimensional poverty, lack of government services, challenging macroeconomic environments, instability, and insecurity.⁹ Both Myanmar and Lao PDR face serious economic challenges, and in the case of Myanmar, multi-dimensional crises that disproportionately affect vulnerable populations.

UNODC data from surveys of households and villages involved in opium poppy cultivation point to a significant development gap when compared to those not involved. Limited availability of legitimate economic opportunities, constrained access to markets and state infrastructure, and a worsening economic climate brought on by inflation and monetary depreciation can make opium, as well as other illicit commodities, an attractive alternative or for subsistence livelihoods.

In Myanmar, this appears to have played a significant role in farmers' decisions in late 2022 to cultivate more poppy. Against the background of continued disruptions to social, political, and economic stability following the military takeover in early 2021, Myanmar's economy faced a series of external and domestic shocks in 2021 and 2022. While the situation showed some signs of stabilization in early 2023, the World Bank notes that household incomes are constrained by high prices and shortages, coupled with import restrictions, preventing a full economic recovery.¹⁰ Governance challenges and the worsening internal conflict also play a role, with prior analysis showing close linkages between the proceeds from illegal drug production insecurity and conflict in Myanmar.¹¹

Opium production in Myanmar jumped 36% from 790 metric tons to 1,080 (95% confidence interval 760 to 1,700) metric tons between the 2022 and 2023 surveys.

Similarly, the economic situation in Lao PDR has become more challenging in recent years. The country's GDP has grown slower than anticipated and the Asian Development Bank recently downgraded forecasted growth for the country in light of high annual inflation (by far the highest in the region with a 2023 forecast at 28%) and currency depreciation (the Lao kip lost half its value in 2022 against the US dollar and a comparable amount against the Thai baht).¹² According to the World Bank, this has raised the cost of food, especially imported food, and severely affected nine out of ten households, encouraging many households and businesses to increase farming activities.¹³ The lack of data and visibility on trends since the last survey in 2015 makes it difficult to assess the impact of this on opium cultivation in Lao PDR, but the area under cultivation, as estimated in 2023, was comparable to the situation in 2015; although production estimates stood at 63 metric tons (30 to 108 metric tons), which is about half the amount estimated (130 metric tons) at the last survey. Irrespective of whether this reflects continuing stability of cultivation or a rebound following an earlier decline, the precarious economic situation is a risk factor requiring close monitoring of the situation.

Other factors, such as a possible global disruption in the availability of opium and heroin out of Afghanistan, which has long served as a leading source of illegally produced opiates, could influence the price of opium in the region. Since the 2022 ban on poppy cultivation in Afghanistan, production estimates in that country have fallen by some 95%, from 233,000 ha in 2022 to a mere 11,000 ha in 2023.¹⁴ An actual or perceived global shortage in opiates, including heroin, could result in upward pressure on the price of opium in the region, which would likely encourage more cultivation.

8 UNODC, "World Drug Report 2023," United Nations: Office on Drugs and Crime, 2023, [//www.unodc.org/unodc/en/data-and-analysis/world-drug-report-2023.html](https://www.unodc.org/unodc/en/data-and-analysis/world-drug-report-2023.html).

9 UNODC, "Southeast Asia Opium Survey 2015."

10 World Bank Group, "A Fragile Recovery," Myanmar Economic Monitor, June 2023, <https://thedocs.worldbank.org/en/doc/aec7787efb398a369338cec9be5e9d4b-0070062023/original/MyanmarEconomic-MonitorJune2023aFragileRecovery.pdf>.

11 UNODC, "Transnational Organized Crime in Southeast Asia: Evolution, Growth and Impact," 2019, https://www.unodc.org/roseap/uploads/archive/documents/Publications/2019/SEA_TOCTA_2019_web.pdf.

12 Asian Development Bank, "Lao PDR: Economy," text, August 10, 2022, Lao People's Democratic Republic, <https://www.adb.org/where-we-work/lao-pdr/economy>; Asian Development Bank, "Lao PDR's Growth Slower than Expected in 2023, Stable Outlook for 2024 — ADB."

13 World Bank Group, "Food Prices Affect Families in Lao PDR despite Easing Inflation - Lao People's Democratic Republic (The)," September 19, 2023, <https://reliefweb.int/report/lao-peoples-democratic-republic/food-prices-affect-families-lao-pdr-despite-easing-inflation>

14 UNODC, "Afghanistan Opium Survey 2023."

Against this background, strengthening the socio-economic resilience and basic livelihoods of farming communities will be critical to countering opium poppy cultivation, and supporting farmers living in poverty and, in the case of Myanmar, at the nexus of humanitarian, development, and conflict-related crises. Similarly, effective local governance mechanisms will be key to developing long-term sustainable solutions to illegal drug production in Southeast Asia.

The region's drug economy is not only shaped by opiates. It is important to understand the revitalized opium economy in conjunction with a surge in synthetic drug production in Myanmar, which continues to accelerate with reported regional seizures, especially for methamphetamine and ketamine, reaching record levels.¹⁵ In Lao PDR, recent seizures of methamphetamine, historic in their size and scope, suggest that the country has been increasingly targeted as a transit point. In particular, the transit route through Bokeo continues to gain in importance, with trafficking through the province increasingly tied to markets in Australia, Japan, New Zealand, the Republic of Korea, and other countries in Southeast Asia.¹⁶ While increased seizures of synthetic drugs do not necessarily equate to increased production, the volume and changes in the geographic pattern of seizures, combined with falling prices and stable or increasing purities of drugs available in consumer markets, point towards an increased sophistication in production, trafficking and availability, especially of methamphetamine.

Amidst expanding conflict in Myanmar and continued economic uncertainty in the region, it will be critical to continue monitoring these developments to ensure they can be factored into broader policy discussions within the region and beyond. In this context, the annual opium survey report is an essential tool for assessing the extent of opium poppy cultivation in Myanmar and Lao PDR, as well as understanding changes in cultivation and production patterns and the links between the illicit trade in drugs, security, the rural economy, the livelihoods of farmers and their communities, and regional and international illicit markets.

15 UNODC, "Synthetic Drugs in East and Southeast Asia Latest Developments and Challenges," 2023, https://www.unodc.org/roseap/uploads/documents/Publications/2023/Synthetic_Drugs_in_East_and_Southeast_Asia_2023.pdf;

16 Ibid.

MYANMAR

Introduction

This report presents the results of the twenty-first opium survey conducted in Myanmar, covering the 2022/2023 opium growing and harvesting season. It is the second survey conducted in Myanmar following the military takeover on 1 February 2021 and the ensuing internal conflict that continues to disrupt the economic, political and social life of the country.

Using a mix of local and global expertise of the UNODC's Illicit Crop Monitoring Programme (ICMP), the methodology used in this report combines the use of satellite imagery, and, when the situation on the ground allowed, field verification and yield surveys to evaluate the extent of opium poppy cultivation and production. In Myanmar, this included a total of 55 sample locations and three target areas in Shan, Kachin, Chin and Kayah States, which were examined to understand the areas under cultivation.¹⁷

The present survey compares cultivation levels with the preceding years to observe long-term trends. The last two surveys in Myanmar, covering the 2020/2021 and the 2021/2022 seasons, showed an increase at the national level in both areas under opium poppy cultivation and opium production. The 2022 survey reported a substantial 33% increase in area under cultivation to an estimated 40,100 hectares. With the areas under cultivation rising by 18% to 47,000 hectares in 2023, it is safe to say that the downward trend in cultivation that started in 2014 has been reversed.

The survey shows increases in cultivation area across almost all geographic areas. Most increases were observed in Shan State, which continues to be the centre of opium production in Myanmar at 88% of total cultivation area. With a combined cultivation area estimated at 41,300 ha, North, South and East Shan showed a year-on-year increase of 20%. Cultivation in Kachin saw a moderate increase of 6%, especially when compared to previous years where Kachin had seen above-average increases. Estimates for Chin and Kayah States, where the

overall area remained small in comparison to other states, showed a 10% increase for Chin and a 4% decrease in Kayah.

The increase is even more pronounced in terms of potential opium production due to continuously high levels of opium yields per hectare. Production was estimated at 1,080 (760-1,720) metric tons in 2023, or 36% more than in 2022, and is now at its highest estimated levels since 2001 (1,100 tons).

The increase in cultivation and production coincided with an increase in farmgate prices of both fresh and dry opium, by 28% and 27%, respectively. In combination with higher production, farmers earned two thirds more than in the previous year, between US\$271 - 613 in 2023 (US\$160 - 350 million in 2022). The farmgate value only represents a small share of the overall income from opiate manufacture and export: the estimated value of the overall opiate economy also increased and ranged between US\$1 to 2.4 billion, representing 1.7 – 4.1% of the 2022 GDP. However, the increase in income did not necessarily translate into purchasing power as inflation has soared in Myanmar. Recent reports indicated that overall inflation remained at high levels and averaged to 14.2% in 2023.¹⁸

17 Prior to the 2022 Myanmar Opium Survey, Chin and Kayah States had last been included in the 2018 survey. Past surveys had utilized the 2018 estimates to calculate the total opium poppy cultivation area in order to maintain comparability with the earlier surveys. The current survey results should also be compared to the 2018 estimates for these two States.

18 International Monetary Fund, Datamapper. <https://www.imf.org/external/datamapper/PCPIPCH@WEO/MMR?zoom=MMR&highlight=MMR>

Myanmar Fact Sheet

	Year 2022 (rounded)	Year 2023 (rounded)	Change 2022-2023
Total opium poppy cultivation (ha)¹⁹	40,100 (29,000 to 62,900)	47,100 (32,200 to 77,200)	18%
Opium poppy cultivation in Shan State	34,600 (23,700 to 45,500)	41,300 (26,500 to 55,900)	20%
Opium poppy cultivation in Kachin State	4,400 (2,500 to 10,900)	4,600 (2,700 to 11,200)	6%
Opium poppy cultivation in Chin State	640 (310 to 970)	700 (590 to 820)	10%
Opium poppy cultivation in Kayah State	500 (280 to 720)	480 (420 to 540)	-4%
Total potential production of dry opium (metric tons)²⁰	790 (580 to 1200)	1,080 (760 to 1720)	36%
Potential dry opium production in Shan State	670 (460 to 1090)	900 (590 to 1510)	35%
Potential dry opium production in Kachin State	100 (58 to 260)	153 (90 to 371)	49%
Potential dry opium production in Chin State	12.7 (6.1 to 19.3)	16.2 (13.4 to 19.0)	27%
Potential dry opium production in Kayah State	9.97 (5.7 to 14.4)	11.0 (9.44 to 12.6)	11%
Average opium yield (kg/ha)²¹	19.8 (18.5 to 21.3)	22.9 (21.6 to 24.4)	16%
Farmgate price of fresh opium ²²	248 US\$/kg (370,000 Kyat/kg)	317 US\$/kg (590,000 Kyat/kg)	28%
Farmgate price of dry opium	281 US\$/kg (418,000 Kyat/kg)	355 US\$/kg (662,000 Kyat/kg)	27%
Farmgate value of opium in million US\$	160 - 350	271 - 613	67 - 75%
Value of the opiate economy (gross) in million US\$	660 - 2,000	998 - 2,460	25 - 50%
Value of the opiate economy (after the farmgate) in million US\$	500 - 1,600	727 - 1,850	14 - 45%
Total opium poppy eradication reported by the CCDAC (ha)	1,403	2,358	68%

Numbers in the table are rounded, percentage changes are calculated with exact estimates. "CCDAC" refers to the Central Committee on Drug Abuse Control.

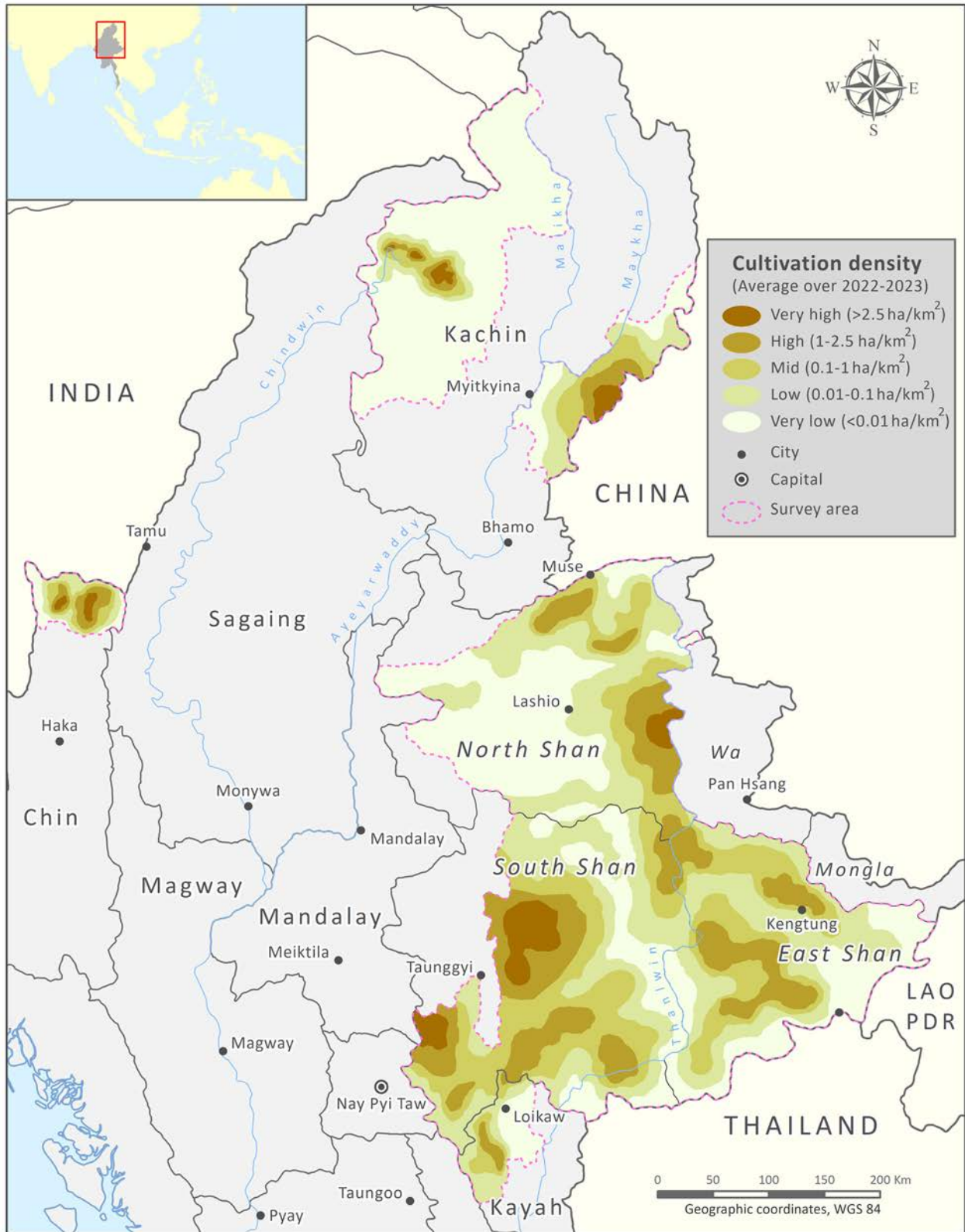
19 The estimates may include areas eradicated after the acquisition date of the satellite images.

20 In 2022, for Shan and Kachin states a multi-year average was applied, using data from 2020 to 2022. For Chin and Kayah States the national average yield was applied (see methodology report for further details).

21 Opium yields weighted by cultivation. In Kayah and Chin, the national average has been applied since no yield measurements were available.

22 National average weighted by regional production estimates. For 2022 and 2023, the applied exchange rates MMK/US\$ are the 2021 and 2022 DCE alternative conversion factors provided by the World Bank (<https://data.worldbank.org/indicator/PA.NUS.ATLS?locations=MM>).

Map 1: Opium poppy cultivation density in Myanmar in 2022-2023²³



Source: UNODC Illicit Crop Monitoring Programme.

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

23 To have a more comprehensive visualisation of cultivation density UNODC uses data from both 2022 and 2023.

1. Findings

1.1 Area under opium poppy cultivation

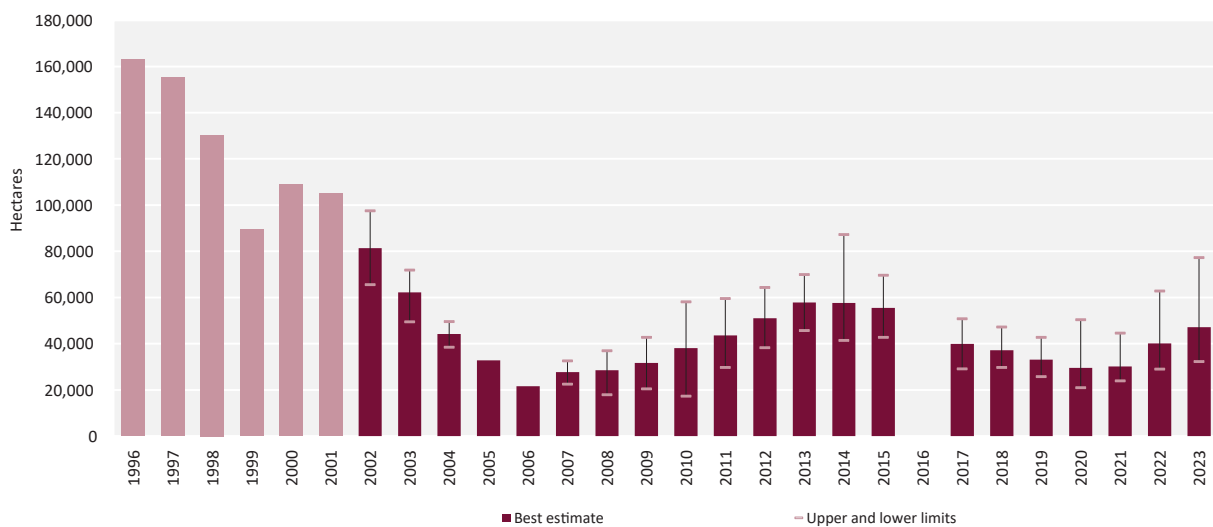
In 2023, the area under opium poppy cultivation in Myanmar was estimated at 47,100 (32,200 to 77,200) hectares. This represents an 18% increase from the 40,100 hectares estimated to be under cultivation in 2022. The national trend of reductions in poppy cultivation starting in 2014, when area under cultivation was estimated at 57,600 ha, levelled off in 2020 and has since risen for three consecutive years.

Poppy cultivation increased across all states. Compared to 2022, Shan state showed the largest increase in absolute terms of cultivated hectares (increase of some 7,000 hectares, or 20% from the

previous year). Major increases were observed in North and South Shan (24% and 33%, respectively). Increases elsewhere were less pronounced. In Kachin State, a 6% increase was detected. Within Kachin State, the Tanai region increased the most (20%) in cultivation. This is noteworthy as, in the 2022 survey, it was the only region that reported a decrease from the previous year.

Shan continued to be the main cultivating area in Myanmar, accounting for about the 88% (41,300 ha) of the overall opium poppy area. Within Shan State, the sub-regions of South, North and East Shan accounted for 48%, 22% and 17% of total cultivation in 2023, respectively. Kachin State accounted for 10% (4,600 ha), and Chin and Kayah States together for 2.5% (1,200 ha).

Figure 1: Opium poppy cultivation in Myanmar, 1996-2023 (ha)



Sources: from 1996 to 2001 USG, from 2002 to 2020 CCDAC-UNODC, for 2021 to 2023 UNODC. In 2016 no area survey was conducted.

Opium poppy cultivation assessment in northern Sagaing

In addition to Shan and Kachin, UNODC conducted the first field assessment of the northern Sagaing region in northern Myanmar after an eight-year hiatus. Although UNODC focuses on main producing areas, it continues to monitor trends elsewhere from time to time. In 2015, a dedicated UNODC national team embarked on a risk assessment mission to Lahe and Nanyun townships in the Sagaing region. During this mission, the team engaged in discussions with local authorities, community organizations, and poppy-growing villagers to understand the poppy cultivation situation. They also conducted on-site visits to various poppy fields across the area. At the time, local communities mainly cultivated poppy for medicinal purposes. These two consecutive years of risk assessment revealed that there was no significant poppy cultivation in northern Sagaing. In the 2015 survey, UNODC estimated that the total poppy cultivation area in the region was approximately 50 hectares.

In the 2023 survey, UNODC organized another assessment mission in northern Sagaing. A local surveyor with expertise in opium surveys visited the region in February 2023, conducting interviews to collect field data. Due to security and accessibility concerns on the ground, the UNODC surveyor was limited to visiting Nanyun township only, near the Indian border. The surveyor interviewed a total of 17 farmers involved in poppy cultivation in nine poppy-growing villages within Nanyun township and visited 17 poppy fields (refer to map below) to document geo-tagged photos of these fields. According to the interviews with farmers, poppy cultivation in Nanyun township in the current year is estimated to cover an area of 250-300 hectares. The farmers emphasized that poppy cultivation in the region has been gradually increasing in recent years.

Total poppy cultivation in northern Sagaing is small relative to major poppy cultivating states, such as Shan, but also relative to other areas with modest cultivation, such as Chin and Kayah. However, the five-fold growth over eight years (from 50 to 250 hectares) points to a need for regular monitoring of the opium situation in Sangaing.

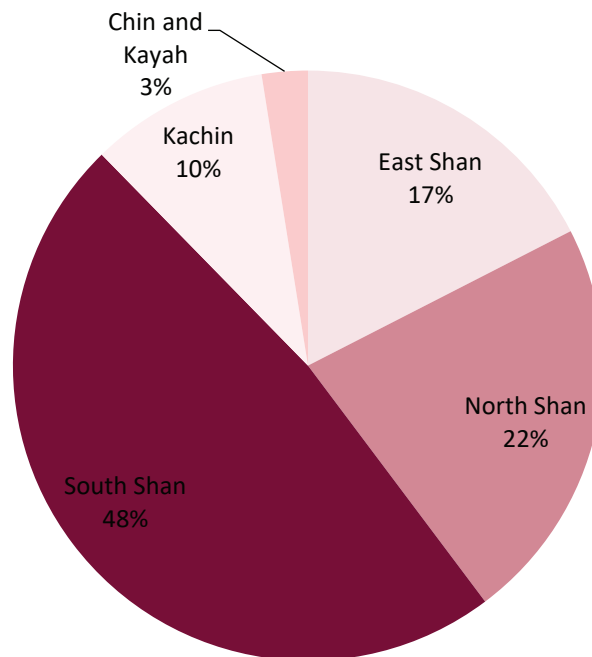
Assessing poppy fields in Northern Sagaing, 2023



Table 1: Areas under opium poppy cultivation in Myanmar (ha), in 2022 and 2023

Region	Year 2022 (rounded)	Year 2023 (rounded)	Change 2022-2023
South Shan	16,900 (7,900 to 34,500)	22,600 (10,200 to 47,300)	33%
East Shan	9,200 (5,700 to 15,800)	8,200 (3,400 to 16,000)	-10%
North Shan	8,400 (3,300 to 19,500)	10,500 (4,100 to 24,300)	24%
Shan State total	34,600 (23,700 to 45,500)	41,300 (26,500 to 55,900)	20%
Kachin	4,400 (2,500 to 10,900)	4,600 (2,700 to 11,200)	6%
Chin	640 (310 to 970)	700 (590 to 820)	10%
Kayah	500 (280 to 720)	480 (420 to 540)	-4%
National total	40,100 (29,000 to 62,900)	47,100 (32,200 to 77,200)	18%

Values in parentheses indicate the 95% confidence interval. Numbers in the table are rounded, percentage changes are calculated with exact estimates.

Figure 2: Regional share of opium poppy cultivation areas in Myanmar, 2023

A landscape of poppy cultivation area, Kachin 2023



Opium poppy cultivation is concentrated in certain areas

Opium poppy cultivation is concentrated in areas characterised by a combination of specific topographical conditions, challenging socio-economic circumstances and a precarious security situation. Furthermore, high-density poppy cultivation tends to be concentrated along international borders, as shown in Map 1 above which provides an overview of the average density of opium poppy cultivation.

South Shan showed high density opium poppy cultivation in the southwestern hills and the mountain ranges east of Taunggyi, whereas the southern part of South Shan was characterized by medium cultivation levels. Extensive cultivation persists in the areas near the boundaries of South, East and North Shan regions, on both sides of the Thanlwin River, while cultivation is dispersed in the areas along the southern boundaries of South Shan and East Shan. In several areas of North and South Shan, cultivation expanded around high-density areas identified in last year's survey, suggesting a further concentration of cultivation in those zones.

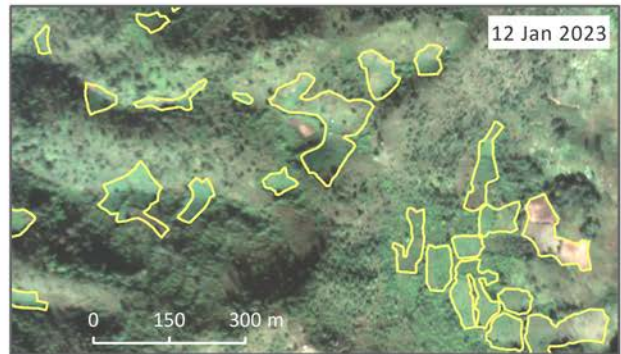
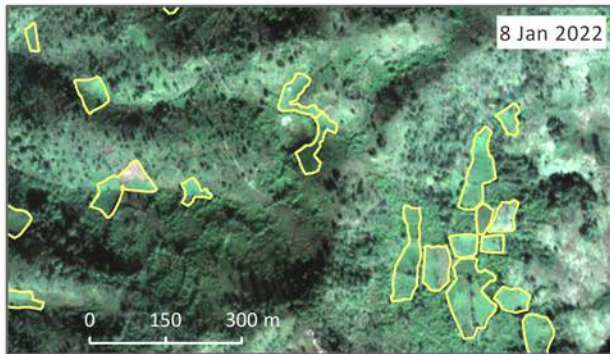
Overall, East and North Shan present areas with medium cultivation levels. The northern part (close to the border with Mongla region) and the mountain areas in the southwestern part of East Shan included some area of poppy. Cultivation is

dispersed in the southeastern and southern areas close to the international border with Thailand.

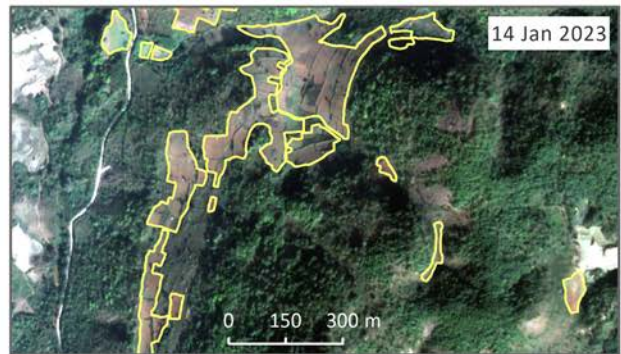
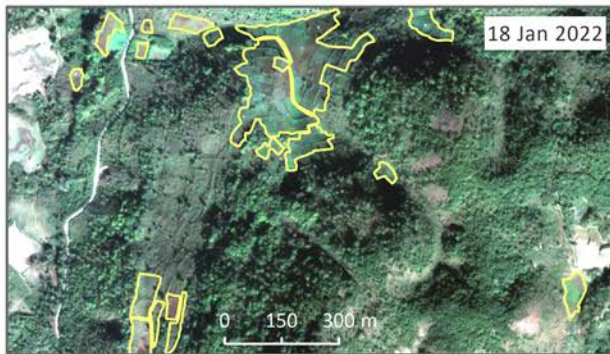
High-density cultivation areas were detected in the southeastern mountains bordering the Wa region. Very high cultivation levels were observed in pockets in the northwestern part of Kachin State and the areas east of Myitkyina, along the border with China. Chin State showed high poppy cultivation density in the mountains north of Tonzang town, along to the Indian border. In Kayah State, poppy cultivation is mainly dispersed.

A visual examination of year-over-year changes for several poppy plots shows increasing density in and around areas already affected by opium cultivation. The following images illustrate several side-by-side hotspot locations in Shan and Kachin. Satellite images were taken approximately at the same time one year apart. The analysis points to an increasing clustering and concentration of cultivation plots, as well as a concentration of cultivation in and around new clearings. Several high-density clusters also grew in size since the past harvest season.

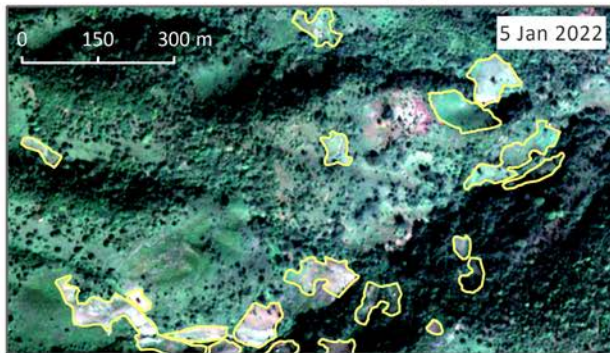
Increasing density of poppy in hotspot locations in Myanmar, 2022 to 2023



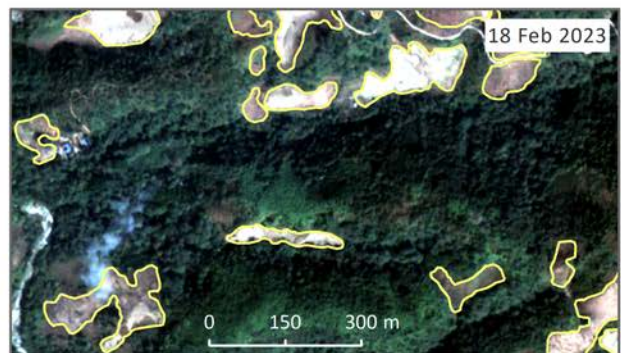
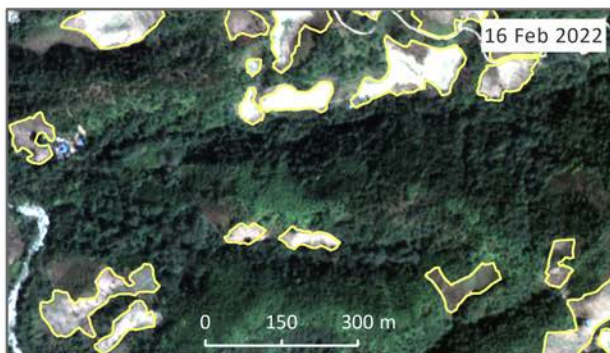
An occurrence of poppy cultivation increases in 2023 compared to 2022, South Shan



An occurrence of poppy cultivation increases in 2023 compared to 2022, North Shan



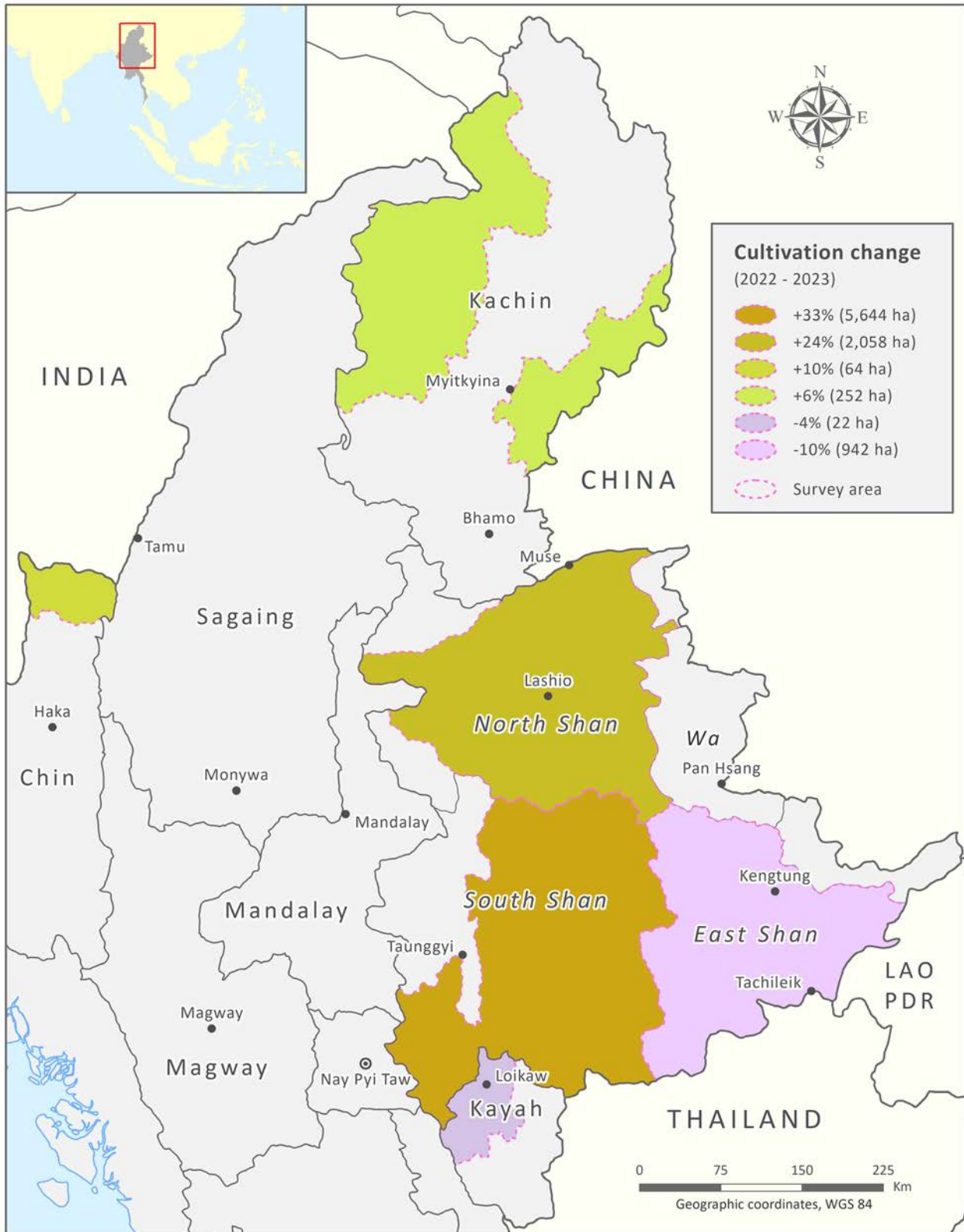
An occurrence of poppy cultivation decrease in 2023 compared to 2022, East Shan



An occurrence of minimal change in 2023 compared to 2022, Kachin

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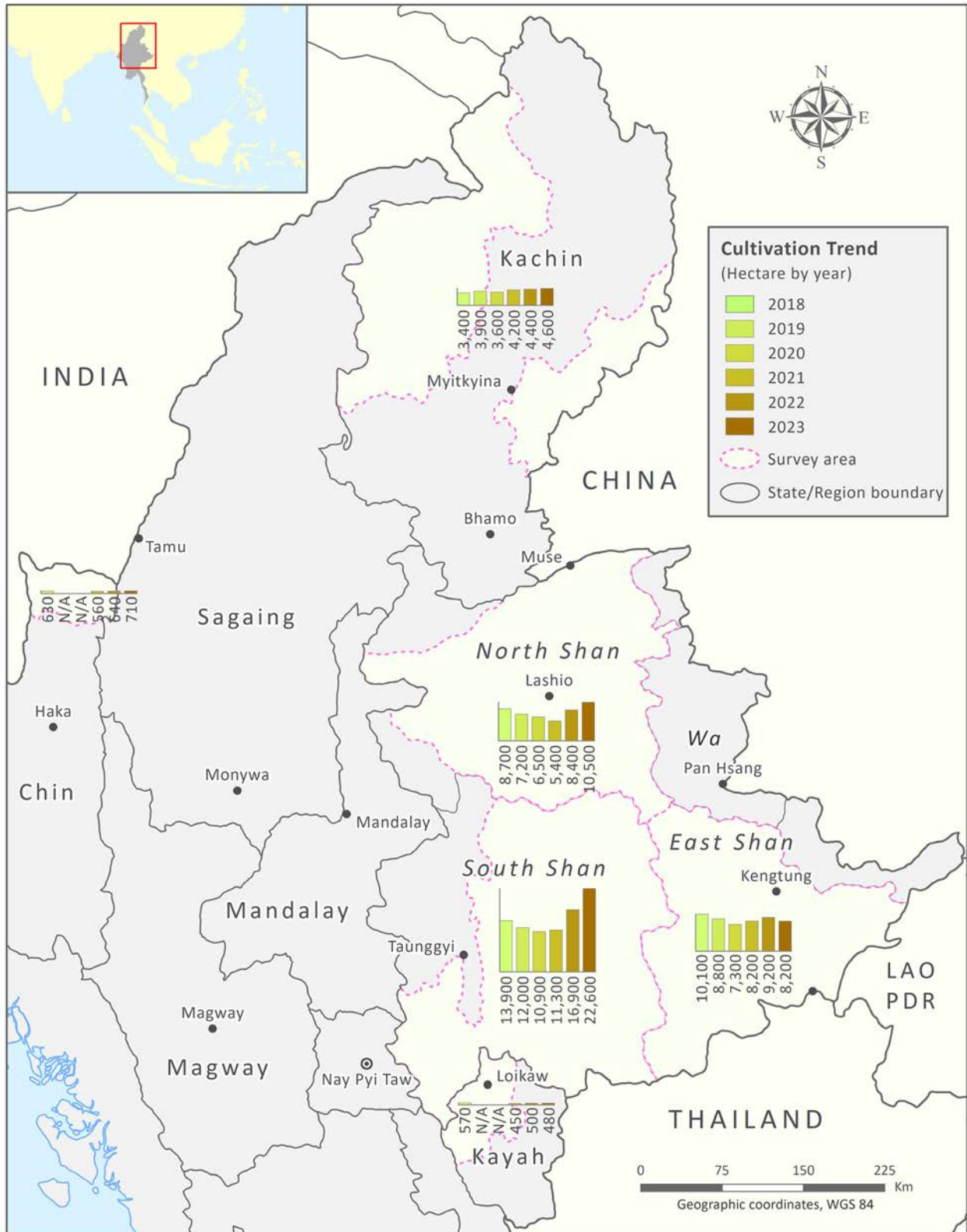
Map 2: Cultivation changes between 2022 and 2023



Source: UNODC Illicit Crop Monitoring Programme.

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

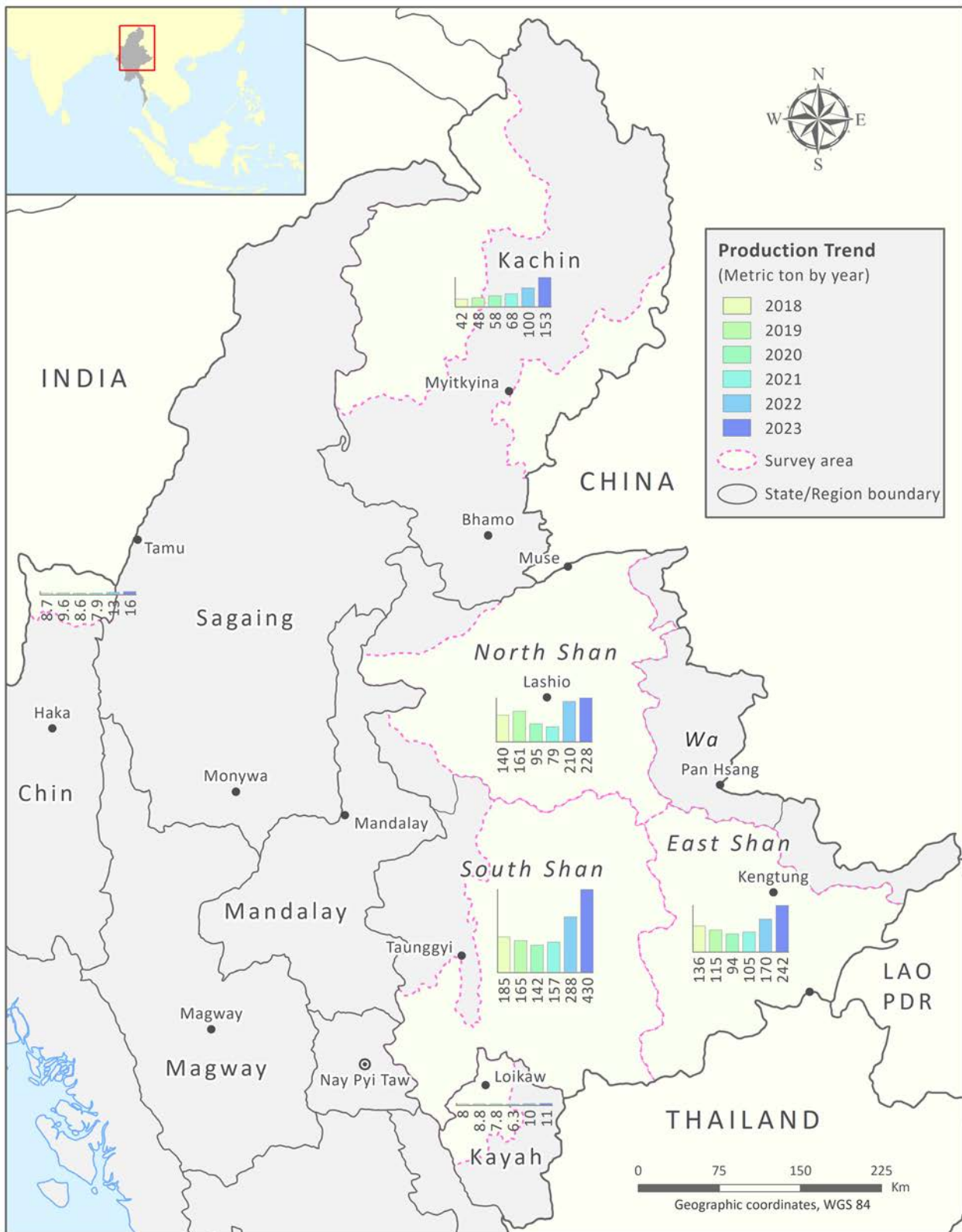
Map 3: Opium poppy cultivation trends in Myanmar, 2018-2023



Source: UNODC Illicit Crop Monitoring Programme.

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

Map 4: Opium gum production trends in Myanmar, 2018 - 2023



Source: UNODC Illicit Crop Monitoring Programme.

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

A poppy field with vibrant red flowers, commonly observed in South Shan, 2023



A well-managed poppy field, Kachin 2023



Watering a poppy field with sprinklers, South Shan 2023



Poppy fields cultivated alongside a hill valley, East Shan 2023



A poppy field with mature and lanced poppy capsules for harvesting, Kachin 2023



A poppy field in the flowering stage, East Shan 2023



Poppies planted across a mountain slope in a climate favourable for cultivation, Kachin 2023



Weeding in a poppy field, North Shan 2023



1.2 Opium yield and production estimates

In 2023, the yield survey was carried out in Shan and Kachin States. As in last year's survey, poppy fields in Myanmar appeared healthy with large capsule volumes. To avoid the possibility of the opportunistic nature of the sample biasing the final estimates, a three-year average was calculated using measures from 2021, 2022 and 2023. For Chin and Kayah States, the national average yield was applied (see separate methodology report for further details).

Compared to 2022, which also averaged yields over three years using measures from 2020, 2021 and 2022, increases in yield were observed in three surveyed regions: 58% in East Shan (29.4 kg/ha in 2023), 12% in South Shan (19 kg/ha in 2023), 40% Kachin (33.1 kg/ha in 2023). Only in North Shan, which reported the highest yield in 2022, was there a slight decline in yield at 13% to (21.7 kg/ha). The national average yield in 2023 was estimated at 22.9 (95% confidence interval: 21.6 to 24.4) kg/ha, 16% higher than the previous year. The yield estimate in 2022 was a record high, which was again surpassed by this year's estimate.

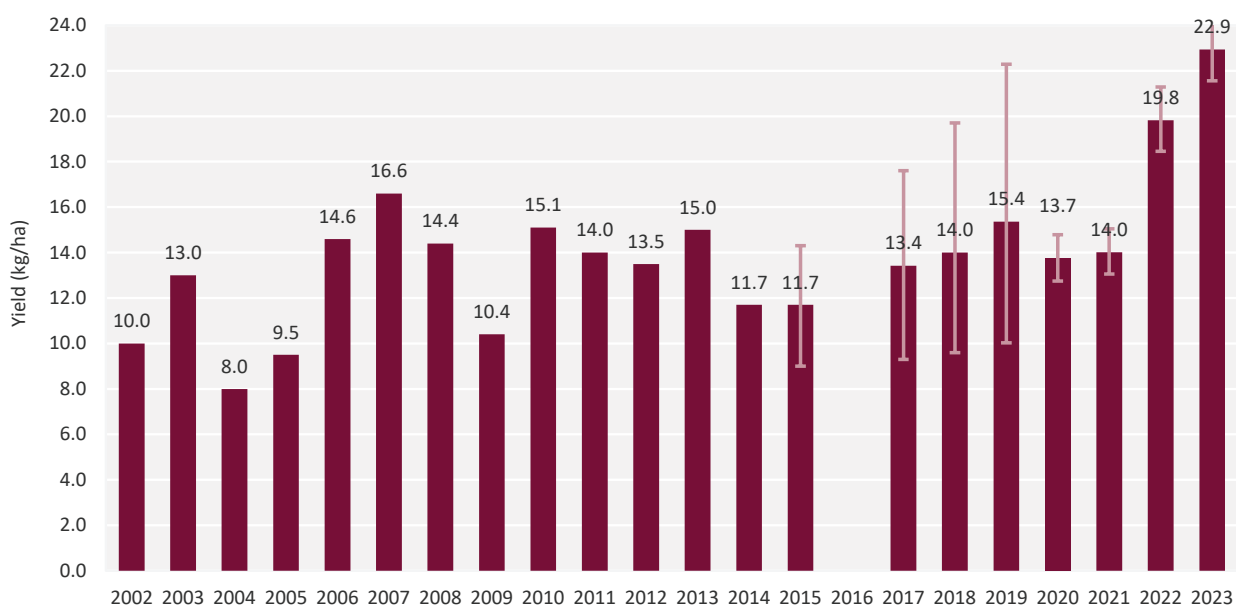
Instead of increasing area of poppy plots, cultivators appear to be increasing production through the use of new practices and inputs. Reports from

Myanmar in recent years point to continued use of sophisticated means of cultivation in some parts of the country, including increased plot density, improved organization of plants, and enhanced practices, such as use of irrigation systems and fertilizers. Field observations of poppy plants in the field note large and healthy capsules. In turn, increased yield estimates are largely driving up total opium production estimates, especially in states that reported modest changes or even decreases in area cultivation but increases in total opium production.

Large poppy capsules in the lancing stage, planted along fertile riverbanks, Tanai area, Kachin 2023



Figure 3: Average opium yield in Myanmar, 2002 – 2023



Average weighted by regional area estimates. In 2016 no survey was conducted. From 2021 to 2023, a multi-year average was used to estimate yields in Shan State regions, which reduced the uncertainty ranges around the average yield, as a much larger sample size was available (see the separate methodology report for further details).

Table 2: Potential opium yield by region (kg/ha), in 2021 and 2022

Region	2022	2023	Change
Kachin	23.6 (21.9 to 25.3)	33.1 (31.2 to 35.0)	41%
South Shan	17.0 (16.1 to 17.9)	19.0 (18.1 to 20.0)	12%
East Shan	18.6 (17.1 to 20.3)	29.4 (27.4 to 31.4)	58%
North Shan	24.9 (22.9 to 27.0)	21.7 (20.1 to 23.6)	-13%
Average yield	19.8 (18.46 to 21.29)	22.9 (21.6 to 24.4)	16%

Average weighted by cultivation. Values in parentheses indicate the 95% confidence interval. Numbers in the table are rounded, percentage changes are calculated with exact estimates but rounded. In Kayah and Chin, the national average has been applied since no yield measurements were available.

The resulting estimate of potential dry opium production in Myanmar in 2023 was 1,080 (760-1,720) metric tons, the highest since 2001 (1,100 tons of opium were estimated that year). This represents a substantial increase of 36% compared with the 2022 estimate. Growth was estimated in all states, with a fifty percent increase in the South Shan and Kachin areas. Increasing yield drove increased opium production in Kachin, which was estimated to have increased area under cultivation by a modest 6% but yield by 41%. Overall, opium production in Kachin was estimated to have increased by 49%.

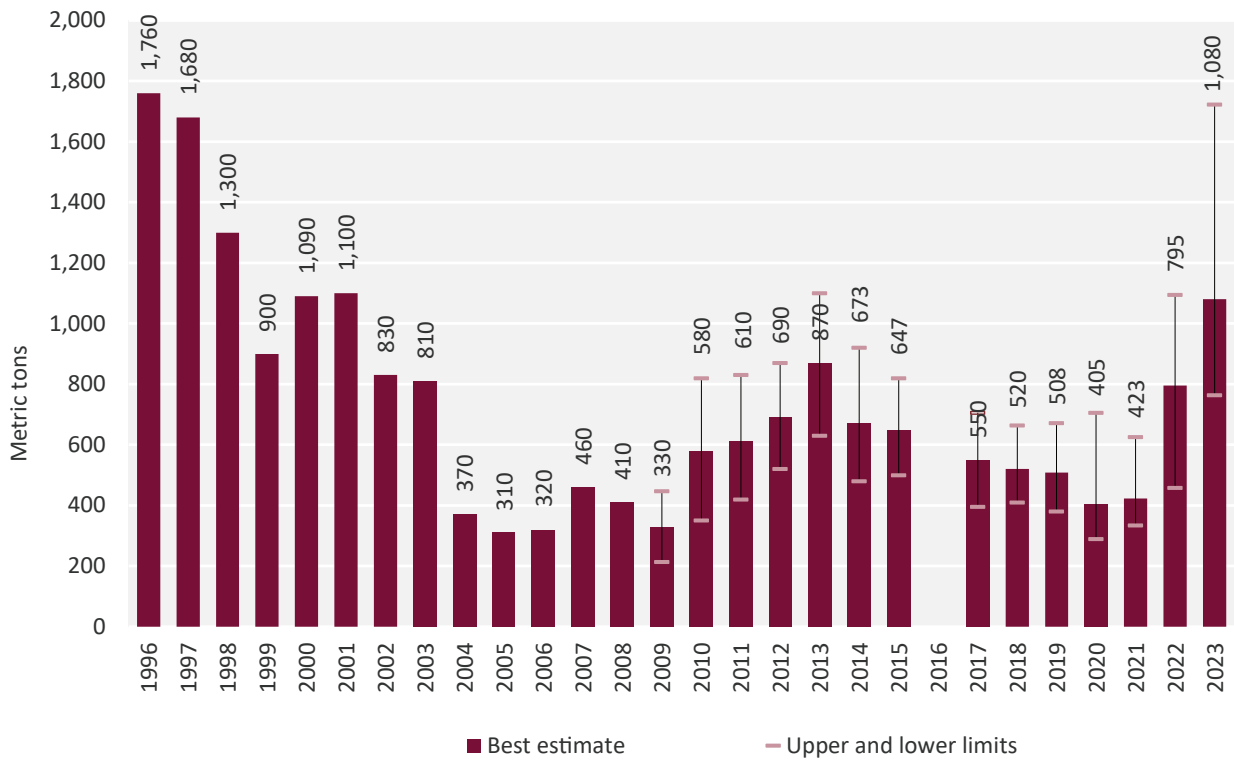
However, at the national level, Shan State continues to be by far the dominant opium producing State, accounting for more than the 83% of the national total of opium, about half of which comes from the South Shan region.

Table 3: Potential opium production by region and State (metric tons) in 2022/2023

Region	Potential production 2022	Potential production 2023	Change 2022-2023	2023 proportion by State
South Shan	288 (134 to 587)	430 (193 to 902)	50%	40%
East Shan	170 (104 to 295)	242 (100 to 470)	42%	22%
North Shan	210 (82 to 488)	228 (87 to 529)	8%	21%
Shan State total	670 (460 to 1100)	900 (590 to 1,510)	35%	83%
Kachin State	100 (58 to 260)	153 (90 to 371)	49%	14%
Chin State	13 (6.1 to 19)	16 (13 to 19)	27%	1%
Kayah State	10 (5.7 to 14)	11 (9 to 13)	11%	1%
Total	790 (580 to 1,200)	1,080 (760 to 1,720)	36%	100%

Values in parentheses indicate the 95% confidence interval. Numbers in the table are rounded, percentage changes are calculated with exact estimates.

Figure 4: Potential opium production in Myanmar, 1996-2023 (metric tons)



Source: from 1996 to 2001 USG, from 2002 to 2020 CCDAC-UNODC, in 2021 and 2022 UNODC only. In 2016 no survey was conducted.

A white-flowered poppy field, commonly observed in South and North Shan, 2023



Brown opium gum on a poppy capsule ready for collection, North Shan 2023



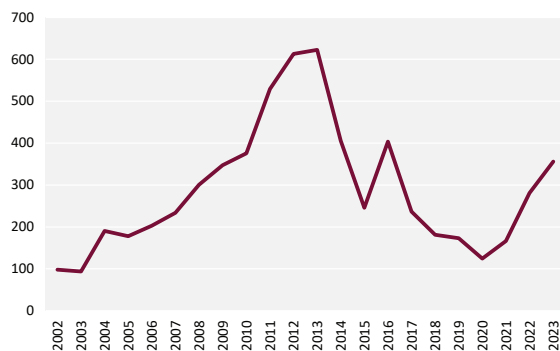
1.3 Farmgate price of opium

Opium price data were collected during the yield survey implemented between December 2022 and February 2023 in the three regions of Shan State and in Kachin State.

The average²⁴ farmgate prices at harvest time of fresh and dry opium in 2023 were assessed at around US\$315 (590,000 Kyat) and US\$356 (662,000 Kyat) per kilogram, respectively.²⁵

In 2023, the farmgate price continued its upward trend started in 2021. However, because of the small number of price data samples collected in 2021, it is difficult to pinpoint the exact reasons for rising prices given growing production. Prices of licit crops, such as rice, have been found to be increasing, too, which has been attributed to conflict-related disruptions to markets, high prices of agricultural inputs, and transport costs.²⁶ It might also be that opium production and prices are linked to political and economic insecurity in Myanmar.²⁷

Figure 5: Nominal farm-gate prices of dry opium in poppy-growing villages, Myanmar, 2002-2023 (US\$ per kilogram)



Without inflation adjustment.

1.4 Opium economy in Myanmar

In 2023, the role of opiates in the Myanmar economy continues growing in importance. The farmgate value of opium is an important measure of the gross income of farmers generated by opium

poppy cultivation. In 2023, it was estimated to range between US\$271 to 613 million, representing between 0.5 and 1% of the 2022 national GDP, and between 2 and 5% of the agricultural, forestry and fishing component of the 2022 GDP, which was estimated at US\$12 billion.²⁸ Between 2022 and 2023, the farmgate value increased some 50 to 75%.

The harvested opium is either consumed raw or further processed into heroin. Both raw opium and heroin reach the end-consumer markets in Myanmar and are exported outside Myanmar – or are seized by law enforcement.

After deducting the seizures of opiates in Myanmar reported by relevant law enforcement agencies,²⁹ it was estimated that 102 tons of raw opium and between 64 to 160 tons of heroin reached the illicit markets in the country and outside.³⁰ Out of these 102 tons of opium, 22 tons were destined for domestic consumption, with a value of US\$13 million; the remaining 80 tons of opium were exported with a value of US\$48 million.

The most valuable component of the opium economy is heroin trafficking. In 2023, it was estimated that 5.8 tons of heroin were consumed in Myanmar, with a monetary value ranging between US\$104 and 197 million. Between 58 to 154 tons of heroin were exported, with a value between US\$835 million and 2.2 billion.

The gross value of the entire opiate economy – comprising both the value of domestic consumption and exports of opium and heroin – in Myanmar in 2023 was estimated to be between US\$1 and 2.5 billion, accounting for about 2 to 4% of the national GDP in 2022.

The value of manufacturing and trafficking after farmgate up to the border of Myanmar ranged between US\$0.72 and 1.85 billion. This value represents the income generated by traffickers after deducting the cost of buying raw opium from the farmers.

24 Weighted by opium production in the respective regions.

25 Applied MMK/USD exchange rate is the 2022 DEC alternative conversion factor provided by the World Bank (<https://data.worldbank.org/indicator/PA.NUS.ATLS>).

26 FAO, "Country Brief on Myanmar -," June 14, 2023, <https://www.fao.org/giews/countrybrief/country.jsp?code=MMR&lang=FR>.

27 UNODC, "Southeast Asia Opium Survey 2015."

28 Source: World Bank.

29 CCDAC reported between 1 of January and 31 October 2022 the seizures of 1,094 kg of opium and 1,249 kg of heroin. The quantities of opiates seized in the whole year 2022 were extrapolated based on these figures, 1,313 and 1,500 kg respectively.

30 See more in separate Methodology report.

Table 4: Estimated values of the opiates economy, 2023

	Gross value Millions of US\$	Value in relation to GDP* (%)
Value of the opiates economy (gross)	998 – 2,460	1.7% – 4.1%
Value of opiates potentially available for export	882 – 2,250	1.5% - 3.8%
Raw opium	48	
Heroin	835 – 2,200	
Value of the opiates market for domestic consumption	117 - 210	0.2% - 0.4%
Raw opium	13	
Heroin	104 - 197	
Farm-gate value of opium	271 - 613	0.5% - 1%
Value of the opiate economy after farm-gate to the border	726 – 1,850	1.2% – 3.1%

* GDP 2022. Source: World Bank.

The gross value of opiates is the sum of the value of the domestic market and the value of opiates believed to be exported. Numbers in the table are rounded, percentages are calculated with exact estimates. Ranges are calculated based on lower and upper bounds of opium production and on assumptions about the different purities of exported and domestic heroin. See more details in the Methodology report.

Limitations of estimating the value of the opiate economy

The estimates presented here have some limitations. There is great uncertainty around the conversion ratio of opium to heroin, which depends on three main factors: The morphine content of opium, the efficiency of traffickers to extract morphine from opium and convert morphine to heroin, and the purity of the heroin estimated.³¹ None of these factors are well researched in the context of Myanmar, but can have a strong impact on the estimated values of the opiate economy. Estimates on demand in the region are based on 2010 data and may have changed since then. Moreover, the estimates presented are gross estimates before deducting any cost, (e.g., costs for precursor substances), such as acetic anhydride, which can substantially reduce the profits of manufacturers and traffickers of heroin. To assess the profits made, other cost components such as transportation, labour costs and costs of bribery also need to be considered.

The estimates presented here need to be understood as an indication of the order of magnitude rather than as precise measurements. UNODC is working to improve the accuracy of the estimates.

31 For a detailed description of the calculation of conversion ratios see “UNODC/MCN Afghanistan opium survey 2014” and “UNODC/MCN Afghanistan opium survey 2017 – Challenges to sustainable development, peace and security”.

2. Eradication and Seizures

2.1 Eradication

During the 2022 – 2023 poppy growing season, CCDAC reported the eradication of 2,358 ha of opium poppy, 68% more than in the previous season, with most of the eradication activities implemented in South Shan, with almost 93% of the eradicated area.

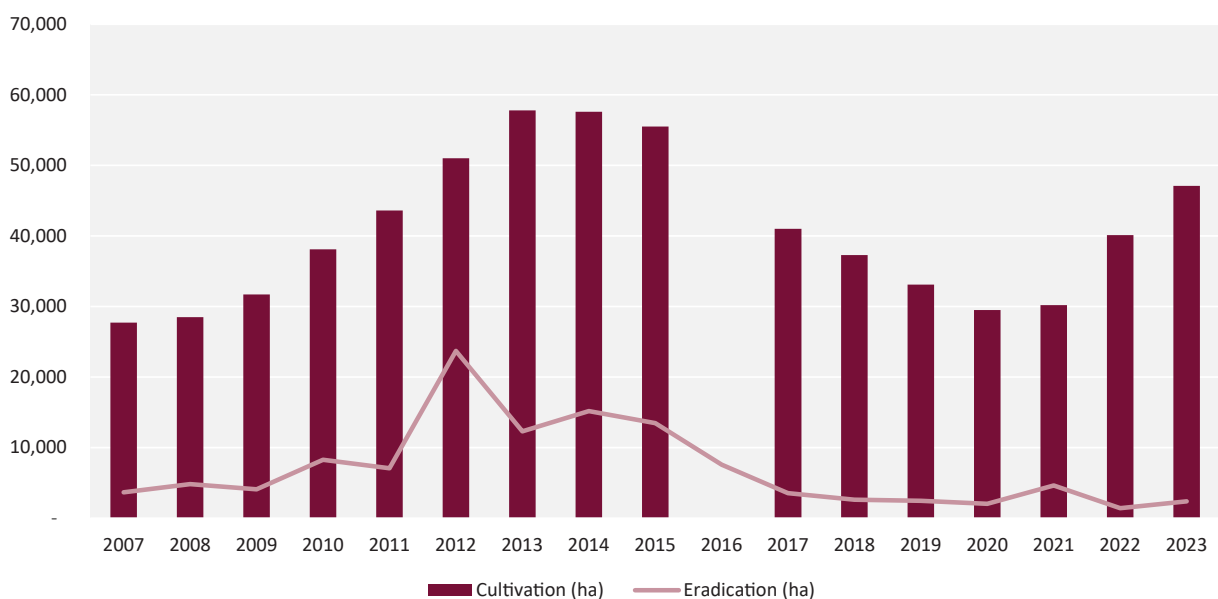
The opium poppy cultivation estimates presented in this report refer to the fields that were identified at the time that the satellite images were taken. Therefore, if any effective eradication was carried out after the satellite image acquisition dates, it is not reflected in the estimated cultivation figures. Data provided by CCDAC may include eradication implemented during the monsoon poppy season, prior to the main growing season when the remote sensing survey was implemented. The eradication figures reported by CCDAC were not verified by UNODC.

Table 5: Reported eradication in Myanmar (ha), 2006-2023

Region	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
East Shan	356	378	482	264	224	100	106	85	55	74
North Shan	337	532	69	97	29	44	179	127	34	53
South Shan	13,696	10,715	4,947	3,019	2,209	2,000	1,571	4,226	1,282	2,186
Shan State total	14,389	11,625	5,498	3,381	2,462	2,144	1,856	4,438	1,370	2,312
Kachin	395	1,495	1,504	28	65	126	75	90	19	33
Kayah	67	54	16	47	12	3	0	0	0	0
Magway	60	8	9	47	44	19	25	18	15	9
Chin	277	267	534	28	22	50	35	81	0	0
Mandalay	0	0	0	1	0	0	0	0	0	0
Sagaing	1	0	0	0	0	118	31	5	0	4
Other States	0	0	0	0	0	0	0	0	0	0
National total	15,188	13,450	7,561	3,533	2,605	2,460	2,023	4,633	1,403	2,358

Source: CCDAC.

Figure 6: Eradication versus opium poppy cultivation in Myanmar (ha), 2007-2023



Sun-drying poppy capsules to extract seeds for the next planting season, North Shan 2023



Collecting freshly harvested opium gum, Kachin 2023



Preparation for conducting measurements in a poppy field to collect yield data, South Shan 2023



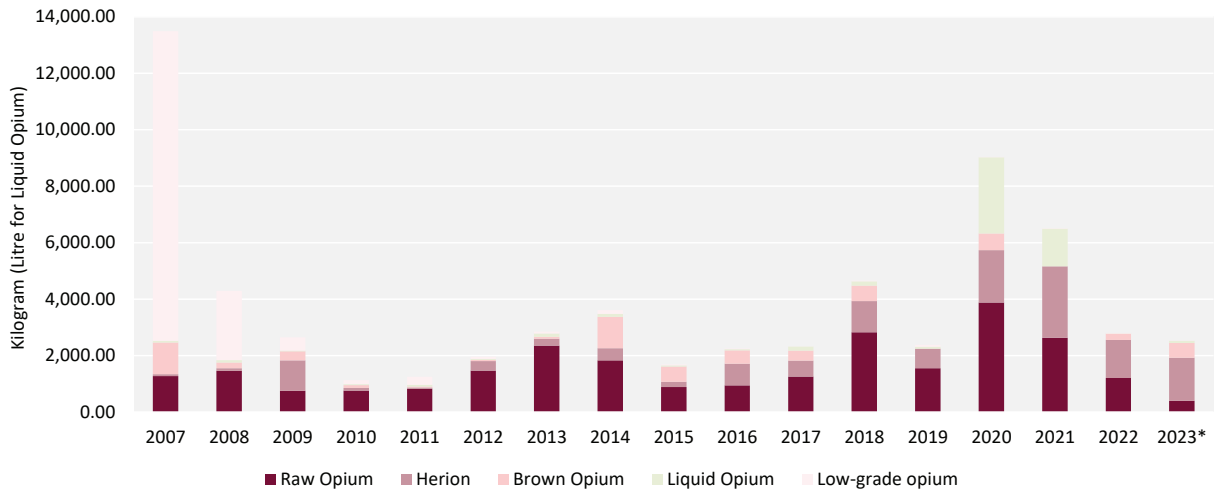
2.2 Seizures

Table 6: Reported opiates seizures in Myanmar (kg), 1988-2023

Year	Raw Opium	Heroin	Brown Opium	Liquid Opium	Low-grade Opium
1998	5,394	404	96	206	312
1999	1,473	245	24	333	314
2000	1,528	159	23	16	245
2001	1,629	97	7	19	142
2002	1,863	334	314	18	126
2003	1,482	568	156	52	204
2004	607	974	59	39	396
2005	773	812	44	21	128
2006	2,321	192	1,371	29	6,154
2007	1,274	68	1,121	56	10,972
2008	1,463	88	206	80	2453
2009	752	1,076	326	27	465
2010	765	89	98	35	147
2011	828	42	37	60	282
2012	1,470	336	46	29	81
2013	2,357	239	72	115	66
2014	1,828	435	1,109	102	134
2015	889	186	539	38	35
2016	944	769	472	47	22
2017	1,256	754	348	146	6
2018	2,829	1,099	554	146	30
2019	1,553	690	6	65	66
2020	3,883	1,853	523	2,694	22
2021	2,110	2,003	0	1,334	21
2022	1,078	1,249	1	2	13
2023*	396	1,526	529	75	0.4

* Figures for 2023 correspond to the period 1 January – 31 October. Source: CCDAC.

Figure 7: Opiates seized in Myanmar (kg), by type, 2007-2023

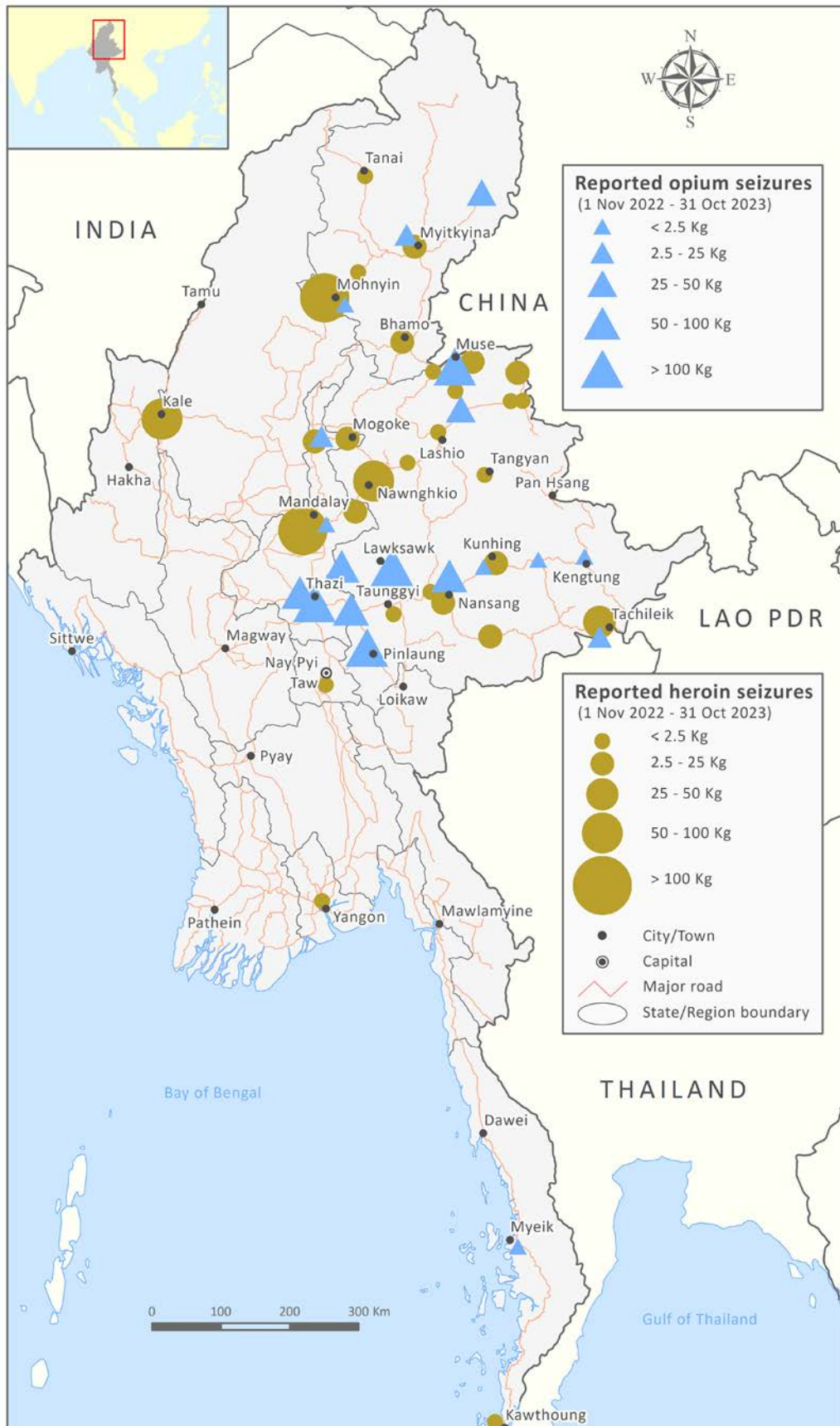


Source: CCDAC. * Figures for 2023 correspond to 1 January – 31 October only.

Heroin (33 Kg) and methamphetamine tablets seizure in Myanmar, October 2023



Map 5: Seizures of opium and heroin in Myanmar, 1 November 2022 to 31 October 2023



Source: CCDAC.

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

3. Socioeconomic Analysis

Myanmar's economy faced a series of external and domestic shocks since February 2021. While the economic situation showed some signs of stabilization in early 2023, the World Bank notes that household incomes remain weak and that high prices and shortages, coupled with import restrictions, prevent a full economic recovery.³² As such, a weak economic environment could drive some farmers to take up or expand cultivation or look to other illegal economic activity.

To better understand the links between poverty, development and illicit crop cultivation, UNODC carries out socio-economic surveys of households and villages in and around poppy cultivation areas.

The socio-economic surveys compare households or villages involved in opium poppy cultivation with those not involved across several key areas. Households and village authorities in Kachin and Shan State were asked a range of questions. The most recent assessments were carried out in Kachin in late-2021, covering the 2021 planting season, and two surveys were recently completed in Shan State, the first in 2019 and later in 2022. In Kachin, 150 village authorities and 447 households were surveyed. In Shan, 1800 and 750 households were sampled in 2019 and 2022, respectively; and 600 and 250 villages were surveyed in 2019 and 2022, respectively. Villages and households surveyed in Shan in each wave were not the same.

The survey data provide measures before and after the military takeover in Myanmar in Shan, allowing for a temporal analysis of the differences over time. Where possible, UNODC compared the extent of socioeconomic vulnerabilities in households and villages as they relate to poppy cultivation or involvement in the opium economy (either through the direct production or trade of opium).

Villages defined as 'involved in poppy cultivation' were those where any households cultivated and/or worked on poppy fields. In contrast, villages were defined as 'not involved' if no households in the village derived income from poppy.

32 World Bank Group, "Myanmar Economic Monitor June 2023: A Fragile Recovery," Text/HTML, World Bank, June 27, 2023, <https://www.worldbank.org/en/country/myanmar/publication/myanmar-economic-monitor-june-2023-a-fragile-recovery-key-findings>.

Opium poppy cultivation in Myanmar is concentrated in areas characterised by a combination of specific topographical conditions and challenging socio-economic environments. Earlier studies on opium poppy cultivation, including from other countries such as Afghanistan, that used socioeconomic surveys with community leaders and households have consistently identified the absence of formalized property arrangements, suitable infrastructure, and basic services as important determinants of illicit crop cultivation.³³

Lancing poppy capsules in a harvesting stage poppy field, Kachin 2023

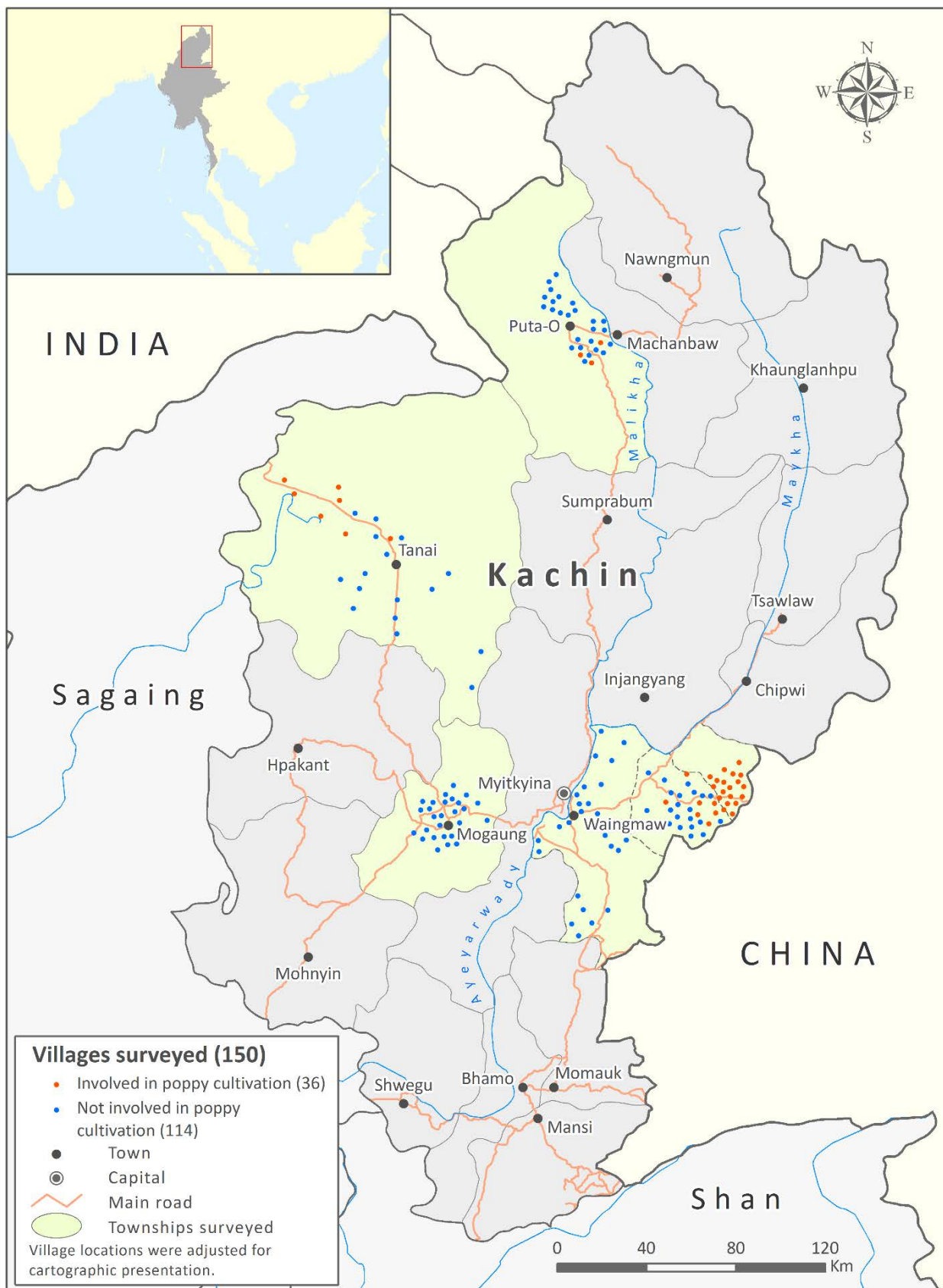


Harvesting opium gum from a lanced poppy capsule, North Shan 2023



33 UNODC and NSIA, "Afghanistan Opium Survey 2018 Challenges to Sustainable Development, Peace and Security," July 2019, https://www.unodc.org/documents/crop-monitoring/Afghanistan/Afghanistan_opium_survey_2018_socioeconomic_report.pdf; UNODC, "Opium Poppy Cultivation and Sustainable Development in Shan State, Myanmar," 2019, https://www.unodc.org/documents/crop-monitoring/Myanmar/Myanmar_Socio-economic_Survey_2019_web.pdf.

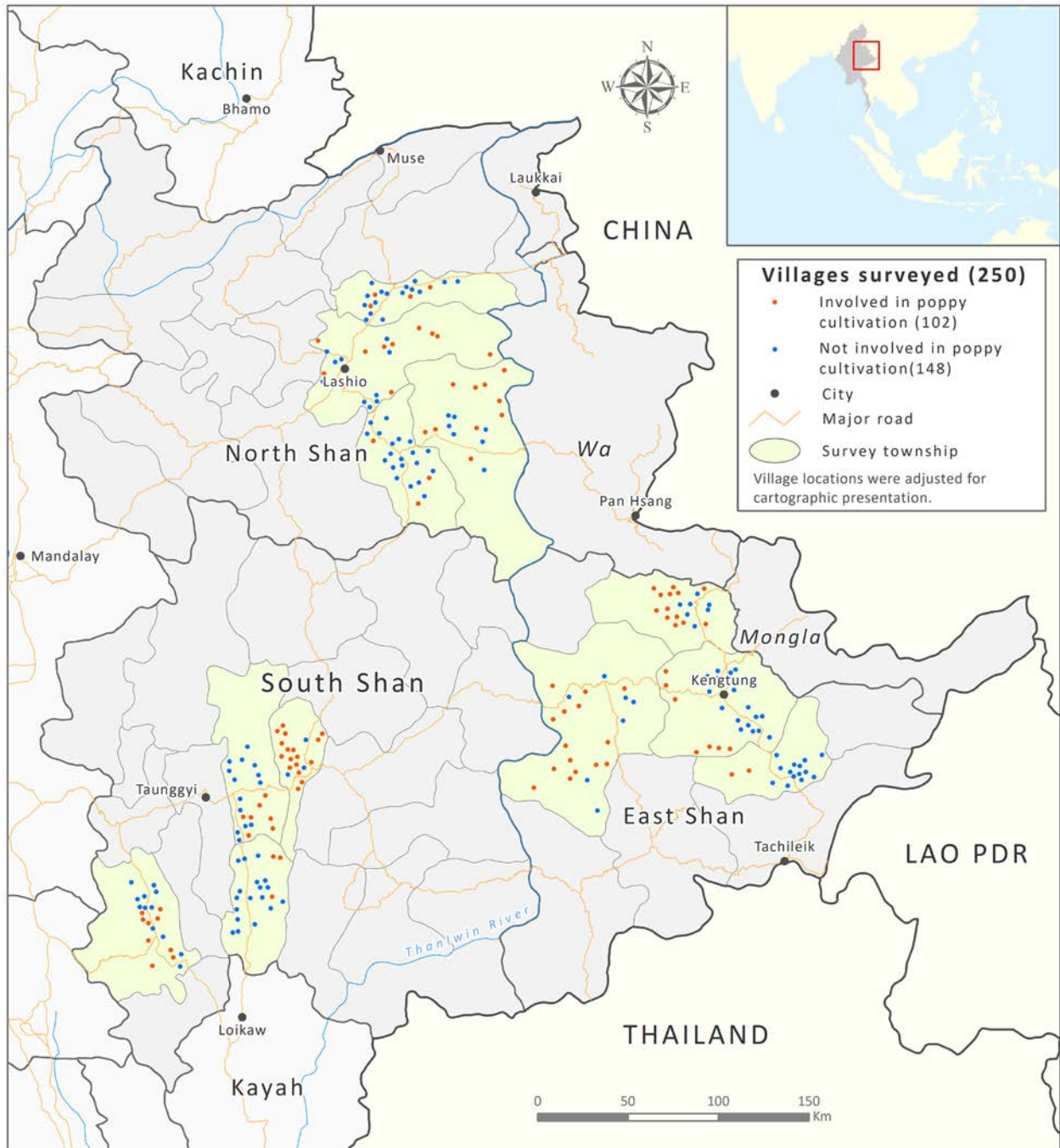
Map 6: Location of surveyed villages in Kachin State (October-December 2021), by involvement in poppy cultivation



Source: UNODC Illicit Crop Monitoring Programme.

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

Map 7: Location of surveyed villages in Shan State (May-July 2022), by involvement in poppy cultivation



Source: UNODC Illicit Crop Monitoring Programme.

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

3.1 Household

When comparing relevant household demographic indicators, Shan reports more significant differences between households involved in poppy cultivation and those not involved. Overall, there were more poppy or opium-involved households in comparison to households not involved in poppy or opium in Shan than in Kachin, reflecting Shan State's role as the centre of opium cultivation. In Shan, 1,888 households were involved with opium or poppy, while 662 were not; in contrast, only 152 were involved in poppy in Kachin compared with 295 which were not.

Demographically, the head of household level of education and average age of household head were the only significantly different measures in Kachin. In this case, heads of non-poppy involved households had greater shares reporting at least

secondary education (31 vs 19%; Wilcoxon rank sum test $p < 0.05$) and were about four years older on average (51 vs 47 years; Wilcoxon rank sum test $p < 0.01$). Apart from that, households were generally the same in terms of average size, share with male heads, and the share of household heads born in their same township.

In contrast, households in Shan reported more significant differences. This may be due to the larger nature and greater diversity of the Shan state as compared to Kachin. In this case, poppy-involved households in Shan were larger on average (5.79 vs 5.26 persons; Wilcoxon rank sum test $p < 0.01$), which was largely attributed to differences in the number of children (1.61 vs 1.93; Wilcoxon rank sum test $p < 0.01$), were more likely to be headed by a male (93 vs 89%; Wilcoxon rank sum test $p < 0.01$), had slightly lower shares of secondary education, lower average ages, and had higher shares reporting being born in the same township.

Table 7: Demographic statistics for poppy-involved and not-involved households in Kachin and Shan

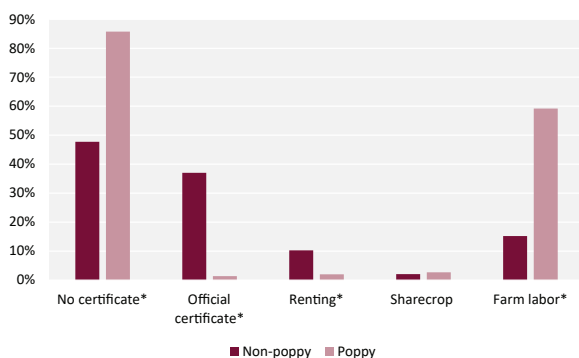
	Kachin		Shan	
	Households not involved in poppy	Households involved in poppy	Households not involved in poppy	Households involved in poppy
Count	295	152	662	1888
Average size	6.27	6.3	5.26	5.79
Average number of adult males	1.97	1.89	1.76	1.98
Average number of adult females	2	2.06	1.9	1.88
Average number of children	2.3	2.35	1.61	1.93
Male head of household	85%	84%	89%	93%
Head of household with at least secondary education	31%	19%	15%	14%
Average age of head of household	50.6	46.6	50.8	47.7
Head of household born in same township as current residence	87%	86%	86%	95%

Cells that are bolded denote significant differences per Wilcoxon rank sum test used to test significance.

The descriptive data show that, on average, both types of households in Kachin had larger household sizes, especially more children. Households in Kachin also had higher shares of heads with secondary education.

Households in Kachin were asked to select all land ownership statuses for all their plots, and so multiple statuses are possible for each household. A substantial share of households (86%) that derive income from poppy reported having no land certificate for at least some of their plots. That compares to 48% of households involved in poppy and is a statistically significant difference ($p < 0.05$). In other words, poppy-involved households report higher rates of informal land tenureship status. Sharecropping is not common among households. In contrast, households not involved in poppy are about five times as likely to rent their land than households that are involved in poppy cultivation (10 vs 2%; $p < 0.05$). Alongside greater shares with official certificates and renting, households not involved in poppy are more likely to have more formalized land tenureship statuses. By contrast, households involved in poppy cultivation are reportedly more likely to cultivate crops as daily farm labour (59 vs 15%; $p < 0.05$).

Figure 8: Land ownership status, by household involvement in poppy

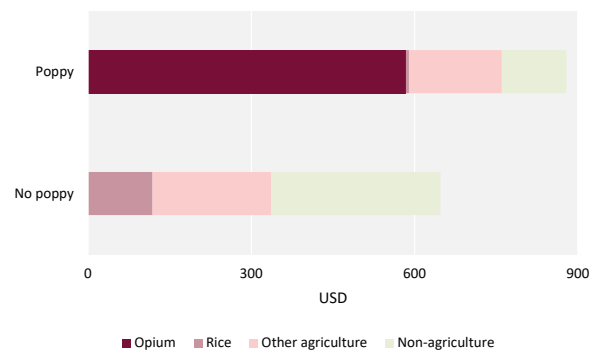


Stars indicate statistical difference with a significance of $p < 0.05$. Significant differences were consistent across both a two-tailed t-test and a Wilcoxon rank sum test.

In Kachin, surveys with household heads also suggest that non-poppy involved households earn considerably more in non-poppy income than poppy-involved households, even though the latter earn more overall per year. The survey did not ask about household costs associated with various agricultural activities, but village

headmen reported those measures. Agricultural expenditures involving poppy suggest the crop is more costly to cultivate and harvest, so even though total household revenues were greater for poppy-engaged households, their total profits may be less overall.

Figure 9: Kachin: Average annual amount earned by each income source, by household involvement in poppy

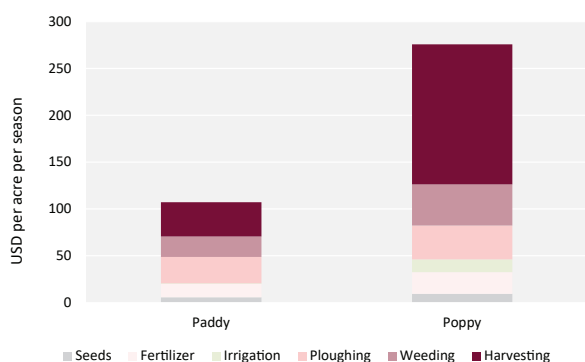


Although households in Kachin not involved in poppy cultivated more land than those involved in poppy cultivation, the income from opium of households involved in poppy cultivation (US\$584) is significantly larger than the income from all agricultural activities of households not involved in poppy (US\$336; $p < .01$) or slightly less than the average total licit economic activity for households not involved in poppy (US\$647). This suggests that poppy cultivation, which occurs on small household plots on average, generates more revenue per acre. Households not involved in poppy in Kachin are economically active in other non-agricultural areas, earning close to half of their annual income from non-agricultural activities, compared with 14% for poppy-involved households. However, poppy-involved households earn less than half as much in all other licit forms of economic activity than non-poppy involved households (US\$295 compared with US\$647).

In terms of cultivation of poppy or other agricultural goods, such as rice paddy, the costs differ substantially per acre of land cultivated. In Kachin, village headmen reported the average cost of cultivating poppy is notably higher than that of paddy rice (almost three times so). The costs of production are similar for seeds and ploughing, yet rice requires no additional irrigation costs and less

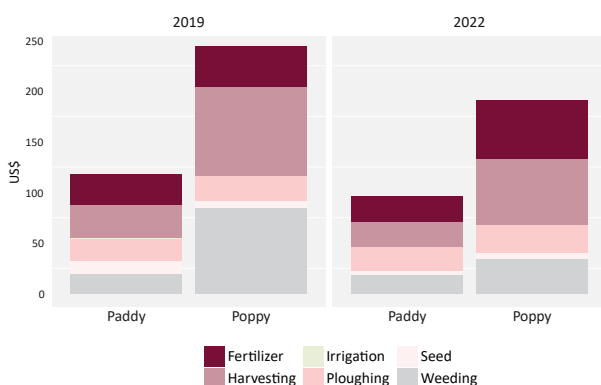
expenditures for fertilizer and weeding. By contrast, poppy is substantially labour-intensive when it comes to weeding and harvesting. Harvesting is significantly more expensive for poppy on average (\$US150/acre) than rice (\$US37/acre; $p < 0.01$). After taking these input costs into consideration, it is likely that poppy's economic advantages to household income is substantially reduced when compared to cheaper-to-produce rice. Further, household production of rice ensures against food insecurity, whereas opium harvested from poppy must be traded or sold in order to acquire food. Village headmen note that food is the primary use of income derived from poppy cultivation.

Figure 10: Cultivation costs by acre, in USD, reported by village headmen in Kachin



A similar relationship was reported in Shan across both survey waves. Rice paddy was less than half as costly to cultivate per acre than poppy, with harvesting costs making up the largest portion of total costs.

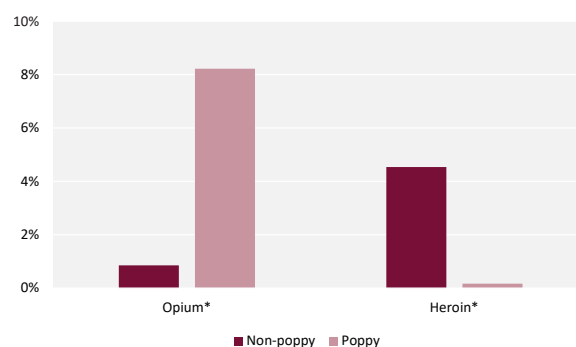
Figure 11: Average household costs of cultivation of paddy and poppy in Shan, 2019 and 2022



As in other places where illicit opium cultivation occurs, such as Afghanistan, drug use prevalence rates have been increasing recently. In the case of Afghanistan, recent UNODC surveys have shown that rural populations, where opium cultivation is greatest, report much higher rates of opium use.³⁴

In Kachin, households involved in poppy cultivation were more likely to have at least one household member who has used opium in the last month. Among poppy-involved households, on average, 8% of household members used opium in the last month compared to less than 1% of those in households not involved in poppy. However, again the inverse is true for heroin: on average 4.5% of household members used heroin in households not involved in poppy, compared to nearly none in poppy-involved households.

Figure 12: Kachin: Percent of household members using illicit drugs, by poppy involvement



Stars indicate statistical difference with a significance of $p < 0.05$. Significant differences were consistent across both a two-tailed t-test and a Wilcoxon rank sum test.

In Kachin, proximity to cultivation appears to correlate with opium use. Nearly one in ten household members in poppy-growing households reportedly uses opium. This is on par with surveys of Afghanistan where 11% of household members reportedly uses one or more drugs.³⁵

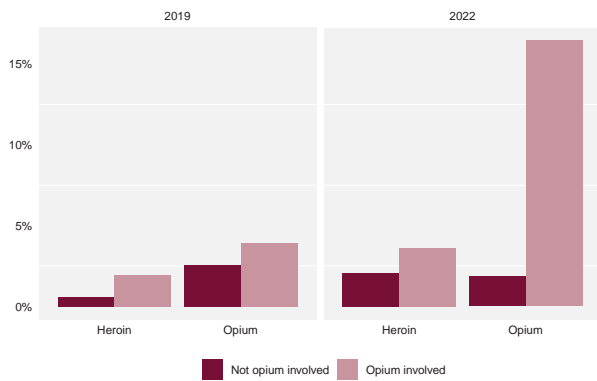
Extending from this, of all 447 households surveyed in Kachin only one reported adequate access to drug rehabilitation. This suggests that even though high shares of local households suffer from drug use disorders, virtually no one has access to the necessary treatment.

34 UNODC, "Drug Situation in Afghanistan 2021: Latest Findings and Emerging Threats," November 2021, www.unodc.org/documents/data-and-analysis/Afghanistan/Afghanistan_brief_Nov_2021.pdf.

35 UNODC.

In Shan, a similar correlation exists of proximity to/ involvement with the opiate economy and drug use. However, in this case, the relationship holds true for both opium and heroin, in contrast to just opium in Kachin. In Shan, opium-involved households report greater shares of past-month use of opium and heroin across both waves. However, this difference was significant only for past-month opium use.

Figure 13: Shan: Percent of household members using illicit drugs, by involvement with opium and poppy



3.2 Village

Surveys of village headmen also report differences in between poppy-involved and non-poppy involved villages. This includes the degree to which villages are connected to the broader national economy and levels of social development.

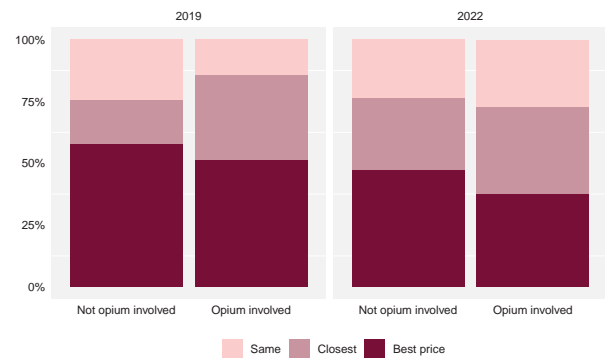
When selling crops, households tend to go with the buyer who provides the best price, according to village headmen in Kachin in 2021. However, there is more variation in this decision for villages with poppy cultivation. In this instance, the decision is split between always using the same buyer versus the closest buyer, or the buyer who offers the best price. This suggests that economies in poppy-dominant villages have fewer formal market transactions. In contrast, villages without poppy cultivation had more market-oriented economies, with over half selling to buyers who would offer the highest prices. Interestingly, almost no village headmen reported that contracts were part of the decision process regarding who to sell to; perhaps because the headmen were providing most common reason for all households in the village.

Figure 14: Where households sell licit crops, by poppy involvement in Kachin



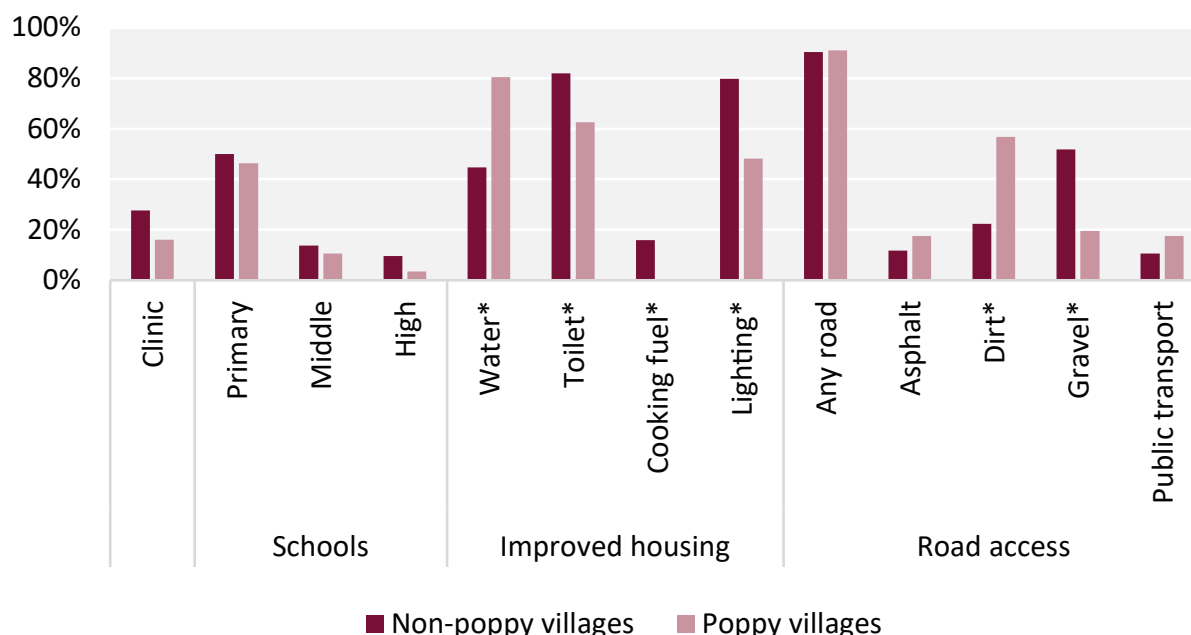
In Shan, a similar dynamic was reported. There, non-poppy involved households across both survey waves sold licit agricultural crops to buyers who offered the best prices. By contrast, poppy-involved households were more likely to report selling to the closest buyer. However, the share of village headmen indicating that households sold to the buyer at the best price declined in 2022 relative to 2019.

Figure 15: Where households sell licit crops, by poppy involvement in Shan



In terms of social services in villages in Kachin, there are no statistical differences between poppy-involved and non-involved villages in terms of access to clinics or schools, though non-involved villages consistently reported higher shares. Nevertheless, access to these services was measured in a binary fashion and not time to destination. It is possible that poppy-involved households, given their more remote location, may experience longer travel times to obtain medical care or education.

Figure 16: Kachin: Community development indicators, by poppy involvement village classification

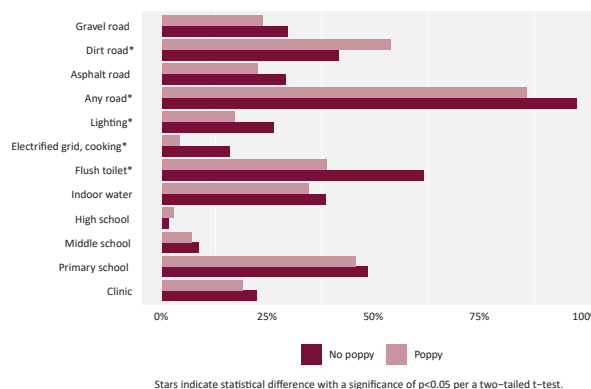


Stars indicate statistical difference with a significance of $p < 0.05$. Significant differences were consistent across both a two-tailed t-test and a Wilcoxon rank sum test. Improved water includes piped water, communal standpipe, and hand-pumps. Improved toilet includes a flush toilet. Improved cooking fuel includes public electricity, gas, and solar. Improved lighting includes public electricity and solar.

Access to basic services such as improved water, improved toilet, improved cooking fuel, and improved lighting vary, with households not involved in poppy reporting higher shares of access to these improved sources for all services except for clean water. However, the type of roads varies across these categories of villages. Poppy-involved villages are more likely to have access to dirt roads (57% versus 22%; $p < 0.05$), while non-involved villages are more likely to have access to a gravel road (52% versus 20%; $p < 0.05$), suggesting better connectivity and reduced travel time.

In Shan, a similar relationship is reported when comparing households by poppy-involvement status. In that state, there were no significant differences in access to clinics or schools, though, with the exception of high school, households not involved in poppy reported higher, but non-significant, rates of access. However, non-involved villages reported higher shares of access to electrified cooking, public lighting, and any road access, pointing to better connectivity with the broader national energy and transportation systems.

Figure 17: Shan: Community development indicators, by poppy involvement



Stars indicate statistical difference with a significance of $p < 0.05$ per a two-tailed t-test.

Opium poppy cultivation in Southeast Asia is closely linked to multi-dimensional poverty, lack of government services, challenging macroeconomic environments, and insecurity. Households and villages involved in opium poppy cultivation face a significant development gap when compared to those not involved in poppy or opium. Households and villages in Myanmar that engage in poppy cultivation and the broader opium economy do so to supplement income or because they lack other legitimate opportunities. Broadly speaking, data point to many overlapping socio-developmental factors that correlate with a household engaging in poppy cultivation in both the Kachin and Shan states.

LAO PEOPLE'S DEMOCRATIC REPUBLIC



Introduction

This is the first opium survey in Lao PDR after an eight-year hiatus following the last survey conducted in 2015.³⁶

The survey was planned and implemented relying on local, regional and global expertise under UNODC's Illicit Crop Monitoring Programme (ICMP). The survey combines data gathered from satellite imagery, areal imagery (helicopter flights) and field verification and yield surveys to evaluate the extent of opium poppy cultivation and production. A total of 89 locations across seven target areas in Bokeo, Phongsaly, Huapanh, Xieng Khuag, UdomXay, Luang Namtha and Luang Prabang were examined.

The results show country-wide poppy cultivation in 2023 reached about 5,000 hectares (95% confidence interval 2,700 to 8,300ha) suggesting overall cultivation in the country remained relatively stable over the past decade. However, due to the long gap in data availability, it is not possible to draw conclusions on developments in the more recent past, including the impact of the COVID pandemic and the subsequent challenging economic environment in the country. The majority of cultivation was observed in Phongsaly province,

reflecting its traditional role as the centre of opium cultivation in Lao. The area under cultivation in Lao PDR represents about one-tenth of the area under cultivation in Myanmar, albeit from a much smaller population base.

Similarly to the cultivation area, the yield estimates remained relatively stable in 2023 when compared with 2014 when the last comparable yield data was assessed. In 2023, a poppy plot in Lao PDR was estimated to produce 12.7kg of opium per hectare (95% confidence interval of 9.5 to 15.9kg per hectare), slightly down from 14.7kg in 2014. Field reports and surveys of village elders and other key respondents noted that an average household could produce only small quantities of opium, with 3kg per year considered a rather large amount.³⁷ The resulting opium production in Lao PDR is estimated at 63 metric tons (95% confidence interval of 30 to 108 tons).

Due to the lack of cultivation data since 2015, it is difficult to assess whether the Lao opium economy underwent a similar trajectory as in Myanmar, with a significant decrease followed by more recent increases. Regular monitoring will be important to close that data gap and inform projections for the coming years.

Lao PDR Fact Sheet

	2014	2015	2023	Change 2014/2015 - 2023
Opium poppy cultivation (hectares)	6,200 ha (3,500 to 9,000)	5,700ha (3,900 to 7,600)	5,000ha (2,700 to 8,300)	-16% (compared to 2015)
Average dry opium yield (kilograms per hectare)	14.7 kg/ha	14.7 to 30.6 kg/ha	12.7 kg/ha (9.5 to 15.9)	-14 % (compared to 2014)
Potential production of dry opium	92 tons (51 to 133)	84 to 176 tons	63 tons (31 to 108)	-32% (compared to 2014)

Ranges refer to the 95% confidence intervals. Yield and production data are compared to the year 2014, as this was the latest year with comparable data. In 2015, in contrast to earlier years, yield was estimated by using a multi-year approach, which led to a large range of possible values (see respective report for reference).³⁸ The better point of comparison is therefore 2014.

³⁶ UNODC, "Southeast Asia Opium Survey 2015."

³⁷ Field reports and interviews with village elders in Lao PDR.

³⁸ UNODC, "Southeast Asia Opium Survey 2015."

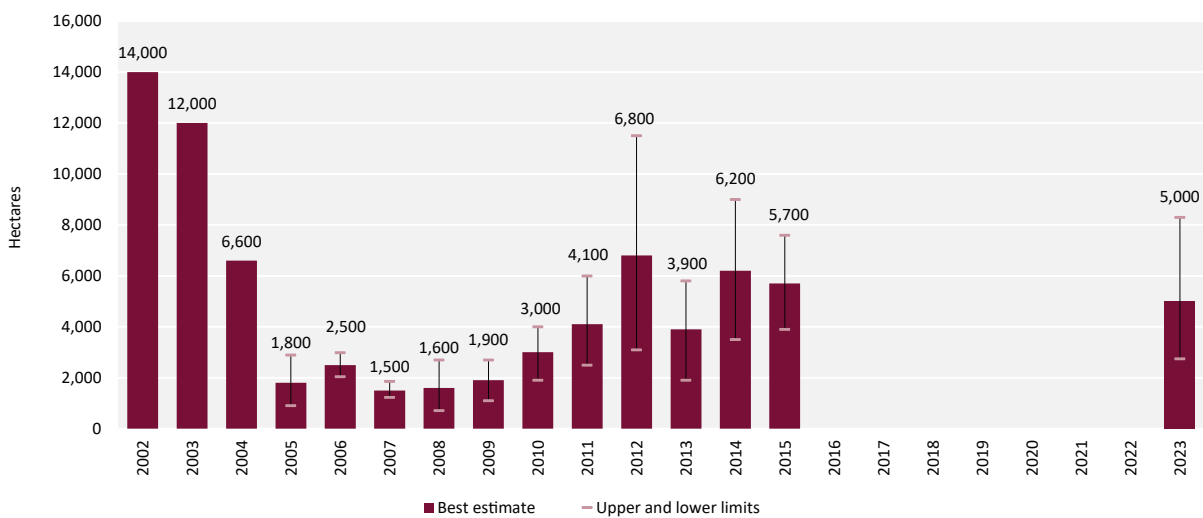
1. Findings

1.1 Area under opium poppy cultivation

In 2023, the area under opium poppy cultivation in Lao PDR was estimated at 5,000 ha (95% confidence interval 2,700 to 8,300 ha). This is slightly down from the last survey in 2015, when 5,700 ha (95% confidence interval 3,900 to 7,600) were estimated. With an eight-year gap in surveys, it is impossible to assess any broader time trends.

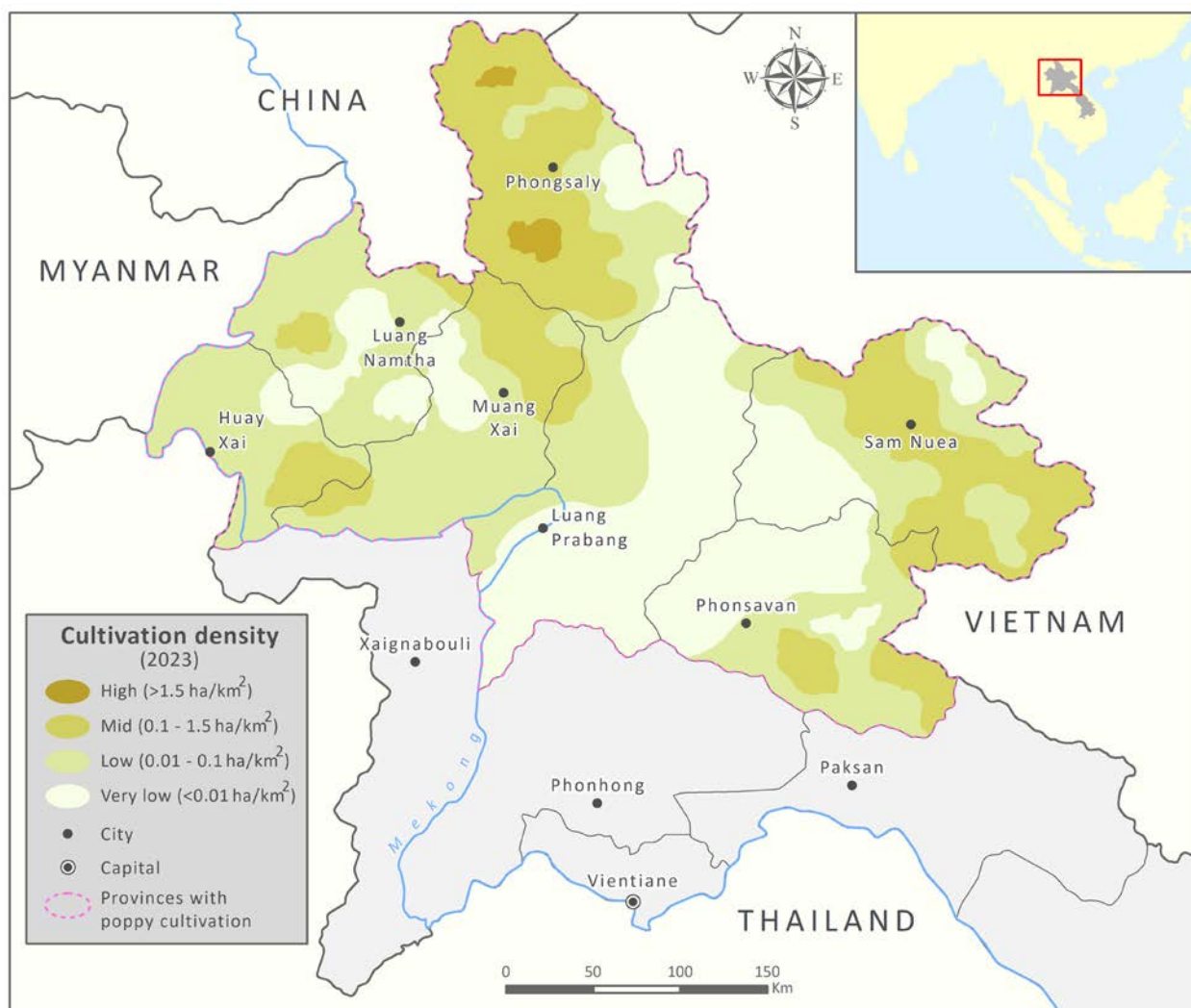
Opium poppy cultivation is primarily concentrated in Phongsaly, which has long been an important region of illicit poppy cultivation in Lao PDR. The survey methodology in 2023 did not allow for the estimation of provincial totals, however, mapping of plots suggests the highest concentrations remain in areas that have long been important sources of opium poppy in Lao PDR and are often close to international borders.

Figure 18: Opium poppy cultivation in Lao PDR, 1996-2023 (ha)



Survey team taking measurements, Lao PDR 2023



Map 8: Opium poppy cultivation density in Lao PDR in 2023

Source: UNODC Illicit Crop Monitoring Programme.

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

That said, poppy cultivation in Lao PDR remains generally less sophisticated when compared with Myanmar. Visual inspections of poppy plots in Lao showed that cultivation was rather sparse, and crops appeared to be staggered with poppy in multiple different stages of growth. It was common to observe plants ranging from cabbage to poppy planted in the same fields, and at both flowering and mature stages. This suggests a strategy for harvesting at different times to reduce labour requirements for the harvest. In some cases, observed poppy fields were interspersed with other agricultural crops such as vegetables. In contrast, plots of poppy in Myanmar (discussed above) were more uniform and denser for maximizing yield.

This suggests that opium poppy cultivation in Lao PDR relies on more traditional practices and are

not as productive as a typical plot in Myanmar. A limited number of field reports and interviews with relevant stakeholders indicated that poppy cultivation in Lao PDR often included inter-cropping, often with small plots far away from roads or deep in the forest. According to interviews and visual inspection of plots, there was no indication of use of fertilizers or other means to boost productivity.³⁹

1.2 Opium yield and production estimates

Data collected from the field noted that households which cultivated poppy do so on small plots and generally extract small amounts of opium. Visual inspection of several plots in 2023 indicated

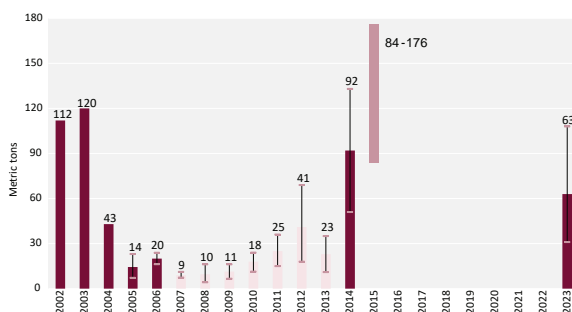
³⁹ Report from field missions between January and February 2023. Key source interview conducted among a limited number of UNODC staff (in June 2023), PCDC personnel (September 2023) and LCDC personnel (October 2023).

stunted plants and premature opium extraction (e.g., lancing of pods) from younger plants that are unlikely to produce high levels of opium latex. Similar indications were reported in the last survey in 2015, pointing to the persistence of sub-optimal harvesting practices. Responses from interviews stated that cultivation practices are passed from generation to generation, pointing to the traditional nature of cultivation in Lao PDR.⁴⁰

Overall, poppy plots in Lao PDR are less productive when compared with other countries where opium poppy is illicitly cultivated. Prior field surveys from 2007 reported a yield of 7kg of opium per hectare. In 2014, the last year for which UNODC calculated comparable data, it was estimated that 14.7 (12 to 17.4) kilograms of opium could be rendered from a hectare of poppy. In 2023, UNODC estimated that 12.7 (9.5 to 15.9) kilograms of opium could be yielded from a hectare of poppy, suggesting that yield estimates have remained stable over the last decade. That stands in contrast to Myanmar, which has seen a jump in yield in the last two years thanks in part to improved cultivation techniques.

In 2023 opium poppy production in Lao PDR is estimated to be 63 metric tons (95% confidence interval of 30 to 108 tons). The overall decline in opium production in Lao PDR is driven largely by a decline in yield and in a modest reduction in area under cultivation. Overall, the 63 metric tons stands at less than six percent the amount produced in neighbouring Myanmar.

Figure 19: Opium gum production in Lao PDR, 1996-2023 (metric tons)



No survey was conducted between 2016 and 2022. The error bars are the upper and lower limits of the confidence intervals of the sampling uncertainty. From 2008 to 2013, 2007 yield estimate was applied. In 2015 only a production range was calculated.

⁴⁰ Report from field missions between January and February 2023. Key source interviews conducted among a limited number of UNODC staff (in June 2023), PCDC personnel (September 2023) and LCDC personnel (October 2023).

1.3 Farmgate price of opium

In 2023, no household survey was conducted in Lao PDR, and no robust information were collected regarding farmgate prices of fresh and dry opium. However, qualitative key interviews were conducted between June and October 2023. Sources from LCDC and PCDC (Provincial Committee for Drug Control) reported that prices of a kilogram of dried opium range from 6 to 10 million LAK (about US\$300 to 500). These values would lead to an income for farmers (farmgate value) that spans from 378 to 630 billion LAK (approximately between US\$20 and 30 million). On the other hand, UNODC staff in the field were also interviewed, reporting that, to their knowledge, the price of one kg of dry opium decreased from 8 million LAK (approximately US\$400) in 2020 to 2.5 million LAK (about US\$120) in 2022. However, it is unclear how representative either qualitative estimate is.

Poppy field with white flowers, commonly observed in Lao PDR, 2023



Survey team during ground verification, Lao PDR 2023

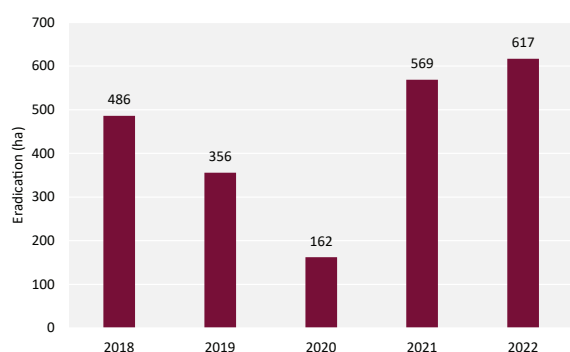


2. Eradication and Seizures

2.1 Eradication

Latest data on eradication reported by the Lao National Commission for Drug Control (LCDC) refer to the year 2022, when 617 hectares were eradicated.

Figure 20: Eradication of opium poppy in Lao PDR, 2018 - 2022



Source: LCDC.

2.2 Seizures

From January to June 2023, LCDC reported the seizure of 125 kg of raw opium and 184 kg of heroin. Compared to the same period in 2022, seizures of opium and heroin increased by 52% and 645%, respectively.

3. Deforestation and poppy cultivation in protected areas

In addition to estimating poppy cultivation and opium production, the potential relationship between poppy cultivation and deforestation in Lao PDR was examined. Using open-source data on deforestation trends and information on poppy plots from 2015 and 2023, the average poppy plot size was analysed and, within provincial variation of the sampled plot area, was identified. The analysis was completed for 2023 and compared against the surveyed plots of 2015.

Considering both samples of 2015 (1,491 plots) and 2023 (909 plots), some commonalities across both years were observed. At both time intervals, Phongsaly and Bokeo report larger poppy plots. In Bokeo, the plots average half a hectare in size. The plots in Xiangkhouang are consistently the smallest. Overall, the size of a poppy plot remains similar for

the entire sample, with an average at or around a third of a hectare (0.29 in 2015 versus 0.33 in 2023).

As noted in field reports, poppy plots are often found in remote areas. Plot size also appears to be correlated with the distance to the capital or connectivity to major urban areas. The map below shows that the largest plots of 2023 (evaluated by mean) are in the northern provinces of Bokeo and Phongsaly. These provinces are farther away from the capital Vientiane and more remote and close to international borders. Reinforcing this spatial trend, the smaller plots are located in the southernmost province of Xiangkhouang.

This alone is not enough to derive a clear conclusion, but it seems to suggest some level of geographical influence for the establishment of poppy plots in Bokeo or Phongsaly. This could have many drivers, including asymmetric landscape characteristics, remoteness, and minimal levels of state capacity.

Opium poppy has been observed to be planted in consolidated agricultural areas and, to some extent, logged forest areas.

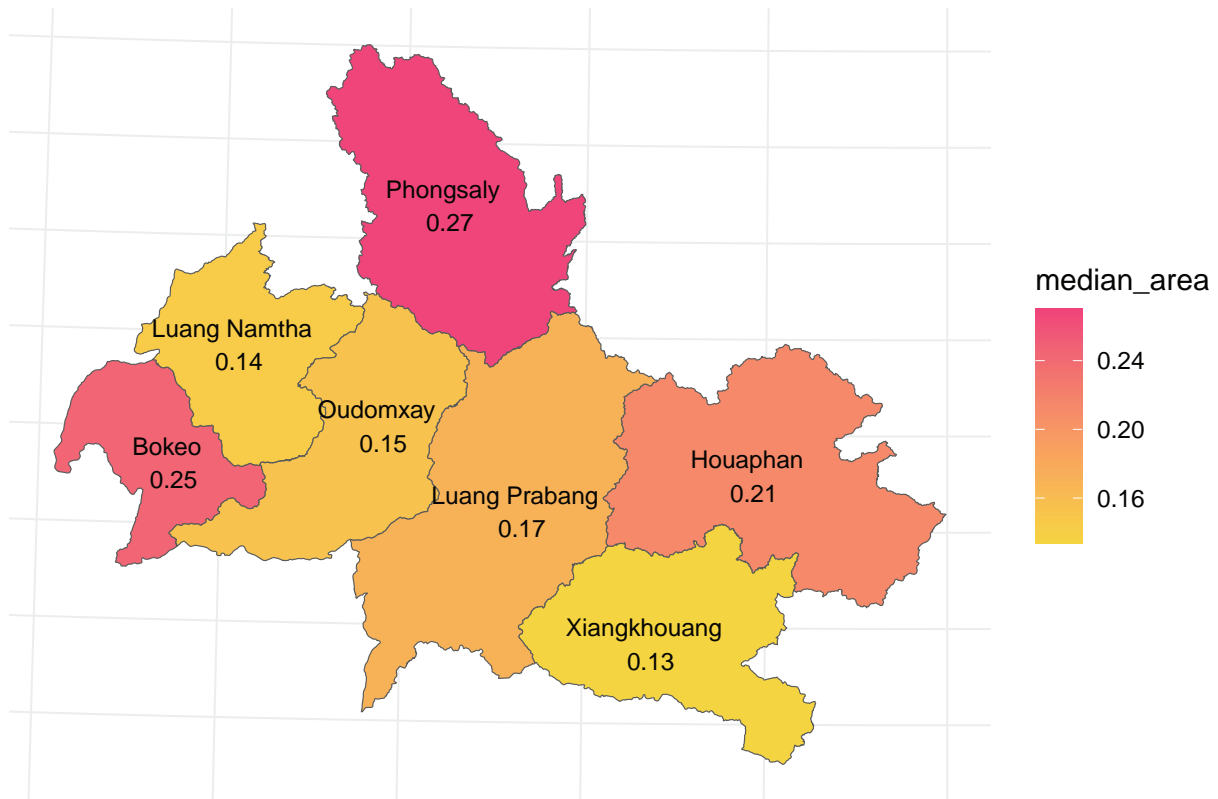
The share of forest cover, as of 2022, and the historical accumulated deforestation over cultivated poppy plots, was calculated using Hansen World resource institute WRI data.⁴¹ Deforestation was calculated as tree cover loss in primary forest areas for the entire northern provinces and for the sampled fields. The analysis was constrained to areas labelled as primary forest in the tropical map created by University of Maryland UMD.⁴² This seeks to ensure the focus on vegetation loss to forest areas (actual deforestation), rather than capturing other tree cover changes captured by the Hansen data (e.g., changes in woody crops).

Additionally, an analysis was carried out on the normalized vegetation index calculated on LandSat and Sentinel images for a time series of observed poppy plots. This analysis gives an indirect view into vegetation changes ahead of the harvest event.

To gain perspective of the magnitude of deforestation beyond the limited extent of the sampled fields, deforestation over the entire northern provinces, irrespective of the driver, was analysed using the

41 Global Forest Watch, "Global Forest Watch Dashboard," n.d., <https://www.globalforestwatch.org/dashboards/global/>.

42 Svetlana Turubanova et al., "Ongoing Primary Forest Loss in Brazil, Democratic Republic of the Congo, and Indonesia," *Environmental Research Letters* 13, no. 7 (2018): 074028.

Map 9: Map representing the median field size per province in 2023

above approach. As shown below, the largest rate of deforestation at the province level was observed in Bokeo, followed by Luang Namtha with rates close to 17% over the period 2002-2022. Phongsaly shows one of the lowest deforestation rates among the northern provinces covered in the survey.

Table 8: Summary of estimated deforestation (hectares) by province

	Deforestation 2022-2022	Forest 2001	Deforestation rate 2002 to 2022
Bokeo	59,314	348,213	17.0%
Houaphan	52,193	575,774	9.0%
Louang-Namtha	83,265	509,407	16.4%
Louangphabang	20,408	290,236	7.0%
Oudomxai	36,984	252,752	14.6%
Phongsaly	46,858	530,641	8.8%
Xiangkhouang	60,743	511,317	11.9%

The time series heatmap below reveals that deforestation peaked in Louang-Namtha in 2020 and 2016. Currently, deforestation is concentrated in Xiangkhouang, Louang Namtha and Bokeo. Phongsaly shows a peak in deforestation for the first time in 2022.

Although there are clear differences in deforestation patterns and trends across provinces, the largest traditional areas of poppy cultivation, notably Bokeo and Phongsaly, do not appear to be the most affected by deforestation. A targeted examination of known poppy plots was conducted to examine the relationship between poppy cultivation and deforestation.

A total of 27.8 hectares of primary forest were cleared after 2000 to give way to poppy in the plots surveyed in 2015. Considering that the 1,490 plots have an area of 428 hectares, the 27.8 hectares cleared since 2000 represent 6.5% of the total poppy area. Some level of deforestation in 226 plots out of the 1490 detected (15% of the total) was found. However, as shown in the figure below, the removal of forest to cultivate opium poppy accelerated right before the harvested year of 2015. Considering the direct relationship of deforestation and poppy cultivation, it was observed that 42% (or 11.8 hectares) of the cleared area (27.8 ha) occurred in the three years preceding the 2015 harvest. In short, only about 10% of the total area of observed poppy had experienced deforestation over the past 20 years. However, about 40% of that deforested area was recently cleared within three years before the observed poppy harvest.

Figure 21: Heatmap of province-wide deforestation 2001-2022

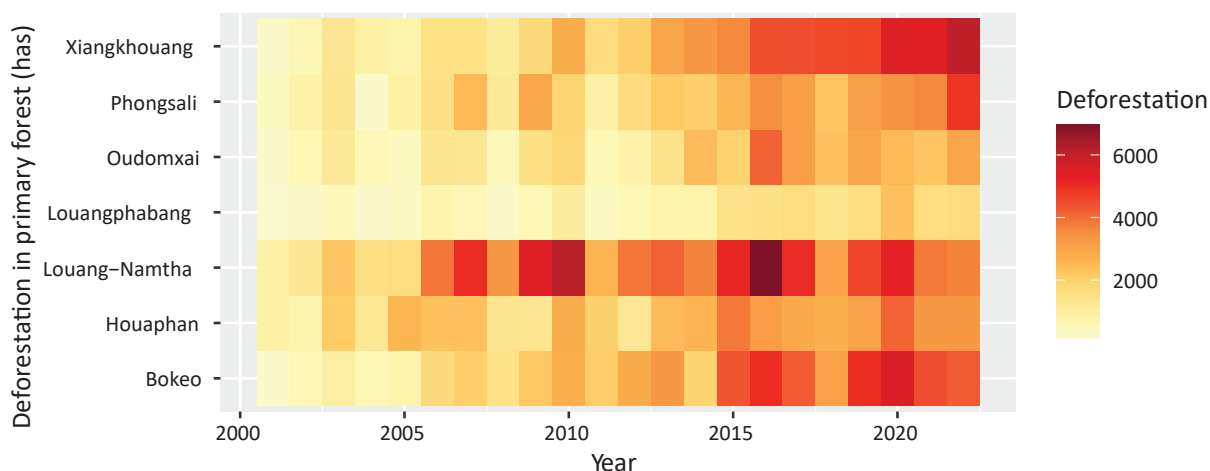
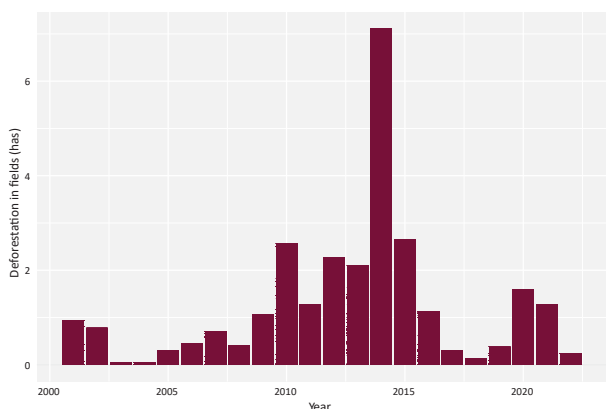
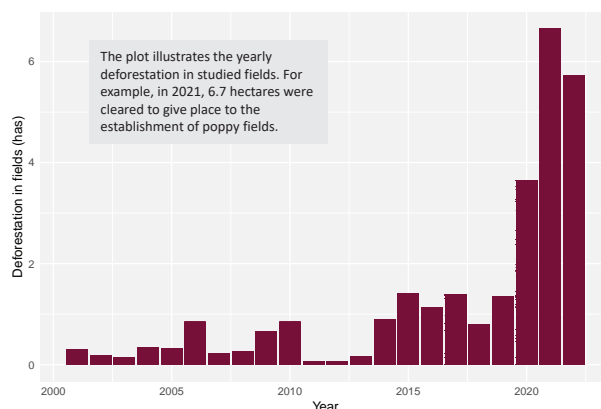


Figure 22: Deforestation of areas with previously observed poppy plots in 2015



A similar examination was conducted for the most recent harvest in 2023. A total of 27.4 hectares of primary forest were cleared after 2000 to give way to poppy in fields surveyed in 2023. Considering that the 909 fields have an area of 299 hectares, the 27.4 hectares cleared since 2000 represent 9% of the total fields area. There was also some level of deforestation in 148 fields out of the 909 detected (16% of the fields). As shown in the figure below, the replacement of forest to poppy accelerated over the last years, just prior to the 2023 harvest.

Figure 23: Deforestation of areas with previously observed poppy plots in 2013



Even though only 9% of the observed poppy area was reclaimed from forest in the last 2 decades, 58% (16 ha) of this cleared area (27.4 ha) was seized in the last 3 years (2020-2022).

An examination of Hansen deforestation data shows that not all the poppy cultivation results in removal of primary forests. In the last two decades, only about 10% of the observed field area is explained by transitions from primary forest to poppy surveyed in 2023. When looking at the 2015 fields, the share of deforested area converted to poppy is 6.5%.

However, for both the 2015 and 2023 surveys, deforestation accelerated in the 3 years preceding the observation of poppy plots. For the 2023 poppy plots, 58% (16 of 27.4ha) of the cleared areas were due to deforestation that occurred between 2021-

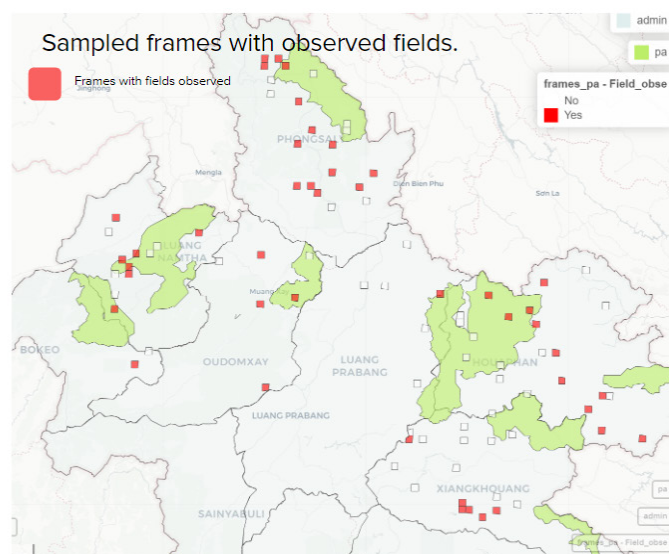
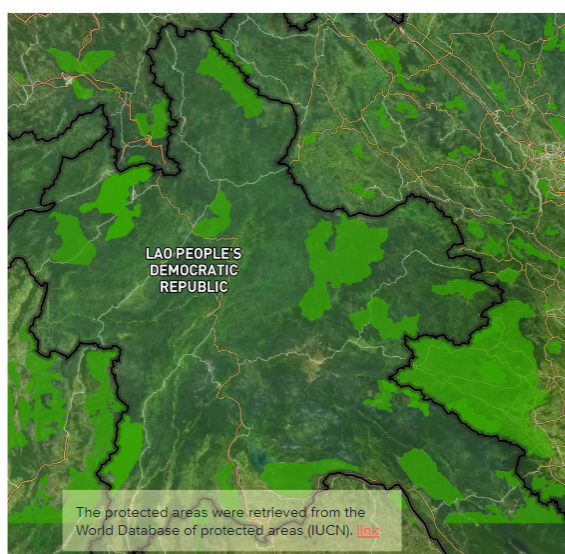
Survey team during ground verification, Lao PDR 2023



Survey team during ground verification, Lao PDR 2023



Detection of poppy plots in protected areas in Lao PDR



2023. For the 2015 poppy plots, 42% of the area that was deforested occurred between 2013-2015. The conclusions are two-fold. First, only a fraction of about 10% of the total area of observed poppy came from 20 years of deforestation prior to the harvest. However, about half of that area (5%), was cleared 3 years prior to the observed poppy harvest. This suggests that most poppy fields are established by shifting cultivation in already integrated agricultural areas or mixed areas of crops and abandoned regenerated shrubs. Only about half of the deforested area used in poppy cultivation (or 5% of the total area observed to be deforested) directly transitioned to poppy cultivation, suggesting a more direct relationship and decision by cultivators to clear primary forests for poppy.

3.1 Presence of poppy in protected areas

Given the remote nature of opium poppy cultivation in Lao PDR, as reported by interviewees, and the general clandestine nature of illicit crop cultivation, there was an interest to examine the extent to which poppy was cultivated in protected areas. Illicit crop cultivation is known to take place in protected areas, such as national parks, forests, and reserves, elsewhere. This trend is well-documented in Colombia, where an increasing amount of coca is cultivated in such protected areas.⁴³

⁴³ UNODC, "Colombia: Monitoreo de Los Territorios Con Presencia de Cultivos de Coca 2022," September 2023, https://www.unodc.org/documents/crop-monitoring/Colombia/Colombia_Monitoreo_2022.pdf.

In 2023, in Lao PDR, opium poppy was detected in 44% of the sampled frames in protected areas, as shown below. A total of 100 plots were found in 5 protected areas. Those plots amount to 28.56 hectares, equivalent to about 10% of the observed number.

Table 9: Poppy plots and protected areas

	Plot area in hectares (%)	Number of plots (%)
Outside protected area	270.5 (90%)	809 (89%)
Inside protected area	28.6 (10%)	100 (11%)
Nam Et Phouloey	11.9 (42%)	37 (37%)
Phou Hi Phi	7.7 (27%)	32 (32%)
Nam Ha	4.0 (14%)	14 (14%)
Phou Daen Din	4.2 (15%)	12 (12%)
Nam Kan	0.8 (3%)	5 (5%)
Total Area	299.1	909

As shown, most poppy plots occurred outside of protected areas. However, the location of poppy plots often appeared in the periphery or proximity of protected areas. Of the 909 plots examined in 2023, 11% were inside protected areas. However, another 299 (or 33%) were found within 10km of protected areas. The remote nature and other geographical or political drivers may be related to why more than 40% of poppy plots identified in 2023 were found inside or within 10km of protected areas.



UNODC

United Nations Office on Drugs and Crime




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