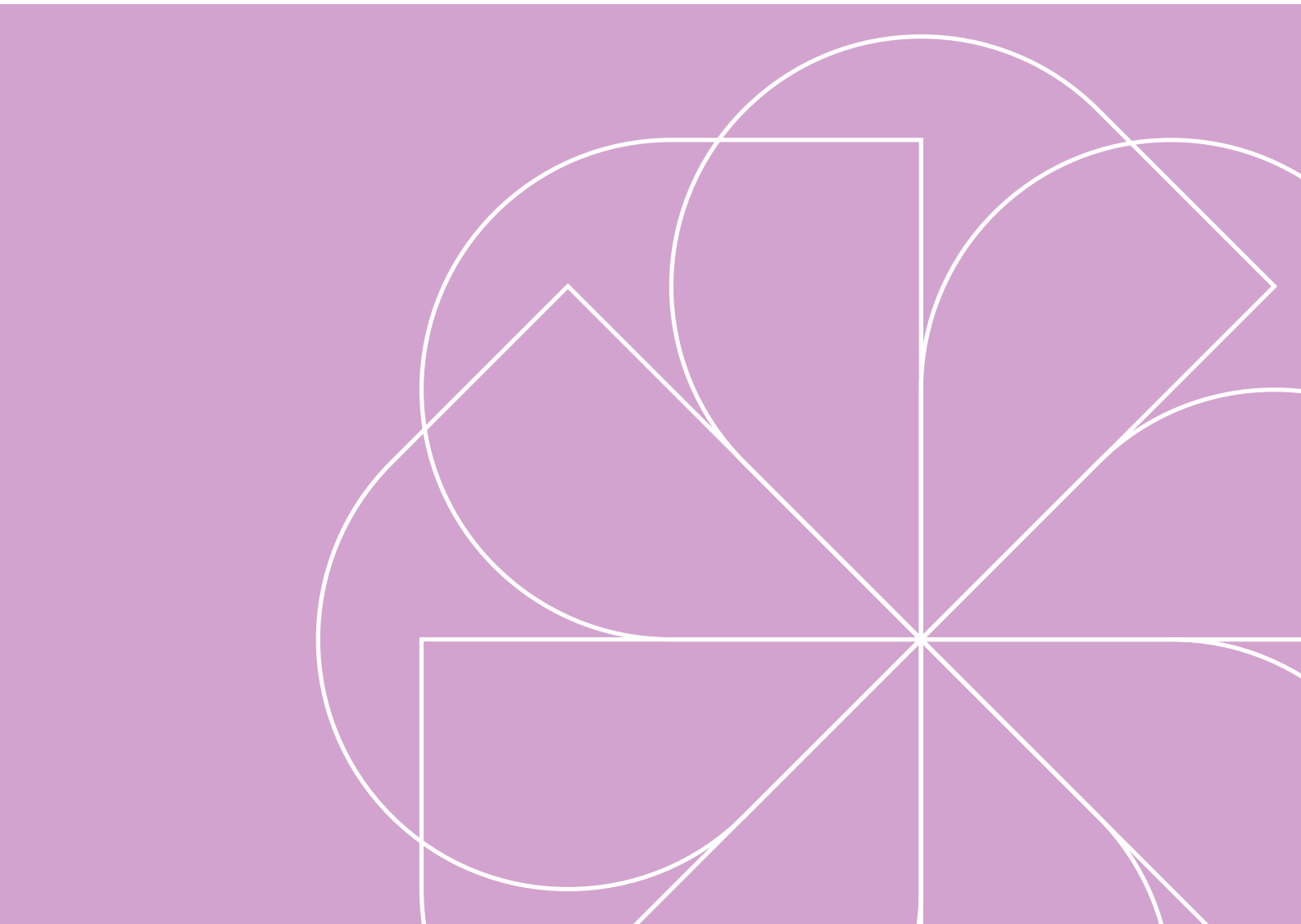
EUDA
EUROPEAN UNION DRUGS AGENCY

TECHNICAL REPORT

Understanding the impact of the Taliban drug ban

Situational analysis of Afghanistan to inform EU policymakers

May 2025



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Acknowledgements

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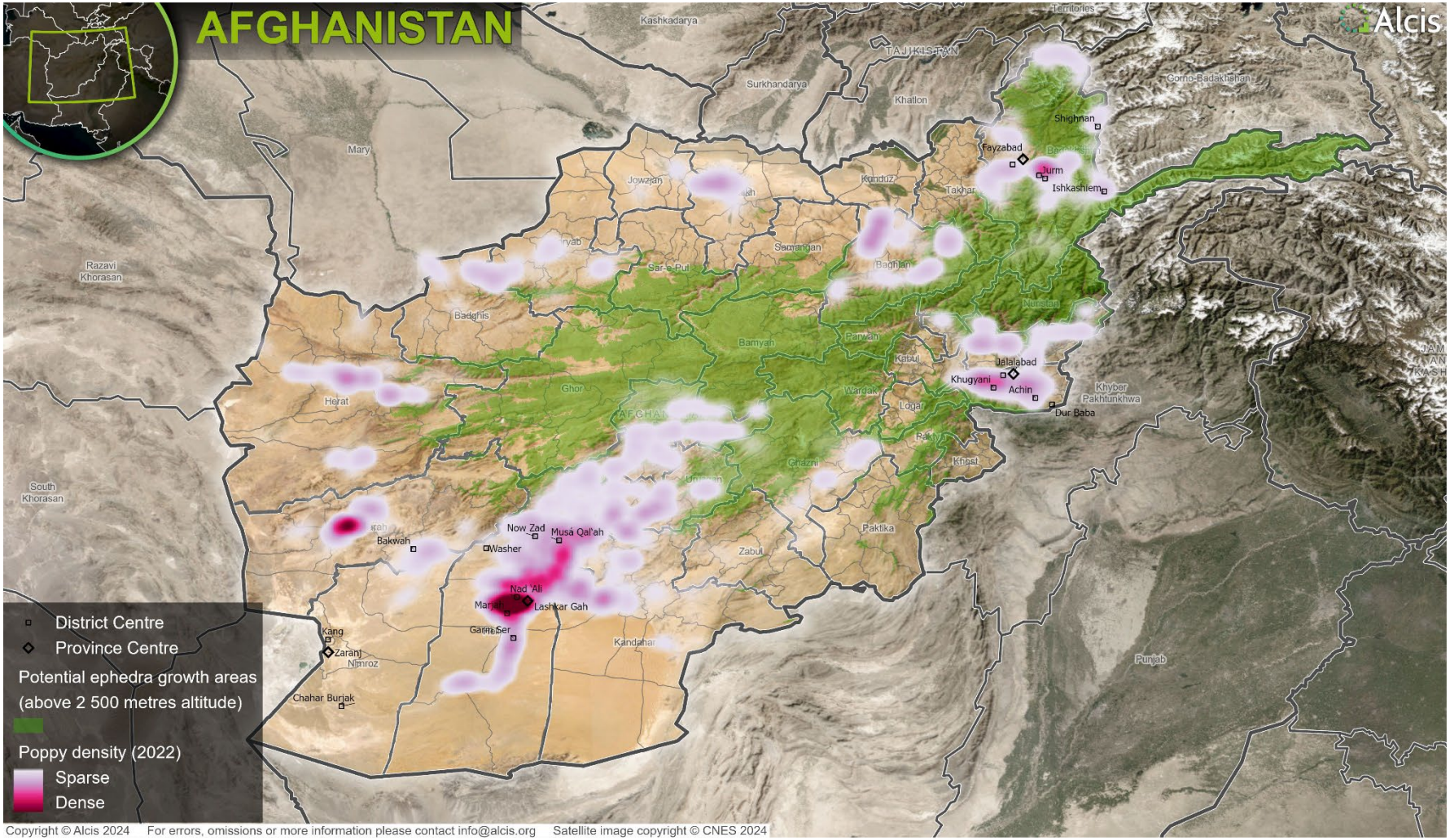
Glossary

Ephedra	A perennial plant that grows wild in Afghanistan, primarily in the central highlands. Ephedra plants contain ephedrine, a primary precursor in the production of methamphetamine in Afghanistan. The crop is known locally as '*oman*' or '*yama*'.
Islamic Republic of Afghanistan	Presidential Republic in Afghanistan (2004-2021) that was formed following the US-led invasion of Afghanistan in response to the terrorist attacks of 11 September 2001, and the subsequent collapse of the first Taliban government (1996-2001).
Harvest labourer	A farmer who works on other farmers' land harvesting their crops, moving from one area to another over the course of the harvest season.
Jerib	Roughly 2 000 square metres and the equivalent of one fifth of a hectare.
Landlord	A farmer with large landholdings who employs other farmers to work their land in return for a share of the crop (sharecropper) or cash payment (harvest labourer).
Man	A unit of measure, the equivalent of 4.5 kilograms in south-west Afghanistan, and either 4 kilograms or 5 kilograms in the central highlands.
Mullah Haibatullah Akhundzada	On 7 September 2021, the Taliban proclaimed Mullah Haibatullah Akhundzada a supreme leader.
Northern Alliance	A loose coalition of militias who opposed the first Taliban regime from 1996 until the regime's fall in 2001. The alliance was instrumental in toppling the Taliban after receiving support from the United States in October 2001.
Landowner	A farmer who cultivates their own land largely using family labour.
Sharecropper	A farmer who cultivates another farmer's land in return for a share of the final yield.
Taliban	An Afghan political and military movement that took power in Afghanistan in 1996 under the banner of the Islamic Emirate of Afghanistan (IEA), which collapsed following the US-led invasion in 2001. The IEA once again took control of the country in 2021 following the withdrawal of North Atlantic Treaty Organization (NATO) and United States Forces – Afghanistan (USFOR-A) forces and the collapse of the government of the Islamic Republic of Afghanistan.
Tube well	A deep water well in which a steel tube or pipe is bored into an underground aquifer.
USFOR-A	United States Forces – Afghanistan. The functioning command and control headquarters for US military forces in Afghanistan operating independently of the US government's contribution to the International Security Assistance Force (ISAF), which in turn was made up of 42 contributing nations.

Figure 1: Overview of Afghanistan, including areas where ephedra potentially grows (areas above 2 500 metres altitude) and poppy density for 2022.



Key findings

- The Taliban imposed a ban on the cultivation, production, trade and consumption of all drugs in April 2022, but its enforcement has been inconsistent.
- The harvesting of ephedra and production of ephedrine and methamphetamine has been significantly impacted by the ban, with large increases in the cost of inputs for methamphetamine production and reductions in both quantities produced and income generated for those involved in the trade.
- The former epicentre of the trade in ephedra and ephedrine production, Abdul Wadood bazaar in Bakwa (south-western Afghanistan, see Figure 1), has been closed by the Taliban. While ephedrine laboratories have relocated closer to the areas where ephedra grows in the central highlands, methamphetamine production remains concentrated in the south-west of the country.
- The Taliban drug ban has led to a significant reduction in opium poppy cultivation. However, poppy cultivation persists in the more accessible and irrigated areas of the north-eastern province of Badakhshan, despite a second consecutive year of low levels of cultivation in the rest of the country and the Taliban's continued efforts to eradicate poppy in 2024.
- Despite the ban, opium trading within Afghanistan continues. This is influenced by several factors, including the likely presence of large opium inventories in the country. Estimates of the area under poppy cultivation, the size of land holdings, and opium yields per hectare indicate that land-owning farmers in the south and south-west have been able to stockpile large quantities of opium.
- The presence of opium inventories has ensured a continued supply into international markets, despite two consecutive years of low levels of poppy cultivation. This has also allowed land-owning farmers and traders to prosper from the dramatic increase in opium prices following the imposition of the ban.
- Rising opium prices have simultaneously led to increased adulteration of opium derivatives (i.e. morphine base, heroin base and heroin hydrochloride) destined for local and regional markets. However, it appears that the purity of the heroin destined for European markets has remained stable, at least for now. This further suggests that, on request from traffickers and traders, drug producers in Afghanistan provide different markets with distinct heroin consumer products at different purities.

- Large seizures of opiates and methamphetamine continue to be reported by neighbouring countries, indicating ongoing cross-border trafficking.
- Smuggling routes from Afghanistan to Pakistan and Iran remain active, despite increased enforcement by the Taliban. Smuggling costs on some routes have, however, risen dramatically, and on others there is no longer a guarantee from cross-border traders that any opium lost or seized would be reimbursed.
- While there have been significant concerns that reduced opium production could lead to a surge in synthetic opioids in Europe, as seen with recent clusters of nitazene overdoses, the available data indicates that there is currently no shortage of opium in Afghanistan. This is probably due to the presence of large inventories, as well as increased opium production in Pakistan. However, if the ban continues to be implemented by the Taliban, this situation is likely to change in the future.

Introduction

On 3 April 2022, the leader of the Taliban, Mullah Haibatullah Akhundzada, announced a religious edict banning the cultivation, production, trade and consumption of all drugs in Afghanistan. The announcement was met with considerable scepticism and seen as an attempt to distract from other ongoing issues, particularly as it coincided with the Taliban's decision not to open girls' schools, as previously promised. This scepticism was further strengthened by the Taliban's decision to offer a two-month 'grace period' to poppy farmers, which allowed them to harvest the opium crop planted four months before the edict. The United Nations Office on Drugs and Crime (UNODC) annual opium poppy survey reported that the area under opium cultivation in 2022 was the 'third largest since monitoring began' (UNODC, 2022).

Doubts over the Taliban's commitment to enforce a drug ban grew in 2023 with claims that cultivation continued unabated, that there were few signs of poppy eradication and that the crop was too important as a source of tax revenue to the Taliban (Arsala and Siddique, 2022). Consequently, the announcement in June 2023 of negligible poppy cultivation levels in the south-west province of Helmand (historically the largest poppy-cultivating area in the country) came as a surprise to many policymakers and analysts. The information that many of these analysts had relied upon was outdated or inaccurate, or lacked appropriate context (Limaye, 2023). By November 2023, the UNODC reported that annual poppy cultivation had fallen by an estimated 95 % in Afghanistan compared with the figure for 2022 (UNODC, 2023a).

As of November 2024, the data shows that the Taliban has enforced a second consecutive year of the ban in most of the major poppy-growing provinces (Mansfield, 2024b). Reports reveal that poppy planting in 2024 was negligible across much of the south-west, with the Taliban pressuring the population in the eastern province of Nangarhar to abandon cultivation completely. It is only in Badakhshan (in north-eastern Afghanistan), where poppy cultivation flourished in 2023, that satellite imagery confirms it continued in many of the accessible irrigated areas in 2024 (Mansfield, 2024b).

In conjunction with the ongoing poppy ban, the Taliban has been forceful in disrupting the country's methamphetamine industry, which had gone largely unnoticed internationally until 2020 and was burgeoning prior to the announcement of the drug ban (EMCDDA, 2020; Mansfield et al., 2019). As early as December 2021, the Taliban banned the harvest of the ephedra crop, which grows wild across the central highlands (above 2 500 metres of altitude) and is used in methamphetamine production, and in 2022 hundreds of ephedrine laboratories (that had been operational since before the Taliban's rise to power in 2021) were

closed. The Taliban's efforts against the methamphetamine industry resulted in a more than threefold rise in the price of ephedra, ephedrine and methamphetamine in Afghanistan. They also led to increased risks and costs for those directly involved in the industry.

Despite the Taliban drug ban, many of Afghanistan's neighbours, including Pakistan, Iran and Tajikistan, continue reporting large seizures of both opiates and methamphetamine on their borders (TASS, 2024; Zahidi, 2024; Amu TV, 2024; Dawn, 2024). This is probably due to a combination of factors, including the continued cultivation of poppy in certain areas of the country (e.g. Badakhshan); the lack of enforcement against the trade in opium; and the accumulation of significant opium inventories prior to and after the ban, particularly among the land-owning farmers in the south and south-west. The continued availability of opium in the country can be seen in the evolution of opium prices. After a peak in December 2023, the price of opium continued to fall in the south-west until September 2024, dropping by almost 40 % despite the continued ban (Mansfield, 2024b). In terms of methamphetamine, the industry has shifted from open trading of ephedra in key locations, such as Abdul Wadood bazaar, to a cottage industry of smaller ephedrine laboratories in the highlands where ephedra grows. This has ensured a continuous, albeit reduced, flow of ephedrine to methamphetamine laboratories in Afghanistan and, potentially, neighbouring countries.

Gaps in the available data, due to the unprecedented and dynamic situation created by the Taliban's rise to power and its subsequent drug ban, present a challenge for policymakers in Europe but also in other consumer markets for Afghan opiates, where there are significant concerns that a sudden gap in heroin availability may be filled by potent synthetic opioids. Recent clusters of fatal and non-fatal overdoses from synthetic opioids, particularly nitazenes, in parts of Europe have further underscored the need for a more accurate assessment of the implications of the drugs situation in Afghanistan and for ways to better anticipate, alert and respond to any sudden market changes (EMCDDA, 2024).

Currently, assessments of the likely impact of the ban rely heavily on the prevailing understanding of the effects of the previous drug ban imposed by the Taliban in 2001 (Felbab-Brown, 2021). That was a time when levels of poppy cultivation were considerably lower, when agricultural practices and drug markets in the region were much less sophisticated, and when new potent synthetic opioids, such as fentanyl derivatives and nitazenes, were less available. The vastly different context in which the current ban is being enforced, perhaps most importantly in relation to the probably significant opium inventories present in the country due to several consecutive years of high levels of cultivation, means that only limited insight can be drawn from the research on the previous Taliban drug ban in 2001 (UNODC, 2021).

This paper draws on a wide set of indicators and methods to document how the drugs industry has changed since the imposition of the current Taliban drug ban, focusing on the production and trade of ephedra and opium and their respective derivatives: ephedrine and

methamphetamine; and morphine base, heroin base and heroin hydrochloride. It documents some of the challenges presented by existing datasets and how they have affected our understanding of the impact of the current drug ban and its implications for Europe. In doing so, it outlines the type of data and methods that can offer a better understanding of what is a complex unfolding situation that is likely to have far-reaching effects on Afghanistan, the surrounding region and drug markets in Europe.

The paper is divided into three sections. The first section charts the impact of the Taliban ban on the methamphetamine industry, drawing on high-resolution satellite imagery and economic data. It shows an industry under stress, with much lower levels of methamphetamine production than in 2021, when it was at its peak (Mansfield, 2023a). The second section uses a similar approach to review the status of the opium industry up to the autumn of 2024. It details the uneven nature of the ban, with a stronger enforcement against the ephedra trade, and the impact that rising opium prices are having on inventories, trade and processing into morphine and heroin. The data presented in this section challenges many of the assumptions that have shaped the general understanding of the opium industry in Afghanistan and charts how the production of opiates and its associated markets have changed over time in response to the current drug ban. The final section provides a conclusion that points to the importance of deploying a wider set of indicators and methods to assess changes in drug production and supply in source countries such as Afghanistan, so that policymakers are better equipped to anticipate and respond to threats.

Methamphetamine industry: signs of stress after the Taliban takeover

The methamphetamine industry has gone through profound changes since the Taliban takeover in August 2021. Ephedra was the first drug crop to be targeted by the Taliban through a ban imposed in December 2021, at the end of the ephedra season and four months prior to Mullah Haibatullah Akhundzada's ban on all drugs (Kermani, 2021; Mansfield, 2023b). This included the prohibition of storing and selling ephedra in the town of Abdul Wadood in Bakwa (south-western province of Farah). Due to its central role in the methamphetamine industry, the targeting of Abdul Wadood bazaar and the surrounding area had a profound effect on the methamphetamine industry, resulting in significant restructuring and a dramatic rise in costs for ephedrine and methamphetamine producers. By the end of 2023, the Taliban had expanded its enforcement efforts into the central region and more than 700 ephedrine laboratories had been closed across the country. In conjunction, the price of ephedra, ephedrine and methamphetamine increased threefold, with those involved in the industry complaining of a rise in risks and costs and a reduction in income (Mansfield, 2023a).

Peak year of methamphetamine production: 2021

Abdul Wadood bazaar is located in a relatively flat former desert area on the main smuggling routes from Helmand to the borders with both Pakistan and Iran. Having ceded the area to the Taliban as early as 2010, the former government of the Islamic Republic of Afghanistan could do little to prevent the growth of the methamphetamine industry there. Fieldwork and satellite imagery show that Abdul Wadood bazaar became a primary hub of the ephedra trade and ephedrine production around 2017 (at the outset of large-scale ephedra-based methamphetamine production in Afghanistan) and remained so until September 2022, when the Taliban closed the bazaar and most of the ephedrine laboratories that surrounded it (Mansfield, 2023a).

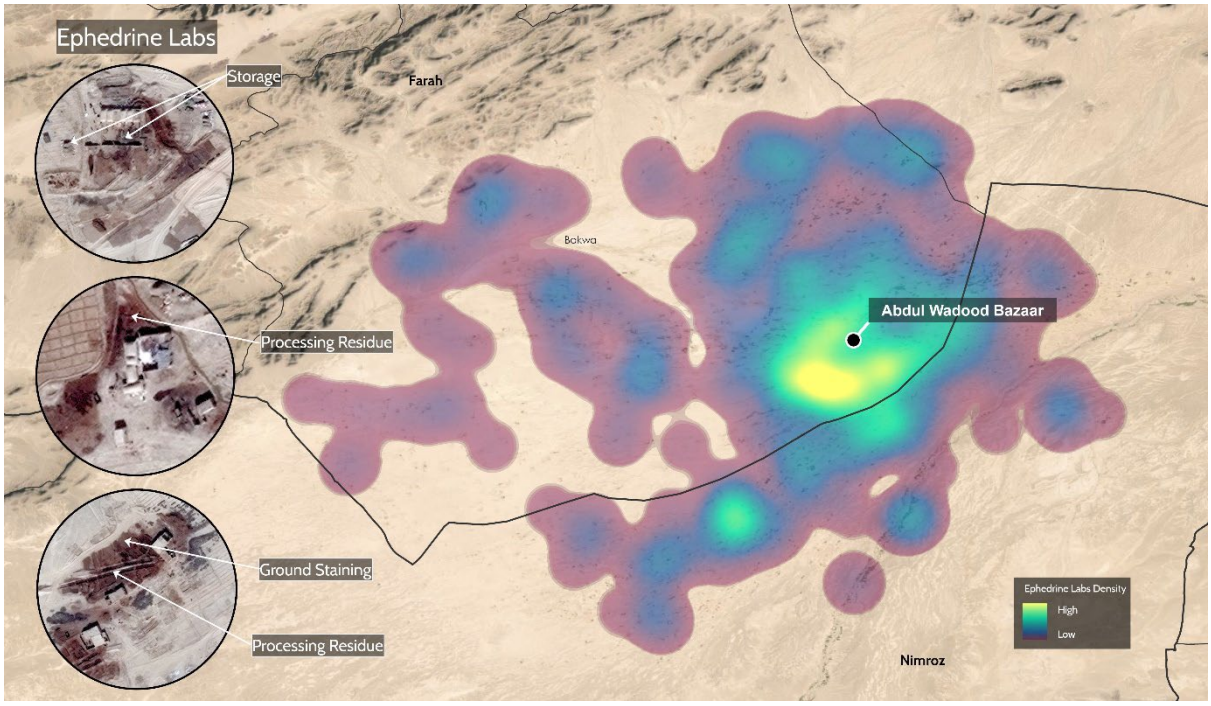
The bazaar grew rapidly after its establishment, increasing roughly fivefold in size between April 2017 and August 2019, coinciding with the switch from over-the-counter medicines to ephedra-based methamphetamine production (see Figure 2). Satellite imagery and fieldwork show that from mid-2019, traders offered the numerous ephedrine laboratories located around Abdul Wadood bazaar an all-year-round supply of ephedra collected from provinces such as Badghis, Ghor, Ghazni, Herat and Helmand (see Figure 3) (Alcis, 2022). The basic understanding of chemistry required for ephedra-based methamphetamine production, and

its low cost, prompted the emergence of a cottage industry. By early 2021, high-resolution satellite imagery identified as many as 448 ephedrine laboratories in the districts of Bakwa and Khashrud, with the highest concentration of laboratories in the immediate vicinity of Abdul Wadood bazaar (EMCDDA, 2020; Alcis et al., 2021a). Interviews with cooks and laboratory owners at the time indicated that these laboratories were capable of producing up to 1 600 tonnes of ephedrine per year, which could, in turn, be used to produce around 1 100 tonnes of methamphetamine (Alcis et al., 2021b).

Figure 2: Satellite imagery showing the growth in the size of Abdul Wadood bazaar in Bakwa between March 2010 and August 2019.

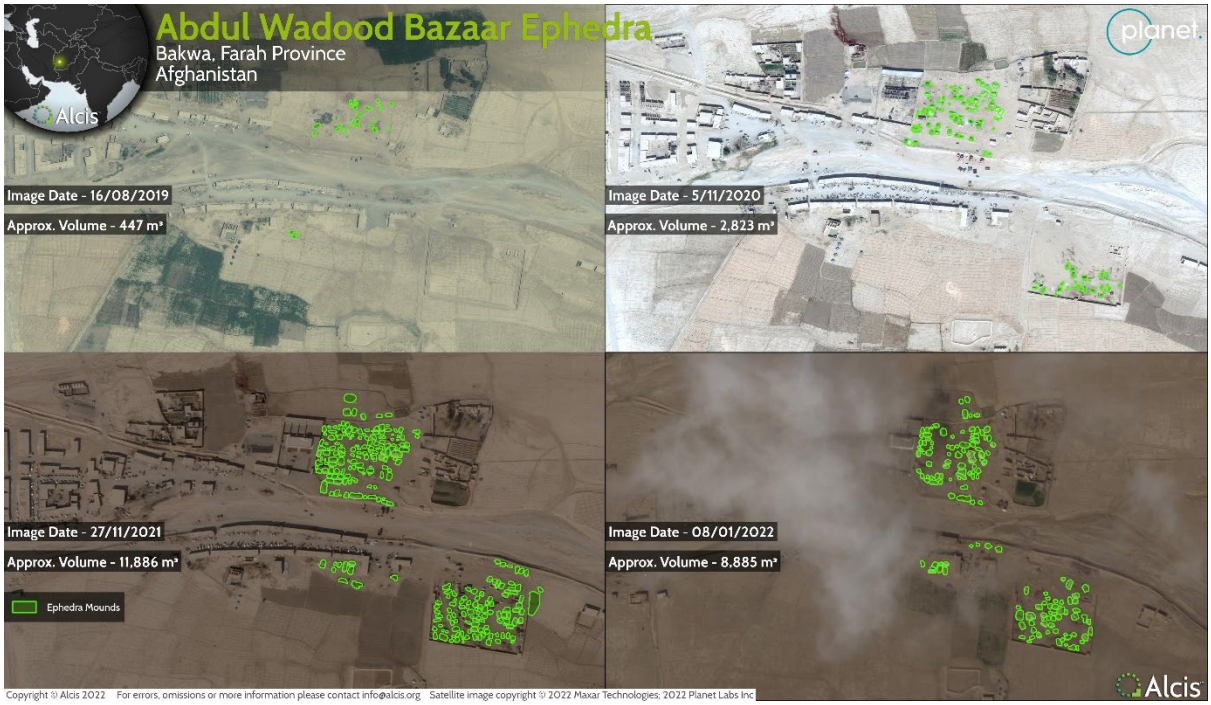
Note: The bazaar increased roughly fivefold in size between April 2017 and August 2019, coinciding with the switch from over-the-counter medicines to ephedra-based methamphetamine production.

Figure 3: Satellite imagery mapping ephedrine laboratory density in the districts of Bakwa and Khashrud in 2021, with the highest density around Abdul Wadood bazaar.



Following the collapse of the Islamic Republic of Afghanistan in August 2021, many in the central region turned to ephedra as a source of income (Alcis, 2022). At the end of the 2021 harvest, visual imagery, including satellite images, videos and photographs (Mansfield, 2022a, 2022b), showed almost 12 000 cubic metres of ephedra stored in Abdul Wadood bazaar on a single day, the largest quantity recorded and enough to produce roughly 220 tonnes of methamphetamine (see Figure 4) (Alcis, 2022). While there is no robust baseline by which to make a definitive judgement, a variety of data sources (including fieldwork, satellite imagery and economic data) indicate that this was the peak year of methamphetamine production in Afghanistan.

Figure 4: Satellite imagery analysis showing the volume of ephedra stored at Abdul Wadood bazaar on intermittent dates between August 2019 and January 2022, with the highest volume recorded on 27 November 2021.



Restrictions on the ephedra crop

The Taliban moved to restrict the methamphetamine industry in December 2021, less than four months after taking power, by announcing a ban on harvesting ephedra and on storing and trading the crop in Abdul Wadood bazaar (see Figure 5). The industry immediately adapted by bypassing the bazaar and transporting ephedra directly to the ephedrine laboratories in the surrounding area, which appeared to grow in size. In early 2022, satellite imagery showed sizeable ephedra mounds and greater volumes of liquid and solid waste outside much larger laboratories than had been observed in the past (see Figure 6 and Figure 7) (Mansfield, 2023a).

Figure 5: Graph showing the quantity of ephedra in Abdul Wadood bazaar (in square metres) between November 2018 and September 2022, derived from satellite imagery. See Alcis (2022) for further details.

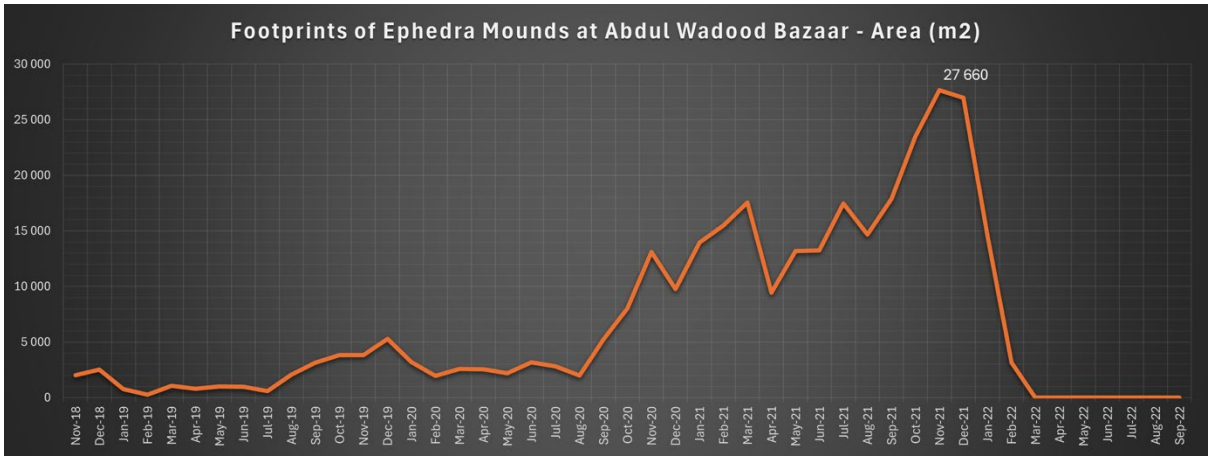


Figure 6: Satellite imagery showing an ephedrine laboratory in Bakwa, with increased stores of ephedra and greater quantities of liquid and solid waste from ephedrine production following the ban on trading in Abdul Wadood bazaar.

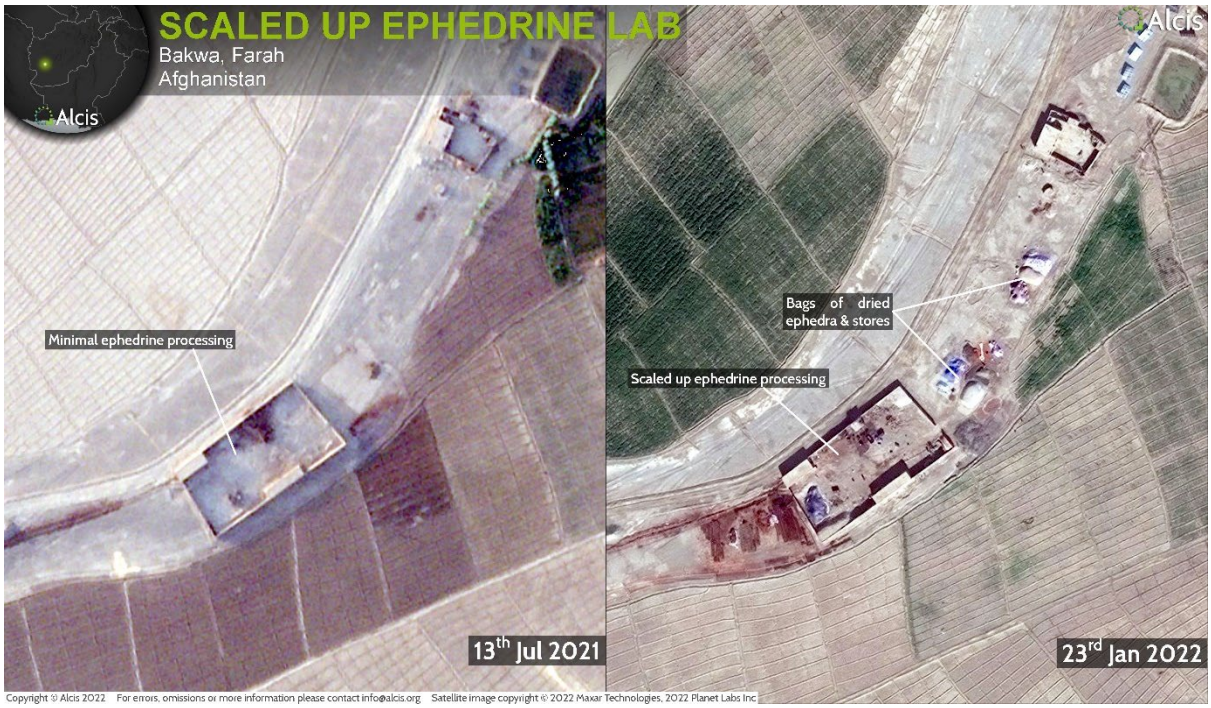


Figure 7: Satellite imagery from January 2022 showing larger ephedrine laboratories with greater volumes of ephedra and larger quantities of liquid and solid waste from ephedrine production than in previous years.

The ban on the ephedra harvest proved restrictive and forced most to conceal their involvement. Those who had harvested the crop prior to the Taliban's rise to power in 2021 could do so daily, transporting the ephedra back from the mountains and drying it on open ground next to their homes, facing relatively low risks of enforcement by the government. The Taliban's ban has greatly increased the risks involved with the trade and shaped the ways in which it now operates. At the time of writing, in November 2024, the trip to the mountains for harvesting and transporting the ephedra now happens infrequently and at night, which has reduced the quantities of ephedra available for processing into ephedrine.

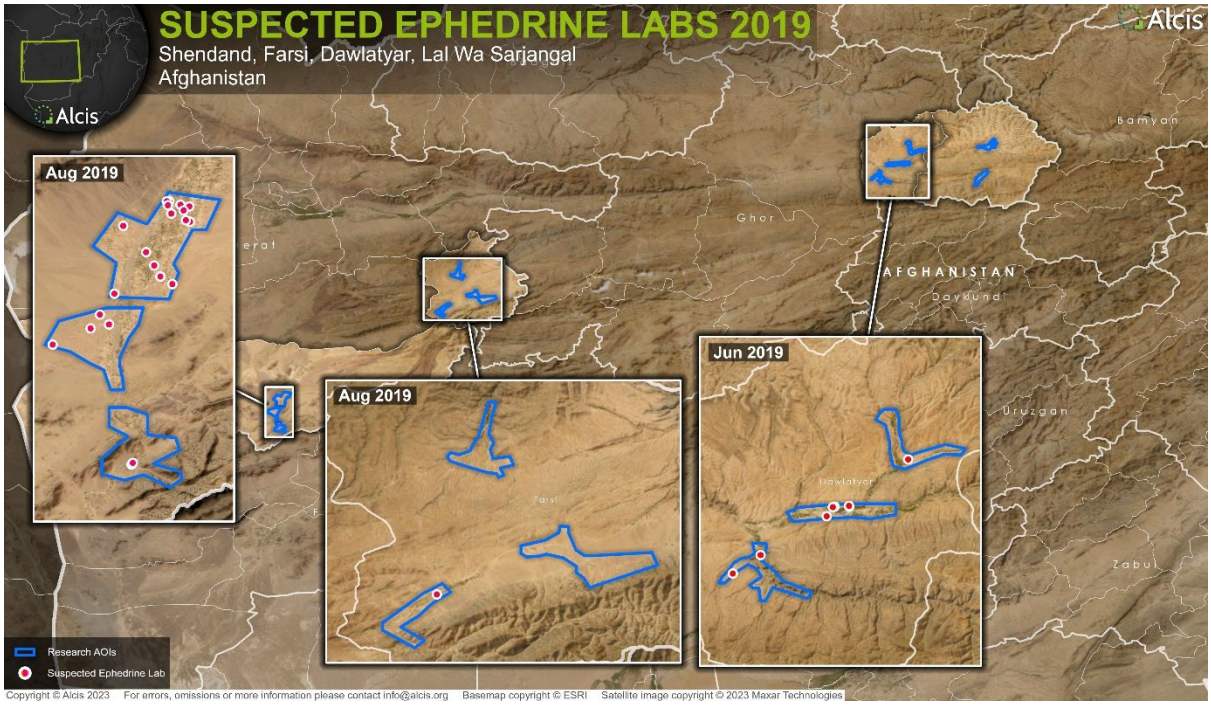
Those trading and transporting ephedra in 2024 also report taking other precautions, such as milling the crop to reduce its volume and transporting much smaller loads (often concealed under other goods) along minor roads to avoid detection. In the past, traders reported transporting up to 20 tonnes of dried ephedra in open trucks along arterial roads from provinces such as Ghazni, Herat and Ghor to Abdul Wadood bazaar. By the summer of 2024, ephedra was no longer transported to Bakwa at all. Rather, it is now moved locally to ephedrine labs within the central highlands, sometimes by motorbike to avoid detection (Mansfield, 2024c).

Curtailment of ephedrine production

While the Taliban's enforcement was focused on Abdul Wadood in 2022, large numbers of laboratory operators and 'cooks' relocated the production of ephedrine closer to the central highlands where ephedra grows. A similar process had been observed in 2019 following raids on Abdul Wadood bazaar by government forces and a limited bombing campaign by United States Forces-Afghanistan (USFOR-A), which targeted the methamphetamine industry as it was believed to be a primary source of revenue for the Taliban at the time (UNAMA and OHCHR, 2019). This prompted some laboratory owners and traders to relocate ephedrine production closer to where ephedra grows, such as in Shendand and Farsi in Herat, Lal Wa Sarjangal and Dawlatyar in Ghor, as well as parts of northern Helmand (see Figure 8 and Figure 9).

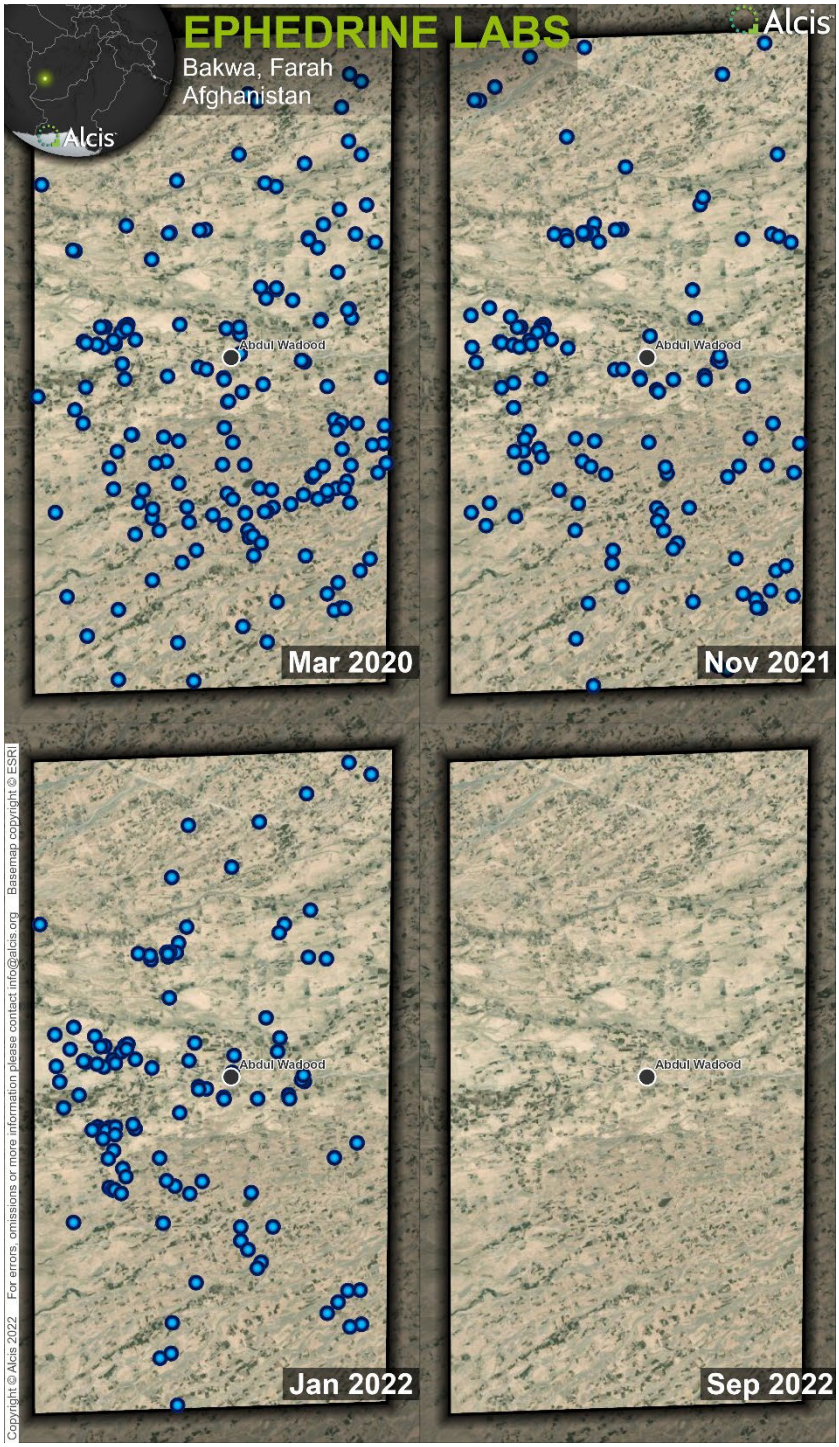
Figure 8: Satellite imagery showing a suspected ephedrine laboratory in Shendand, Herat, in 2019.

Figure 9: Satellite imagery analysis showing suspected ephedrine laboratories in Shendand, Farsi, Dawlatyar and Lal Wa Sarjangal in 2019.



The relocation of ephedrine production to these areas in the central highlands escalated following the Taliban's enforcement efforts against Abdul Wadood bazaar, culminating in a raid that closed the bazaar on 17 September 2022. This followed a series of warnings by Taliban authorities to the population in Bakwa, informing them that they should cease trading and producing ephedrine and methamphetamine. By the end of September 2022, satellite imagery analysis showed that there were no active ephedrine laboratories in an area of 320 square kilometres around Abdul Wadood bazaar, compared with 187 laboratories in June 2020 and 125 larger laboratories (capable of processing batches of up to 900 kilograms of ephedra per production cycle) in March 2021 (see Figure 10) (Mansfield, 2023a).

Figure 10: Satellite imagery analysis showing the reduction in the number of ephedrine laboratories in a 320 square kilometre area around Abdul Wadood bazaar between March 2020 and September 2022.



By the end of the 2022 ephedra season, the methamphetamine industry was showing increasing signs of stress. The price of ephedra had risen almost threefold, increasing the

cost of producing ephedrine and reducing its profitability (see Table 1). In turn, increased ephedrine prices, along with the rising costs of other chemicals needed to produce methamphetamine, such as iodine, red phosphorus and acetone, led to an almost doubling of methamphetamine production costs in 2022 (see Table 2). Like those harvesting and trading ephedra, laboratory owners were also compelled to curtail their work and complained of rising costs and increased risks, as well as falling incomes, as they produced smaller and more infrequent batches of ephedrine and methamphetamine, due to the Taliban's ban. Thus, while the price of ephedrine and methamphetamine increased in 2022 and 2023, the increased cost of production and much smaller batch sizes produced has meant that net returns have still remained significantly lower than in 2020.

Table 1: Cost of inputs of ephedrine production (using 100 man — 450 kilograms of ephedra — as the starting material) and net returns per kilogram and average batch size of ephedrine produced.

1. Cost of inputs and net returns of ephedrine production from 100 *man* (450 kilograms) of ephedra									
	2020			**2022**			**2023**		
Input	**Quantity**	**Unit**	**Cost (USD)**	**Quantity**	**Unit**	**Cost (USD)**	**Quantity**	**Unit**	**Cost (USD)**
Oman	450	kg	321	450	kg	897	450	kg	764
Salt	80	kg	14	3	bags	9	100	kg	36
Xylene	30	litres	57	10	litres	51	10	litres	42
Caustic soda	5	bags	71	50	kg	90	50	kg	118
Acid (car battery)	18	litres	9	20	litres	10	20	litres	28
Gas	80	kg	57	55	kg	55	36	kg	28
Diesel	100	litres	43	300	litres	320	160	litres	167
Sulphur	N/A	kg		100	kg	61	80	kg	50
Cloth	4	metres	5	N/A			4	metres	2
Filters	N/A			4	units	36	N/A		
Universal test	N/A			1	units	9	1	units	16
Cook	2	days	7	2	days	16	2	days	83
Labour	6	days	21	6	days	27	6	days	58
Tax	15	kg	5	N/A			N/A		
Other costs (e.g. food)	1	units	29	1	units	27	2	days	28
Cost of production (USD)	**641**			**1 607**			**1 419**		
Output	**Quantity**	**Unit**	**Price (USD)**	**Quantity**	**Unit**	**Price (USD)**	**Quantity**	**Unit**	**Price (USD)**
Ephedrine	15	kg	1 179	15	kg	1 695	14	kg	2 333

2. Net returns (cost of production - selling price) on ephedrine from 100 *man* (450 kilograms) of ephedra									
Output	**Quantity**	**Unit**	**Net return (USD)**	**Quantity**	**Unit**	**Net return (USD)**	**Quantity**	**Unit**	**Net return (USD)**
Ephedrine	15	kg	538	15	kg	88	14	kg	914

3. Net returns (cost of production - selling price) on ephedrine from average batch size produced						
Output	**Batch size (2020)**	**Net return (USD)**	**Batch size (2022)**	**Net return (USD)**	**Batch size (2023)**	**Net return (USD)**
Ephedrine	30 kg	1 075	15 kg	88	3.5 kg	229

Table 2: Cost of inputs of methamphetamine production (using 100 kilograms of ephedrine as the starting material) and net returns per kilogram and average batch size of methamphetamine produced.

1. Cost of inputs of methamphetamine production from 100 kilograms of ephedrine									
Input	**2020**			**2022**			**2023**		
	Quantity	**Unit**	**Cost (USD)**	**Quantity**	**Unit**	**Cost (USD)**	**Quantity**	**Unit**	**Cost (USD)**
Ephedrine	100	kg	7 857	100	kg	18 834	100	kg	18 056
Thinner	1	barrels	821	200	litres	1 076	80	litres	347
Petrol	1	barrels	157	200	litres	90	120	litres	125
Iodine	100	kg	8 571	84	kg	13 827	80	kg	8 056
Red phosphorous	35	kg	1 375	25	kg	2 242	30	kg	1 771
Caustic soda	6	bags	86	100	kg	179	100	kg	208
Xylene	30	litres	57	N/A		0	30	litres	125
Ammonium chloride	N/A			100	litres	179	N/A		
Gas	120	kg	86	67	kg	60	72	kg	55
Cook	8	days	57	8	days	72	72	kg	875
Labour	24	days	86	24	days	108	20	days	104
Other costs (food, etc.)	4	batch	114	4	batch	113	4	batch	56
Tax	75	kg	161	N/A			N/A		
Cost of production			**19 429**			**36 779**			**29 816**
Output	**Quantity**	**Unit**	**Price (USD)**	**Quantity**	**Unit**	**Price (USD)**	**Quantity**	**Unit**	**Price (USD)**
Methamphetamine	75	kg	22 500	67	kg	39 462	72	kg	33 750

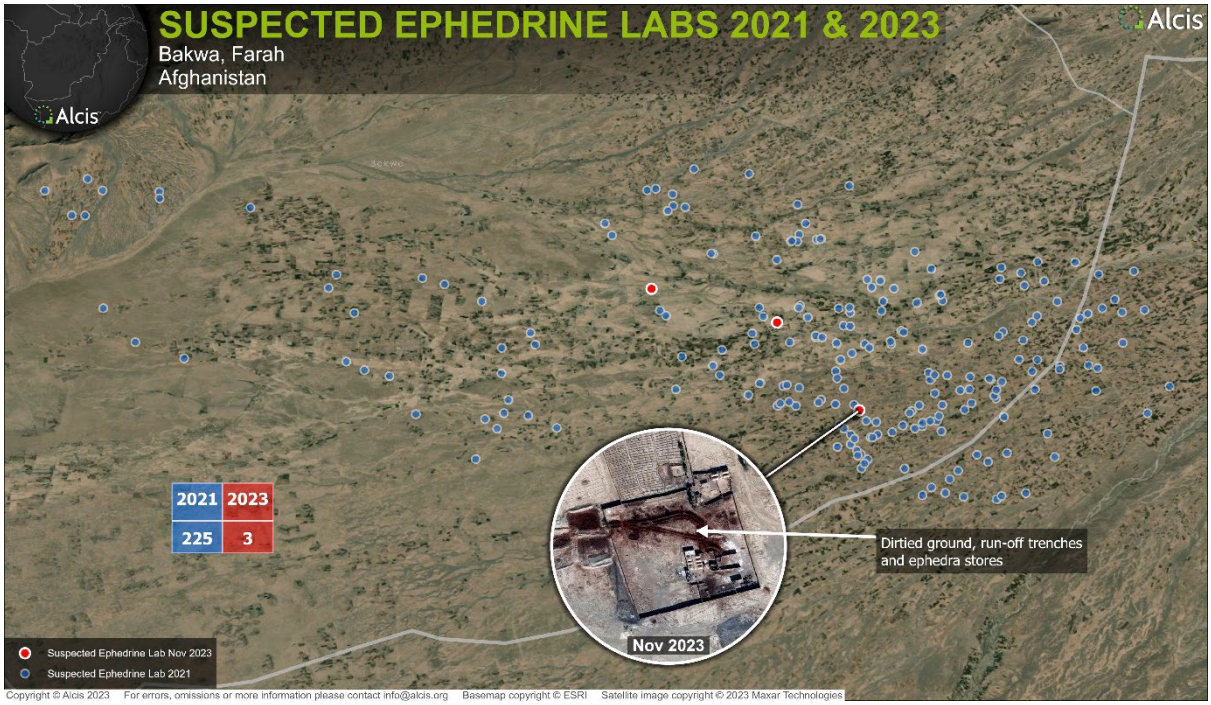
2. Net returns (cost of production - selling price) on methamphetamine from 100 kilograms of ephedrine									
Output	**Quantity**	**Unit**	**Net return (USD)**	**Quantity**	**Unit**	**Net return (USD)**	**Quantity**	**Unit**	**Net return (USD)**
Methamphetamine	75	kg	3 071	67	kg	2 683	72	kg	3 934

3. Net returns (cost of production - selling price) on methamphetamine from average batch size produced						
Output	**Batch size (2020)**	**Net return (USD)**	**Batch size (2022)**	**Net return (USD)**	**Batch size (2023)**	**Net return (USD)**
Methamphetamine	75 kg	3 071	30 kg	805	25 kg	983

Continued disruption through 2023 and 2024

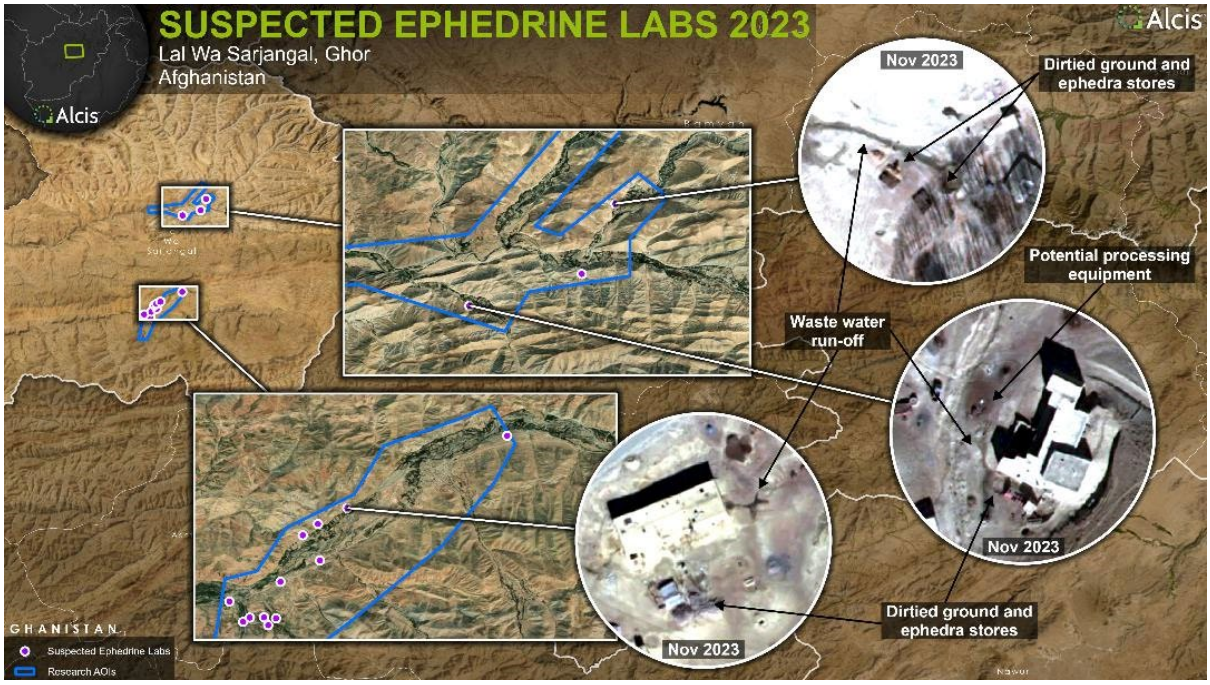
The pressure on the methamphetamine industry continued in 2023 and 2024, with the ephedra harvest season (between July and October) accompanied by further restrictions, including Taliban patrols and checkpoints in the mountain areas. The drugs law announced by the Taliban on 1 October 2023 added further impetus to enforcement efforts, including in remote valleys in central Afghanistan where ephedrine laboratories were concentrated. There were growing reports (evidenced by video footage) of laboratory closures in the upper districts of Herat, Ghor, Faryab, Jawzjan and Uruzgan (Darvish, 2023; Voice of America Dari, 2023; Wesal, 2023). By the end of 2023, roughly 300 ephedrine laboratories in 82 districts and across 23 provinces had been destroyed by the authorities (Mansfield, 2023a). This showed the industry's expanded footprint and the geographic reach of the Taliban's enforcement efforts. Furthermore, while there were rumours that ephedrine production had returned to Abdul Wadood bazaar, satellite imagery showed only three suspected laboratories in the surrounding area in November 2023, where 225 had been observed in March 2021 (see Figure 11) (Mansfield, 2023a).

Figure 11: Satellite imagery analysis showing the number of suspected ephedrine laboratories in a 650 square kilometre area around Abdul Wadood bazaar in March 2021 and in November 2023.



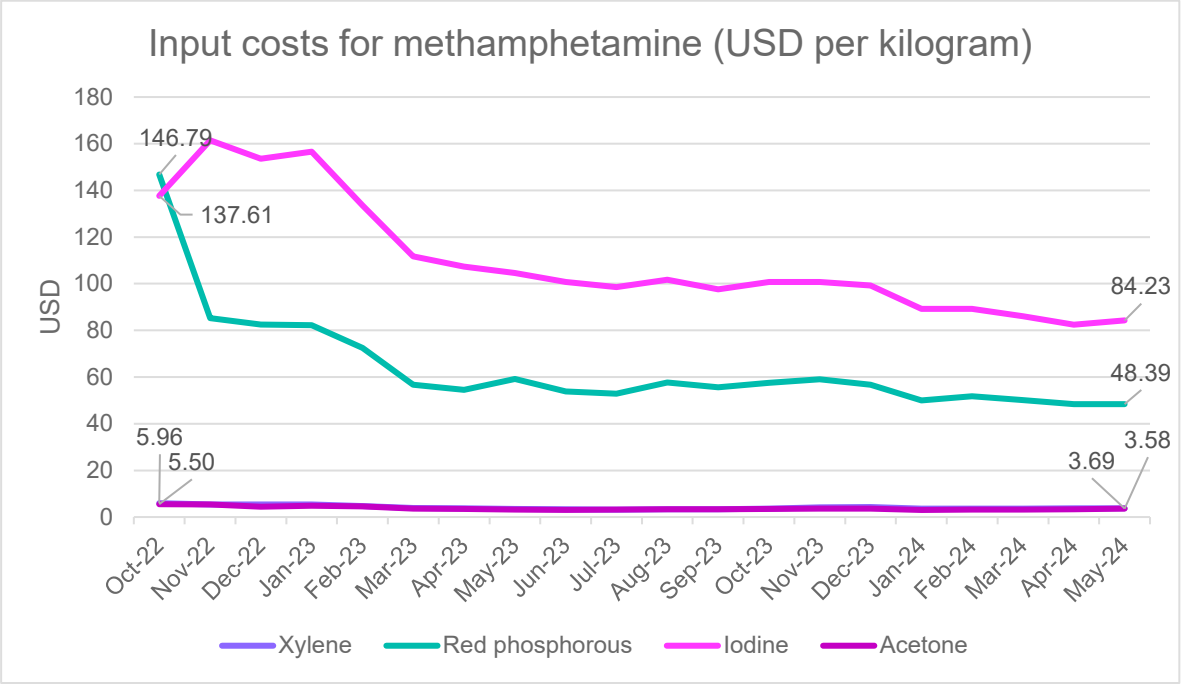
By 2023, ephedra could not be harvested and transported openly and in bulk, and it could not be traded in large volumes in a single bazaar. In addition, it was no longer possible to purchase and process large volumes of ephedra into ephedrine in the makeshift laboratories in the area surrounding Abdul Wadood bazaar. Rather, ephedrine production became further established in the remote and inaccessible mountain areas, in proximity to where ephedra grows, and ephedrine was transported to the south-west for methamphetamine production (see Figure 12). This trend continued in 2024, with further restrictions imposed by the Taliban, and ephedrine labs moving to ever more remote valleys in the central highlands (Mansfield, 2024c).

Figure 12: Satellite imagery showing ephedrine laboratories in Lal Wa Sarjangal, Ghor, all significantly smaller and with much less waste than the laboratories in Bakwa in 2021 and 2022.



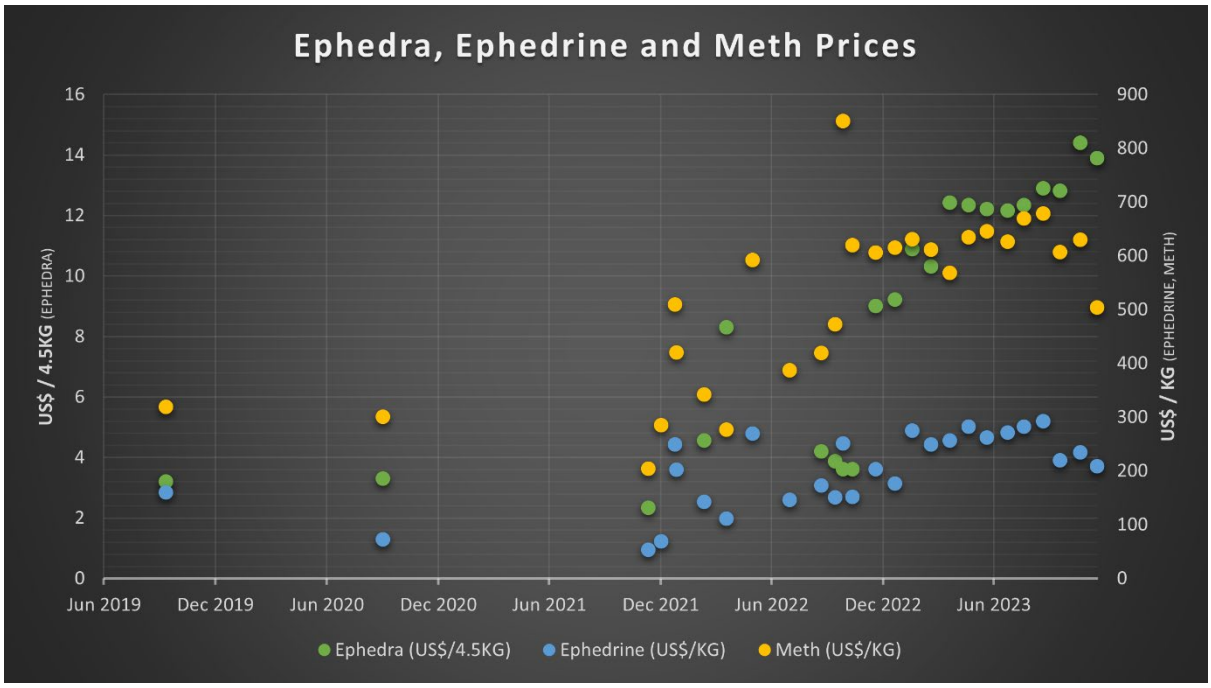
These remote laboratories were much smaller in size and were capable of processing only about a quarter of the quantity of ephedra processed by the larger laboratories around Abdul Wadood bazaar. Thus, it is highly unlikely that these new ephedrine laboratories could compensate for the significant loss in productive capacity that followed the Taliban's closure of those larger laboratories. In addition, the data available shows a downward trend in the price of chemicals used in the production of methamphetamine in Afghanistan over this period, including xylene, red phosphorus and iodine, and this is attributed to lower levels of demand for methamphetamine production in Afghanistan, and therefore for ephedrine (see Figure 13).

Figure 13: Graph showing the price of key chemicals used in the production of methamphetamine, October 2022 to May 2024.



Despite the reduced cost of some essential chemicals, the significant increase in the cost of ephedrine and skilled labour led to a large increase in overall methamphetamine production costs (see Table 2 and Figure 14). The increased costs of production, combined with reduced volumes of ephedra, have curtailed the incomes of those directly involved in the methamphetamine industry at a time when they also face increased risks.

Figure 14: Graph showing the increase in the price of ephedra, ephedrine and methamphetamine, initially following the Taliban's imposition of a ban on the ephedra harvest in December 2021, then following the closure of Abdul Wadood bazaar and ephedrine laboratories in the surrounding area.



Declining overall production of methamphetamine

Overall, the available data points to falling levels of methamphetamine production in Afghanistan as a direct result of the Taliban drug ban. While some have asserted that a reduction in ephedra-based methamphetamine production might be offset by the use of over-the-counter medicines (UNODC, 2023b), the economic data does not support this claim as production costs would far exceed the price of methamphetamine in Afghanistan or on its borders. For example, fieldwork in Afghanistan has indicated that a single carton containing 1 000 tablets of the type of over-the-counter medicines used to make methamphetamine costs between USD 900 and USD 1 000. One such carton could be used to produce between 0.5 and 0.6 kilograms of methamphetamine. Thus, in October 2023, if using over-the-counter medicines, the cost of only the precursor (excluding all other costs, such as those related to labour and inputs) required to make 1 kilogram of methamphetamine would be USD 1 500 to USD 2 000. At the time, methamphetamine was selling on the domestic market for roughly USD 630 per kilogram. Hence, based on the data available, producing methamphetamine using over-the-counter medicines would lead to a significant financial loss. At the same time, total ephedra-based production costs (labour and all inputs) for 1 kilogram of methamphetamine peaked at roughly USD 552 in 2022 (see Table 2).

The use of bulk active pharmaceutical ingredients (API) in Afghanistan would be an alternative, but currently there is neither the seizure data nor information from those involved in the methamphetamine industry to confirm that this is happening. Until the Taliban takeover, Afghanistan's advantage in methamphetamine production was the availability of low-cost ephedra and an ability to transport and trade it across the country in large volumes. A shift to bulk API would not need such an environment and could be undertaken in any country in the region. In this case, it would probably be more logical for production to be based closer to the source of bulk precursors, rather than in Afghanistan.

A ban on poppy cultivation

Compared with the methamphetamine industry, the reduction in opium cultivation in Afghanistan in 2023 has received significant attention from decision-makers and the media. Poppy cultivation in 2023 was at its lowest level since the first Taliban ban in 2001 and coincided with a growing concern about outbreaks of fatal and non-fatal poisonings linked to synthetic opioids in Europe. There is an increasing worry that reduced opium production in Afghanistan will have a direct impact on the availability of heroin in Europe and that more harmful synthetic opioids may fill the gap. While the trafficking of heroin to Europe may be impacted in the medium term, and gaps in supply may emerge, there is no sign yet of a shortage of opium in Afghanistan (Mansfield, 2024c). The available data suggests that a significant inventory of opium exists among farmers and traders from the years prior to the ban announced in April 2022 (Mansfield, 2024d). Hence, both internal and cross-border trade of opiates continues unabated (Dawn, 2024; Tass, 2024; Amu TV, 2024). Nevertheless, high opium prices following the Taliban drug ban have impacted the production and trade in morphine, heroin base and heroin hydrochloride by increasing the cost of their production. Simultaneously, the dramatic rise in opium prices in Afghanistan has not been met with a commensurate increase in the price of those opium derivatives. This has led to falling profits and what appears to be a move to increased adulteration of different heroin consumer products, particularly those destined for local and regional markets. Adulteration appears to be infrequent for the heroin destined for European markets, which continues to command higher prices and generate higher profits, although this situation may change as the second year of the ban takes hold. Importantly, there are signs of decreased heroin purity in Europe in 2024 (Berry, 2025). For now, it appears that heroin adulteration is taking place closer to European consumer markets rather than in Afghanistan.

A slow and awkward start

The Taliban's decision to impose a ban on the production, trade and use of drugs was always going to be met with some scepticism, particularly following more than two decades of reporting by a range of government, media and research organisations that drugs were their primary source of finance. The Taliban's announcement of their drug ban in early April 2022, within days of informing the international community that girls' schools would not be reopened, led many to believe that the edict was an attempt to distract from human rights issues (Bjelica and Clark, 2022).

These doubts were exacerbated by the Taliban's subsequent failure to act against the existing crop in the spring of 2022. With the ban announced only two weeks prior to the 2022

harvest, and the Taliban unable to destroy the crop without risking widespread resistance, the Deputy Minister of the Interior in Kabul announced a two-month 'grace period' for those who had planted their poppy prior to the edict.

Officially, this statement allowed those who had planted opium in the autumn of 2021 (four months before the drug ban was announced) to harvest and sell their crop. While the more marginal spring and summer poppy crops were eradicated in the south-west, the Taliban authorities did nothing to suppress these later crops in higher-altitude areas in provinces such as Badakhshan and Ghor (some of which were planted after the ban was announced) (Mansfield, 2023b). In sum, despite the announcement of a ban, most farmers who wanted to could obtain an opium yield in 2022.

There was little surprise, therefore, in November 2022 when the UNODC announced a 32 % rise in poppy cultivation, with an estimated 233 000 hectares of land under cultivation compared with 177 000 in 2021 (UNODC, 2022). With few restrictions on poppy cultivation and a continuation of cross-border trade, officials and international observers challenged the Taliban's assertion that a ban was in place and its ability to enforce one (Faulkner, 2023; Simms, 2023; Arsala and Siddique, 2022).

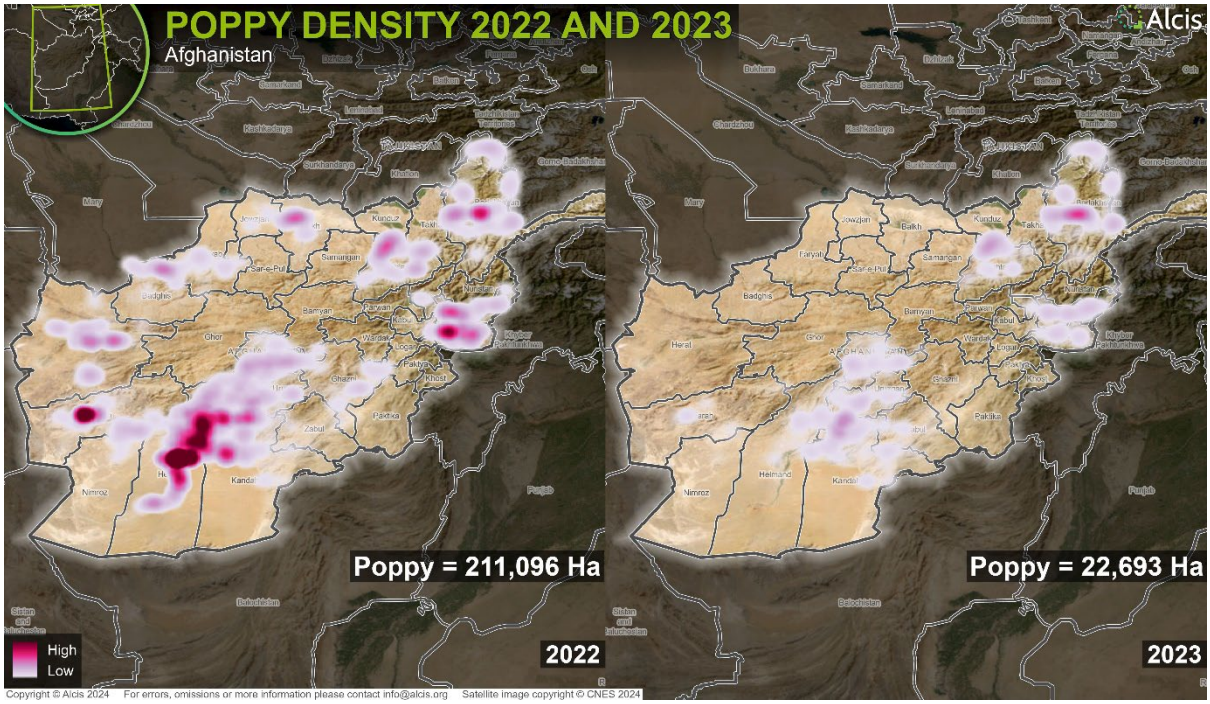
A dramatic reduction in poppy cultivation in 2023 and the prospects of a continued ban

It was against this backdrop of scepticism that the scale of the reduction in the 2023 opium crop went largely unnoticed. At the start of the poppy-planting season and in the first few months of 2023, there were suggestions that the Taliban authorities were once again failing to move against the standing crop as there were very few reports of eradication. In fact, the absence of a widespread eradication campaign reflected the success of the Taliban's efforts to deter planting across much of the southern and eastern parts of Afghanistan, rather than being a measure of their lack of commitment or ability to impose a ban.

In early June 2023, satellite imagery analysis confirmed the degree to which cultivation had fallen in Helmand, the most significant poppy-producing province in Afghanistan. This showed a reduction from 128 000 hectares of poppy cultivation in 2022 to 740 hectares in 2023 (Mansfield, 2023b). By 2 November 2023, satellite imagery analysis conducted by Alcis for all 34 provinces in Afghanistan showed a reduction of about 89 % in poppy cultivation, from an estimated 211 093 hectares in 2022 to 22 694 hectares in 2023 (Mansfield, 2023d). Almost one third of the cultivation in 2023 was located in the north-eastern province of Badakhshan (6 795 hectares) (see Figure 15). A few days later, the UNODC reported its annual poppy estimates, stating that poppy cultivation had fallen by 95 % to 10 800 hectares in 2023 (UNODC, 2023a). Unlike the estimate developed by the UNODC, Alcis' estimate of

22 694 hectares of opium cultivation in 2023 is the result of analysing satellite imagery collected across the whole of Afghanistan repeatedly throughout the winter cropping season, rather than a partial survey based on satellite imagery from a sample of locations to extrapolate estimates (Byrd, 2023). This method reviews every field in Afghanistan multiple times through its growing cycle, revealing poppy in areas that, for example, the UNODC has not included in its sample of potential areas of cultivation.

Figure 15: Satellite imagery analysis of poppy density in Afghanistan, comparing cultivation in 2022 and 2023.



Differences in poppy cultivation estimates pose a challenge for assessing the ban

Discrepancies in poppy cultivation estimates and yields (for yields, see Larger opium production than estimated has implications for inventories) pose a challenge for assessing the drug ban's impact in Afghanistan and in destination countries for heroin, as this will lead to different estimates of production capacity of morphine, heroin base and heroin hydrochloride. In this respect, the situation in Badakhshan is likely to have a significant influence on the continuation of the drug ban and its impact on Afghanistan's political economy, as well as the potential availability of heroin in Europe. The UNODC has reported that opium poppy cultivation in Badakhshan decreased from 4 305 hectares in 2022 to 1 573 hectares in 2023, largely in line with reductions in other provinces. However, Alcis reports

both higher levels of cultivation in Badakhshan in 2022 (an estimated 4 913 hectares) and a rise in cultivation in 2023 (to 6 795 hectares) (Mansfield, 2023d).

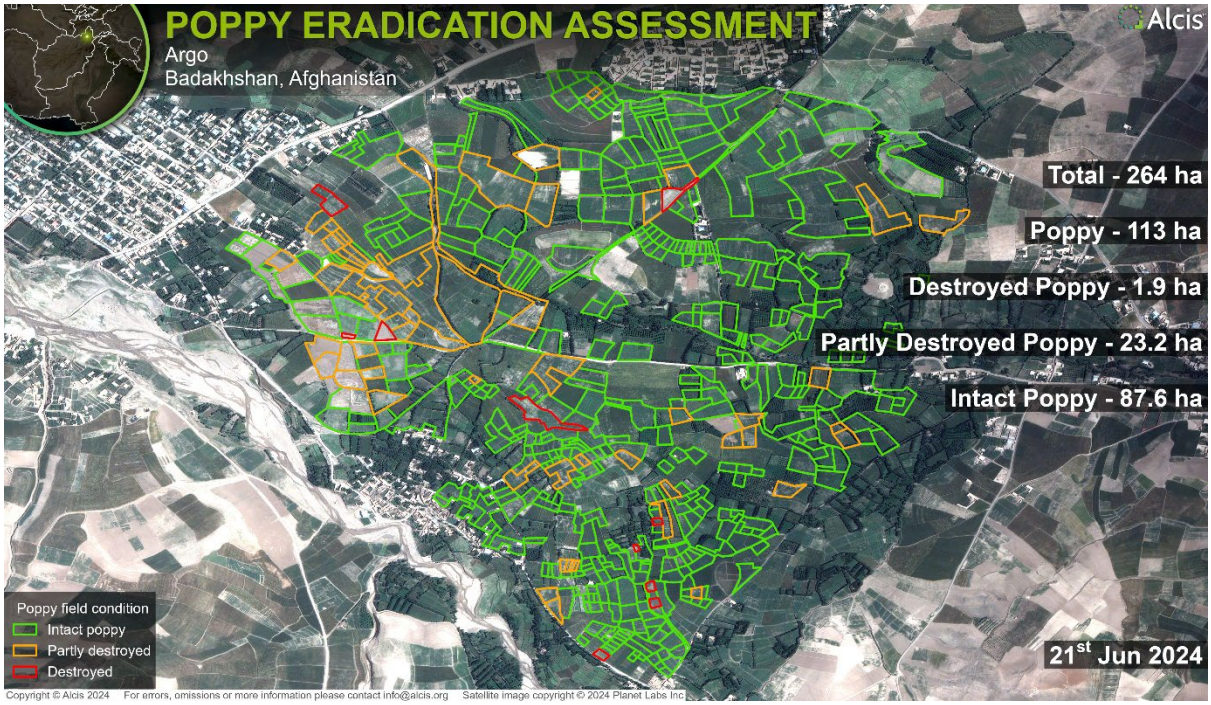
The situation in Badakhshan presents the Taliban with a significant challenge as it seeks to deter cultivation across Afghanistan in the future (Byrd, 2023). Securing continued low levels of cultivation in the provinces that complied with the ban in 2023 becomes harder to achieve in subsequent seasons if farmers and local Taliban commanders in other provinces ignore the pressure to refrain from planting. Continued disregard for a religious edict by some of the population may also be seen as a challenge to Taliban rule and could be used as an opportunity by rural elites and farmers in provinces such as Helmand and Nangarhar to argue that they, too, should be allowed to return to poppy cultivation in the future.

The Taliban's control in Badakhshan in the north-east is weaker than in the south-west or east of Afghanistan. Reducing poppy cultivation here will therefore be a challenge. The province was once a stronghold of the Northern Alliance and the last bastion of resistance to the Taliban in the 1990s. Many of those currently in the provincial and district authorities are local Badakhshi commanders, who fear not only the impact that enforcing a ban will have on the livelihoods of the local population, but also the potential political backlash that this might cause. In a province that has already seen several violent incidents since the Taliban takeover, including armed resistance to eradication efforts (Afghanistan International, 2023) and high-profile attacks targeting provincial leaders (Afghan Witness, 2023), a more aggressive campaign of crop destruction could prove destabilising.

The available data shows continued widespread poppy cultivation in accessible irrigated areas in Badakhshan in 2024, with cultivation close to main roads and even the airport in the provincial centre in Fayzabad (see Figure 16). There were few signs of the provincial and district authorities making efforts to deter planting in the autumn of 2023, and by March 2024 crop destruction had been minimal. Enforcement against poppy cultivation would have been important in the spring of 2024, to dissuade farmers from further planting in higher-altitude areas, such as the district of Khash where poppy has flourished.

In the spring of 2024, efforts by the Taliban leadership to respond to continued cultivation in Badakhshan prompted a violent backlash from rural communities, and an ineffective eradication campaign (Mansfield, 2024a; 2024b). Concerned that this might provoke more widespread dissent in the province and that it could also act as an example to other areas, the provincial authorities curbed their crop destruction effort, delaying some of it until the crop had already been harvested. High-resolution imagery analysis showed that in many areas the bulk of the crop remained untouched and, where eradication was conducted, much of the crop was left intact (see Figure 16) (Mansfield, 2024b).

Figure 16: Imagery showing only partial crop destruction in the district of Argo in Badakhshan, where many of the Taliban's eradication efforts were centred in the spring of 2024.



In October 2024, Alcis reported reductions in poppy cultivation in Badakhshan, where only 3 646 hectares of poppy was found, compared with 6 795 hectares a year earlier. However, the reductions were concentrated in the more remote rainfed areas, where the provincial authorities' reach was limited and any eradication efforts were nominal, suggesting that climate factors played a determining role (Mansfield, 2024b). In the better-irrigated and more accessible valleys of Argo, Baharak and Jurm, where most of the poppy destruction had been focused, poppy cultivation remained stable, and in districts such as Darayem and Khash it even rose. These divergent trends further highlighted the limits of Taliban rule in the province (Mansfield, 2024b).

The UNODC, on the other hand, with its more limited sampling method, suggested a substantial rise in poppy cultivation of almost 400 % in Badakhshan, increasing from 1 573 hectares in 2023 to 7 408 hectares in 2024 (UNODC, 2024).

Either way, patterns of poppy cultivation in Badakhshan in 2024 thus stand in stark contrast to those in provinces such as Helmand in the south-west and Nangarhar in the east, where compliance with the ban prevailed for a second year, even in some of the most remote areas. In fact, the local authorities in Nangarhar proved particularly proactive in pressuring the population not to plant poppy in late 2023, including in some of the most remote parts of the province.

The prospect of a second consecutive year of the ban led opium prices to rise dramatically in late 2023 (see Figure 17). This prompted many farmers not to sell any opium that they had stored, in anticipation of further price increases. However, between January and March 2024, prices fell by roughly 40 % as the market adjusted, possibly in response to continued poppy cultivation in Badakhshan. This may also have been influenced by falling demand from heroin producers as they adjusted to potential losses, as the rise in opium prices was not commensurate with the price they could obtain for morphine or heroin (see Figure 18). Prices of both opium and its derivatives continued to fall throughout much of 2024, reflecting continued cultivation in Badakhshan, the size of inventory, as well as reports of increased opium production in Pakistan (Mansfield, 2024b).

Figure 17: Graph showing the price of opium in Nangarhar, Kandahar and Badakhshan between January 2022 and September 2024.

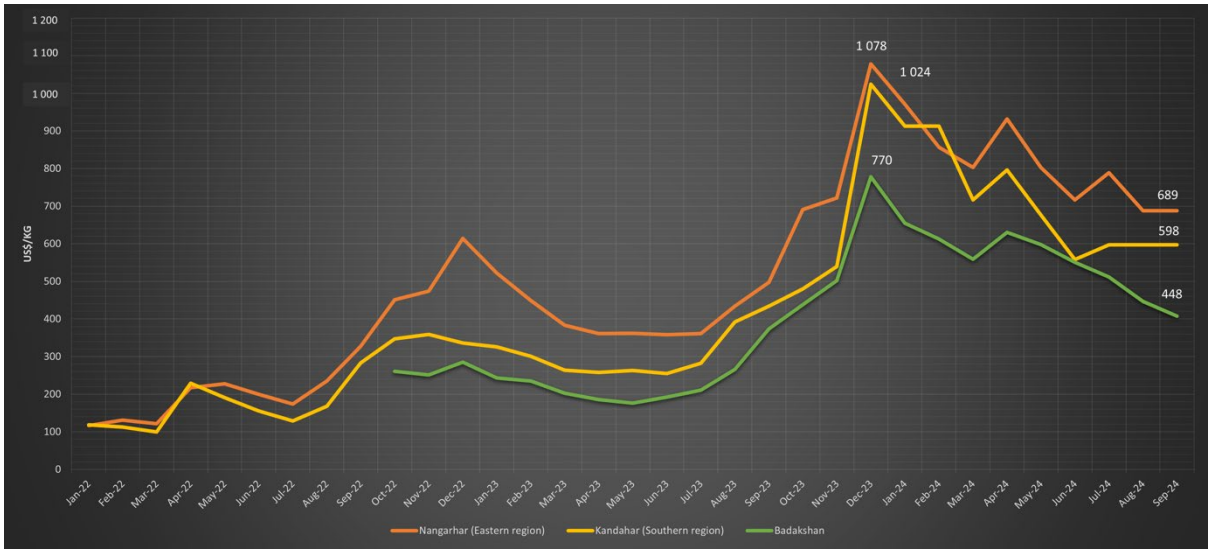
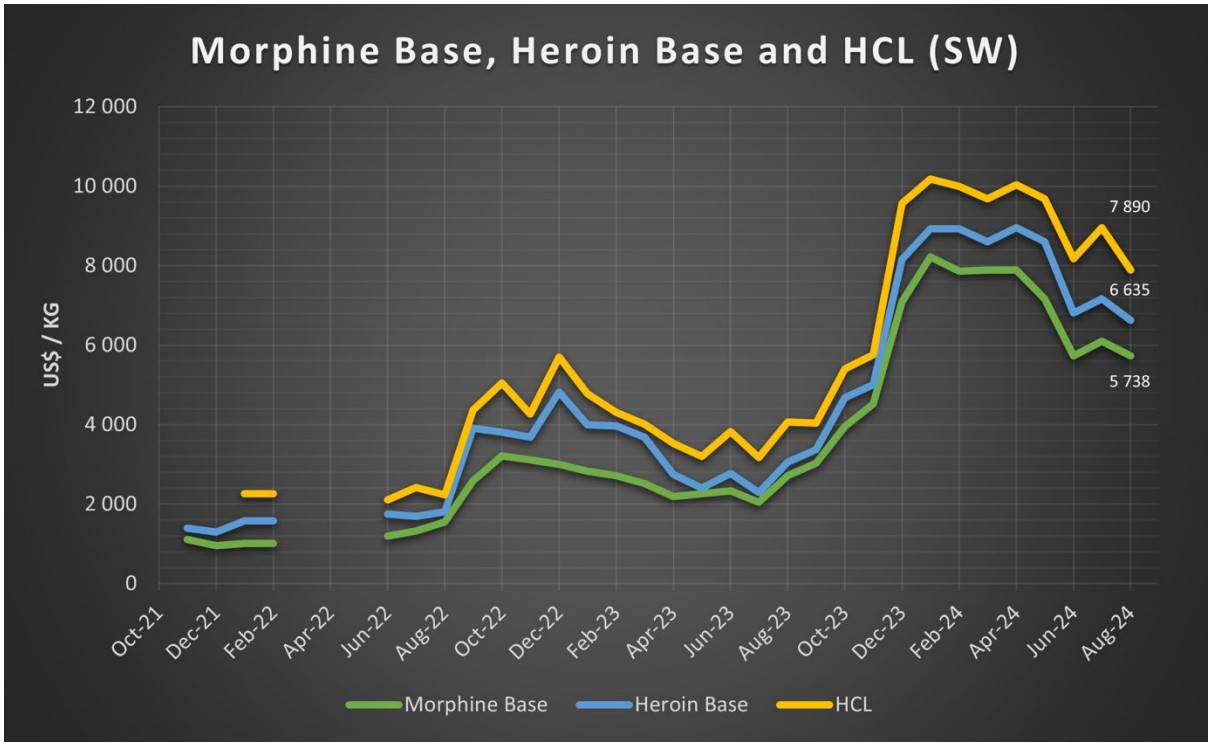


Figure 18: Graph showing the price of morphine base, heroin base and heroin hydrochloride in south-west Afghanistan between August 2021 and September 2024.



Continued trade in opium despite low levels of poppy cultivation

Despite the significant drop in poppy cultivation in 2023 and continued low levels of cultivation in 2024, there are few indications of an opium shortage in Afghanistan or on its borders. Within the country itself, opium continues to be traded openly in both weekly and permanent markets. Traders also remain active in areas experiencing a second consecutive year with little poppy cultivation, such as Helmand and Farah in the south-west and Nangarhar in the east.

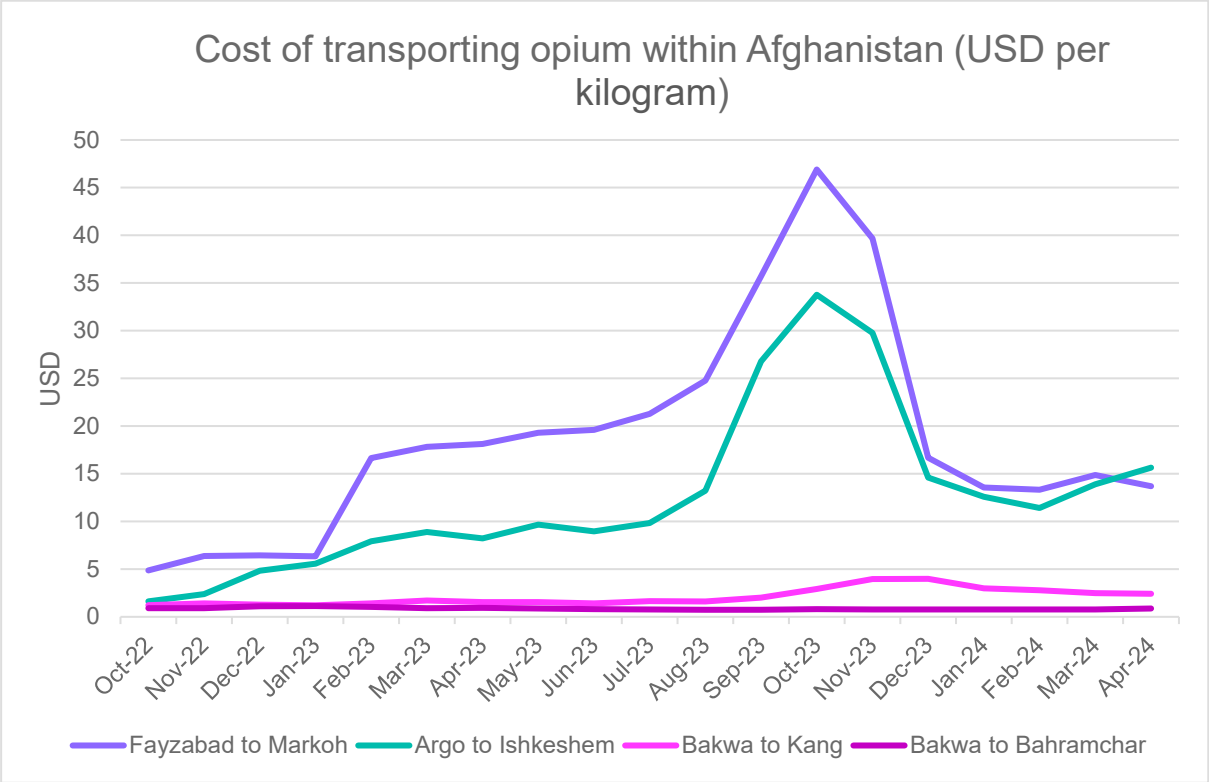
While the Taliban has sought to restrict opiate trafficking on key routes, e.g. during the summer and autumn of 2023, smuggling costs had generally been decreasing since before the Taliban takeover in August 2021. This was probably due to a combination of factors, including the reduced risk of interdiction by international and government forces in the time leading up to the collapse of the Islamic Republic of Afghanistan, and less interference in the drugs trade by either corrupt officials or thieves. For example, the available data shows that

the amount smugglers charged per kilogram of opium being trafficked on routes between the primary trading hub at Bakwa in Nimroz and the borders with Iran (Kang) and Pakistan (Bahramchar) fell by 80 % between October 2019 and October 2022 (Mansfield, 2021).

Between October 2022 and October 2023, however, the available data shows that smuggling costs for a kilogram of opium increased on many major routes (except for those from Bakwa to Iran and Pakistan). This appears to have been influenced by a combination of factors, including instructions to provincial governors in February 2023 to remove the taxation on the drugs trade, signalling that the Taliban was serious about the drug ban, and the discussion of and subsequent decision to implement a new drugs law over the summer and autumn of 2023 (see Figure 19). Some opium smuggling routes have nevertheless remained largely unaffected, such as those through the southern town of Bahramchar in Helmand. In the case of Bahramchar, this is probably due to the town's geographical location and accessibility via a multitude of routes through the desert. This makes it an area difficult to police, and the low fee charged for transporting opium along this route is believed to reflect the low likelihood of detection. The subsequent drastic reduction in smuggling costs in late 2023 and early 2024 is, in part, thought to have been seasonal, due to the challenges of trading during the winter through mountainous terrain, but it also appears to have been influenced by the significant increase in opium prices in the final months of 2023 and the subsequent reduction in demand from heroin laboratories, which could no longer produce opiates at a profit.

Authorities in both Nangarhar and Nimroz also mounted a campaign to deter smuggling at key border crossing points in the second half of 2023 (Mansfield, 2023d). Initially, smugglers were briefly detained but then released with their drugs. Later, they were detained for a few days and their drugs were confiscated on release. In Nangarhar, this campaign culminated in October 2023 with the closure of the primary border crossing point from Markoh to Peshawar in Pakistan, via Durbaba and Tirah in Khyber Pakhtunkhwa. In November 2023, the route reopened briefly, and although smugglers charged the same fee, they would not provide guarantees for opium that was either seized or stolen, which they did prior to the border closure. In December 2023, the route from Markoh to Peshawar rerouted through the Mohmand valley before closing in February 2024 due to the snow. As of March 2024, smuggling across this border remained challenging, and smugglers continued to operate, though only under the condition that any losses were at the trader's expense. Overall, as part of an attempt to raise the risks and costs of smuggling, while seeking to avoid dissent from border communities, the Taliban's campaign has proved effective.

Figure 19: Graph showing the costs of smuggling opium in Afghanistan, October 2022 to April 2024.



Part of the Taliban's campaign against smuggling in the latter part of 2023 focused on preventing the use of catapults to launch drugs across the Afghan-Iranian border in the districts of Kang and Ziranj in Nimroz. These catapults were established prior to the Taliban takeover in 2021, but proliferated after Haibatullah's announcement of a drug ban in April 2022 (see Figure 20). Since the Taliban takeover, smugglers had used these catapults during the day (while previously they had been used under the cover of dusk or at night). Following a ban on catapults in July 2023 and several arrests in the vicinity of the Afghan Border Police checkpoints in Kang, new catapults began to appear further north and south in the district of Ziranj. Between February and November 2023, there were only marginal increases in the cost of transporting opium domestically between Bakwa and the border at Kang. There was, however, a marked increase in the cost of cross-border smuggling into Iran due to the Taliban's action against catapults and heavy clashes between Iranian and Afghan border guards in May 2023. Overall, the cost of smuggling opium across the Kang (Afghanistan) to Zahedan (Iran) border has risen dramatically since the Taliban takeover (see Figure 21).

Figure 20: Satellite imagery analysis showing catapults on the Afghan-Iranian border.

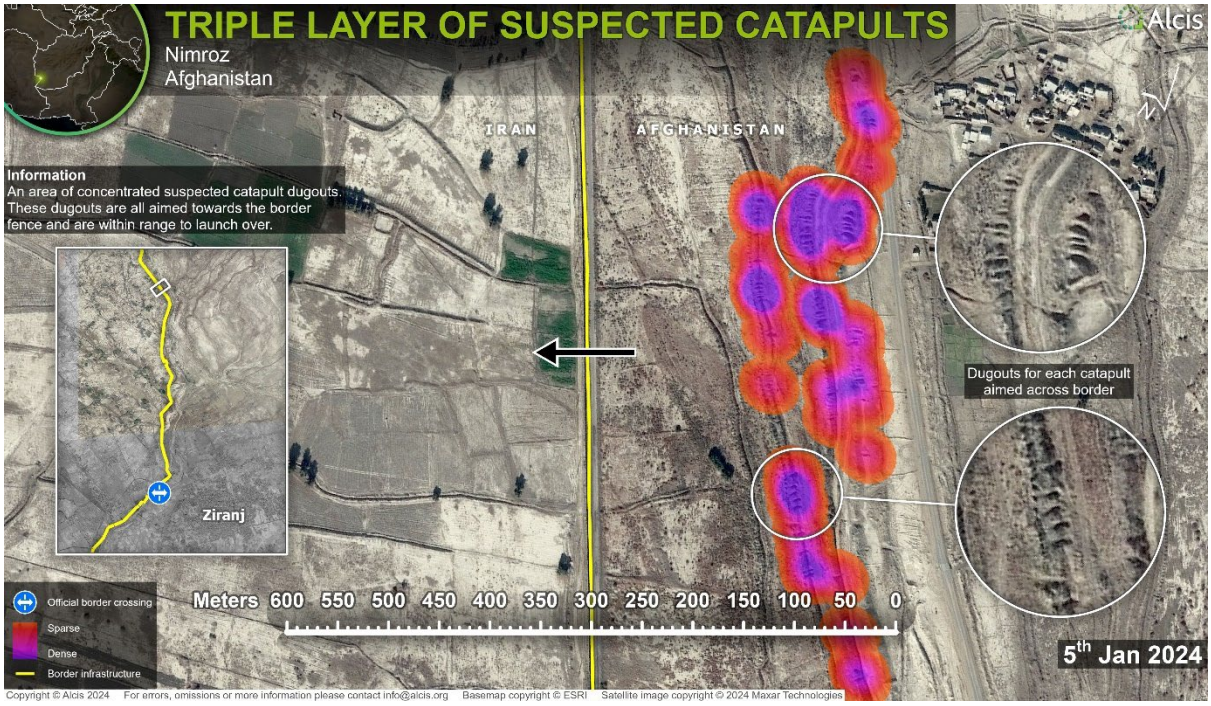
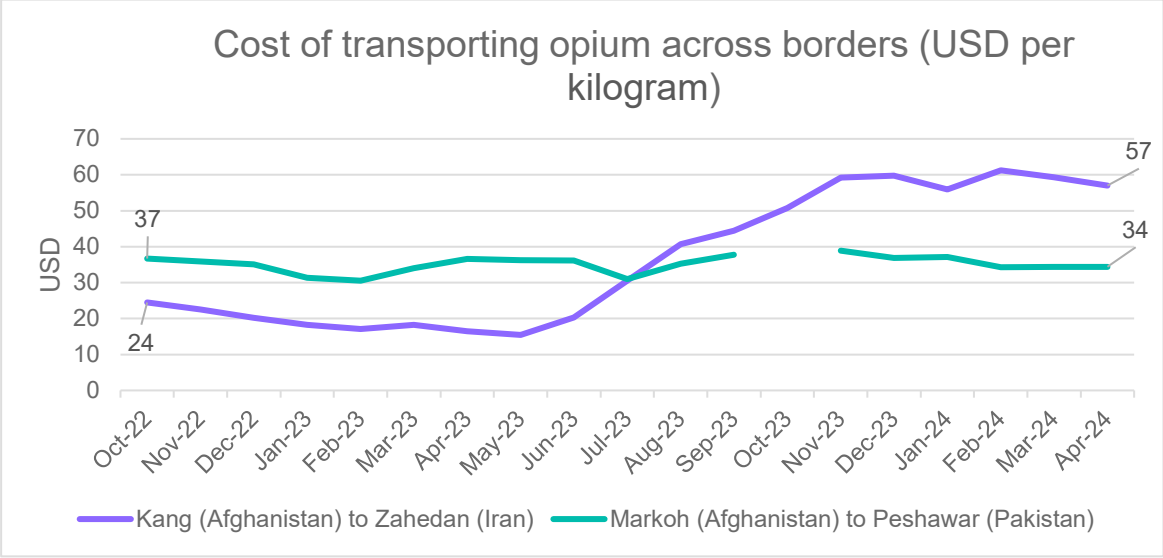


Figure 21: Graph showing the costs of cross-border smuggling between October 2022 and April 2024.



Larger opium production than estimated has implications for inventories

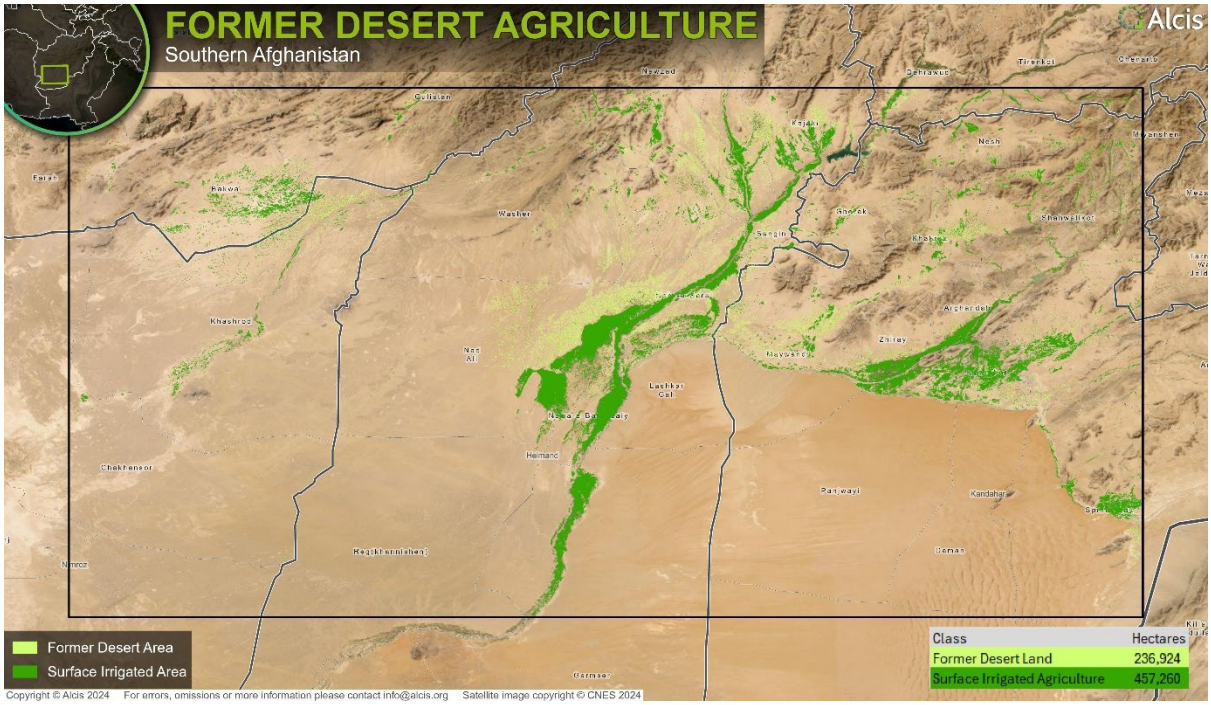
The continuation of opium trading within Afghanistan, and of seizures on its borders, is explained, at least in part, by the scale of poppy cultivation and the volume of opium production in 2023 and preceding years. Specifically, it appears that potential opium inventories in Afghanistan have been underestimated. This, in turn, seems largely influenced by underestimates of both the hectarage under cultivation and opium yields per hectare.

For example, the UNODC poppy survey of 2023 estimated 10 800 hectares of opium cultivation and the production of 333 tonnes of opium, citing a yield of 31 kilograms per hectare, estimated to be the 'average for the past 6 years for which data is available' (UNODC, 2023c). In comparison, the UNODC estimated yields of 22.9 kilograms of opium per hectare of poppy cultivation in Myanmar in 2023. This appears confusing, as the growing conditions and farming practices differ widely between the two countries. In Myanmar, poppy is largely grown in remote mountain areas, reliant on precipitation, and without chemical fertilisers (UNODC, 2023d). This is in contrast with Afghanistan, where poppy is typically grown on well-irrigated soil, with generous applications of chemical fertilisers (both nitrates and phosphate) (Mansfield et al., 2016).

India may be a more appropriate comparison when examining opium yields, as farmers there legally cultivate opium poppy under similar agronomic and weather conditions to those in Afghanistan (Mansfield et al., 2016; Mansfield, 2001). Opium yields have been found to be particularly responsive to both regular irrigation and fertilisers, as well as a harvest season consisting of warm, clear days and cool nights (Ngernsaengsaruay et al., 2023). These conditions are typical of the poppy-cultivating areas of Afghanistan and for those growing the crop legally in India (Mansfield, 2001). In 2021, the average yield of opium per hectare of poppy cultivation in India was above 64 kilograms, more than twice that currently reported for Afghanistan (Central Bureau of Narcotics, 2024).

Similar to the techniques used by farmers growing licit poppy in India, the opium crop in Afghanistan is well tended: it is weeded, thinned, fertilised and well irrigated. Moreover, across much of the south and south-west of the country, where up to 80 % of the opium crop has historically been grown, the poppy crop is irrigated regularly using solar-powered deep wells that were installed by farmers initially to support agriculture on up to 237 000 hectares of former desert lands, and more recently to offset drought conditions in the surface-irrigated areas (see Figure 22) (Mansfield, 2020).

Figure 22: Satellite imagery analysis showing the encroachment of farmers into the former desert areas of south-western Afghanistan and the expansion of agricultural land, 2003 to 2023.



Longitudinal fieldwork in Afghanistan reveals opium yields similar to those in India, with farmers in the south and south-west typically reporting yields averaging 67.5 kilograms per hectare (Mansfield, 2020), except in years when disease has been endemic (Mansfield, 2013). Yields in more mountainous areas such as Badakhshan or southern Nangarhar are not as favourable, but typically range from 35 to 60 kilograms per hectare (Mansfield, 2016).

Information suggests that yields were not as high in 2023 largely due to the impact of the ban. For example, satellite imagery indicates that poppy was pushed out of the prime irrigated land in many areas and became largely concentrated in more mountainous and remote areas. Perhaps more importantly, farmers did not invest as much time and resources in their poppy, as they were conscious that their crop might be eradicated. Hence, some failed to weed and thin the crop, and reduced the application of expensive fertilisers. In certain areas, such as Achin in Nangarhar, farmers accelerated the harvest of the crop by lancing the poppy twice in one day, to obtain a yield before the eradication campaign reached their village. Nevertheless, the 22 694 hectares of poppy cultivation across Afghanistan in 2023 could still have produced between 921 and 1 260 tonnes of opium, significantly more than the 333 tonnes reported by the UNODC (2023c). Similarly, the 7 306

hectares reported by Alcis in 2024 would have yielded between 290 and 414 tonnes of opium in that year ([1]).

Significant opium inventories appear to remain available

Aside from any opium that was stockpiled from the 2023 poppy crop, farmers and traders also retained a significant inventory accumulated from previous years' harvests (Mansfield, 2018). While this runs contrary to other accounts, some of which have claimed that as much as 80 % of the opium crop is sold within a year (UNODC, 2021), there is considerable data supporting this argument. This includes continued and substantial seizures of opiates by neighbouring countries, despite two consecutive years of an effective poppy ban (TASS, 2024; Amu TV, 2024; Dawn, 2024) and satellite-imagery-based data showing the size of landholdings and the level of poppy cultivation, particularly in the former desert lands of the south and south-west.

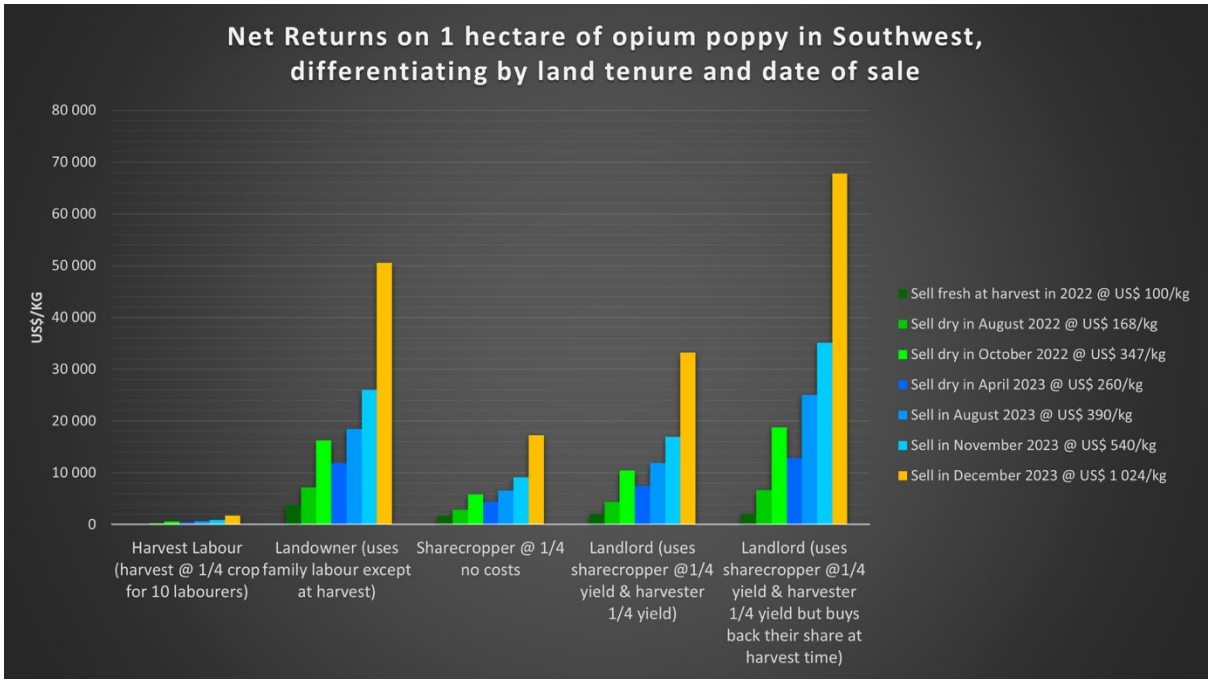
Opium farmers in Afghanistan typically seek to retain a surplus of opium as it is easy to store, is non-perishable ([2]) and retains its relatively high value, and has a readily available market (with traders travelling to the farm). A farmer's ability to retain such an inventory is determined by a number of factors. These include land tenure, and in particular whether land is owned; the amount of land dedicated to opium each year, and its yield; the price of opium relative to that of food and other basic necessities; the other assets a farmer can draw on, including income from other crops and non-farm activities; and the frequency and severity of the shocks to which they are exposed. These factors have influenced a situation in which many farmers, especially those with a large amount of land, are able to retain some opium when market conditions are favourable. In contrast, farmers with only a small amount of land (e.g. up to a hectare) have limited opportunity to retain a surplus of opium each year, as their opium will be sold to meet basic household expenses, particularly in the absence of other non-farm income. Sharecroppers often have an even more limited possibility of retaining a surplus of opium, as they typically receive only one quarter of the final yield.

For farmers with large landholdings, the likelihood of retaining a surplus of opium and building an inventory can vary quite dramatically, particularly during periods of rising opium prices (see Figure 23). Large landholdings are not common in the traditional surface-irrigated areas of eastern and north-eastern Afghanistan, since a finite amount of land has been divided up over many generations, resulting in a growing reliance on some form of non-farm income to subsidise any food deficit. This situation is most acute in the mountainous areas,

([1]) At the time of writing, the UNODC had not published an estimate of the amount of opium produced in Afghanistan (UNODC, 2024).
([2]) Farmers and traders report that opium can be stored almost indefinitely. While opium will dry and reduce in volume over time, if stored properly this can result in an increased value, as 'dry' opium often sells at a higher price than 'wet' or 'fresh' opium.

where thin soils, high population densities and small landholdings make it almost impossible for farmers to grow sufficient food for their families.

Figure 23: Graph showing net returns on one hectare of poppy cultivation in 2021, 2022 and 2023, differentiated by land ownership and time of sale.



The same cannot be said in the south and south-west, where landholdings are typically larger, in part due to several major irrigation programmes completed prior to the Soviet invasion in 1979. Landholdings are even more generous in what were former desert lands, which have been settled over the last two decades by farmers, mostly from neighbouring surface-irrigated areas with insufficient land. With no restrictions from the former Afghan government or the Taliban over the last two decades, and access to improved technology for agricultural purposes, such as solar-powered deep wells, an additional 237 000 hectares of land has been brought under agriculture in these former desert areas. Much of this land has been dedicated to poppy cultivation (see Figure 24 and Figure 25). Satellite imagery analysis shows that in these former desert areas, there are as many as 48 500 households, typically with a little less than 5 hectares of agricultural land, of which poppy occupied 1.68, 1.93 and 1.98 hectares in 2019, 2020 and 2022, respectively (see Figure 26 and Figure 27).

Figure 24: Satellite imagery showing the settlement of desert areas north of the Boghra canal in Nad e Ali, Helmand, in 2007, 2019 and 2024.

Figure 25: Satellite imagery analysis showing the amount of poppy cultivation in a selected area to the north of the Boghra canal in Nad e Ali, Helmand, covering the period 2019-2023.

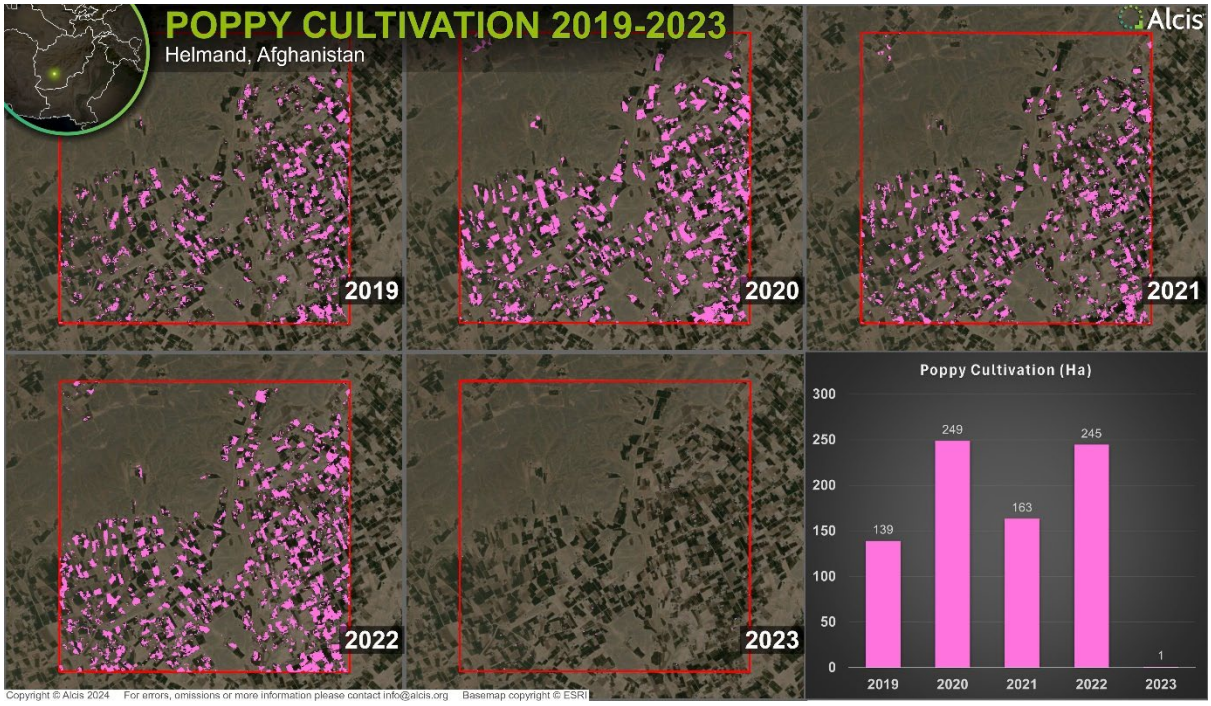
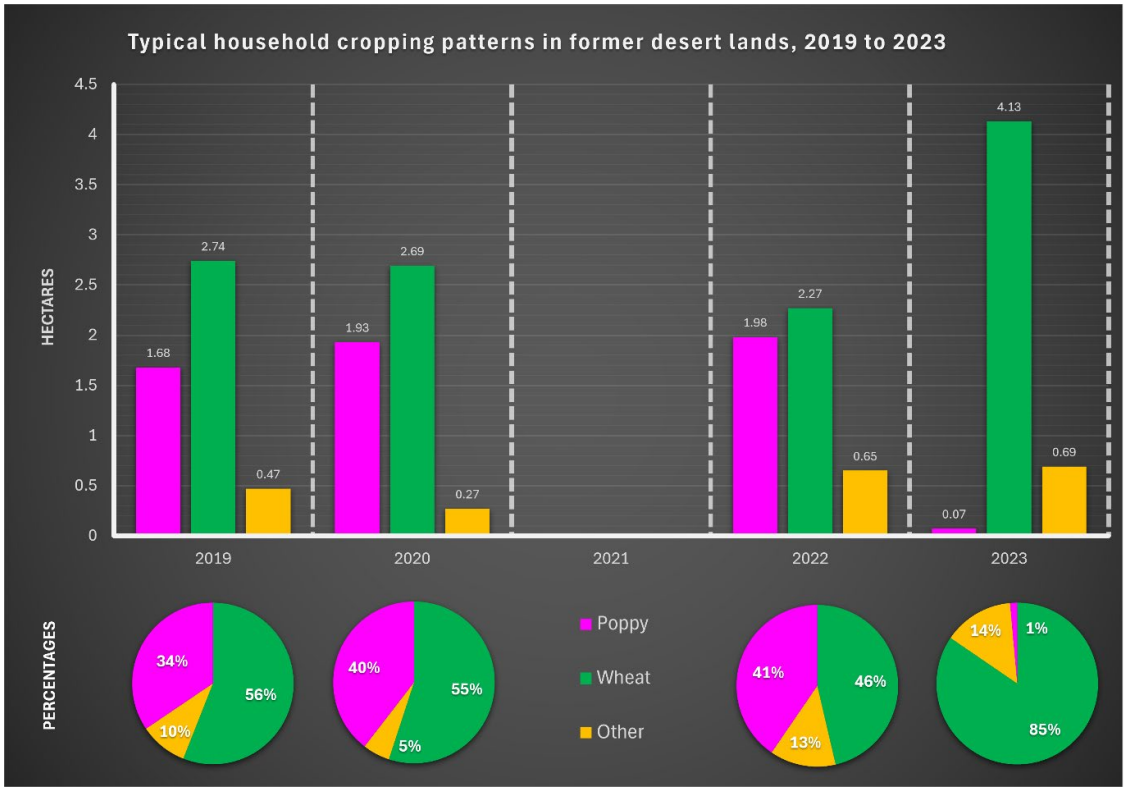


Figure 26: Satellite imagery showing typical layout of farms in former desert areas. This example is from former desert areas in Musa Qala in northern Helmand.

Figure 27: Graphic showing typical household cropping patterns in former desert lands of south and south-western Afghanistan, derived from high-resolution satellite imagery analysis, covering the period 2019 to 2023.



Note: At the time of writing in November 2024, crop mapping had not been completed for 2021.

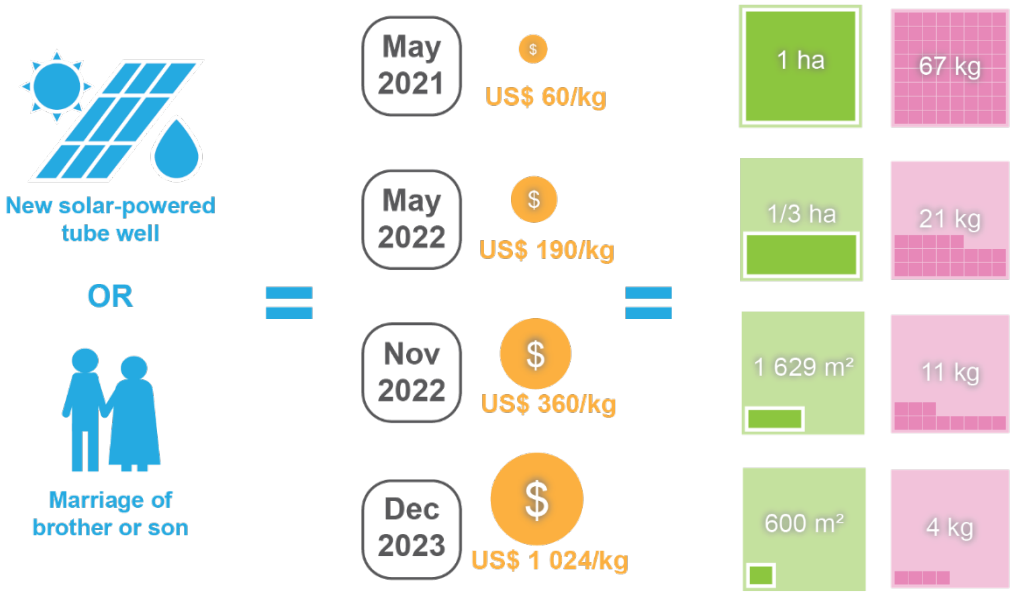
Further analysis reveals that 2 hectares of a combination of wheat in the winter, cotton in the spring, and crops such as tomato, okra and groundnut in the summer, is almost enough for a farmer to grow sufficient food to feed a typical family of 10 individuals (see Figure 28). Hence, these farmers would need to sell only a small quantity of opium harvested on any additional land to meet any food deficit. With 3 hectares of land dedicated to other crops, a farmer could retain their entire opium crop each year in the absence of other expenses such as those related to sickness or injury, lifecycle events such as marriage or death, or irregular maintenance of equipment. For example, marriage can cost up to USD 4 000 in the south and south-west; a new motorcycle or car can cost around USD 400 or between USD 2 000 and USD 4 000, respectively; and agricultural equipment (e.g. solar panels and water pumps for deep well irrigation) can cost between USD 2 900 and USD 4 000.

Figure 28: Net returns on typical cropping patterns in Helmand, differentiated by land size, tenure and canal or desert area.

Land Size	Land Type	Winter (ha)	Summer (ha)	Landowner Net Returns US$			Sharecropper Net Returns US$		
				Winter	Summer	Total	Winter	Summer	Total
1 ha	Canal	1 Wheat	1 Cotton	2 378	1 869	**4 247**	546	557	**1 102**
		1 Wheat	0,5 Okra/0,5 Tomato	2 378	2 736	**5 114**	546	817	**1 363**
2 ha	Desert	2 Wheat	1 Maize/1 Cotton	2 570	1 847	**4 417**	656	1 458	**2 114**
	Canal	1 Wheat/1 Cotton	1 Maize/1 Mung Bean	5 417	3 711	**9 128**	1 225	2 636	**3 861**
		2 Wheat	1 Tomato/1 Okra	4 756	4 335	**9 091**	1 093	2 716	**3 808**
		2 Wheat	1 Cotton/1 Ground Nut	4 756	7 595	**12 351**	1 093	3 442	**4 535**
3 ha	Desert	3 Wheat	1 Maize/2 Cotton	3 855	3 084	**6 939**	984	2 266	**3 250**
	Canal	2 Wheat/1 Cotton	2 Maize/1 Mung Bean	7 795	5 607	**13 402**	1 771	3 882	**5 653**
		3 Wheat	1 Maize/ 1 Cotton/ 1 Ground Nut	7 134	8 321	**15 455**	1 639	4 395	**6 034**
4 ha	Desert	4 Wheat	1 Maize/3 Cotton	5 140	4 321	**9 461**	1 311	3 074	**4 385**
		3 Wheat/ 1 Cotton	2 Maize/2 Cotton	5 092	3 694	**8 786**	1 302	2 905	**4 207**
5 ha	Desert	5 Wheat	3 Maize/2 Cotton	6 426	4 304	**10 730**	1 639	3 568	**5 207**
		4 Wheat/1 Cotton	2 Maize/3 Cotton	7 331	4 931	**12 262**	1 820	3 951	**5 771**

When opium prices are low, more of it needs to be sold to meet both regular and unexpected expenses. When opium sold for USD 60 per kilogram at harvest time in May 2021, a new solar-powered tube well, or the marriage of a brother or son, could cost as much as 67 kilograms of opium. This is the equivalent yield of 1 hectare of opium poppy, thereby significantly reducing the quantity of opium that even a farmer with a large amount of land could store. When prices rise, as they did following the announcement of the ban in April 2022, these expenses can be met with the sale of a much smaller quantity of opium. In May 2022, when opium sold for USD 190 per kilogram in the south-west, that same solar system would cost the equivalent of 21 kilograms of opium, the yield of around one third of a hectare; by November 2022, when prices reached USD 360, only 11 kilograms of opium would need to be sold, the yield of less than 1 *jerib* (2 000 square metres); and by December 2023, when prices peaked at USD 1 024, that same solar-powered system would cost less than 4 kilograms of opium, the product of about 6 *biswa* (600 square metres) of poppy (see Figure 29).

Figure 29: Graphic showing the impact of changing opium prices on irregular household expenses (purchase of new solar-powered tube well or cost of marriage of brother or son) between May 2021 and December 2023.



Hence, the April 2022 drug ban created favourable conditions for farmers to retain more of their opium crop. The announcement of the ban just prior to the harvest also allowed farmers to prepare for the subsequent year of low cultivation. This is in stark contrast to the Taliban drug ban in 2001, which was announced at the end of July 2000, three months after the spring harvest and three months before the next planting season. In 2022, farmers were conscious that the price of opium would rise if a ban was imposed on the 2023 crop and thus sought to retain as much of their opium as possible. Some even sold other assets to meet their household expenses, such as a motorbike or car, rather than selling their opium (Mansfield, 2023c). The result was that many of the land-owning farmers in the south and south-west welcomed the ban, as it precipitated a dramatic increase in their purchasing power and capital due to the increase in opium prices (Mansfield, 2023b, 2023c).

Calculating opium inventories

Estimating the quantity of opium stored following the imposition of the current ban is challenging. Many land-owning farmers acknowledge that they have stored some opium. However, they are reticent to share details of the exact quantity due to fear of theft,

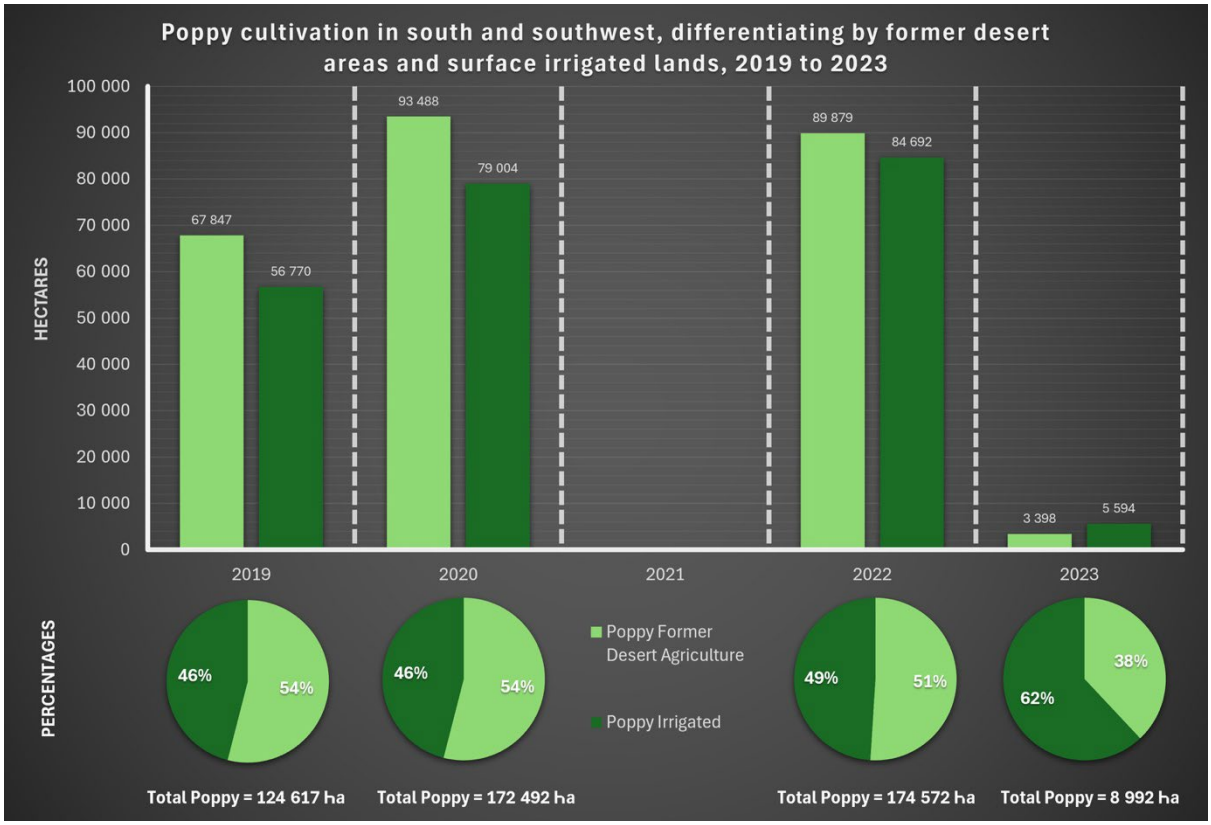
particularly as opium prices continue to rise and a growing portion of the population becomes impoverished by the ban.

While it is not possible to estimate the potential opium inventory for the entire country, a more limited focus on the former desert areas of the south and south-west is possible and shows the potential for significant opium inventories to remain in Afghanistan. These areas are important, and are typically responsible for around half of the annual poppy crop in the south and south-west, and therefore one quarter of the entire opium crop in Afghanistan prior to the current ban.

Satellite imagery shows that farmers in these former desert areas cultivated a total of 67 847 hectares of poppy in 2019, 93 488 hectares in 2020 and 89 879 hectares in 2022 (see Figure 30). With average land holdings of 4.89 hectares, and with poppy occupying less than 2 hectares, these farmers are largely able to meet their basic household expenses each year from their non-opium crops and only have to sell their opium to mitigate crop failure or meet other unexpected expenses. Thus, based on a yield of 67.5 kilograms of opium per hectare, these farmers would have been able to retain an estimated 45.9 kilograms of opium in 2019 (the yield from 0.68 hectares) and 62.8 kilograms of opium in 2020 (the yield from 0.93 hectares). These estimates assume that little to no opium would have been sold by these farmers to meet unexpected expenses during these 2 years.

Assuming a similar level of poppy cultivation in 2021, it is estimated that farmers in these former desert areas would have accumulated roughly 171 kilograms of opium inventory (the yield from 2.54 hectares) over the 3 years (2019-2021) prior to the imposition of the 2022 ban. With as many as 48 500 households in these former desert areas, inventories could have been as much as 8 300 tonnes of opium prior to the 2022 harvest. Once prices rose following the announcement of the ban in April 2022, farmers in these former desert areas would have been able to retain almost all of their harvest in 2022. This could have added an estimated 5 400 tonnes to the overall opium inventory held in these former desert areas, for a total potential inventory of over 13 700 tonnes.

Figure 30: Graphic showing poppy cultivation in the south and south-west region of Afghanistan, differentiating by former desert areas and surface-irrigated areas, covering the period 2019 to 2023.



Note: At the time of writing in November 2024, crop mapping had not been completed for 2021.

It is important to note that this estimate of potential opium inventories in these former desert areas does not include any opium that farmers may have stored from poppy cultivation prior to 2019, or those inventories held by traders. As the satellite imagery shows, the encroachment by farmers into this desert land began in the first few years after the fall of the Taliban in 2001, rapidly expanding with the use of solar-powered deep wells after 2014. Thus, there is a possibility that inventories in these areas are larger than the estimated 13 700 tonnes.

This estimate also does not include inventories in other parts of Afghanistan, which may be significant. If farmers in the surface-irrigated areas of the south and south-west retained just half of their opium crop from 2022, which is not unlikely given the dramatic rise in opium prices following the Taliban ban, this would add an estimated 2 850 tonnes to the inventory,

producing a total estimated 16 550 tonnes of opium inventory (enough to produce roughly 920 tonnes of heroin base) ([3]).

The potential scale of these inventories may partly explain the continued tolerance that land-owning farmers have towards the drug ban, particularly in the south and south-west, and the continuation of a vibrant opium trade across many parts of Afghanistan despite 2 consecutive years of a drug ban. It also may explain why significant quantities of opiates continue to be seized on the country's borders, including by law enforcement in Pakistan, Iran and Tajikistan (Zahidi, 2024).

Adapting to disruption: increasing adulteration of heroin consumer products

In contrast to the Taliban's enforcement against ephedrine and methamphetamine production, there have been few reports of dismantled heroin laboratories. Despite this, it is becoming apparent that those trading and producing heroin are also having to adapt to the ban, most notably due to the rise in the price of opium.

Assessing the full effect of the Taliban ban on the production of morphine base, heroin base and heroin hydrochloride is challenging, as is obtaining information on heroin processing, including chemical inputs and adulterants. Complicating this is the differences in the names and varieties of chemicals and adulterants used for heroin processing between different production areas in Afghanistan. Hence, in the absence of chemical forensic testing both in Afghanistan and in neighbouring countries, the available data is limited to the information provided by those directly involved in the production and trade of heroin.

It is known with a high degree of confidence that heroin laboratories in Afghanistan do not process on an ongoing basis, but produce to order at the request of a trader (Mansfield, 2019; UNODC, 2020). Thus, it is the trader who determines the quantity, type and 'quality' (purity) of the opiate produced, as they cater to the demands of their customers and the distinct markets that they supply. The laboratory owner is only a service provider, often paid a fixed fee for each kilogram of morphine base, heroin base or heroin hydrocholoride produced. In many cases, the trader purchases the opium that they wish to be processed,

([3]) In 2013, local researchers from the Ministry of Counter Narcotics (MCN) reported conversion rates of 10-12:1 for opium to morphine base, 1.2:1 for morphine base to heroin base and 1.5:1 for morphine base to heroin hydrochloride (MCN and UNODC, 2013, p. 49). This is the equivalent of between 18:1 and 21.8:1 for opium to heroin hydrocholoride. In an experiment with Afghan laboratory workers, Zerell et al. (2005) documented conversion rates of 9:1 for opium to morphine base and 2:1 for morphine base to white heroin hydrocholoride. Further work drawing on interviews with laboratory owners and heroin cooks in northern Helmand in 2018 showed conversions rates of 9:1 from opium to morphine base, 2:1 for morphine base to heroin base and 1.1:1 for heroin base to heroin hydrochloride (Mansfield, 2019). The UNODC (2018) cited Zerell et al. (2005) and a conversion rate of 18.5:1 in their discussion of heroin processing in 2018, which forms the backdrop of their current estimates of heroin production (although this is then adjusted to refer to 'exportable quality' heroin).

and if they require a high-purity product they may even request that the laboratory owner hires a specific cook, paying a premium for their services (Mansfield, 2019).

This has led to a situation in which a variety of opiate derivatives, namely varieties of morphine base, heroin base and heroin hydrochloride, are produced in Afghanistan for both domestic and international markets. Many of these are of low purity and some appear to be by-products of heroin production that may contain little to no heroin at all ([4]). For opiate markets outside Afghanistan, the available information shows that traders commission the production of four main products (see Figure 17 for prices of these different products, except 'crystal', for which price data is not available).

(i) Morphine base, known locally as *beest* (see Figure 31). Morphine base is transported to Iran, Tajikistan and Pakistan, where it may be consumed, processed for local markets, or trafficked to other markets ([5]).
(ii) Heroin base, a smokeable powder that comes in various shades of brown (see Figure 32). It is known locally as *gul* (flower) and is produced for markets in Iran, Pakistan, India, Russia and Europe.
(iii) Heroin hydrochloride. It is known locally as *spin maal* (white product) and is produced predominantly for markets in India, Pakistan, Iran and Central Asia (see Figure 33).
(iv) 'Crystal', a low-purity smokeable form of heroin hydrochloride that is particularly popular in Iran, but also Pakistan and India (see Figure 34 and Box '"Crystal" heroin'). In contrast to refined heroin hydrochloride, 'crystal' is found in the form of hard thumbnail-sized chunks that are creamy in colour and resemble popcorn or cheese.

([4]) For example, one product known in the south-west as *patan* is reported to be a mix of caffeine and *gur*, a by-product of converting morphine base to heroin base.
([5]) Traders on the Afghanistan-Iranian border report that while morphine is consumed in Tehran and Isfahan, most of it is smuggled to Turkey.

Figure 31: Morphine base.

Figure 32: Heroin base.

Figure 33: Heroin hydrochloride.

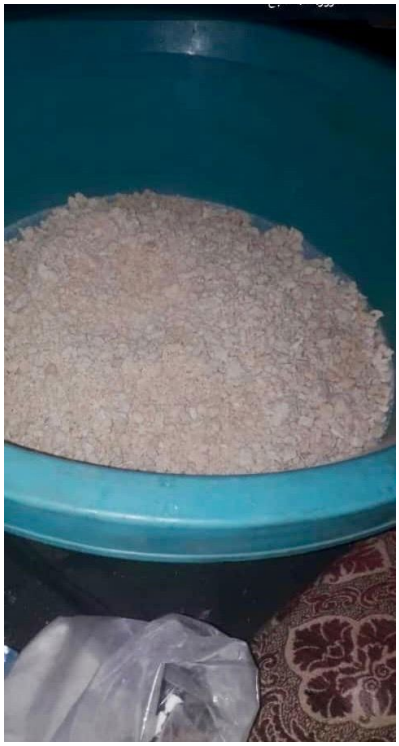


Figure 34: ‘Crystal’, a smokeable form of heroin hydrochloride.

‘Crystal’ heroin

Reports from Myanmar in the 1990s suggest that ‘crystal’ heroin is produced by adding caffeine at the liquid heroin hydrochloride stage (CNPA and UNODC, 2009). In contrast, cooks in south-western Afghanistan report mixing caffeine and other adulterants with water and ‘acid’ (probably acetic anhydride) to heroin base before heating it (CNPA and UNODC, 2009). ‘Crystal’ was first reported (and chemically tested) in 2009 following a seizure in western Afghanistan in transit to Iran (CNPA and UNODC, 2009). There are also multiple reports of Iranian ‘crack’ heroin (dating back to 2011) that fit the description of ‘crystal’ heroin in Afghanistan, including a high concentration of adulterants such as caffeine, paracetamol, dextromethorphan and chloroquine (all of which have also been found in samples of ‘crystal’ seized in Afghanistan) (Farhoudian et al., 2014). This indicates that Afghan ‘crystal’ heroin is also produced for Iranian markets, where it is sold as ‘crack’ heroin. Differences in the naming of opiate derivatives both within Afghanistan and in neighbouring countries further underscore the need for systematic forensic testing of drug seizures in the region.

Adulteration now common across the heroin production chain

Adulteration has been common in Afghanistan at each stage of the heroin production chain for many years. For example, farmers in rural Afghanistan have been known to add items such as cane sugar (*gura*), fruit (*anjaroot*) and tree gum (*largay*) to their opium to increase its weight. Consequently, farmgate traders will test the opium for adulterants prior to purchase and sometimes add their own adulterants, including lower-quality opium, to increase their profit margins.

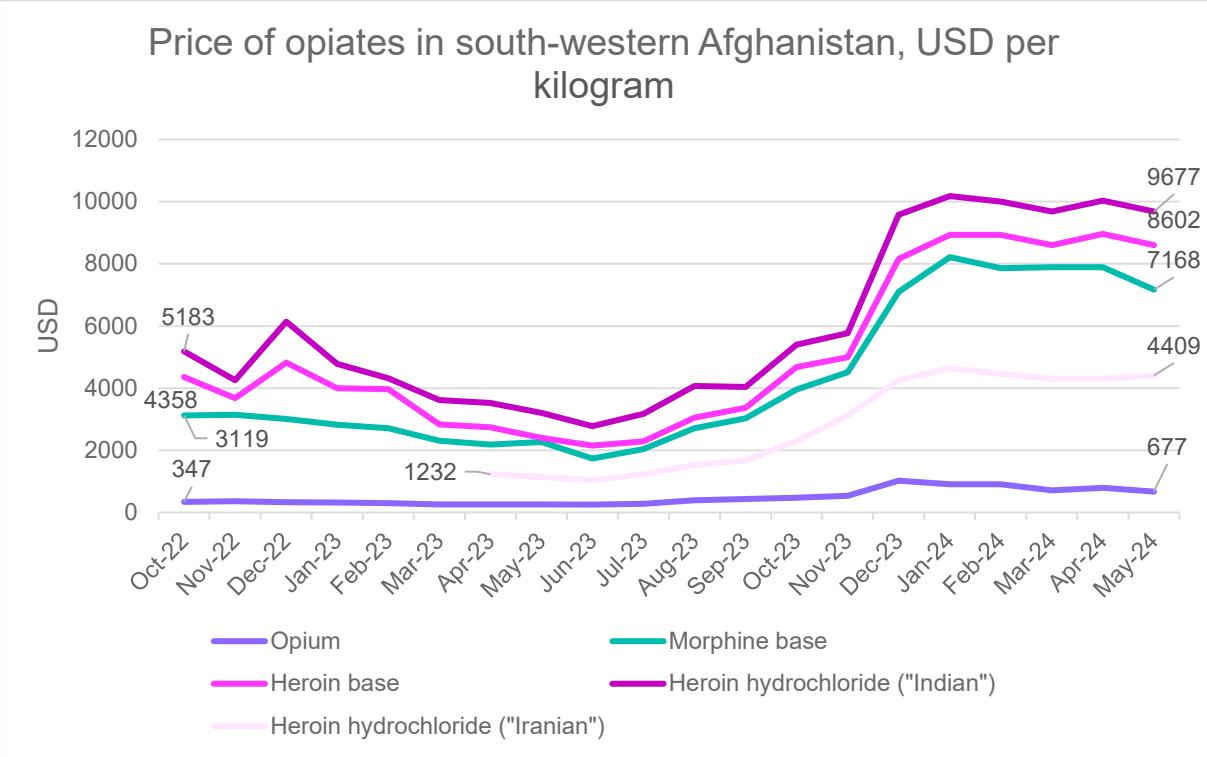
While cross-border traders may anticipate a degree of adulteration by heroin laboratory owners, they also explicitly order adulterated opiates. These traders define the desired purity, or degree to which the opiates are to be adulterated, and in some cases the adulterants to be used. Prices of these different consumer products vary considerably based on the proportion of opiates they contain, with the least adulterated and higher-purity products reported to be destined for European markets. This suggests that markets for Afghan opiates are highly differentiated, with diverse products produced for different markets.

Different heroin consumer products even have specific names in different parts of Afghanistan. For example, in the south-west, the highest-quality heroin hydrochloride is

known as ‘Indian’, whereas a lower-quality product is referred to as ‘Iranian’ and sells at between a third and a half of the price of the better-quality ‘Indian’ hydrochloride (see Figure 35).

In Badakhshan, north-eastern Afghanistan, heroin hydrochloride is sold by the kilogram as either ‘pure’ or in batches that are marketed as 40 %, 60 % or 80 % pure — indicating some adulteration at the point of production. In contrast, the heroin (base and hydrochloride) traded across the border from Nangarhar to Pakistan is believed to be adulterated in the laboratories around Spin Majid in Khyber Pakhtunkhwa (Pakistan), rather than at the point of production in Afghanistan.

Figure 35: Graph showing the prices of opiates in south-western Afghanistan, October 2022 to May 2024.



Adulterants used in heroin processing

Identifying the adulterants currently used in Afghanistan is challenging. Chemical testing conducted in the country between 2008 and 2011 identified caffeine, chloroquine, paracetamol, dextromethorphan, phenolphthalein and sugar as heroin adulterants (CNPA and UNODC, 2011, 2010, 2008). Since then, there appears to have been relatively limited forensic testing of heroin seizures in the country.

Cooks and traders often discard the original labelling and packaging of adulterants and are often unaware of the chemical name of adulterants used. In addition, the names used for these adulterants often vary from one local area to another. A further potentially complicating factor is that for many of these adulterants there are various 'qualities' on offer (e.g. for caffeine, there is 'simple', 'coarse' and 'white') that are priced and potentially named differently. Thus, in the absence of systematic testing, it is challenging to determine the exact adulterants used for heroin production in the country.

Nevertheless, some adulterants are easily identifiable by both their local name and their appearance. This includes *kapeen* (caffeine) (see Figure 36). *Plastic* is a term used in Badakhshan for another adulterant, which is mixed with caffeine in order to dilute heroin hydrochloride (see Figure 37). While the appearance of *plastic* suggests it could be paracetamol, the high price indicates that this is unlikely. Ultimately, in the absence of forensic testing, it is difficult to know what it is.

Figure 36: Kapeen, an adulterant used in heroin processing (probably caffeine).

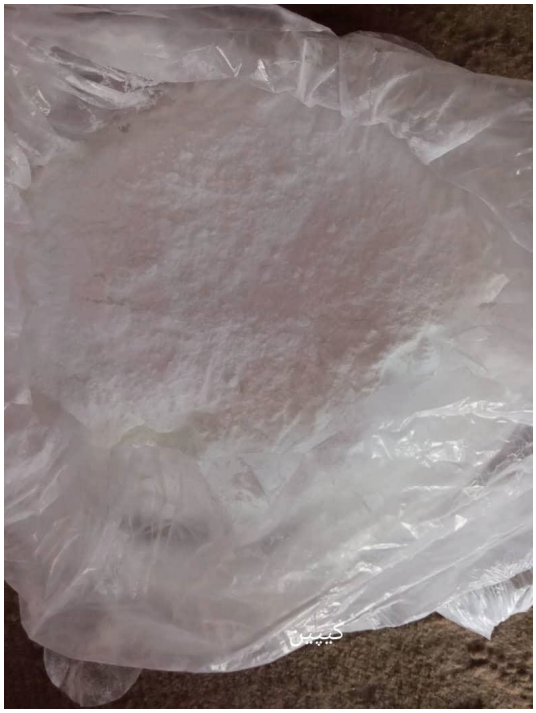


Figure 37: Plastic, an adulterant used in heroin processing in Badakhshan.

Some adulterants can be identified as by-products from morphine or heroin processing. For example, *gur* is used as an adulterant in 'crystal' heroin, and is described as an impurity extracted when converting morphine base into heroin base, probably a mixture of noscapine and papaverine (see Figure 38).

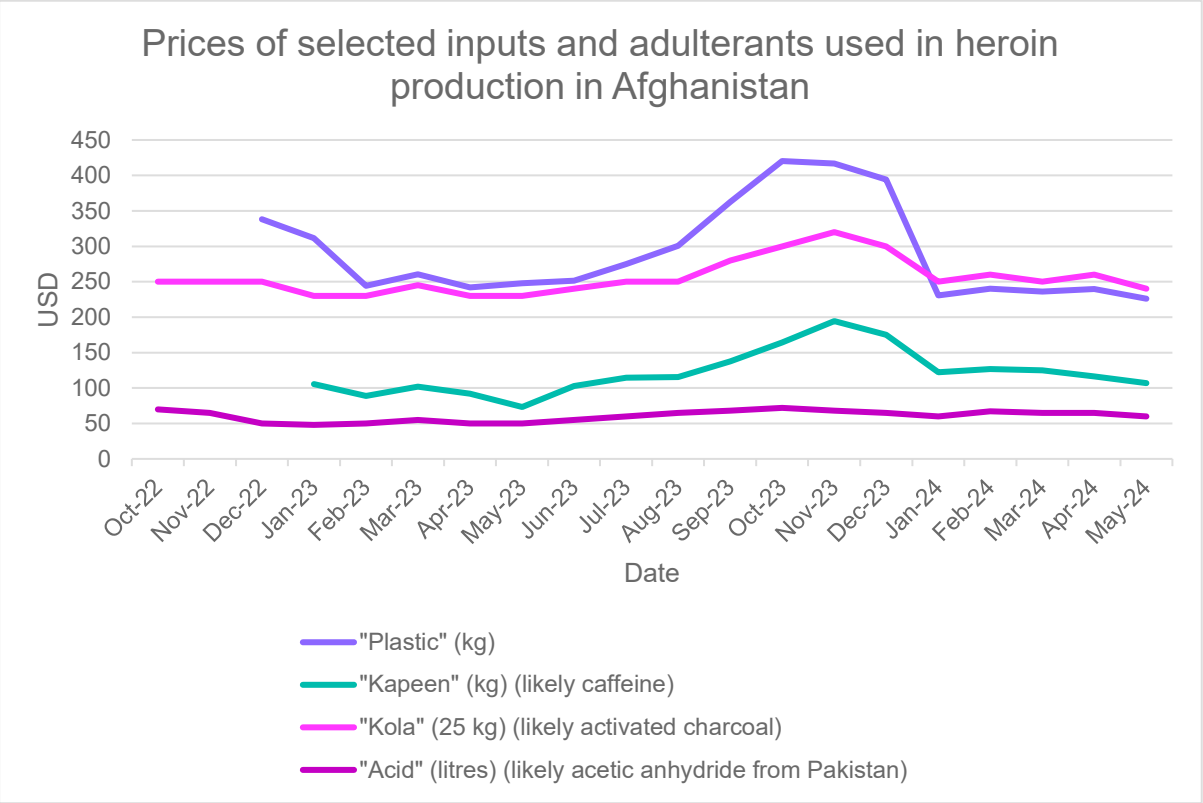
Figure 38: Gur, used as an adulterant in ‘crystal’ heroin production.

Other adulterants are far more difficult to identify by either name or appearance and consist largely of a collection of powders described as *masalas* (spices) (see Figure 39). These include *shna masala* (green spice), *zharka masala*, (yellow spice), *khwaja masala* (sweet spice), and *pasta masala* (soft spice). The mixture *tarkha masala* (hot spice) was determined to be dextromethorphan through testing in 2010 (CNPA and UNODC, 2010).

Figure 39: Masala, an adulterant used in heroin processing.

The limited data available suggests that the prices of some adulterants rose in conjunction with opium prices in the latter half of 2023, and fell in conjunction with the opium price in the first few months of 2024 (see Figure 40). As already discussed, laboratory owners also report that a growing number of opiate traders are ordering lower-purity adulterated heroin, which may also have prompted a rise in the price of adulterants. For example, in March 2024 a trader selling heroin in Iran was reported to have commissioned a batch of heroin that was 50 % pure, with the remainder being a mix of caffeine (30 %), *spice* (11.6 %), *gur* (5 %), and *shna masala* (green spice) (3.3 %). The small quantity of *shna masala* used and its colour, texture and price (quoted at between USD 2 150 and USD 2 500 per kilogram, almost one quarter of the price of heroin base) indicates that it is probably an API, possibly dextromethorphan. However, in the absence of forensic analysis, it is not possible to determine this with certainty.

Figure 40: Graph showing the costs (USD) of inputs and adulterants used in heroin production in Afghanistan, October 2022 to May 2024.



Further economic analysis shows how the rise in opium prices has impacted the production and trade in morphine and heroin base, and why the demand for adulterants may be increasing (see Table 3 and Table 4). For example, in September 2018, opium made up 87 % of the total cost of the production of heroin base, with a conversion rate of 18 to 1, allowing traders to make a net return of USD 765 per kilogram of morphine base and USD 828 per kilogram of heroin base when sold at prevailing prices on the same day. The stark increase in opium prices, peaking at USD 1 035 per kilogram in December 2023, has had a significant impact on the cost of producing morphine base and heroin base. At such a high price, opium made up 99 % of the cost of production of heroin base, with traders potentially making substantial losses on the sale of morphine and heroin base. Thus, the data suggests that traders can maintain profitability only by using cheaper opium that was bought prior to the increase in prices, or by adulterating or improving conversion rates.

Table 3: Overview of costs and net returns of morphine base production, using opium prices at several time points in 2018 and 2023.

Morphine base production costs and net returns (USD) (laboratories using 120 barrels, i.e. 3 780 kilograms, of opium as the primary input)				
Inputs	**September 2018**	**December 2023**	**December 2023 (using opium purchased in August 2023)**	**December 2023 (using opium purchased in November 2023)**
Opium	353 415	3 913 980	1 565 591	2 107 527
Lime	768	1 050	1 050	1 050
Ammonium chloride	23 902	753	753	753
Wood	57	169	169	169
Cloth	6 283	2 559	2 559	2 559
Labour	488	323	323	323
Cook (morphine)	8 537	6 624	6 624	6 624
Tax on output	1 707	N/A	N/A	N/A
Tax (irregular payments)	813	N/A	N/A	N/A
Total cost of production	**395 970**	**3 925 457**	**1 577 069**	**2 119 005**
Net returns per batch	321 103	−914 705	1 433 684	891 748
Net returns per kilogram	765	−2 178	3 414	2 123

Table 4: Overview of costs and net returns of heroin base production, using morphine base prices at several time points in 2018 and 2023.

Heroin base production costs and net returns (USD) (laboratories using 420 kilograms of morphine base as the primary input, with a conversion rate of 2:1 for heroin base)				
Inputs	**Sep-18**	**Dec-23**	**December 2023 (Using morphine base purchased in August 2023)**	**December 2023 (Using morphine base purchased in November 2023)**
Acetic anhydride	65 520	22 581	22 581	22 581
Sodium carbonate	5 855	2 581	2 581	2 581
Cook	4 268	3 312	3 312	3 312
Morphine base	395 970	3 925 457	1 577 069	2 119 005
Total cost of production	471 613	3 953 931	1 605 543	2 147 479
Net returns per batch	108 874	−2 222 748	125 640	−436 296
Net returns per kilogram	518	−10 585	598	−2 078

While there are reported efforts to improve conversion rates in response to the dramatic rise in opium prices, including using better-quality ‘acid’ (presumably acetic anhydride), this remains anecdotal. For now, adulteration appears to have become the most common response, although traders continue to claim that this is less frequent with heroin base destined for more lucrative European markets. Thus, continuous monitoring of heroin purity in Europe is essential for assessing the impact of developments in drug markets in Afghanistan.

Conclusion

The first Taliban drug ban in 2001 may provide only limited insight into the possible effects of the ban announced in April 2022, including on how to increase preparedness and develop responses to ameliorate some of its potentially most damaging outcomes. The most common prognosis based on the ban of 2001 is that it will take 18 to 24 months before heroin markets in Europe are affected, meaning that a shortage of opiates may be imminent. However, by drawing on a wide body of data that sheds light on the current situation in drug markets in Afghanistan, this paper shows some marked differences between the current Taliban drug ban and that of 2001 — indicating that a shortage of heroin in Europe may not be inevitable in the short term. It appears more likely that adulteration of heroin for European markets, at the point of production in Afghanistan, may become more common in the future. However, there are currently no signs of this occurring.

The April 2022 drug ban was imposed after more than a decade of poppy cultivation typically exceeding 200 000 hectares per year. Much of this cultivation took place in former desert areas by farmers with large landholdings using improved agricultural techniques, including solar-powered irrigation and herbicides. Widespread cultivation in these former desert areas alone has probably allowed for significant opium inventories to be established, possibly as much as 13 000 tonnes between 2019 and 2022. This is a significantly different situation from the years leading up to the 2001 drug ban, when poppy cultivation was typically less than 60 000 hectares, farm sizes were much smaller, agricultural practices were basic and desert lands remained uncultivated.

The timing of the 2022 drug ban has also had different implications for policy and practice, both within Afghanistan and in Europe. The ban imposed on the 2001 crop was announced in late July 2000, three months after the harvest and three months prior to the next planting season. In addition, opium prices at harvest time in May 2000 were as low as USD 30 per kilogram, giving farmers few chances to retain any crop that year as they had to sell their opium to meet their household expenses. The timing, the opium price and the much smaller landholdings gave farmers little opportunity to take precautionary measures and store any surplus. In 2022, the ban was announced two weeks prior to the harvest of the primary poppy crop, which was left untouched by the Taliban authorities. This created powerful incentives for farmers to hoard the 2022 opium harvest, as well as to retain any surplus from previous years, assuming that these inventories would increase significantly in value.

The resulting significant increase in opium prices between March 2022 and December 2022, and further increases over 2023, established a ‘bull market’ in which prices continued to rise and farmers were reluctant to sell. This was particularly notable in December 2023, at the

end of the primary planting season for the 2024 crop, when opium sold for the equivalent of over USD 1 000 per kilogram. The fact that farmers could continue to sell their opium without restrictions in local markets ensured that they could realise the economic benefits of their crop and see their purchasing power and capital increase dramatically. In 2001, there was no prior warning of the ban and landholdings were much smaller. This meant that an economic cushion would not have been available to many farmers. Going forward, the combination of inventories and an unimpeded trade in opiates could prove critical to the Taliban in maintaining support for the ban from influential land-owning farmers, particularly in the Taliban's heartlands in the south and south-west.

Despite what would appear to be persistent, albeit limited, annual cultivation and significant inventories, markets have had to adapt to a dramatic rise in opium prices. Adulteration appears to have become more common as the price of morphine base, heroin base and heroin hydrochloride has failed to keep up with the dramatic rise in the price of opium, as seen in reports of laboratories increasingly being commissioned to produce adulterated morphine and heroin consumer products for both local and international markets. While heroin base produced in Afghanistan for European markets is reported to still be of high purity and to sell at higher prices, it would be surprising if this, too, has not seen greater quantities of adulterants added in recent months, given the dramatic rise in opium prices in late 2023. There are also emerging signals of decreasing heroin purity in Europe, although further research and more forensic testing is needed to better understand where heroin adulteration is taking place along the supply chain from Afghanistan to European markets (Berry, 2025).

Ultimately, this paper shows that there are multiple areas where comparisons between the effects of the 2001 ban and the current ban may not be helpful for policy and practice. Drawing too heavily on lessons learned from the 2001 ban may lead analysts and policymakers to make incorrect judgements about whether — and to what degree — there will be a shortage of heroin and an impact on European drug markets, particularly the risk posed by new synthetic opioids. Efforts to judge the progress of the poppy ban in 2023, based on hectarage eradicated, proved inadequate given that most farmers did not plant opium in the first place. An assessment of the poppy crop also needs a census method that covers the entire country, not solely areas where it has historically been cultivated.

In other cases, existing data has often been of limited value and has not been able to capture developments such as the encroachment of farmers on former desert areas, changes in the differentiated markets for opium derivatives and Afghanistan's move into large-scale methamphetamine manufacturing. This is due not only to market shifts and changes to production techniques since 2001, but also to the rapid change in conditions created by the current Taliban ban. This points to the need for a more sophisticated approach to data collection for the study of drugs markets, drawing on a wider set of indicators. The area under cultivation and drug prices can provide some insight into how those directly involved in

the production and trade of opiates and methamphetamine respond to market shocks, such as the drug ban imposed by the Taliban. However, to reach a more informed understanding, a mixed methods approach is required that draws much more heavily on in-depth economic analysis, high-resolution satellite imagery, and forensic testing of opium, morphine and heroin consumer products in Afghanistan, in neighbouring countries and on established heroin routes to Europe.

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