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Afghanistan opium survey 2019

Socio-economic survey report:
Drivers, causes and consequences
of opium poppy cultivation

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Introduction

The Afghanistan opium surveys 2019 collected and analysed detailed data on the location and extent of opium poppy cultivation, potential opium production and the socio-economic situation in rural areas. The results provide a detailed picture of the outcome of the 2019 opium season and, together with data from previous years, enable the identification of medium- and long-term trends in the evolution of illicit opium poppy cultivation in Afghanistan. This information is essential for planning, implementing and monitoring measures required for tackling a problem that has serious implications for Afghanistan and the international community.

The survey was implemented by the Afghan government counterpart agency, the National Statistics and Information Authority (NSIA), in collaboration with UNODC. Since 2005, the Afghan counterpart and UNODC have also been involved in the verification of poppy eradication conducted by provincial governors and poppy-eradication forces. This information is essential for planning, implementing and monitoring counter-narcotic efforts.

The opium survey is implemented within the technical framework of the UNODC Illicit Crop Monitoring Programme (ICMP). The objective of ICMP is to assist the international community in monitoring the extent and evolution of illicit crops in the context of the Plan of Action adopted by the 53rd session of the United Nations Commission on Narcotic Drugs in March 2009. Under ICMP, UNODC carries out monitoring activities in other countries affected by illicit crop cultivation in Asia (Myanmar), the Americas (Bolivia (Plurinational State of), Colombia, Ecuador, Mexico and Peru); and in Africa (Nigeria).

The *Afghanistan Opium Survey 2019* was implemented under the project “Monitoring of Opium Production in Afghanistan” (AFG/F98), with financial contributions from the Government of the United States of America.

Regional grouping

The 2019 opium poppy survey report updated its regional groupings to fit with other work of NSIA. Historical data has been adjusted where needed, in case comparability is limited it is noted accordingly.

MAP 1 REGIONAL BREAKDOWN USED IN THE 2019 OPIUM SURVEY REPORT, NSIA



Source: Government of Afghanistan, National Statistic and Information Authority (NSIA)
The dotted line represents approximately the line of control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

Executive summary

Livelihoods on the brink

Opium prices fall to lowest levels since monitoring began

The “farm-gate” price of opium, which is an indicator for the income of farmers from the opium sales, fell by 33% from its 2018 value to US\$ 63/kg. These prices were at the lowest level since systematic monitoring began.

After three years of high production levels, the market for opium appears to be saturated, forcing the prices down. The low prices suggest the situation of already impoverished opium farmers probably became even more precarious because of the loss of expected income from opium sales, and the situation of those who are “better off” may have become more difficult.

Millions of US\$ taken in taxes by Taliban and other insurgent groups

More than one-third of headmen in poppy villagers reported that their farmers paid taxes of roughly 6 per cent on sales of opium, and mostly to the Taliban. At the farm gate, this corresponded to roughly \$14.5 million paid in opium taxes. If the revenues from manufacturing and trafficking of opiates were taxed in the same way, it could have yielded a total of \$61 – 113 million for non-state actors in 2019.

And these opium taxes are not the only source of income for insurgency groups. Most headmen reported that farmers paid the *Ushr* – a traditional Islamic tithe on agricultural production of about 10 per cent. While the most common recipients of the *Ushr* were ‘poor people’, about one-fifth of headmen also named the Taliban as beneficiaries – almost double the rate of the previous year.

Area under opium poppy cultivation lowest since 2013

The total area under opium poppy cultivation in Afghanistan was estimated at 163,000 hectares in 2019, a decrease of 38 per cent or 100,000 hectares when compared with 2018. The area under cultivation was the lowest observed since 2013. The number of poppy-free provinces increased from 10 in 2018 to 13 the following year.

As a result, the number of villages reporting poppy cultivation also declined markedly. About 15 per cent of headmen reported that (at least some) villagers were cultivating poppy in 2019, compared to 2018 when one in three headmen reported the same. Many farmers do not cultivate opium poppy each year, NSIA/UNODC opium surveys have shown. Some cultivated once every two years, others restarted cultivation after longer pauses. In 2019, cultivation was driven by farmers who regularly cultivated opium poppy. In the south-west, where the bulk of cultivation took place, almost three out of four were farmers who cultivated poppy regularly (three out of four years).

Opium income increasingly used for everyday expenses

Food, medical expenses, and debt repayment were the three most common uses of opium income reported by farmers in 2019. Fewer farmers said they had invested in property, education, or other activities that could potentially build alternatives to opium poppy cultivation.

The trends are consistent with previous years. Farmers cultivating opium frequently tended to report more often to use opium income for everyday items and repaying debt than farmers who cultivated less frequently. In 2019, the difference was less pronounced than in earlier years, suggesting that opium revenue was a more integral component of household income in 2019 than in previous years. It points to

a possible decline in investments that may contribute to increased economic opportunities outside of opium in the long run.

Overall, farmers who cultivated opium had higher incomes than those who did not. For opium poppy farmers, sales of opium and poppy derivatives constituted the main source of income at 46 per cent of overall income.

Overall size of the opiate economy remained stable in 2019

The overall income generated by domestic consumption, production and exports of opiates in Afghanistan was estimated at between \$1.2 billion and \$2.1 billion in 2019. The gross income from opiates exceeded the value of the country's officially recorded licit exports in 2019.

In comparison with 2018, the overall size of the opiate economy contracted only slightly despite the large drop in farm-gate price. This is because export prices of opiates did not collapse in the same way as the prices for the raw product. Shocks in the system take longer to affect heroin and morphine prices.

At each step of the opiate trade – cultivation and production of opium, local distribution and manufacture of heroin, the international trade in opiates – different actors benefit economically. The largest profits are made in the retail markets outside Afghanistan.

Poppy cultivation and village life

Opium poppy cultivation is more prevalent in villages under non-state control

Afghanistan's power structure is scattered and complex, and the Afghan state has difficulty enforcing its will in many parts of the country. The percentage of villages controlled by actors other than the government was much higher in villages where opium was cultivated, with 83 per cent of headmen reporting control by insurgency and other non-state actors. Among villages without opium poppy cultivation, the share was significantly lower, at 44 per cent.

As with previous years, opium poppy farming generally took place in villages regarded as less secure. Some 36 per cent of headmen in poppy-growing villages described the situation as "very insecure" or "insecure". In villages without poppy cultivation, 21 per cent reported the same.

Villages without poppy cultivation have greater perception of risk of legal consequences for opium cultivation

Despite comparatively small areas of opium cultivation being eradicated, farmers have consistently named "fear of eradication" as one of the main reasons for stopping the practice. In villages where opium poppy was not cultivated, 47 per cent assessed the risk of legal consequences if opium poppy is cultivated as "very likely" or "likely" compared with 32 per cent in villages where poppy was cultivated. By contrast, 28 per cent of headmen in non-poppy villages thought legal action was "unlikely" or "very unlikely" compared with 44 per cent in poppy villages.

Like previous years, opium poppy cultivation was also strongly linked to difficulties in accessing essential infrastructure and services relevant for sustainable development.

Selling patterns suggest most farmers are not keeping large opium inventories

Farmers sold most of their opium products during the month of the harvest or in the months following it. Opium can retain freshness for longer than a year, meaning farmers who are able to store it could reap rewards and manage to save money if prices go up. But this is only possible for better-off farmers. Impoverished poppy cultivators are likely to need to sell quickly to finance their daily needs.

Most farmers sold opium at the farm-gate, meaning farmers do not need to bring opium to the local markets. This supposedly adds to the attractiveness of opium as a cash crop. While 58 per cent of farmers reported the farm-gate as their primary selling point, the remaining number said they sold it at markets.

Opium poppy is a labour-intensive crop that provides employment for many

In 2019, harvesting activities provided the equivalent of up to 119,000 full time jobs to local and migrant workers hired by farmers. Reported wages for those weeding opium poppy fields are comparable to other types of farm labour at roughly \$4 a day. But lancing can bring in \$6 a day – 50 per cent more.

As with opium farmers, the hired workers said their wages went to covering basic needs such as food, paying debt and medical expenses, rather than purchases that could improve livelihoods on the long run. This is an indication that savings or investments were difficult to achieve.

Future challenges

Pandemic pushes women and children into the poppy fields

Although the survey results reflect the situation in 2019, some patterns ushered in by the COVID-19 pandemic are already evident. The crisis hit Afghanistan at the end of March 2020, at the beginning of the key months for the opium harvest. Prices for basics such as flour, heat and rice shot up – increases likely to be felt more keenly by the most vulnerable. Many people lost their jobs and businesses, and reports from the field indicate they increasingly worked as opium poppy harvesters in the 2020 season.

Involvement in opium production also widened to implicate the families of farmers more deeply. Farmers in some regions were unable to find enough poppy lancers at the start of the season. To cover the shortfall, women and children in poppy-growing households were more deeply engaged in the work. This tactic appears to have worked, with opiate production largely uninterrupted in the 2020 season.

COVID-19 and other long-term factors likely to boost attraction of illicit crop cultivation

Life for many in Afghanistan was precarious before the pandemic. The evidence suggests COVID-19 will exacerbate many of the factors that drive farmers and workers to opium poppy cultivation – among them are absence of infrastructure and services, income inequality, food insecurity, weak governance, and insecurity.

The COVID-19 crisis is expected to have a disproportionate impact on the poor, through job loss, loss of remittances, rising prices, and disruptions in services such as education and health care. In addition, the COVID-19 crisis comes after a string of unusual weather years – a drought in 2018 and floods in 2019 – which had already caused hunger, malnutrition, and rising debt.

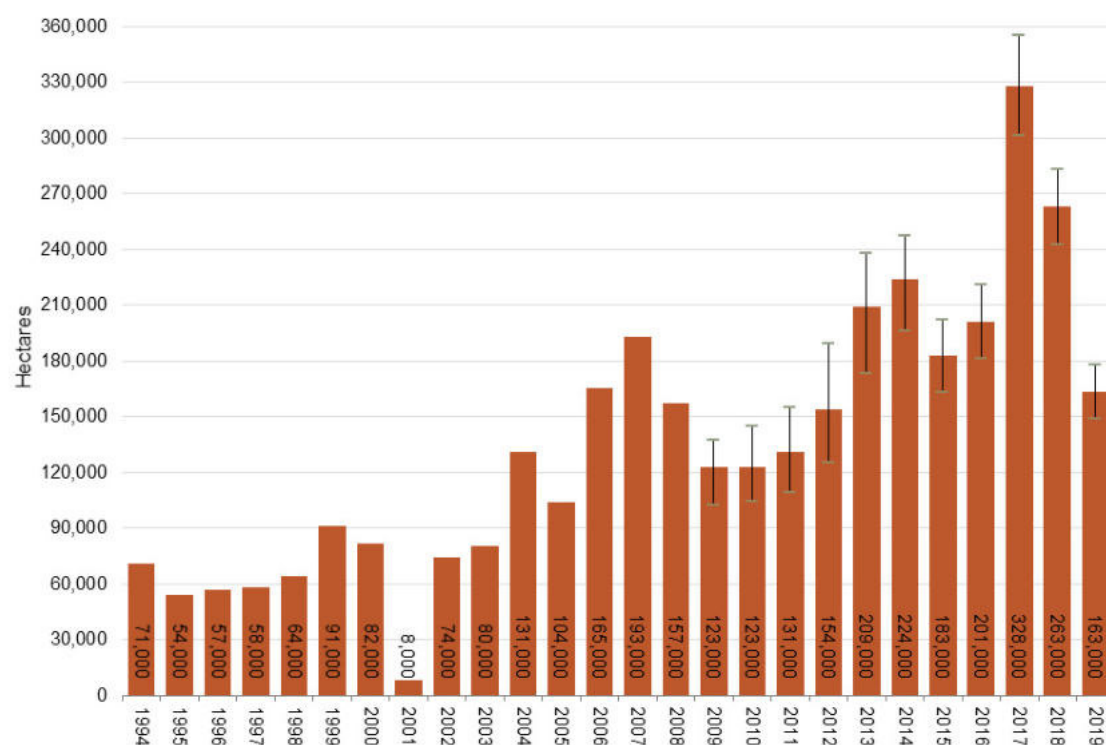
All these developments are likely to further reduce licit economic opportunities and increase the propensity of the rural population to engage in opium cultivation and heroin manufacture.

Opium poppy cultivation in 2019

Area under opium poppy cultivation decreased considerably in 2019

The total area under opium poppy cultivation in Afghanistan was estimated at 163,000 hectares (149,000 - 178,000) in 2019, a decrease of 38% or 100,000 hectares when compared to 2018. The area under cultivation was the lowest observed since 2013.

FIGURE 1 OPIUM POPPY CULTIVATION IN AFGHANISTAN, 1994-2019 (HECTARES)



Sources: UNODC/NSIA/MCN opium surveys 1994-2019. The vertical lines represent the upper and lower bounds of the 95% confidence intervals.

All regions¹ saw decreases in opium poppy cultivation in 2019, with the largest relative decreases being in the Eastern region (-76%), followed by the Southern (-67%), Central (-52%), North-eastern (-45%), South-western (-38%) and Western (-23%) regions. Cultivation in the Northern region reduced less pronounced by -5%. The largest absolute decreases took place in the South-western and Eastern regions, where opium poppy cultivation decreased by 72,120 and 16,058 hectares, respectively.

Opium poppy cultivation decreased in all main opium poppy-growing provinces: in Nangarhar (-82%), in Nimroz (-78%), Kandahar (-40%), Uruzgan (-38%), Farah (-35%) and Hilmand (-34%). Increases were observed in provinces with low levels of cultivation, in Jawzjan (+294%) and Sari Pul (+223%).²

¹ The regional groupings of provinces have been changed in comparison to previous survey reports. The groupings used in this report are in line with the groupings used in the work of NSIA. Percentage changes refer to the new regional groupings.

² Given the degrees of uncertainties in sampled provinces, changes of less than 10 per cent in area under cultivation are considered as being stable.

Hilmand remained the country's major opium poppy cultivating province (90,727 ha), followed by Kandahar (13,954 ha), Uruzgan³ (11,578 ha), Badghis (7,631 ha), Farah (7,113 ha), Balkh (7,042 ha) and Faryab (6,621 ha). Table 5 presents an overview of all provincial estimates.

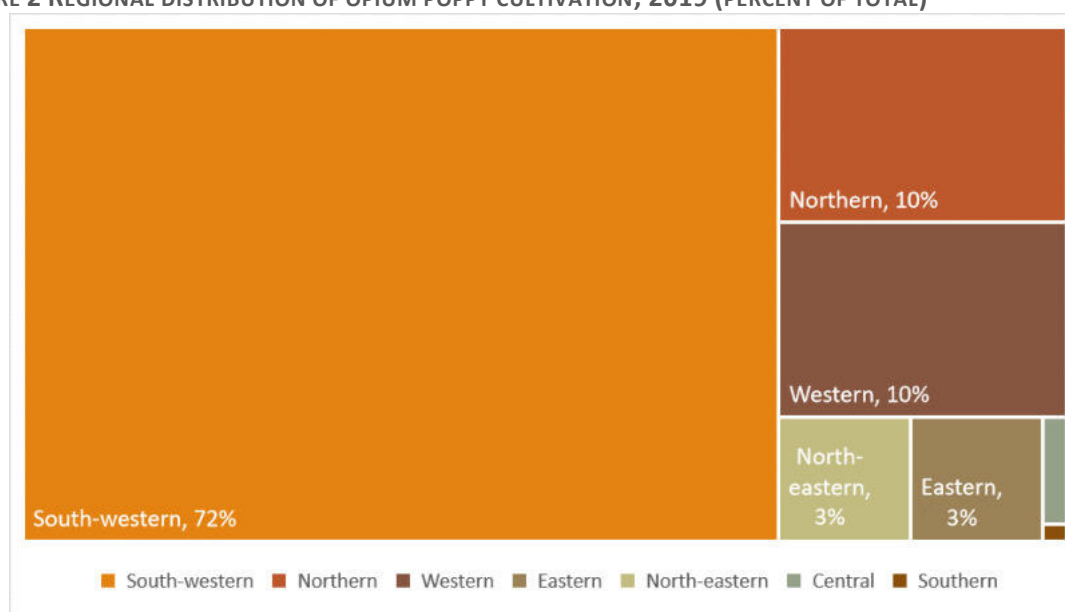
In 2019, the number of poppy-free provinces in Afghanistan increased from 10 to 13 when compared to 2018. Kapisa, Samangan and Takhar regained their poppy-free status.

TABLE 1 REGIONAL DISTRIBUTION OF OPIUM POPPY CULTIVATION, 2018-2019 (HECTARES)

Region	2018 (ha)	2019 (ha)	Change 2018-2019	2018 (ha) as % of total	2019 (ha) as % of total
Central	1,617	780	-52%	1%	0.5%
Eastern	21,001	4,942	-76%	8%	3%
North-eastern	9,030	4,973	-45%	3%	3%
Northern	17,944	17,128	-5%	7%	11%
South-western	190,565	118,444	-38%	72%	73%
Southern	373	123	-67%	0.14%	0.1%
Western	22,059	17,053	-23%	8%	10%
Rounded Total	263,000	163,000	-38%	100%	100%

Note: the regional groupings have been changed in comparison to previous survey reports. The groupings used here are in line with the groupings used by NSIA. See Map 1.

FIGURE 2 REGIONAL DISTRIBUTION OF OPIUM POPPY CULTIVATION, 2019 (PERCENT OF TOTAL)



³ Including Gizab district, a district formally part of Day Kundi province, but since 2014 under the administration of the Governor of Uruzgan province.

TABLE 2 KEY FINDINGS ON OPIUM CULTIVATION IN 2019

	2018	Change (%)	2019
Net opium poppy cultivation (after eradication)	263,000 ha (242,000 - 283,000)	-38%	163,000 ha (149,000 - 178,000)
Number of poppy free provinces ⁴	10	+30%	13
Number of provinces affected by poppy cultivation	24	-13%	21
Eradication	406 ha	-95%	21 ha
Average farm-gate price (weighted by production) of fresh opium at harvest time	US\$ 76/kg	-32%	US\$ 52/kg
Average farm-gate price (weighted by production) of dry opium at harvest time	US\$ 94/kg	-33%	US\$ 63/kg

Note: Numbers in brackets indicate the lower and upper bounds of the 95% confidence interval.

⁴ A province is defined as poppy-free when it is estimated to have less than 100 hectares of opium poppy cultivation.

Eradication of opium poppy decreased by 95%

In 2019, a total of 21 hectares of opium poppy was eradicated by the provincial Governors in 2019 (verified by NSIA/UNODC). This represented a decrease of 95% from 2018 when 406 hectares were eradicated.

In 2019, eradication took place only in two provinces, in Badakhshan (1.2 hectares) and Hilmand (19.4 hectares).

TABLE 3 VERIFIED GOVERNOR-LED ERADICATION AND CULTIVATION, 2010 - 2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of provinces eradication carried out	11	18	18	18	17	12	7	14	4	2
Governor-led Eradication (ha)	2,316	3,810	9,672	7,348	2,692	355	355	750	406	21
Cultivation (ha)	123,000	131,000	154,000	209,000	224,000	183,000	201,000	328,000	263,000	163,000
Poppy-free provinces	20	17	17	15	15	14	13	10	10	13

Note: Cultivation refers to net area under cultivation after deducting eradicated area.

TABLE 4 VERIFIED GOVERNOR-LED ERADICATION, BY PROVINCE, 2018 - 2019

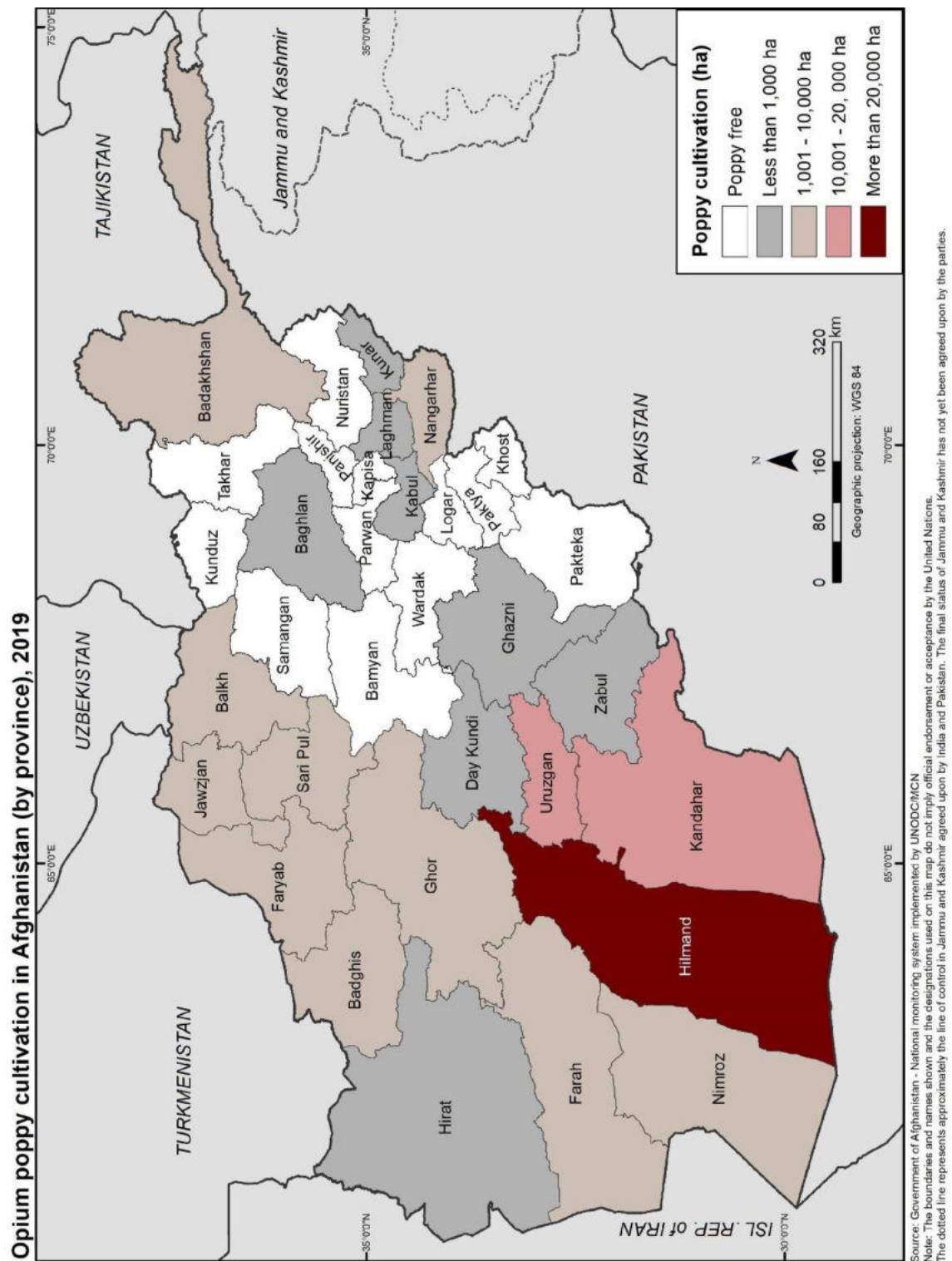
Province	Verified eradication (ha) 2018	Verified eradication (ha) 2019	% Change
Badakhshan	85	1.2	-99%
Kandahar	13	0	-100%
Nangarhar	301	0	-100%
Hilmand	0	19.4	NA
Kunar	7	0	-100%
Total	406	20.6	-95%

TABLE 5 OPIUM POPPY CULTIVATION AND ERADICATION IN AFGHANISTAN 2018-2019 (HECTARES)

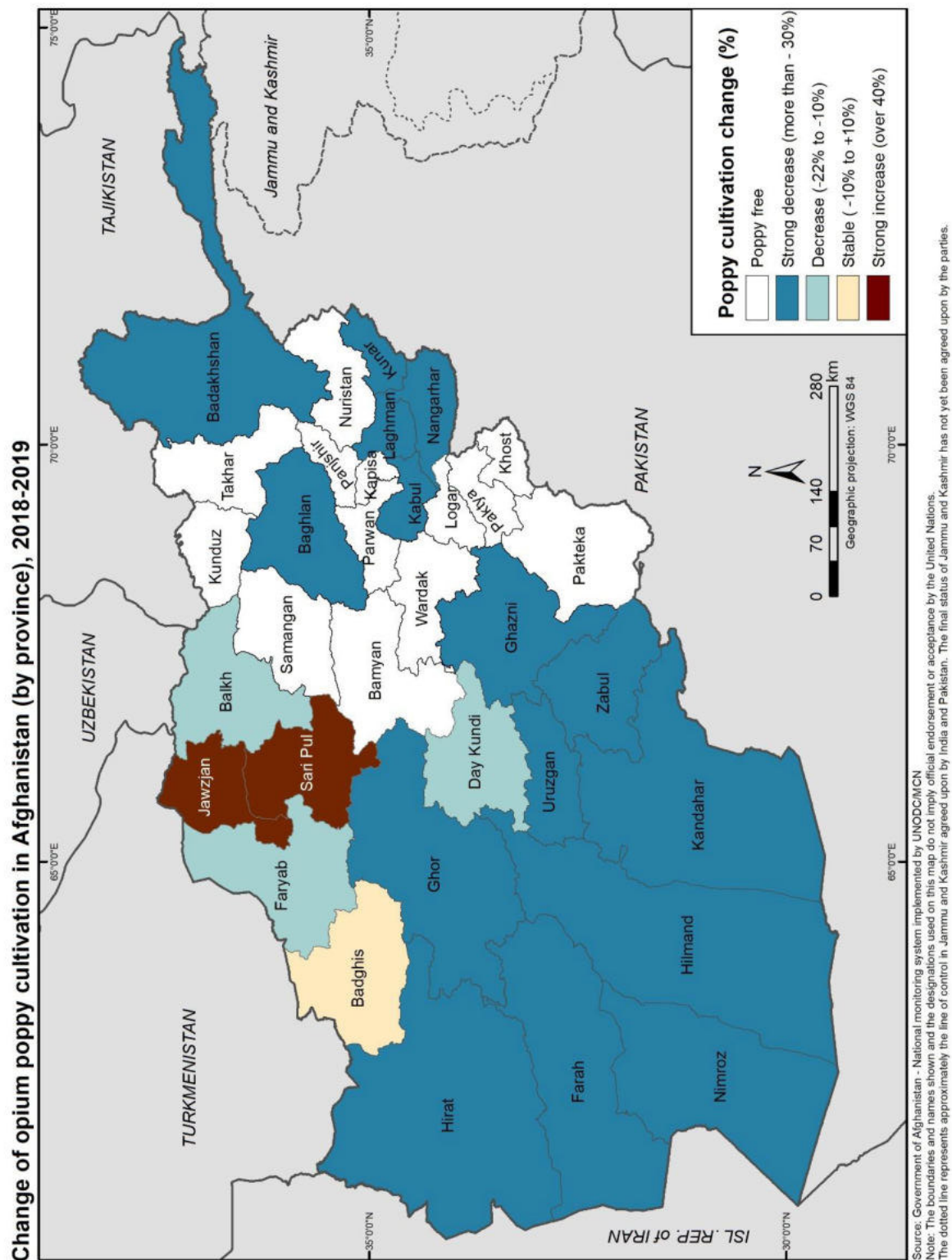
Province	Cultivation (ha)		Change (%)	Estimation method 2019	Eradication (ha)		Change (%)
	2018	2019			2018	2019	
Kabul	484	197	-59%	T	0	0	NA
Logar	Poppy-free	Poppy-free	NA	T	0	0	NA
Panjshir	Poppy-free	Poppy-free	NA	V	0	0	NA
Parwan	Poppy-free	Poppy-free	NA	T	0	0	NA
Wardak	Poppy-free	Poppy-free	NA	V	0	0	NA
Kapisa	386	Poppy-free	-100%	T	0	0	NA
Bamyan	Poppy-free	Poppy-free	NA	V	0	0	NA
Day Kundi*	747	583	-22%	S	0	0	NA
Central region	1,617	780	-52%		0	0	0%
Kunar	1,732	967	-44%	S	7	0	-100%
Laghman	2,092	908	-57%	S	0	0	NA
Nangarhar	17,177	3,067	-82%	S	301	0	-100%
Nuristan	Poppy-free	Poppy-free	NA	T	0	0	NA
Eastern region	21,001	4,942	-76%		308	0	-100%
Badakhshan	7,703	4,702	-39%	S	85	1	-99%
Kunduz	Poppy-free	Poppy-free	NA	T	0	0	NA
Takhar	251	Poppy-free	-100%	T	0	0	NA
Baghlan	1,076	271	-75%	T	0	0	NA
North-eastern region	9,030	4,973	-45%		85	1	-99%
Balkh	8,532	7,042	-17%	S	0	0	NA
Faryab	8,175	6,621	-19%	S	0	0	NA
Jawzjan	338	1,332	+294%	S	0	0	NA
Samangan	238	Poppy-free	-100%	T	0	0	NA
Sari Pul	660	2,134	+223%	S	0	0	NA
Northern region	17,944	17,128	-5%		0	0	0%
Hilmand	136,798	90,727	-34%	S	0	19	NA
Kandahar	23,410	13,954	-40%	S	13	0	-100%
Uruzgan*	18,662	11,578	-38%	S	0	0	NA
Zabul	2,581	183	-93%	S	0	0	NA
Nimroz	9,115	2,002	-78%	S	0	0	NA
South-western region	190,565	118,444	-38%		13	19	46%
Khost	Poppy-free	Poppy-free	NA	V	0	0	NA
Paktya	Poppy-free	Poppy-free	NA	V	0	0	NA
Ghazni	373	123	-67%	T	0	0	NA
Paktika	Poppy-free	Poppy-free	NA	V	0	0	NA
Southern region	373	123	-67%		0	0	0%
Badghis	6,973	7,631	+9%	S	0	0	NA
Farah	10,916	7,113	-35%	S	0	0	NA
Ghor	3,574	1,960	-45%	S	0	0	NA
Hirat	595	349	-41%	T	0	0	NA
Western region	22,059	17,053	-23%		0	0	0%
Total (rounded)	263,000	163,000	-38%		406	21	-95%

Area estimation method: S=remote sensing sample survey, T=remote sensing target survey, V=village sample survey and field observation. A province is defined as poppy-free when it is estimated to have less than 100 hectares of opium poppy cultivation. Cultivation hectares are net values after deduction of eradication. *Gizab district of Day Kundi province was considered under Uruzgan province as per presidential decree.

MAP 2 OPIUM POPPY CULTIVATION IN AFGHANISTAN (BY PROVINCE), 2019



MAP 3 CHANGE OF OPIUM POPPY CULTIVATION IN AFGHANISTAN, BY PROVINCE, 2018-2019



Impoverished farmers experienced a bleak year of declining income while the overall income from opiates remained stable

The farm-gate prices of opium decreased by 33% since 2018

The farm-gate price of opium, which is an indicator for the income of farmers from the sales of opium, decreased by 33% from its 2018 value to US\$ 63/kg. These prices were at the lowest level since systematic monitoring began.

The continuous decrease in dry-opium prices was attributed to a saturation of the market with opium following three consecutive years of high production levels. The opium price being so low indicated that the situation of already impoverished opium farmers likely became even more precarious due to the loss of expected income from opium sales.

FIGURE 3 NATIONAL AVERAGE PRICE OF DRY OPIUM AT THE FARM-GATE, US\$/kg, JUNE 2004 TO FEBRUARY 2020



Source: Ministry of Interior (2020) Afghanistan monthly drug price monitoring. Values are not adjusted for inflation.

The overall size of the opiate economy remained stable

The value chain of opium in Afghanistan comprises more than the farm-gate value of opium. Opium is sold onwards to be consumed in its raw form in the region and to be manufactured into derivatives such as heroin and morphine, which are then exported to end-consumer markets across the globe. At all these steps, income is generated.

In 2019, it was estimated that some 360 – 600 tons of heroin of export quality (50 – 70 per cent purity) or 250 to 300 tons of pure heroin base could be produced from Afghan opium.⁵ These values represent a potential heroin production: A noteworthy share of the opium and heroin production is seized or lost along the supply chain from source to destination countries, and a proportion of the product does not enter the market in the year of interest. The amounts of heroin that reached end-consumer markets are thus have been lower than this estimate.

FIGURE 4 HEROIN SEIZURES



Source: UNODC and Combined Maritime Forces (CMF).

Opiate trafficking generates income for Afghans when it is sold to end-consumers domestically or exported. The overall (gross) income generated by domestic consumption, production and exports of opiates in Afghanistan was estimated at between US\$ 1.2 billion and US\$ 2.1 billion in 2019,⁶ which, when expressed as a share of the total economy, was equivalent to between 7 and 11 per cent of the GDP.⁷

The gross income generated from opiates remained of considerable size when compared to Afghanistan's licit economy, and exceeded the value of its officially recorded licit exports of goods in 2019 (estimated at 4.8 per cent of GDP).⁸ It was also worth between 24 and 44 per cent of the value of the licit agricultural sector of the country, which constituted an estimated 25.5 per cent of GDP in 2018/2019.⁹

In comparison with 2018, the overall size of the opiate economy contracted between 2 and 7 per cent did thus not shrink as pronounced as the farm-gate value. This can be explained by a, in comparison to the farm-gate price, much more moderate reduction of export prices of opiates. Due to time lags in the supply chains, export prices of heroin and morphine react with some delay towards changes in the farm-gate prices. Because of this and since export prices of the current year needed to be approximated by prices of

⁵ See "Afghanistan opium survey 2018 – Challenges to sustainable development, peace and security" for details on the methodology. Seizure data indicated some two-thirds of the Afghan opium harvest were converted into heroin or morphine within Afghanistan and that the remainder was exported as unprocessed opium; this was based on the ratio between opium and heroin/morphine seizures in Afghanistan and its neighbouring countries (three-year average of latest available data, 2016-2018).

⁶ Economic calculations as these remain far less robust than estimates of the area under cultivation, opium yield and opium production. The calculations presented here are intended to provide reasonable orders of magnitude of the income generated rather than exact amounts.

⁷ National Statistics and Information Authority, "Afghanistan Statistical Yearbook 2019", March 2020, Table 7-3. GDP, excluding opium poppy was estimated at US\$ 17.9 billion in 2019.

⁸ Ibid. Table 12-2.

⁹ Ibid. Table 7-6.

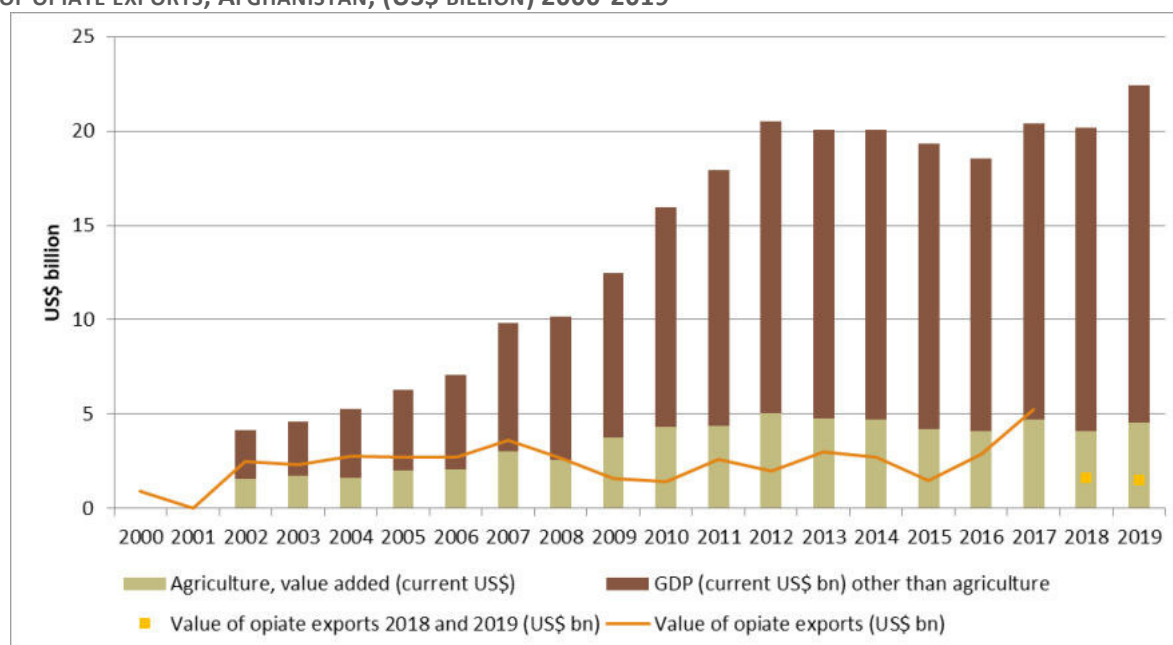
the previous year due to reporting practices of countries, the value of the opiate economy adapts slower to market dynamics than the farm-gate value.

TABLE 6 ESTIMATED GROSS AND NET VALUES OF THE OPIATE ECONOMY, 2019

	Gross value US\$ (rounded)	Value in relation to GDP
Value of opiate economy (gross)	1.2 - 2.1 billion	7 - 12%
Value of opiates potentially available for export	1.1 - 2.0 billion	6 - 11%
Value of domestic use market	76 million	<1%
Value of imported precursor substances	77 - 144 million	<1%

Note: Ranges are calculated based on different assumptions on the conversion of opium to morphine/heroin within Afghanistan and on the purity of the exported products. "Value of the opiate economy (gross)" is the sum of the value of the domestic market and the value of opiates believed to be exported, including the value of the imported precursor substance acetic anhydride. The net value of the opiate economy excludes the value of imported precursor substances. Details on the calculation and the underlying assumptions are provided in the methodology section. Figures are rounded; calculations are based on raw values.

FIGURE 5 GDP, BY VALUE ADDED OF THE AGRICULTURAL SECTOR AND OTHER SECTORS, AND ESTIMATED GROSS VALUE OF OPIATE EXPORTS, AFGHANISTAN, (US\$ BILLION) 2000-2019



Source: MCN/UNODC Afghanistan opium surveys (value of opiate exports up until 2018); NSIA/UNODC (value of opiate exports 2019); World Bank (GDP and value added of the agricultural sector, 2002-2015); CSO/NSIA Afghanistan (GDP and value added of the agricultural sector, 2015/16, 2016/17 and 2017/18, 2018/19). Note: The gross value of opiate exports is shown because of data availability prior to 2011. For comparison with GDP, the value of the opiate economy without the costs for imported precursor substances is more appropriate. Due to a change in methodology, the estimates prior to 2018 are not directly comparable with the estimates from 2018 onwards.

Actors in Afghanistan benefitting from the trade with opiates

The trade with opiates can be broken down into several (mostly) consecutive steps: cultivation and production of opium (the agricultural process that yields raw opium gum), local distribution of opium and manufacture of heroin within the country, and the international trade with opiates (raw opium, illicit morphine and heroin) across the borders of Afghanistan to transit and then destination countries.

At each step, different actors are involved, who benefit economically from opiates. Besides these “primary” actors, who are directly involved in drug production and trafficking, many others make profits by providing supporting services, such as transportation or security services, or by facilitating the trade by taking bribes.

Opium poppy has become a crucial component that secures the livelihoods of many Afghans who engage in cultivation, work on poppy fields or partake in the illicit drug trade. While area under cultivation and locations of opium cultivation are well understood, one of the most persistent gaps in knowledge of the phenomenon has been the lack of systematic information about the number of households and individuals involved or profiting from the trade in opiates in Afghanistan.

Based on recent data it is understood that opiate production and trafficking is run by a large number of individuals who organise themselves in various forms. Information provided by Afghan drug traffickers in a recent research report¹⁰ provided a picture of drug trafficking organisations in Afghanistan (both large and small) that are mainly based on family-structures, around shared tribal connections and localised neighbourhoods. The report revealed a range of different sizes, from small – consisting two or three family members operating in a single province or district – to much larger organizations consisting of many members of an extended family working together in Afghanistan and Europe.

Equally difficult to assess are numbers of households involved in cultivation. Households may cultivate just one plot or several small or large plots of illicit crops; some locations with large total illicit crop areas may have a relatively small number of such households, while others may have a large number. Therefore, the total extent of illicit crop areas alone does not provide an indication of the number of households growing illicit crops. In a recent assessment,¹¹ based on a methodology that combined data from remote sensing, socioeconomic surveys and agricultural censuses, UNODC estimated the global number of households cultivating opium poppy at between 325,000 and 600,000, with the majority of these households being located in Afghanistan.

What remains undisputed is that the largest share of profits made from opiates of Afghan origin is outside of Afghanistan, in retail markets. Onwards trafficking and sale in retail markets represent the largest piece of the total income generated by Afghan opiates. A 2015 UNODC study¹² on Afghan opiates trafficked to Western Europe through the Balkans estimated the total value of illicitly trafficked heroin and opium at some US\$ 28 billion per year, which was worth more than the entire GDP of Afghanistan in 2019, and this estimate pertained only to opiates trafficked along the Balkan route and leaves out other important routes such as the Northern route to Central Asia and the Russian Federation and the Southern route.

¹⁰ UNODC, 2020. *“Voices of the Quchaqbar” – Understanding opiate trafficking in Afghanistan from the perspective of drug traffickers*. AOTP UPDATE.

¹¹ UNODC, estimates made in 2019 of the number of households cultivating illicit crops worldwide. See World Drug Report 2020, Booklet 6, p46.

¹² UNODC (2015), *Drug Money: the illicit proceeds of opiates trafficked on the Balkan route*.

FIGURE 6 BENEFICIARIES OF THE TRADE WITH OPIATES OF AFGHAN ORIGIN

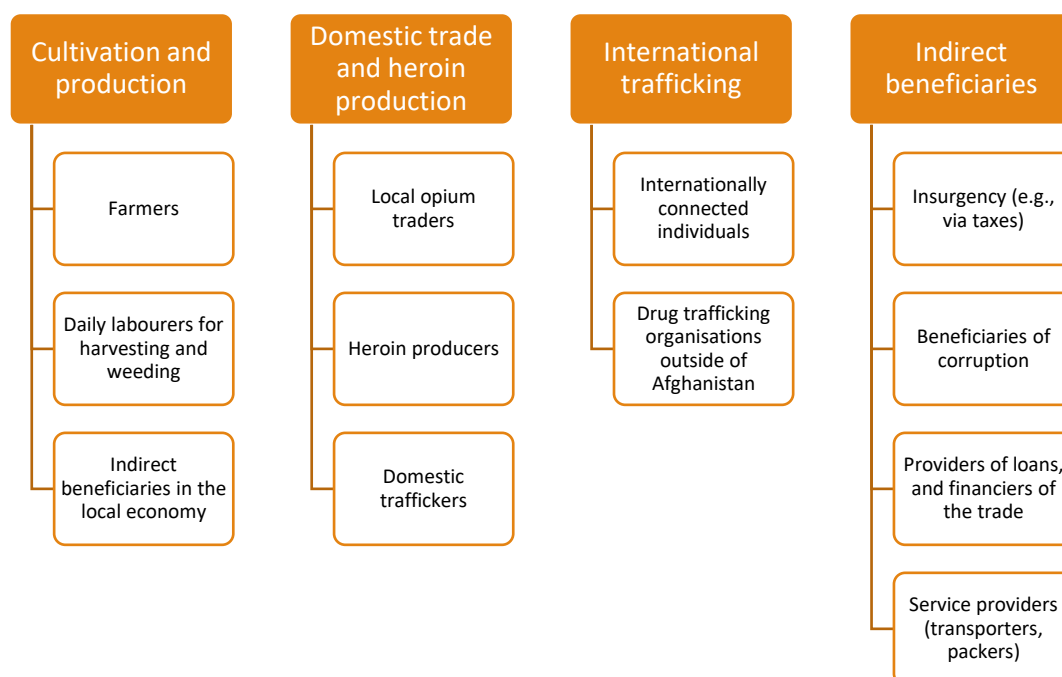


FIGURE 7 DRUG SEIZURE MADE BY THE CNPA, AFGHANISTAN.



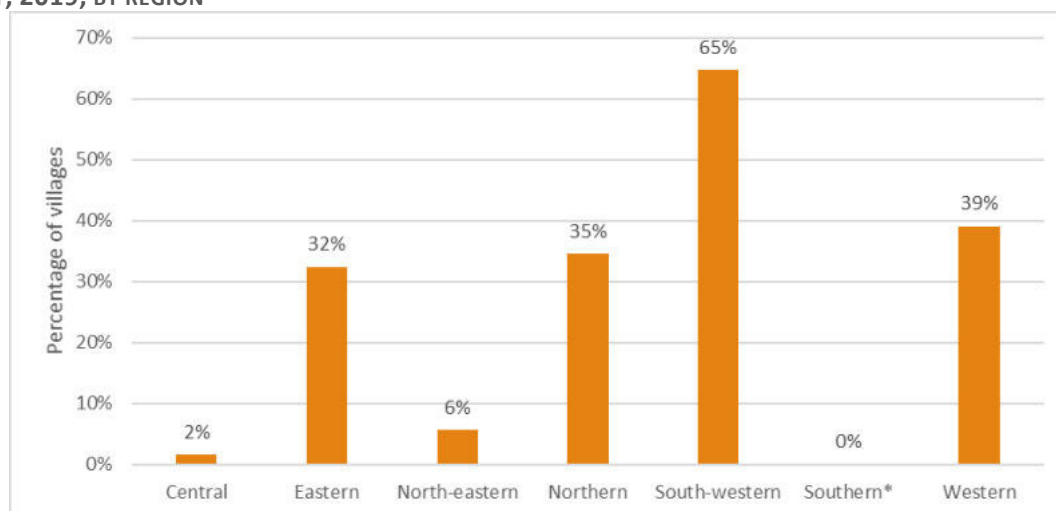
Source: Ministry of Interior, Afghanistan.

Opium poppy cultivation affected less villages in 2019 than in 2018, and was driven by poppy farmers who cultivate opium regularly

Opium poppy has become a crucial element in the livelihoods of many Afghans who engage in cultivation or work on poppy fields. In rural areas, a considerable share of the population was economically benefiting from opium poppy cultivation in 2019, as about 15 per cent of headmen reported that at least some villagers cultivated opium poppy. Reflecting the larger area under cultivation in 2018, more villages were affected than in 2019 where about 1 in 3 of all headmen reported the presence of poppy cultivation.

The average of some 15 per cent masked a large variability across regions. The South-western region had the highest share of villages with opium poppy being present at 65 per cent of all villages surveyed. In the Eastern, Northern and Western regions about a third of villages cultivated opium poppy, whereas in the Central and Southern regions only a small fraction of poppy cultivating villages was found.

FIGURE 8 PERCENTAGE OF VILLAGE HEADMEN REPORTING THAT HOUSEHOLDS IN THE VILLAGE CULTIVATE OPIUM POPPY, 2019, BY REGION



Note: In the Southern region only limited amounts of opium poppy were found. The randomly selected sample of villages did not contain a poppy village.

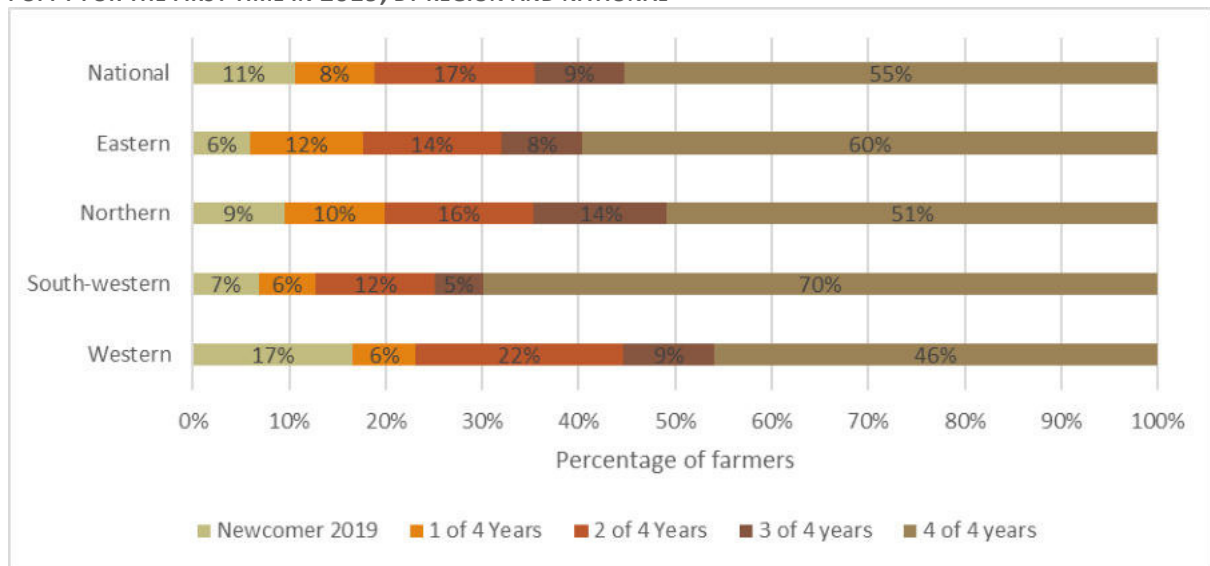
The role opium poppy plays in the economy of a household is not fixed and can change from year to year. Cultivating opium poppy is one of the many coping strategies that a rural household may employ for securing its livelihood.¹³ Livelihood strategies adopted by a household – poppy growing or others – are not constant and change over time in response to changed circumstances, such as increased monetary needs or adverse weather conditions in the crop growing season. Thus, the decision to cultivate opium poppy can change from one year to the next.

The NSIA/UNODC opium surveys have shown consistently that a considerable share of farmers does not cultivate opium poppy each year. Some cultivated every other year and others took up cultivation after pausing for a year or two.

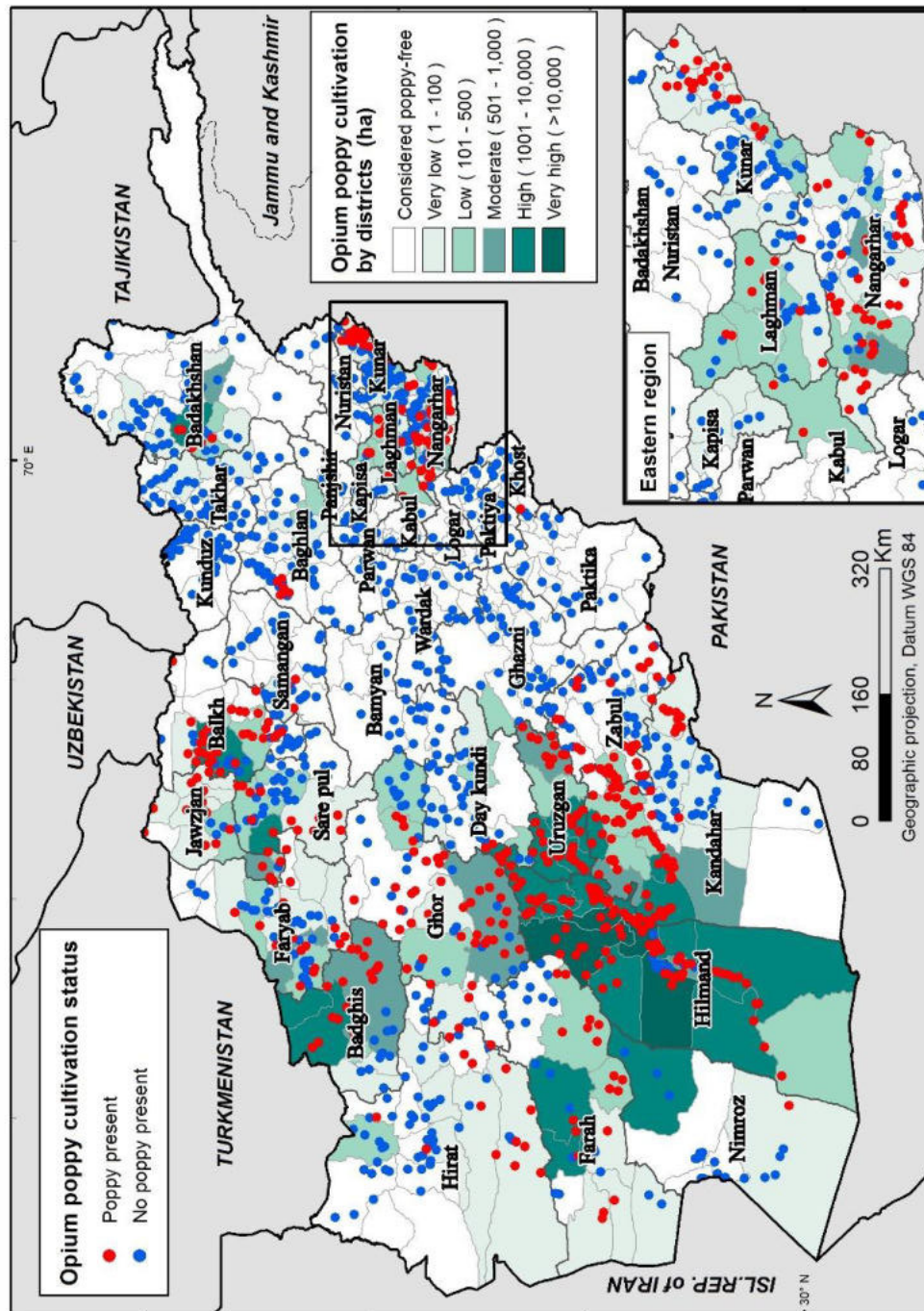
In 2019 opium poppy cultivation was driven by regular poppy farmers. According to the reports of the 2019 poppy farmers, some 64 per cent were cultivating poppy on a regular basis (3 or more years out of 4 prior to the survey). In the South-western region, where most of the cultivation took place, it was 75 per cent. In 2018, a smaller percentage of (60 per cent) cultivated opium poppy frequently (national average).

¹³ Livelihood is understood as all activities and decisions that enable members of a household to sustain their living.

FIGURE 9 NUMBER OF YEARS CULTIVATED FROM 2015 TO 2018 AND THE PROPORTION OF FARMERS CULTIVATING POPPY FOR THE FIRST TIME IN 2019, BY REGION AND NATIONAL



MAP 4 VILLAGES IN THE 2019 AFGHANISTAN OPIUM SURVEY, BY POPPY CULTIVATION



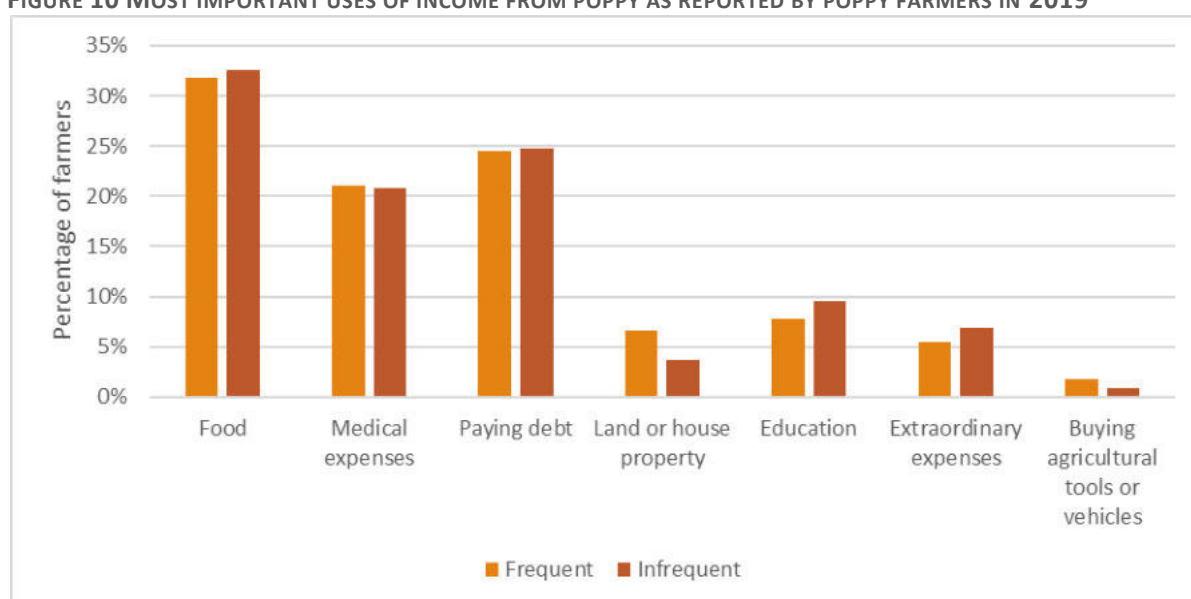
Source: Government of Afghanistan - National monitoring system implemented by UNODC/INSIA.
Note: The boundaries and names shown and the designation used on this map do not imply official endorsement or acceptance by the United Nations.
The dotted line represents approximately the line of control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

Frequent poppy farmers used the income from opium poppy differently than non-frequently cultivating farmers

The 2019 village survey asked poppy farmers about their use of the income from opium. Food, medical expenses, and paying debt were the three most common uses of opium income reported by farmers. Investment in property, education, or other activities that have potential in building alternatives to opium poppy cultivation were reported by fewer farmers. The findings of the 2019 village survey confirmed the findings of previous years that those farmers, who cultivate opium infrequently, use their income more often for education and extraordinary expenses.

In 2019, however, the difference was less pronounced than in previous years, possibly being an indication that for those who did cultivate, the income from opium poppy was a more integral component of their household income that was used rather for covering daily needs and expenditure than for investments that may contribute to increased licit economic opportunities on the long run.

FIGURE 10 MOST IMPORTANT USES OF INCOME FROM POPPY AS REPORTED BY POPPY FARMERS IN 2019



Note: Based on responses of poppy farmers in the Eastern, Northern, South-western and Western regions.

In 2019, opium poppy farmers reported a higher income than farmers who do not engage in opium cultivation

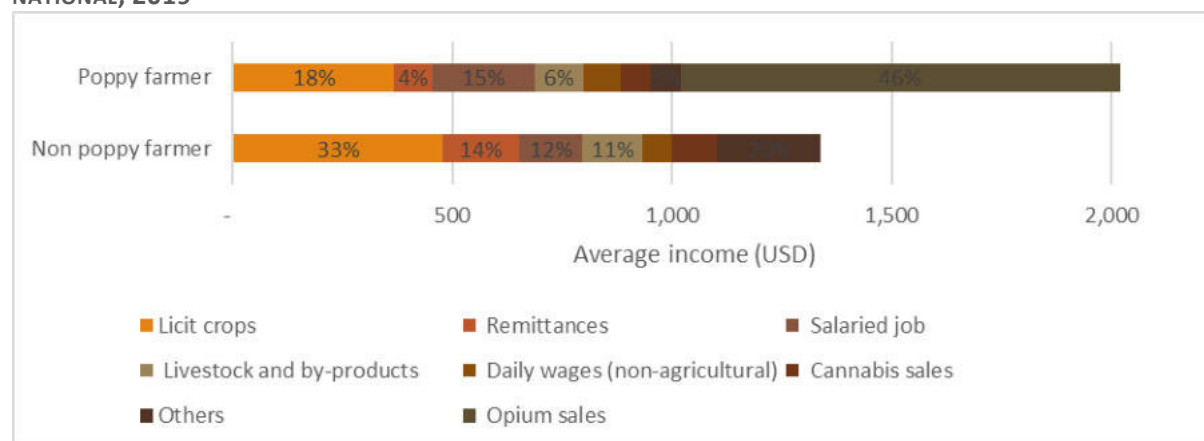
In terms of absolute household income, farmers who cultivated opium poppy, both frequently and infrequently, reported a higher average income than farmers who reportedly never had cultivated opium poppy. This has been a consistent finding over the years and demonstrates that illicit crop cultivation cannot be explained by income alone. Profits derived from illicit crops can be used to temporarily escape poverty,¹⁴ or to compensate for higher costs of living or lesser opportunities to earn income from licit economic activities in the village.

An indicator of the relevance of opium poppy in a household is the share of household income it provided to farming households. For opium poppy farmers, sales of opium and poppy derivatives (e.g., poppy seeds and straw) constituted the main source of income at 46 per cent of overall income.

¹⁴ Allan Gillies, John Collins and Alexander Soderholm, "Addressing the development implications of illicit economies: the rise of a policy and research agenda", *Journal of Illicit Economies and Development*, vol. 1, No. 1 (2019), pp.1–8.

Excluding income from opium poppy cultivation reversed the order. If counting income from non-poppy activities only, farmers who cultivated poppy earned less than farmers who did not. Once opium had been excluded, the main sources of income for poppy farmers were sales of licit crops, livestock and by-products and remittances. The main sources of income for farmers who had never grown poppy were revenue from the sale of licit crops, livestock and by-products and remittances, too, however with a different importance.

FIGURE 11 SHARES OF AVERAGE ANNUAL INCOMES (IN US\$) OF FARMERS BY INCOME-GENERATING ACTIVITY, NATIONAL, 2019



The length of the bar shows the average income as reported, the percentages represent income shares by activity. Income shares are calculated as percentage a certain income source provided to the overall income of poppy and non-poppy farmers, respectively.

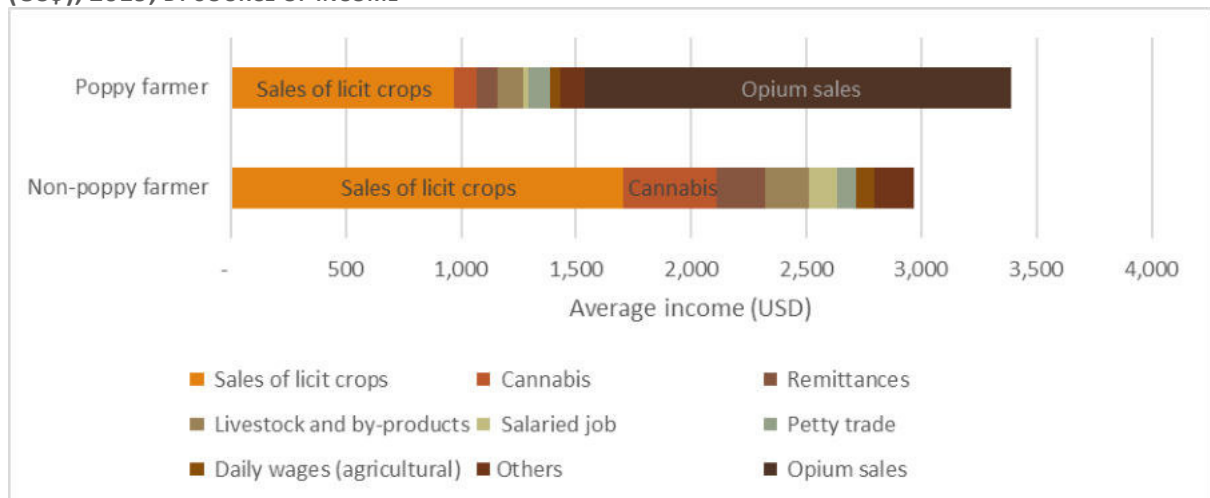
The difference in income distribution was even more pronounced in the South-western region, where most of the opium cultivation took place. When comparing income distribution of poppy and non-poppy farmers in the South-west, it shows that non-poppy farmers earn almost twice as much from licit crops, and that licit crops constitute a larger share of the income of non-poppy farmers than for poppy farmers (57 percent compared to 29 per cent).

An interesting finding concerns cannabis cultivation. Non-poppy farmers earned four times more from cannabis sales than poppy farmers, and cannabis sales constituted 14 per cent of their income whereas poppy farmers earned only 3 per cent of their income from cannabis. Another difference lies in money sent from abroad: non-poppy farmers received twice as much remittances than poppy farmers.

Using household income to measure standards of living or livelihood opportunities has its limitations. In poor rural economies with a substantial variability of income associated with seasonality and high degrees of self-consumption, standards of living also depend on other household assets, such as livestock and size of landholdings, as well as on local costs of living.

The opportunities and availability of income generating activities may therefore be different for those farmers who engage in opium poppy cultivation and those who abstain from it. The drivers of illicit cultivation are of dynamic, versatile and context-specific nature and there is not one single factor that drives farmer's decisions making on opium poppy cultivation.

FIGURE 12 ANNUAL INCOME AS REPORTED BY POPPY AND NON-POPPY FARMERS IN THE SOUTH-WESTERN REGION (US\$), 2019, BY SOURCE OF INCOME



Note: the length of the bars represents average income.

FIGURE 13 CANNABIS CULTIVATION IN AFGHANISTAN



Source: GoIRA/UNODC (2012). Left: cannabis field in Herat province, top right: cannabis laid out in the sun to dry; bottom right: cannabis processing in Herat province.

Farmers practices in selling opium and wheat in 2018 and 2019

Poppy farmers sold some of their wheat harvest and most of the opium harvest in the same year

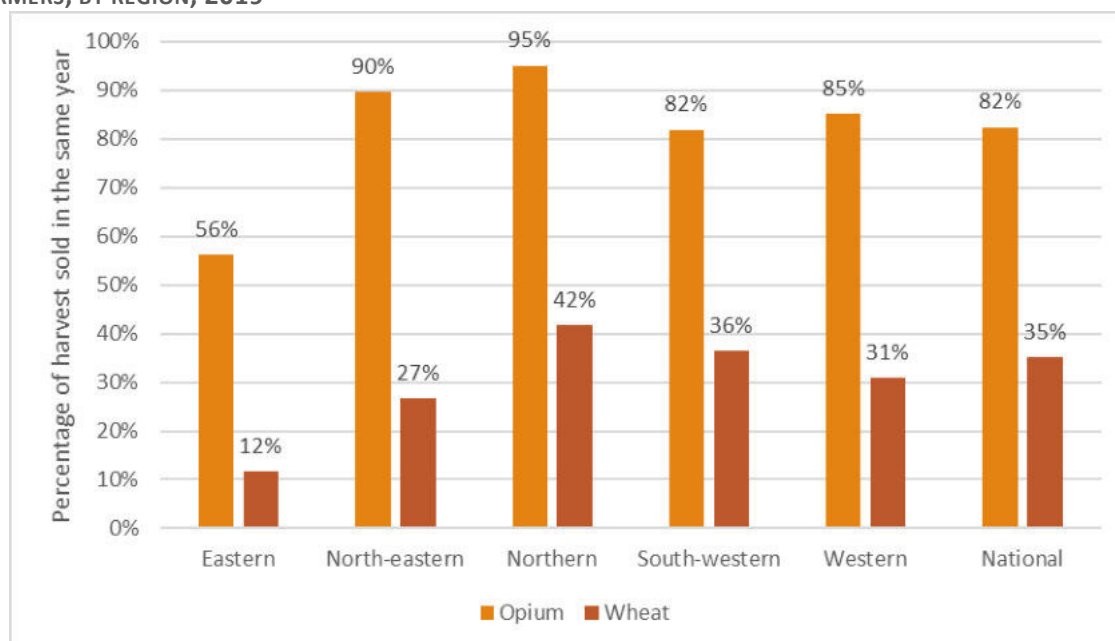
Poppy farmers were asked about the percentage of the opium and wheat harvest that was sold in the same year.

According to the farmers, 82 per cent of the opium harvest was sold within the same year,¹⁵ indicating that farmers aim at selling opium relatively quickly and do not stockpile large proportions. The estimate remained stable when compared to 2018 when 80 per cent of the opium harvest was sold in the same year. On average, 8.1 kilograms of opium remained with single farmers, presumably to be stored, used for self-consumption or as payments to opium harvesters. Opium that was used for payments for opium harvesters may have entered the market in the same year, namely when lancers sell opium onwards to traders. The estimate of 82 per cent entering the market in the same year is thus understood to be on the lower, cautious side.

Out of all farmers for which information was available, 10 per cent sold more than they harvested, indicating that they reduced the amount of opium stored. With very low prices in what is apparently a saturated market, it may not have made sense economically to hold on to the product for more farmers. The share of farmers selling more than harvesting was highest in the Eastern region, at 30 per cent and lowest in the Western region at 6 per cent. In the remaining region, between 7 and 8 per cent of farmers sold more than they harvested.

The proportion of the wheat harvest that opium poppy farmers sold within the same year was much lower than the one for opium. At national level, farmers sold 35 per cent of their wheat harvest and kept the rest within the household, presumably mostly for self-consumption. This might be an indication that most of the wheat was cultivated for subsistence and not for selling at markets.

FIGURE 14 PERCENTAGES OF THE OPIUM AND WHEAT HARVEST SOLD IN THE SAME YEAR, AS REPORTED BY POPPY FARMERS, BY REGION, 2019



¹⁵ Data collected in 2019, referring to the 2018 harvest.

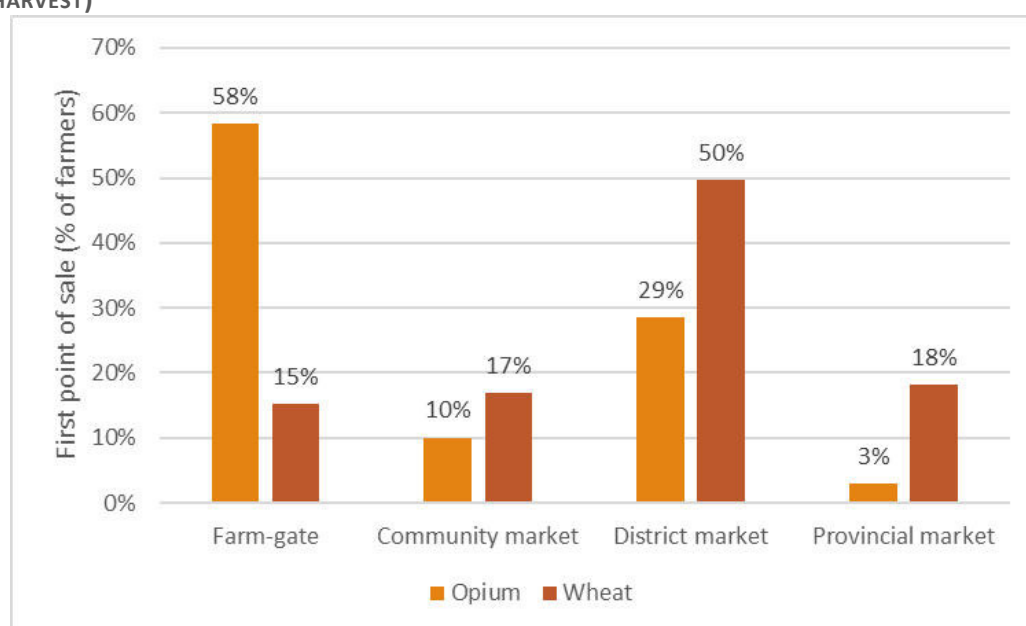
Percentages refer to poppy farmers only. Central and Southern region have been omitted because of a very low number of samples.

58 per cent of poppy farmers sold opium at the farm-gate, the others on markets. A common conception is that opium is purchased by traders directly at the farm-gate,¹⁶ and not at local or provincial markets. In such cases, farmers would not need to bring opium to the local markets, which supposedly adds to the attractiveness of opium as a cash crop. In 2018 and 2019, data from farmers on the main selling points for opium and wheat was collected.

In 2019, some 58 per cent of farmers reported the farm-gate as primary selling point and the remaining farmers reported selling opium at local, district or provincial markets. As comparison, for wheat, 15 per cent of farmers named the farm-gate as primary selling point. The percentage sold at the farm-gate was lowest in the South-western region, where most of the opium was collected. Here, 46 per cent of farmers named the farm-gate as primary point of sale (13 per cent for wheat).

The 2019 survey results confirmed that opium is frequently sold at local, district and provincial markets, suggesting that the activities of opium farmers converged with farmers of licit crops, at least in those areas heavily affected by opium poppy cultivation.

FIGURE 15 SHARE OF FARMERS SELLING THEIR PRODUCTS AT A CERTAIN MARKET, 2019 (DATA COLLECTED ON THE 2018 HARVEST)



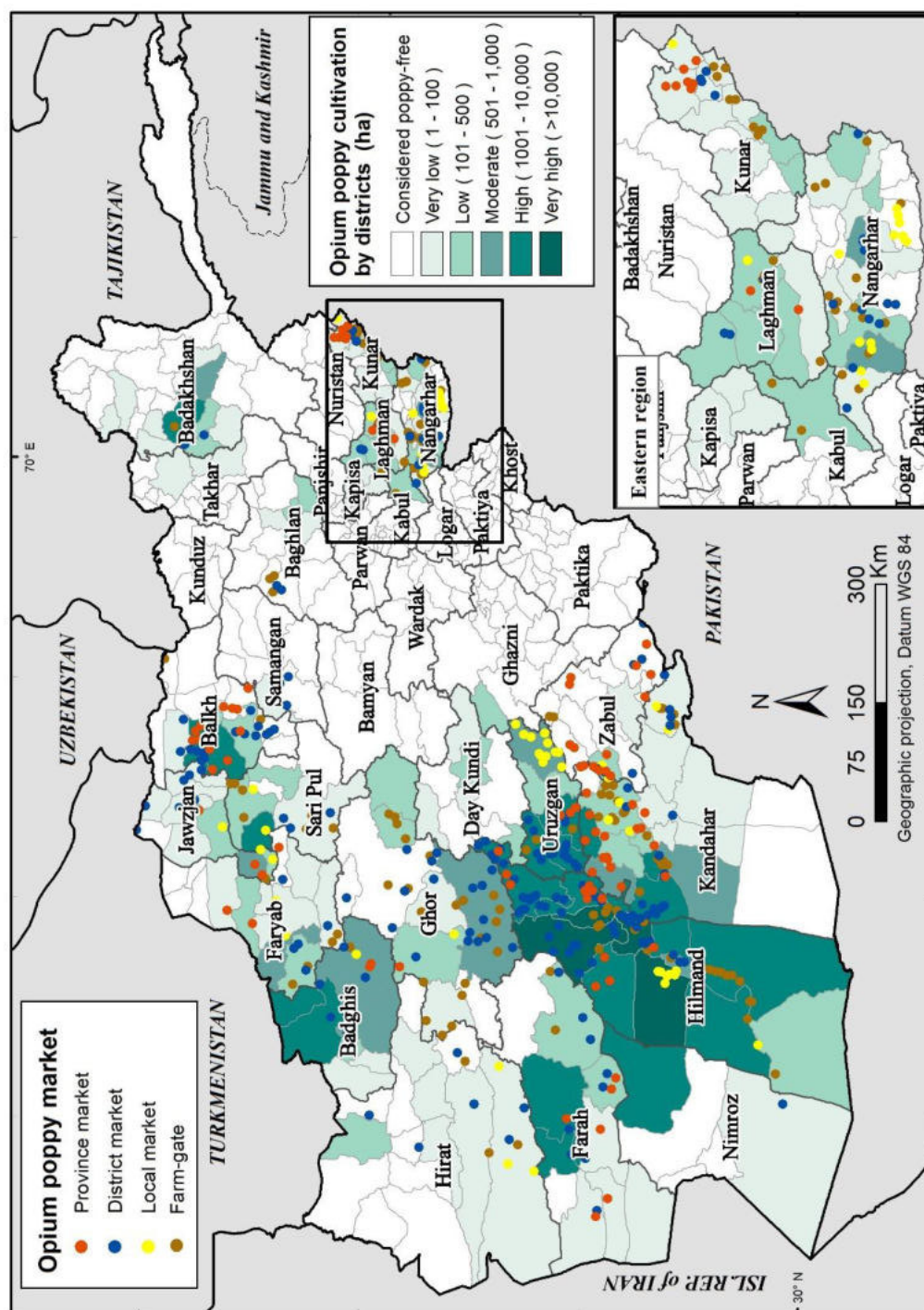
¹⁶ See e.g., MCN/UNODC Afghanistan opium survey 2011

FIGURE 16 MARKET IN KISHM DISTRICT OF BADAKHSHAN



Source: UNAMA, 2017.

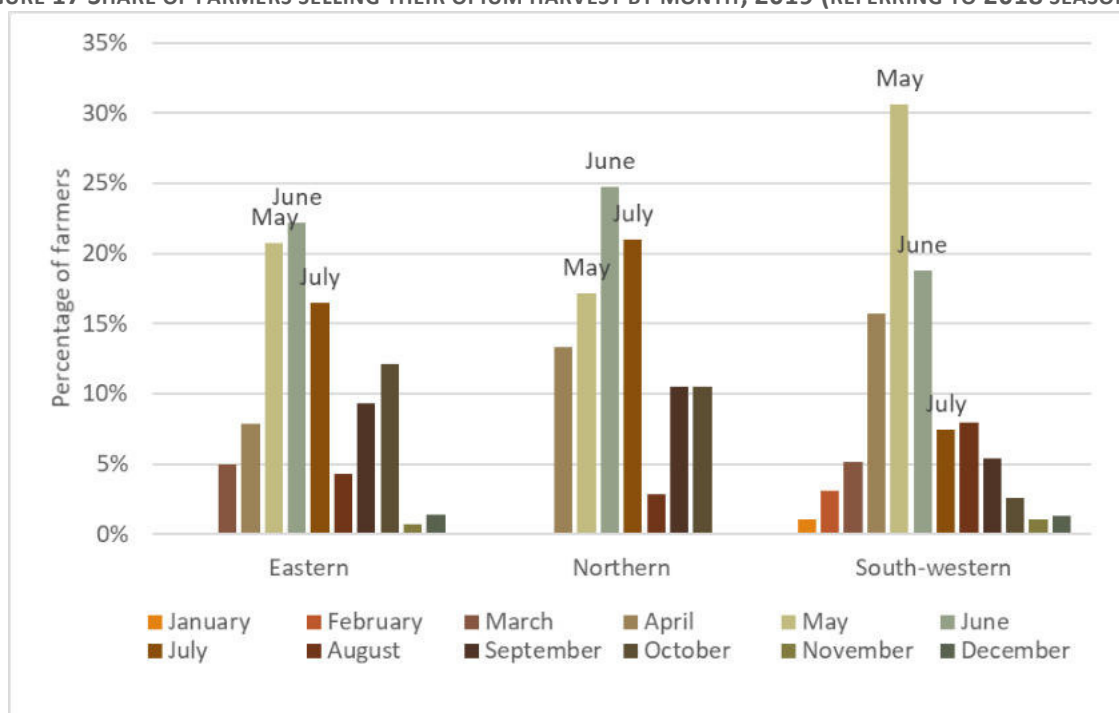
MAP 5 MAIN POINT OF SALE OF OPIUM FOR FARMERS, 2019



Most poppy farmers sell opium in the month of the harvest or the month after. Farmers were also asked to indicate the month in which they sold their opium. Most farmers sold it during the month of the harvest or in the months following it. In the South-western region, where the harvest occurs in April, about two thirds of farmers (61 per cent) sold opium during the months of April, May or June. Similar patterns were found in other regions. This indicated that farmers prefer to sell the bulk of the harvest fairly quickly and did not appear to keep large inventories for a long time.

Keeping inventories of opium could act as savings for farmers. If dried and stored properly, opium keeps its quality for a long period of time (longer than a year), so an opium inventory can act as savings or be kept in speculation for better prices.¹⁷ Storing opium is however only possible for farmers who can afford to save a portion of their income. Impoverished farmers may need to sell opium more quickly than those who are better-off, in order to cash in the harvest and finance their daily needs.

FIGURE 17 SHARE OF FARMERS SELLING THEIR OPIUM HARVEST BY MONTH, 2019 (REFERRING TO 2018 SEASON)



¹⁷ UNODC (2003), "The opium economy in Afghanistan - An International Problem United Nations", Publication Sales No. E.03.XI.6 ISBN 92-1-148157-0

FIGURE 18 A FARMER HARVESTS WHEAT IN BAMYAN.



Source: UNAMA

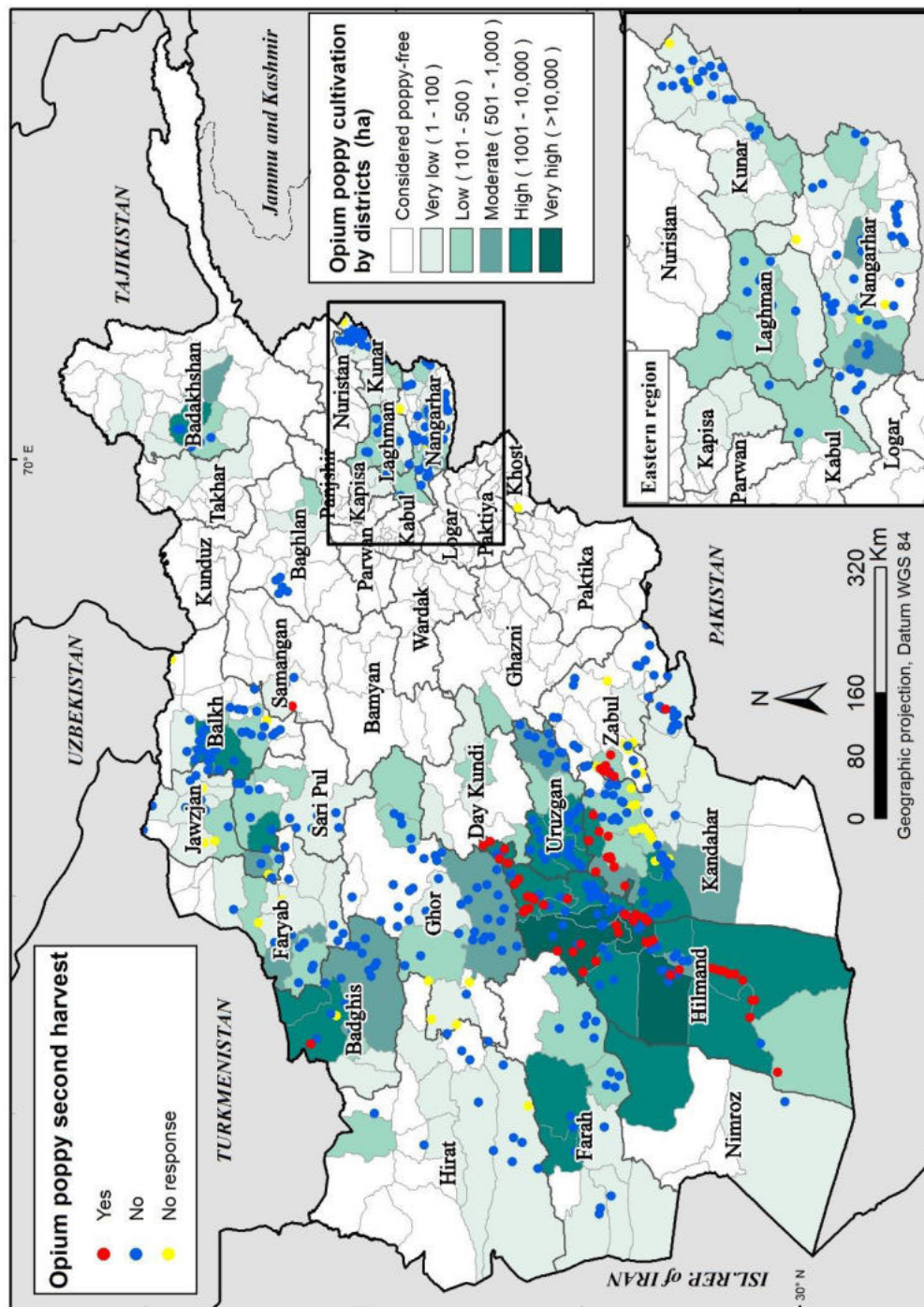
Opium poppy is harvested twice a year in 30 per cent of villages in the South-western region

In many provinces of Afghanistan, two harvests are possible during the agricultural year (one winter crop and one summer crop). It is therefore possible, that farmers sow and harvest opium poppy twice a year. So far, the Afghanistan opium surveys did not take the cultivation of a second opium poppy crop into consideration; all estimates refer to the main opium poppy growing season.

The village surveys asked village headmen whether villagers cultivate opium poppy as a second crop in the summer months. Opium poppy was mentioned as a second crop in the Northern, North-eastern, South-western and Western regions. However, only in the South-western region a noteworthy share of 30 per cent of headmen reported that poppy was cultivated as summer crop in their villages. Most of these (73 per cent) were from Hilmand province followed by Kandahar (17 per cent). At national level, 14 per cent of village headmen reported opium poppy cultivation as second crop (11 per cent in 2018 and 6 per cent in 2017).

The share of village headmen reporting that opium poppy was cultivated as second crop appeared to be on the increase. This did, however, not necessarily imply that the area under cultivation with opium poppy in the summer season was of significant size: if only little area was cultivated in each village in summer, it would not have translated into significant additional opium production. NSIA/UNODC monitors the situation closely to be able to better understand these developments.

MAP 6 OPIUM POPPY CULTIVATION AS SUMMER CROP, BY VILLAGE, 2019

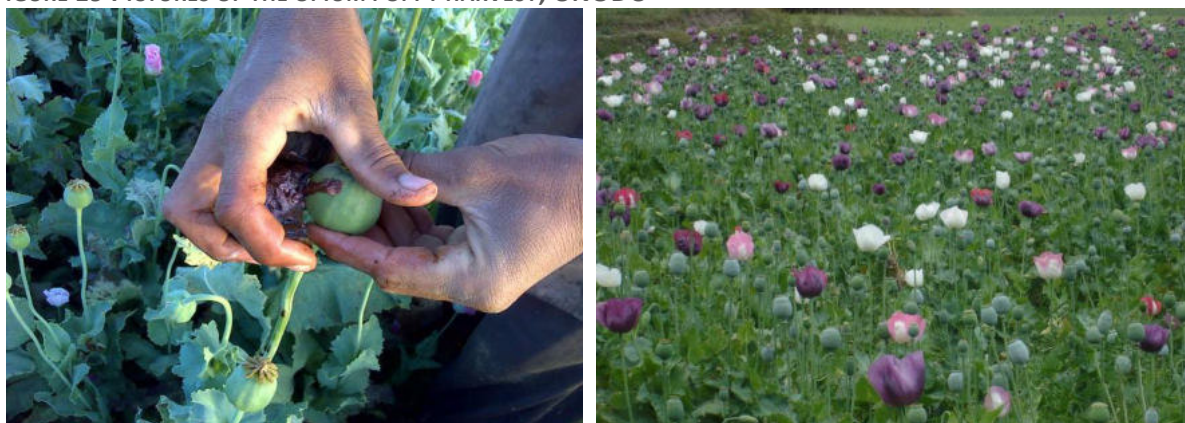


Opium poppy harvesters: the backbone of opium poppy cultivation

Opium poppy is a labour-intensive crop that provides employment for many. Collecting opium poppy in the field is a labour-intensive process. Opium poppy is harvested over a period of 8 to 12 days. In this time, opium harvesters ('lancers') visit the fields, lance mature opium poppy capsules and return on the next day to manually collect the opium gum that has oozed out overnight. A single poppy capsule can be lanced up to 6 times during the harvest.

The opium harvest requires a large workforce: in 2019, a poppy field contained on average some 29 yielding capsules per square meter, translating into a rough estimate of 47 billion capsules in 2019 overall, highlighting the amount of manual labour needed. Depending on the size of the opium fields a household cultivated, it needed to hire external labourers to manage the harvest.

FIGURE 19 PICTURES OF THE OPIUM POPPY HARVEST, UNODC



Source: UNODC, 2018

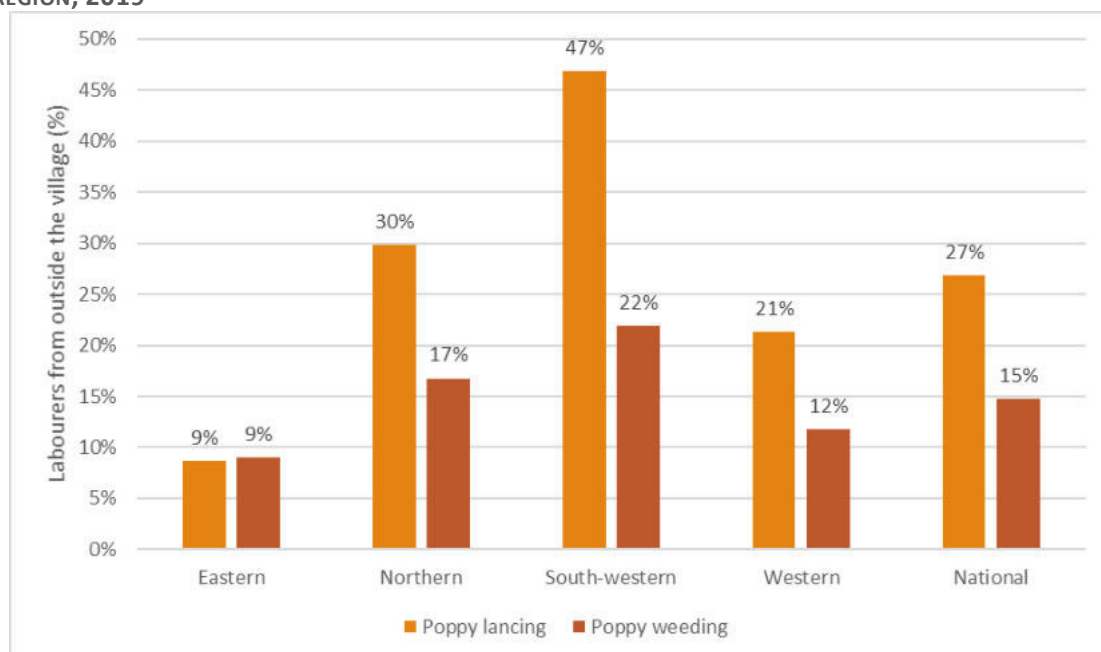
The work force hired by farmers for weeding and harvesting opium was substantial. In 2019, these activities provided the equivalent of up to 119,000 full time¹⁸ jobs to local and migrant workers hired by farmers. Family labour, e.g. labour by members of an opium poppy cultivating household, was not included in this estimate.

Opium farmers hired workers from within the village and migrant workers who come from outside the village and even from abroad.¹⁹ In the season investigated, overall, 27 per cent of poppy lancers and 15 per cent of persons hired for weeding came from outside the village. Possibly reflecting the demand and availability of local workers, the percentages of migrant workers from outside were highest in the and South-west (47 per cent).

¹⁸ Full time job assumed to have 200 working days a year. Opium farmers were asked how many persons they employed for poppy weeding and harvesting in the previous year. The average number of labourers employed per hectare (2018 data) was extrapolated to the area under cultivation in 2019. The estimated number of full-time jobs refers to labour created in addition to the income it provides to farming households.

¹⁹ Mansfield, D., 2020. Business as Usual: The Uninterrupted Illicit Supply Chain across the Borders of Afghanistan. Blogpost. Available at: <https://medium.com/@davidmfd/business-as-usual-the-uninterrupted-illicit-supply-chain-across-the-borders-of-afghanistan-238305af4227>

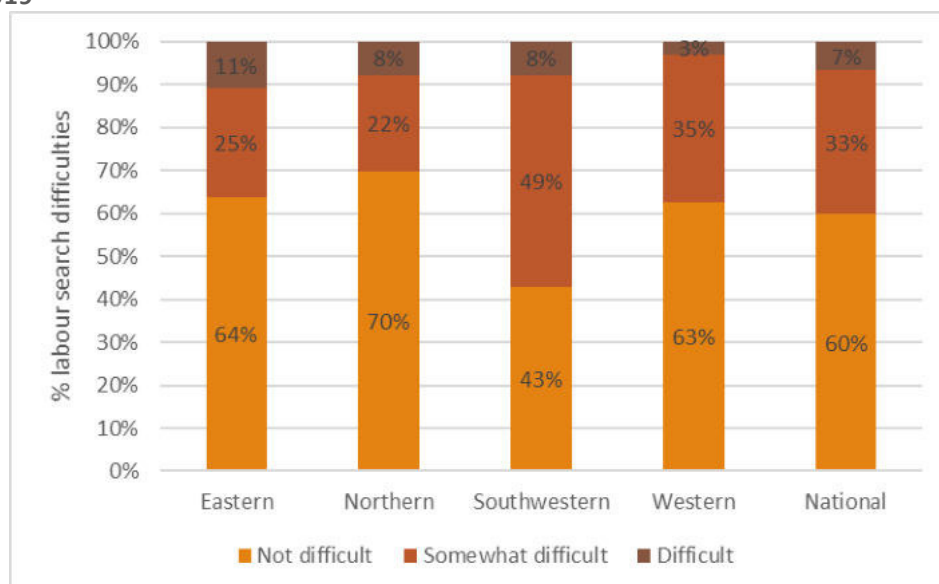
FIGURE 20 PERCENTAGE OF LABOUR HIRED FROM OUTSIDE THE VILLAGE FOR POPPY WEEDING AND POPPY LANCING, BY REGION, 2019



Note: Central, Southern and North-eastern regions have not been considered because of a low number of observations.

In 2019, some 60 per cent of all farmers reported at least some difficulties in finding labour for harvesting and weeding. This share was lower than in 2018, where some 75 per cent of farmers reported at least some difficulties, possibly being related to the smaller area under cultivation. In line with last year's findings, labourers were most difficult to find where most of the poppy was cultivated, in the South-western region.

FIGURE 21 FARMERS' REPORTS ON DIFFICULTIES IN FINDING LABOURERS FOR THE OPIUM HARVEST, PERCENTAGE, BY REGION, 2019



Note: Central, Southern and North-eastern regions have not been considered because of a low number of observations.

Opium harvesters hired by farmers worked typically for more than one household. In 2019, harvesters reported to have worked for an average of 2.4 households and 18 days per season.

TABLE 7 AVERAGE NUMBER OF FARMERS PROVIDING EMPLOYMENT A LANCER WORKED FOR AND AVERAGE NUMBER OF DAYS WORKED, BY REGION, 2019.

Region	Number of employers	Number of days worked
Eastern	2.3	16.9
North-eastern	3.1	17.6
Northern	2.8	18.4
South-western	1.3	17.5
Western	2.2	19.2
National	2.4	18.0

Note: Regional estimates for the Central and Southern regions are not available due to a low number of samples.

Lancers in provinces in the Northern and North-eastern regions generally worked for fewer household than in provinces in the South-west. In the South-western region lancers reported to have worked for 1.3 farmers on average, whereas lancers in the North-eastern and Northern region for 3.1 households and 2.8 households, respectively.

Opium poppy cultivation provided labour to farmers who did not engage in poppy cultivation themselves. This was specifically the case in the South-west where 21 per cent of farmers who reportedly never cultivated opium poppy said that they had worked for poppy farmers during the opium harvest. Poppy farmers active in 2019 harvested opium for other farmers, too: overall, 19 per cent reported doing so in 2019. These shares are consistent with the findings of the 2018 opium poppy survey.

FIGURE 22 FARMERS REPORTING TO WORK FOR OTHER FARMERS TO HARVEST OPIUM, 2019, BY REGION

	Non-poppy farmers	Poppy farmers
Eastern	6%	28%
North-eastern	6%	0%
Northern	3%	17%
South-western	21%	21%
Western	14%	10%
National	10%	13%

*Note: * Poppy farmers in the Central and Southern region were not considered due to a low number of observations.*

Labourers are paid in cash, opium and food

Poppy lancing, a job that requires some skill and experience, is paid well in comparison to other farm and non-farm labour. While reported wages for daily labour for weeding opium poppy fields is comparable to other types of farm labour, the wages for lancing and opium gum collection are – throughout Afghanistan – well paid.

FIGURE 23 DAILY WAGES BY ACTIVITY (US\$) AS REPORTED BY FARMERS, BY REGION, 2019

Region	Lancing /gum collection	Opium poppy weeding	Farm labour	Non-farm labour
Central	NA	NA	4.2	4.5
Eastern	5.2	3.7	3.1	3.3
North-eastern	9.0	8.4	4.3	4.8
Northern	6.7	4.2	4.3	4.5
South-western	5.7	3.6	3.4	3.9
Southern	NA	NA	3.6	3.9
Western	6.4	4.1	3.7	4.4
National	6.1	4.1	3.9	4.2

Note: No poppy related estimates available for the Central and Southern regions (low level of samples). National estimate is an average weighted by production of regional estimates.

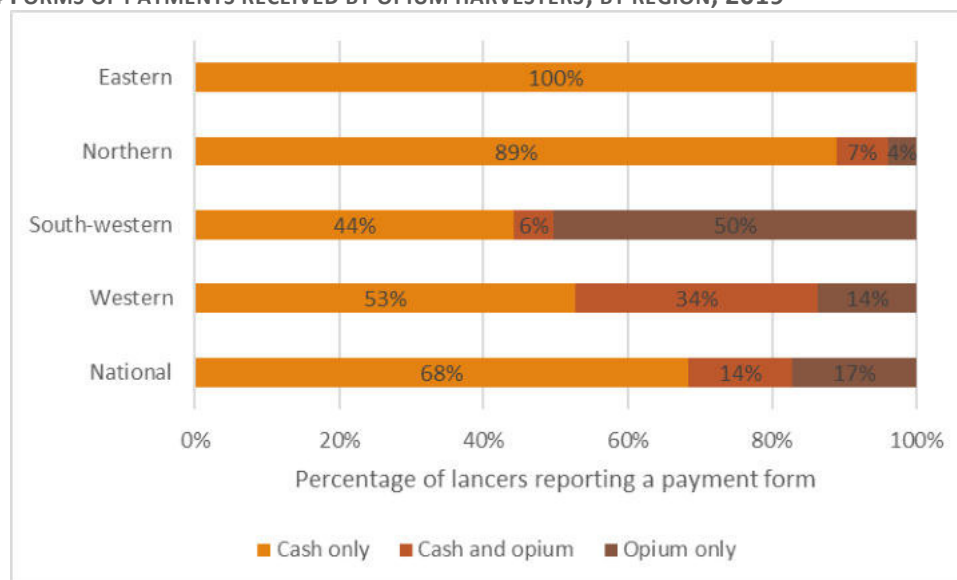
Opium harvesters reported payment forms other than cash, too, namely by the provision of daily food and payments received in raw opium. On average, 85 per cent of harvesters were provided with daily food by their employers and was most frequently reported in the Eastern and South-western regions. The provision of daily food to labourers appears to be common practice in Afghanistan and may be specifically attractive for migrant workers.

In 2019, 32 per cent of the lancers reported payments in form of opium (in 2018, only 20 per cent reported this practice). The practice appeared to common in all main opium cultivating regions, with exception of the Eastern region, where none of the interviewed reported to have received payments other than cash, which was consistent with the findings of the 2018 survey.

To determine the amounts paid, farmers run certain schemes where the amounts paid depend on the harvest. Qualitative reports collected from farmers indicated that one fourth of the harvest appeared to be the most common share; in very good years or when labour has been scarce, a third was reported to be paid out, too.²⁰ The portion of opium set aside for payments is distributed among all persons involved.

The opium received by lancers was thought to typically be sold to a trader for cash.²¹ It is unclear if this yielded a higher income than being paid in cash.

FIGURE 24 FORMS OF PAYMENTS RECEIVED BY OPIUM HARVESTERS, BY REGION, 2019



Opium harvesters use income for food, medical expenses and loan repayment. Opium harvesters were asked about the three most important uses of their income from the opium harvest. As with opium farmers, the income went towards covering basic needs, such as food, paying debt and medical expenses, rather than purchases that could improve livelihoods on the long run. This is an indication for most of the income being spent on daily expenditures and savings or investments were difficult to achieve.

²⁰ Based on qualitative interviews with a small number of lancers and interviewers with local knowledge.

²¹ Ibid.

FIGURE 25 THREE MOST IMPORTANT USES OF INCOME AS REPORTED BY LANCERS, 2019

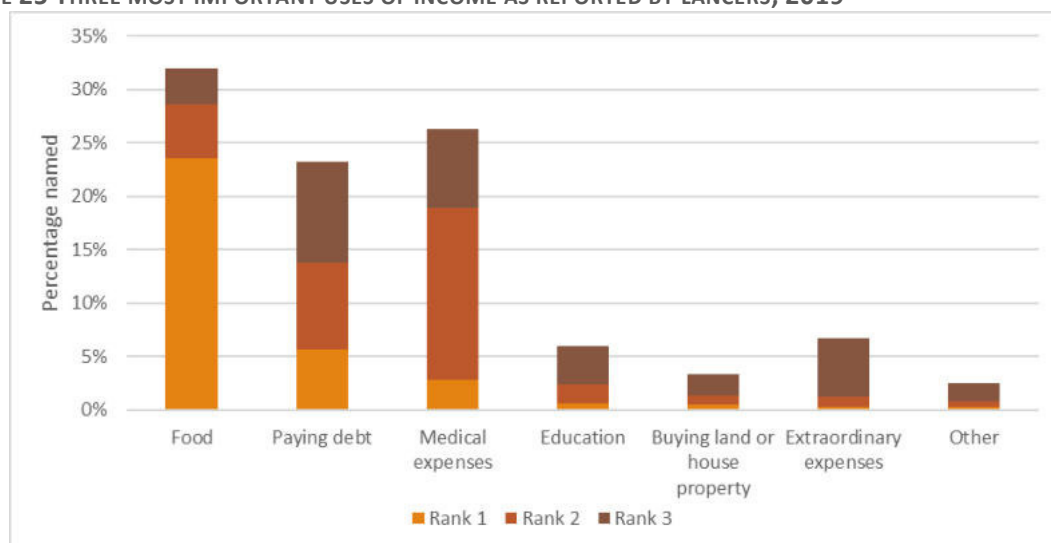


FIGURE 26 OPIUM HARVEST IN AFGHANISTAN.



Source: UNODC.

Taxes were levied by non-governmental actors on an estimated 60 per cent of the opium harvest

In 2019, an estimated US\$ 61 - 113 million were incurred from taxing opiates in Afghanistan

Headmen in 36 per cent of poppy villages said that their farmers paid taxes to non-governmental actors at a rate of roughly 6 per cent of earnings from opium sales. This was consistent with 2018, where estimates were at similar levels; in 2018, 36 per cent of village headmen reported opium taxes being paid and an average tax rate of 5 per cent. The tax rates reported in 2019 varied considerably from 1 per cent to more than 30 per cent of the sales price. Half of the values stated were between 2 and 10 per cent of the sales price.

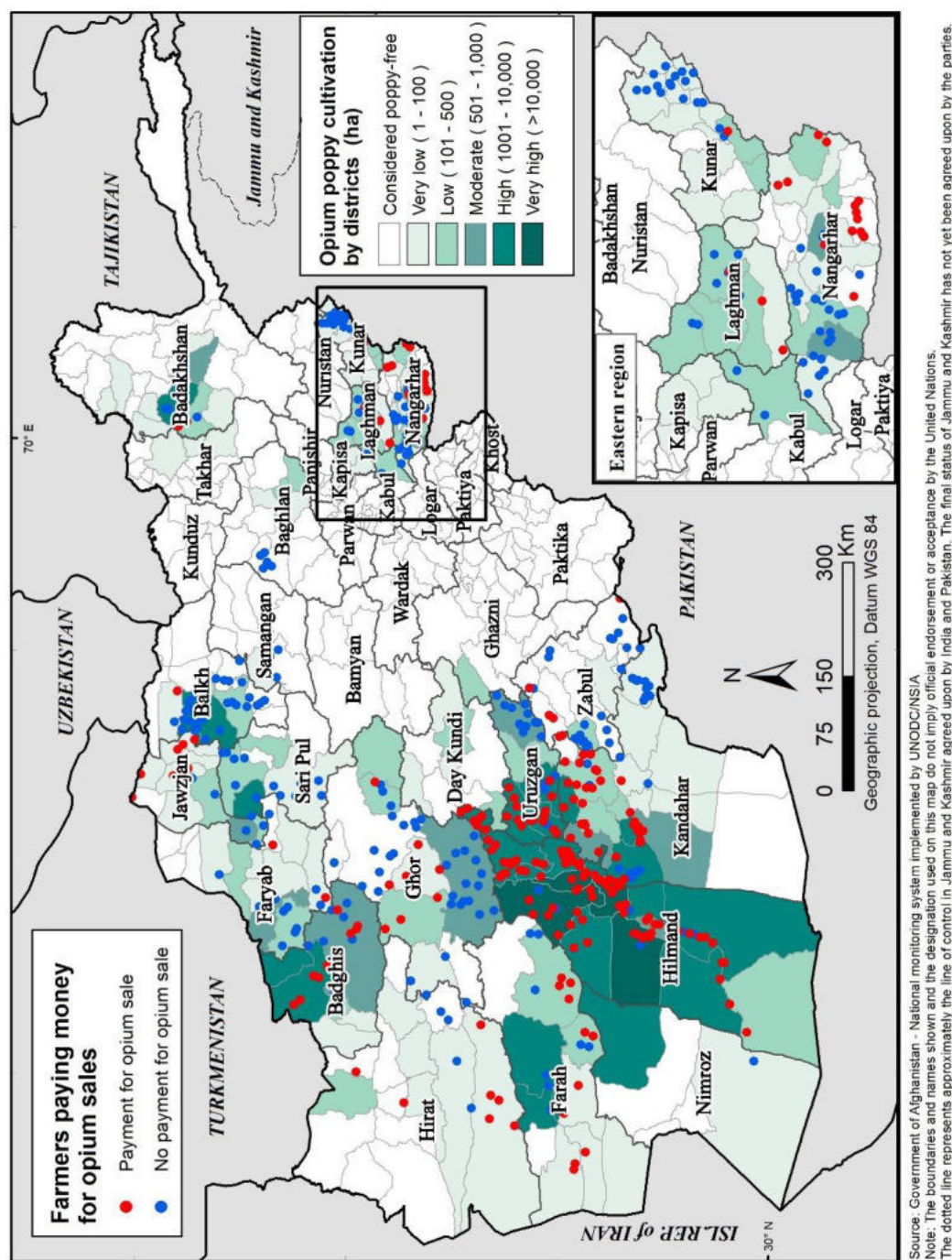
With the average tax rate reported, this yields US\$ 14.5 million in taxes from the farm-gate value of opium alone, which constitutes a reduction of 50 per cent when compared to 2018. If assuming that the same tax rate is imposed to the same extent on the revenues from manufacturing and trafficking of heroin and morphine, a further US\$ 46 – 98 million are added in income from taxing opiates, totalling in US\$ 61-113 million.

FIGURE 27 PERCENTAGE OF OPIUM HARVEST TAXED, AVERAGE TAX RATE AND TAXES INCURRED FROM OPIUM SALES, 2019

Region	Percentage of opium production* taxed	Average tax rate	Taxes paid from farm-gate value (US\$ million)
Eastern	27%	7.3%	0.3
North-eastern	27%	3.3%	0.1
Northern	15%	16.1%	0.8
South-western	69%	5.7%	12.3
Western	41%	9.1%	1.1
National average	60%	6.0%	14.5

Note: The proportion of villages where taxes were paid is used as a proxy to estimate the proportion of the opium harvest taxed.

MAP 7 VILLAGE HEADMEN REPORTING THAT FARMERS PAY TAXES ON OPIUM SALES, BY VILLAGE, 2019



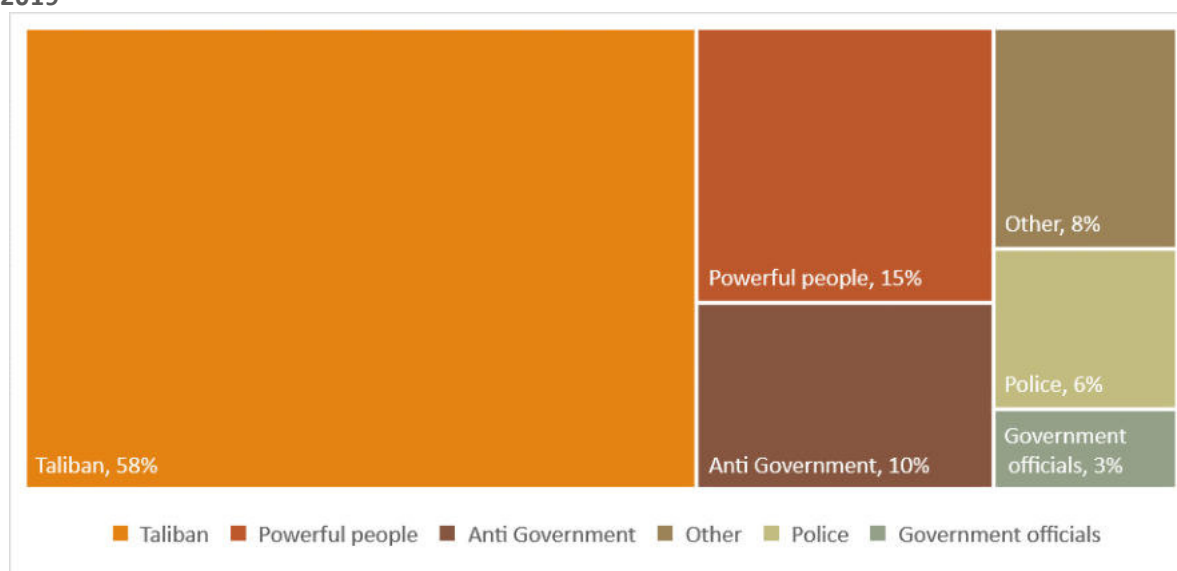
Recipients of taxes

Village headmen were asked about the recipients of the opium poppy taxes. Responses were open-ended, meaning that the headmen could report freely to whom they thought that villagers paid their taxes. Taxes in rural Afghanistan can be complex and are often paid to more than one player.²² This complexity cannot be fully captured in the village survey, which intends to provide a national overview of the situation.

In 2019, overall responsiveness to the question was very low, as only 14 per cent of all interviewed village headmen provided a response. In the South-western region, the percentage was highest, at 42 per cent. The following considers therefore the South-western region only.²³

According to the responses, in the South-western region some 58 per cent of opium taxes went to the Taliban, 1 per cent to “Powerful people”, which denotes local powerbrokers and authorities, 10 per cent to not further specified anti-government groups, and 9 per cent to the police and government officials. The groups of recipients were reported here as they were provided. Since no further information on the nature of these groupings was available, it cannot be excluded that some of the answers (e.g., “anti-government”) referred to the Taliban even if they were not explicitly named.

FIGURE 28 RECIPIENTS OF TAXES ON OPIUM SALES AS REPORTED BY VILLAGE HEADMEN, SOUTH-WESTERN REGION, 2019



Note: The groups of recipients are reported here as they were provided. Since no further information on the nature of these groupings was available, it cannot be excluded that some of the answers (e.g., on Anti-government or “powerful people”) referred to the Taliban even if they were not explicitly named. “Others” included “enemies”, “villagers” and “authorities” without further specification.

²² Mansfield, David, Understanding Control and Influence: What Opium Poppy and Tax Reveal about the Writ of the Afghan State (AREU, August 2017, <https://areu.org.af/wp-content/uploads/2017/08/1724E-Understanding-Control-and-Influence1.pdf>).

²³ A detailed discussion on taxes and recipients can be found in previous issues of the Afghanistan opium survey reports. Reports available at <https://www.unodc.org/unodc/en/crop-monitoring/index.html>

Ushr as source of income for insurgency was named more frequently than in 2018. Opium poppy is not the only source of funding for insurgency groups. The 2019 village survey collected evidence that non-state authorities, including the Taliban, used the traditional *ushr* to fund their activities. *Ushr* denotes the traditional Islamic tithe on agricultural production, usually about 10 per cent, which is payable on the harvest a farmer makes. The term *ushr* combines many forms of taxes, including Zakat, the Muslim tradition of alms giving.

Paying *ushr* was a wide-spread phenomenon. Overall, 80 per cent of all headmen reported that farmers paid *ushr* in 2019. The highest percentage was found in the South-western region at 97 per cent of headmen, the lowest in the Central and Southern regions at 66 and 77 per cent, respectively.

TABLE 8 PERCENTAGE OF VILLAGE HEADMEN REPORTING USHR PAYMENTS, BY REGION, 2019

Region	Payments of ushr
Central	66%
Eastern	83%
North-eastern	95%
Northern	92%
South-western	97%
Southern	77%
Western	86%
National	80%

The most named recipients of the *ushr* were ‘poor people’ (36 per cent of all villages), followed by the Taliban, named by 18 per cent of all village headmen. This is a major change in comparison to the previous year, where only 10 per cent of village headmen named the Taliban as recipient of the *ushr*. ‘Mullah’ and ‘Madrasa’ were named by 15 respectively 5 per cent of headmen; and unspecified anti-government elements by 2 per cent. In 20 per cent of all villages no *ushr* was collected and in 2 per cent no information was available.

FIGURE 29 RECIPIENTS OF USHR AS REPORTED BY VILLAGE HEADMEN, NATIONAL ESTIMATE, 2019

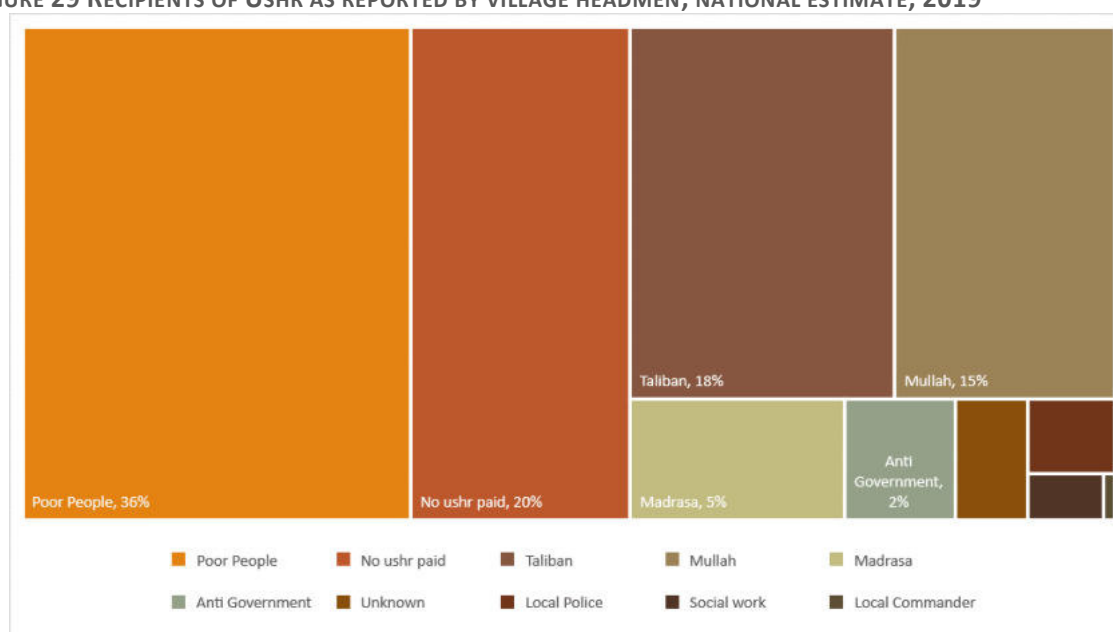


TABLE 9 RECIPIENTS OF USHR AS REPORTED BY VILLAGE HEADMEN, BY REGION, 2019

	Central	Eastern	North-eastern	Northern	South-western	Southern	Western	National
Poor People	42%	53%	38%	17%	23%	39%	17%	36%
No ushr	34%	16%	5%	8%	3%	23%	14%	20%
Taliban	15%	17%	27%	40%	22%	6%	32%	18%
Mullah	2%	2%	3%	4%	49%	25%	30%	15%
Madrasa	4%	1%	16%	14%	0%	2%	1%	5%
Anti - Government	0%	0%	8%	13%	2%	0%	4%	2%
Unknown	2%	8%	0%	0%	1%	1%	1%	2%
Local Police	0%	0%	4%	3%	0%	2%	0%	1%
Social work	0%	1%	1%	0%	0%	2%	0%	1%
Local Commander	0%	0%	1%	0%	0%	0%	0%	0%

Note: based on 1,435 responses.

When comparing opium poppy cultivating villages with villages without opium poppy cultivation, the village survey found that ushr was more often collected in villages with opium-poppy cultivation (97 per cent) than in villages without opium poppy (83 per cent). This finding is consistent with findings of the 2018 village survey. If and how the presence of opium poppy tax and ushr are related was difficult to assess. It cannot be excluded that in areas where opium poppy was taxed, ushr was paid in its more traditional form as tithe for the support of the poor and religious communities.

Opium poppy villages scored worse on development related indicators than non-poppy villages

Rule-of-law related challenges, such as political instability, lack of government control and security have been found to be main drivers of illicit opium cultivation in Afghanistan. The 2019 opium survey confirmed the links between insecurity, the lack of government control and rule of law, and increased opium poppy cultivation. It explored the perception of risk of legal consequences for opium poppy cultivation in villages and assessed trends in funding of insurgency from opium cultivation, insecurity and government control.

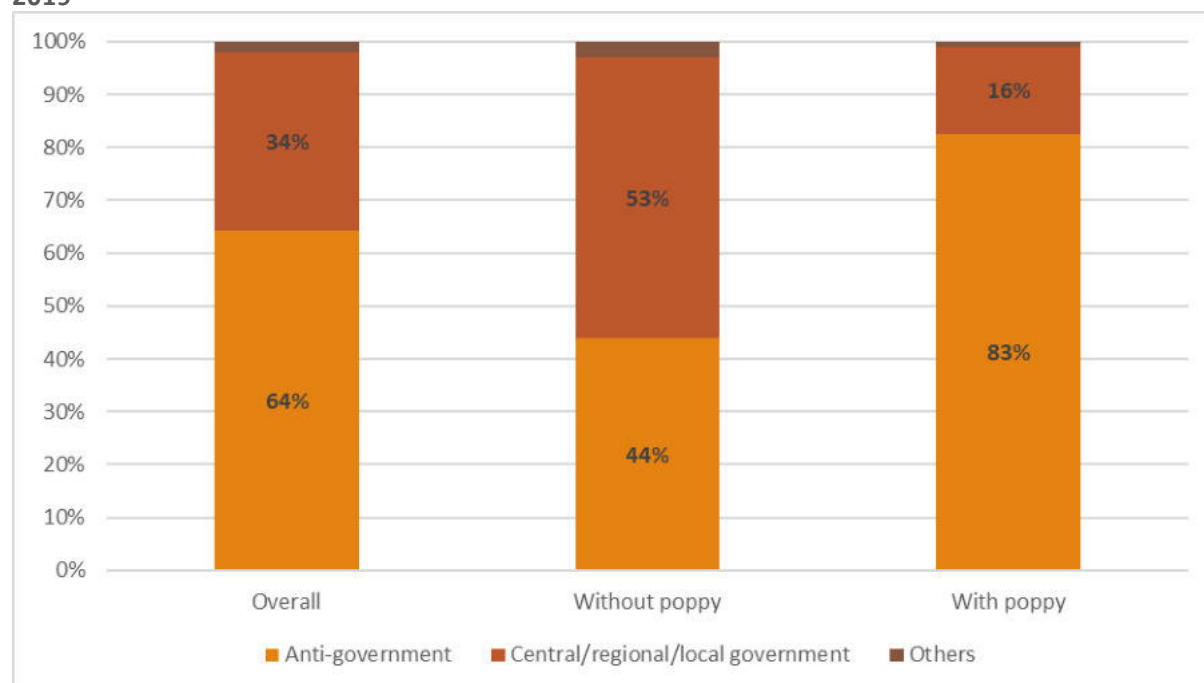
Opium cultivation is more prevalent in villages under non-state authorities and less secure villages

Government control and government presence, and related concepts such as the strength of the rule-of-law and access to justice are difficult to measure. Afghanistan's power structure is scattered and complex, and the Afghan state has difficulties to enforce its will in many parts of the country. The NSIA/UNODC village survey aimed at capturing government control and government presence by asking for the village headmen's perception of who exerts control over a village.

In the Central, North-eastern and Southern regions, only a small number of poppy villages was available in the sample. The following focuses therefore on the Eastern, Northern, South-western and Western regions of the country.

Where opium poppy cultivation took place, the share of villages outside of government control was much higher than in villages without opium poppy cultivation: 83 per cent of all headmen of poppy villages reported that the village was under control of insurgency and other non-state actors. Among villages without opium poppy cultivation, the share was significantly lower, at 44 per cent.

FIGURE 30 GOVERNMENT CONTROL IN VILLAGES AS REPORTED BY VILLAGE HEADMEN, BY POPPY CULTIVATION, 2019

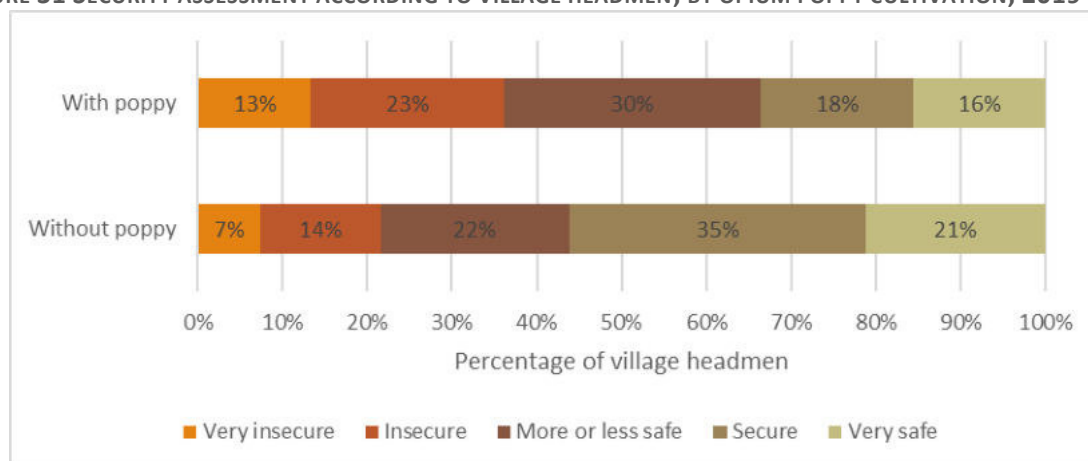


Note: estimates were based on responses from 985 responses of village headmen from the Eastern, Northern, South-western and Western regions. The responses reflected the perception of the village headmen.

As in previous years, village headmen were asked to assess whether the village was very safe, safe, more or less safe, insecure or very insecure. The findings confirmed patterns of previous years that opium poppy

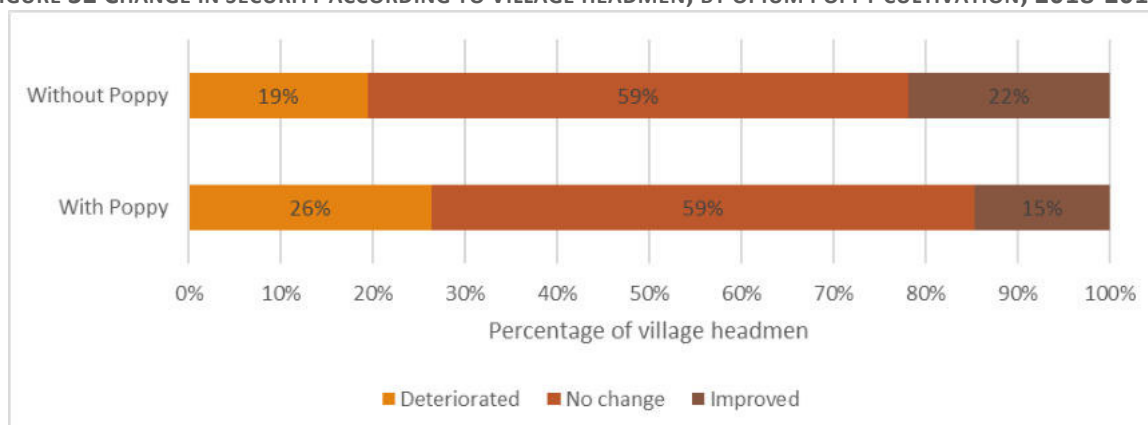
cultivation tends to take place in less secure areas and in areas where the security situation was perceived as deteriorating. In poppy cultivating villages, 36 per cent of headmen assessed security as “very insecure” or “insecure”, in villages without poppy cultivation, 21 per cent said the same. A similar picture presented when comparing the assessment on changes in security. While 19 per cent of headmen of non-poppy villages assessed that security deteriorated, it was 26 per cent of headmen in poppy villages who said the same.

FIGURE 31 SECURITY ASSESSMENT ACCORDING TO VILLAGE HEADMEN, BY OPIUM POPPY CULTIVATION, 2019



Based on data collected in 986 villages in the Eastern, Northern, South-western and Western regions.

FIGURE 32 CHANGE IN SECURITY ACCORDING TO VILLAGE HEADMEN, BY OPIUM POPPY CULTIVATION, 2018-2019



Based on data collected in 1020 villages in the Eastern, Northern, South-western and Western regions.

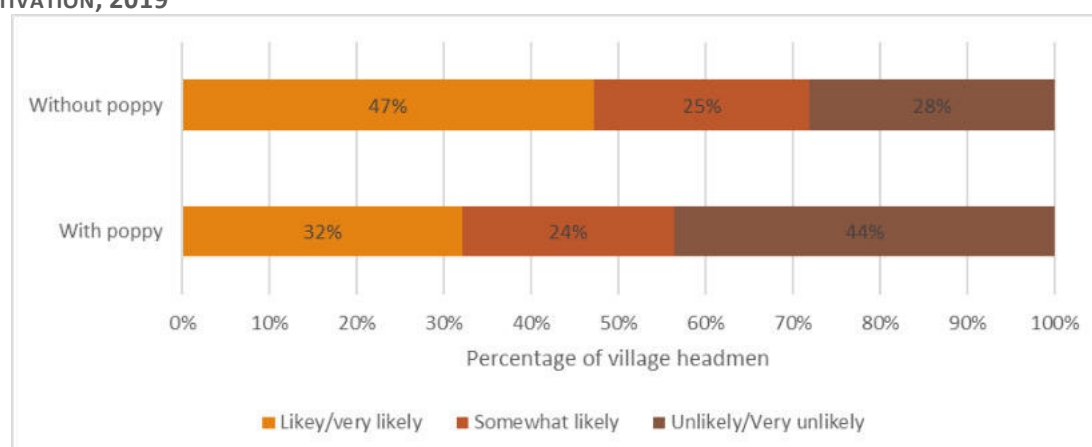
Risk of legal consequences for opium cultivation is perceived higher in villages without poppy cultivation than in villages under government control

Possible legal consequences can be one among many factors in farmer's decision making on opium poppy cultivation. Despite comparatively small areas eradicated, farmers have consistently named "fear of eradication" as one of the main reasons for stopping opium poppy cultivation in previous years' village surveys. Risk perception and actual risk may thus be diverting.

The village survey collected data from village headmen about their assessment of the likelihood of legal consequences for opium poppy cultivation. The risk assessment reflected the perception of headmen based on their experience; a verification of the perception was not possible. It cannot be excluded that the responses were subject to a so-called social-desirability-bias, where respondents to a survey answer questions in a way that will be viewed positively by others.²⁴

Risk perception differed strongly between headmen of villages with and without opium poppy cultivation in the Eastern, Northern, South-western and Western regions. In villages without opium poppy cultivation, 47 per cent assessed the risk of legal consequences as "very likely" or "likely" and 28 per cent as "unlikely" or "very unlikely". In villages where poppy was present, 32 per cent assessed the risk as "very likely" or "likely" and 44 per cent as "unlikely" or "very unlikely".

FIGURE 33 PERCEIVED RISK OF FACING LEGAL CONSEQUENCES FOR OPIUM POPPY CULTIVATION, BY OPIUM POPPY CULTIVATION, 2019

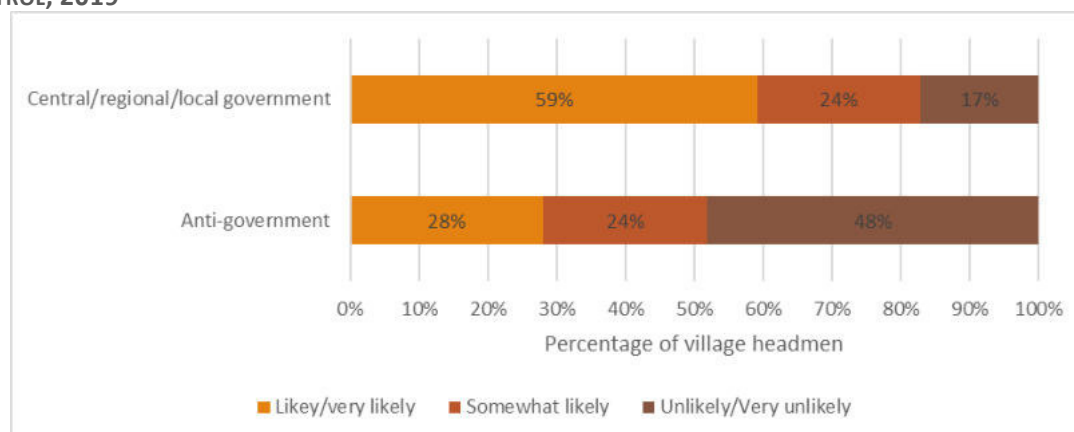


Based on data collected in 1,025 villages in the Eastern, Northern, South-western and Western regions.

Risk perception was correlated with government control, too. Of those village headmen who reported that the government was under control, 59 per cent assessed the risk of legal consequences as "very likely" or "likely" and 17 per cent as "unlikely" or "very unlikely". In villages under control of non-state actors, 28 per cent assessed the risk as "very likely" or "likely" and 48 per cent as "unlikely" or "very unlikely". These results might be an indication that being outside of government control gave a sense of impunity towards opium poppy cultivation to the villagers.

²⁴ See e.g., Krumpal, Ivar. "Determinants of social desirability bias in sensitive surveys: a literature review." *Quality & Quantity* 47.4 (2013): 2025-2047

FIGURE 34 PERCEIVED RISK OF FACING LEGAL CONSEQUENCES FOR OPIUM POPPY CULTIVATION, BY GOVERNMENT CONTROL, 2019



Based on data collected in 996 villages in the Eastern, Northern, South-western and Western regions.

Opium cultivation took place in areas with more limited access to crucial infrastructure

When comparing opium poppy cultivating villages with poppy-free villages, it became apparent that opium poppy cultivation was strongly linked to less access to essential infrastructure and services relevant for sustainable development. The results have been very consistent over the years.

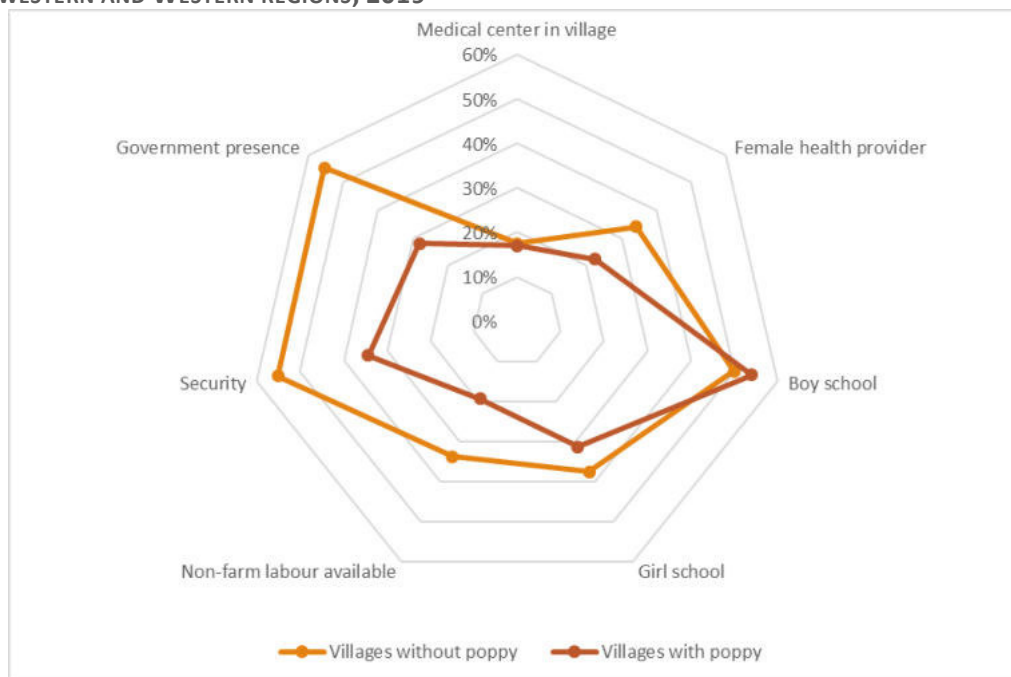
In 2019, the opium survey collected data on the availability of medical services and female health providers, schools for boys and girls, the security situation and the presence of the government.²⁵ The data showed that poppy cultivating villages scored lower on an availability scale and faced a “development gap” when compared to villages without opium poppy cultivation.²⁶

In the Eastern, Northern, South-western and Western provinces, for the indicators considered, the development gap was most pronounced for government presence and security, and least pronounced for the presence of a medical centre in the village and boy schools.

²⁵ Village headmen were asked about who was mainly controlling the village. “Government” summarised central, regional and local government presence.

²⁶ For a more detailed analysis of the “development gap” see the GoIRA/UNODC report “Sustainable development in an opium production environment 2016” and in an issue of the UNODC Bulletin on Narcotics. <https://www.unodc.org/unodc/en/crop-monitoring/index.html>; United Nations Office on Drugs and Crime, 2018, “Alternative development: practices and reflections,” Bulletin on Narcotics, Volume LXI, 2017.

FIGURE 35 DEVELOPMENT GAP BETWEEN POPPY AND NON-POPPY VILLAGES IN AFGHANISTAN, EASTERN, NORTHERN, SOUTH-WESTERN AND WESTERN REGIONS, 2019



Notes: The indicators in the graphs are interpretative elements of the Sustainable Development Goal indicators, not the Sustainable Development Goal indicators themselves. The development gap refers to the difference between villages affected and villages not affected by illicit crop cultivation. The closer the lines are to the outside boundaries of the graphs, the better the situation of the villages is in relation to the presented indicators. Based on data collected from 958 non-poppy and 458 poppy villages.

In the South-western region, the development gap was less pronounced. The most pronounced difference was found in government presence, with 55 per cent of headmen having reported government presence in non-poppy villages, while only 15 per cent did so in poppy villages. There was no difference found in the security, availability of non-farm labour, and the presence of girl schools. Villages with poppy cultivation scored better in the presence of a medical centre, female health provides (although at very low levels) and the presence of a school for boys.

These results indicated a further convergence of poppy and non-poppy villages in the South-western region. With opium poppy cultivation being widespread, the availability of infrastructure appeared to be less influential than in areas where opium poppy was less frequently cultivated.

FIGURE 36 DEVELOPMENT GAP BETWEEN POPPY AND NON-POPPY VILLAGES IN THE SOUTH-WESTERN REGION, 2019

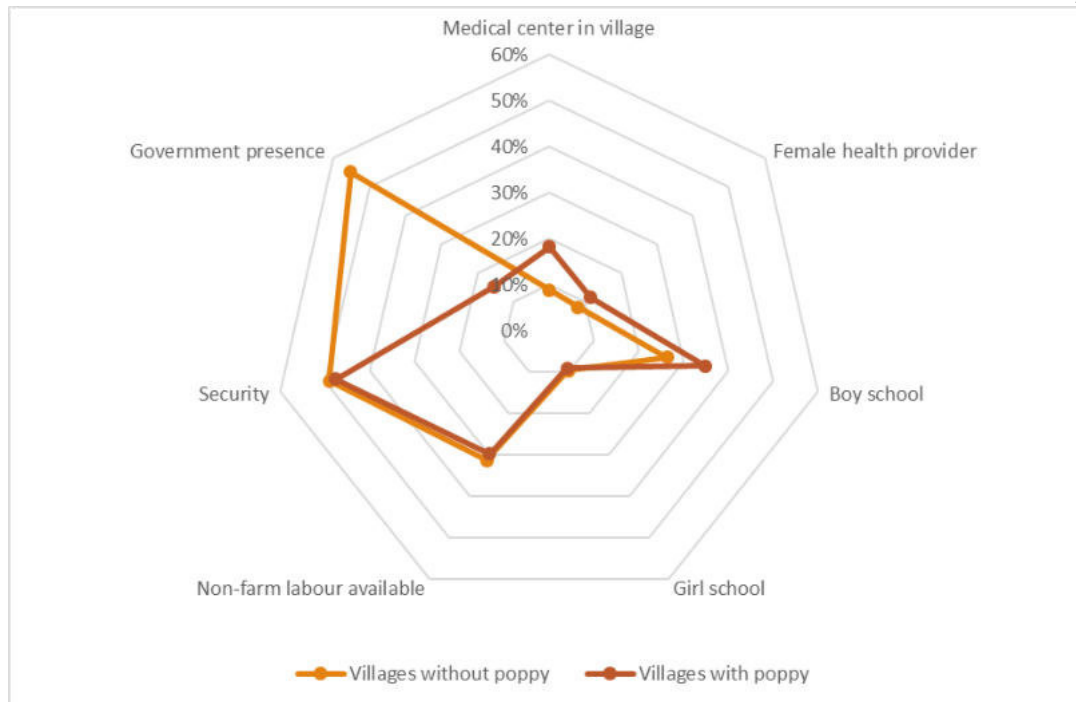


FIGURE 37 COMMUNITY BASED SCHOOL IN JALALABAD.



Source: UNAMA.

COVID-19 is expected to lead to increases in opium cultivation on the long-run

The COVID-19 crisis hit Afghanistan end of March 2020. As the key months for the opium harvest in Afghanistan are March to June, the 2020 opium harvest took place during the COVID-19 crisis. At the beginning of the harvest, a shortage of poppy lancers was observed in the Western and South-western provinces of the country. However, later reports indicated that women and children²⁷ in poppy-growing households appeared to be increasingly engaged in the poppy-lancing process, as were people who lost their jobs due to the COVID-19 crisis. It appeared that the shortage of lancers was eventually overcome, with most recent reports pointing towards the harvest – and opiate trafficking in general – being largely uninterrupted.

While the 2020 growing season appeared to have been proceeding as normal, the COVID-19 pandemic is expected to show an effect on opium cultivation on the long run. Socioeconomic surveys with community leaders and households conducted annually by UNODC and its counterparts have consistently identified the absence of infrastructure and services as important determinants of illicit crop cultivation. Income inequality, food insecurity, weak governance and insecurity were found both causes and consequences of illicit crop cultivation and households cultivating illicit crops had less access to licit economic activities than non-cultivating households. The 2019 Afghanistan village survey confirmed these results.

The severe economic contraction and instability associated with the COVID-19 crisis may have a significant impact on the number of households cultivating illicit crops in Afghanistan. Affected farmers will be inclined to participate in the illegal economy if it provides them with an opportunity of recovery (that other crops cannot easily offer) and continuous access to secure, international markets for selling products.

FIGURE 38 MESSAGES ABOUT PROTECTION FROM COVID-19, JALALABAD.



Source: UNAMA

The global economy is projected to shrink by an unprecedented 4.9 per cent in 2020,²⁸ much worse than during the 2008–09 financial crisis.²⁹ The economic projections imply a particularly acute negative impact on low-income households worldwide that could significantly raise inequality.³⁰

²⁷ <https://gandhara.rferl.org/a/with-schools-shut-afghan-children-work-the-poppy-fields/30726508.html>

²⁸ <https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEUpdateJune2020>

²⁹ IMF. 2020. "World Economic Outlook. Chapter 1: The Great Lockdown"

³⁰ <https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEUpdateJune2020>

Afghanistan is one of the least developed countries in the world. In 2016, 55 per cent of the population lived in poverty, 45 per cent were considered food-insecure, and 28 per cent severely or very severely food insecure.³¹ More than 80 per cent of people are living on less than the internationally applied poverty line (US\$ 1.90 per day) and personal remittances made up almost 5 per cent of the GDP in 2019.³²

The COVID-19 crisis is expected to have a disproportionate impact on the poor, through job loss, loss of remittances, rising prices, and disruptions in services such as education and health care.³³ Early projections forecast a negative economic growth for 2020 for Afghanistan, with the prospects for its recovery weakened by the limited available fiscal space, uncertain donor support and a weak health sector.³⁴ The pandemic continues to have significant adverse health, social, and economic impacts on the country.³⁵

The World Food Programme³⁶ estimates that more than 16 million people across the country rely on unsustainable livelihoods that will be disrupted by the shocks due to the outbreak of COVID-19. The COVID-19 crisis is on top of a string of unusual weather years, including a widespread drought in 2018 and high seasonal floods in 2019, which had already resulted in high levels of hunger and malnutrition and escalating rates of household debt. These recent climate-related shocks have placed this country close to famine and made it vulnerable to any other shock, such as the current pandemic.³⁷

Since the on-set of the pandemic in Afghanistan in mid-March 2020, almost all main food commodity prices showed an increase in November of the same year, affecting the purchasing power of low-income households.³⁸ When compared to March 14, in November

- The average prices for high-price and low-price wheat flour were 11% higher;
- The average price of wheat was 18% higher;
- The average prices of rice (high and low quality) were 9% and 21% higher, respectively;
- The average price of cooking oil was 29% higher;
- The average price of pulses was 23% higher;

Such increase in prices would be felt the most by vulnerable populations as well as those already depending on humanitarian assistance.

Casual laborers' and pastoralists' purchasing power (Terms of Trade) have deteriorated by 4% and 11% respectively by June 2020, mainly due to increased wheat prices.³⁹ Reports from the field indicate that individuals who lost their jobs or businesses due to the COVID-19 impact increasingly worked as opium poppy harvesters in the 2020 season, an activity that yields significantly better salaries than licit agricultural labour. Depending on the degree to which the economy is interrupted and the degree to which the rural population is affected, loss of livelihoods may overwhelm the currently precarious coping mechanisms.⁴⁰

³¹ Islamic Republic of Afghanistan Central Statistics Organization (2018), "Afghanistan Living conditions survey 2016-17". Very severely food insecure was defined as a deficit of 600 Kcal in the daily food consumption.

³² <https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?locations=AF>

³³ <https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOWUpdateJune2020>

³⁴ UNDP Afghanistan 2020, Afghanistan Covid-19 impact: short term disruptions and policy considerations, final note, April 2020.

³⁵ <https://www.worldbank.org/en/news/press-release/2020/07/09/world-bank-200-million-for-afghanistan-to-protect-people-support-businesses-amid-covid-19>

³⁶ World Food Programme, Afghanistan Country Brief, May 2020. <https://docs.wfp.org/api/documents/WFP-0000116792/download/>

³⁷ Food Security Information Network. 2020. "Global Report on Food Crises. Joint Analysis for Better Decisions"

³⁸ World Food Program, Weekly market price bulletin Issue 25, November 2020.

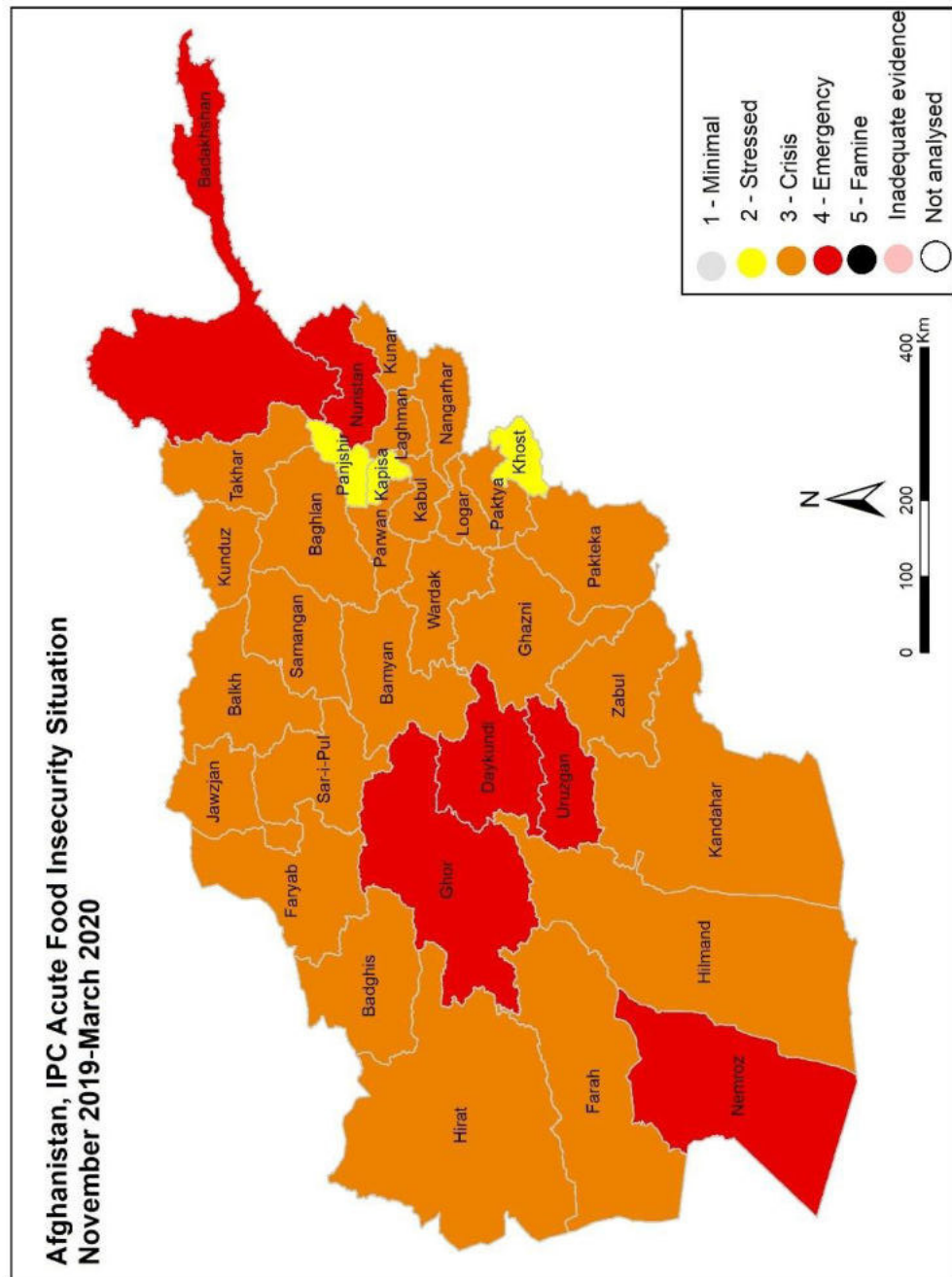
³⁹ World Food Program, Weekly market price bulletin Issue 7, July 2020.

⁴⁰ FAO. 2020. "Addressing the impacts of COVID-19 in food crises"

All these developments are likely to further reduce licit economic opportunities and increase the propensity of the rural population to engage in opium cultivation and heroin manufacture. Identifying the upcoming socio-economic crises and addressing the linkages with the drug economy, will be critical to guarantee a recovery trajectory outside the illegal economy. This means continuous monitoring with a view of protecting the livelihoods and food access of the most vulnerable population and in turn design and implement or scale-up the most appropriate social-safety net responses⁴¹ with support from alternative development donors and other interested parties.

⁴¹ World Bank. 2020. "Part I. COVID-19: Impact and Response"

FIGURE 39 AFGHANISTAN FOOD INSECURITY SITUATION NOVEMBER 2019 – MARCH 2020, AFGHANISTAN IPC TECHNICAL WORKING GROUP



Statistical annex I - indicative district level estimates of opium poppy cultivation, 2006-2019 (Hectares)

Province	District	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Badakhshan	Arghanj Khwah	-	54	-	-	-	-	-	-	-	10	3	11	5	0
Badakhshan	Argo	-	210	60	203	327	617	610	565	2,046	1,273	2,648	3,658	3828	2142
Badakhshan	Baharak	710	-	14	2	-	-	43	322	41	271	0	0	0	0
Badakhshan	Darayim	-	682	43	145	289	662	898	684	1,282	1,530	1,744	1,957	1749	1144
Badakhshan	Darwaz-i Payin (mamay)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Badakhshan	Darwaz-i Bala (nesay)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Badakhshan	Faiz abad (Provincial Center)	7,154	83	64	11	10	64	7	48	65	4	1	10	1	0
Badakhshan	Eshkashim	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Badakhshan	Jurm	2,027	170	6	6	2	43	98	196	85	50	23	46	17	569
Badakhshan	Khash	-	999	7	6	4	46	-	-	-	152	330	640	281	67
Badakhshan	Khwahan	-	-	-	-	-	-	-	5	21	7	40	61	0	8
Badakhshan	Kishim	3,165	-	2	68	204	73	45	141	117	35	674	1,128	825	380
Badakhshan	Kohistan	-	-	-	-	-	-	2	0	11	8	-	-	-	-
Badakhshan	Kuf Ab	-	-	-	-	-	-	-	0	-	-	-	-	-	-
Badakhshan	Kiran wa Munjan	-	10	-	-	-	-	0	-	-	-	-	-	-	-
Badakhshan	Raghistan	-	400	-	-	-	-	19	9	26	-	44	61	49	21
Badakhshan	Shahri Buzurg	-	313	-	2	3	3	36	148	59	37	4	35	66	7
Badakhshan	Shighnan	-	-	-	-	-	-	-	0	-	-	-	-	-	-
Badakhshan	Shiki	-	-	-	-	-	-	-	0	-	-	-	-	-	-
Badakhshan	Shuhada	-	-	-	-	-	-	12	86	236	-	-	-	-	-
Badakhshan	Tagab	-	93	-	-	-	-	22	36	101	57	167	63	44	6
Badakhshan	Tashkan	-	136	-	57	163	145	73	107	92	595	582	570	697	327
Badakhshan	Wakhan	-	-	-	-	-	-	-	0	-	-	-	-	-	-
Badakhshan	Wardooj	-	9	3	14	1	1	-	0	-	-	10	15	34	8
Badakhshan	Yaftal-i-Sufla	-	305	-	43	97	50	32	18	12	25	23	52	107	26
Badakhshan	Yangian	-	10	-	-	-	1	-	5	10	-	4	3	-	-
Badakhshan	Yawan	-	166	-	-	-	-	30	-	-	2	2	-	-	-
Badakhshan	Zaybak	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Badakhshan Total		13,056	3,642	200	557	1,100	1,705	1,927	2,374	4,204	4,056	6,298	8,311	7,703	4,704
Badghis	Ab Kamari	127	-	11	161	16	5	14	24	-	1,996	71	281	208	43
Badghis	Ghormach	624	250	328	299	486	1,485	1,005	2,395	1,009	6,855	17,594	Part of Faryab	Part of Faryab	Part of Faryab
Badghis	Jawand	431	66	13	1,090	130	106	187	850	797	683	940	2,303	1358	503
Badghis	Muqur	220	149	7	102	81	9	61	26	47	86	1,062	2,097	324	314
Badghis	Bala Murghab	1,034	3,557	81	2,754	2,055	284	870	-	3,762	1,417	12,372	18,202	4682	6225
Badghis	Qadis	391	198	146	906	135	92	152	264	57	1,331	3,185	1,802	377	538
Badghis	Qala-i-Now (Provincial Center)	378	-	-	99	55	9	75	37	49	23	11	38	26	8
Badghis Total		3,205	4,219	587	5,411	2,958	1,990	2,363	3,596	5,721	12,391	35,234	24,723	6,973	7,631
Baghlan	Andarab	947	130	475	-	-	18	5	3	4	8	92	91	54	14
Baghlan	Baghlan *	72	-	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Baghlan-i-Jadeed	371	287	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Burka	39	31	-	-	-	-	-	4	1	0	4	11	25	0
Baghlan	Dahana-i- Ghuri	35	-	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Deh Salah	-	14	-	-	-	113	33	37	60	68	351	473	690	111
Baghlan	Dushi	174	68	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Firing Wa Gharu	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Gozargah-i-Noor	-	30	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Kahmard *	255	-	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Khinjan	137	23	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Khost Wa Firing	442	56	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Khwajah Hiran (Jalgah)	-	10	-	-	-	-	-	-	-	-	84	57	66	12
Baghlan	Nahreem	36	-	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Pul-i-Hisar	-	-	-	-	-	30	139	97	103	104	319	424	242	139
Baghlan	Pul-i-Khumri (Provincial Center)	81	21	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan	Talah wa Barfak	153	-	-	-	-	-	-	-	-	-	-	-	-	-
Baghlan Total		2,742	671	475	p-f	p-f	161	177	141	168	180	849	1,057	1,076	275
Balkh	Balkh	1,975	-	-	-	-	-	-	-	-	-	5	2,334	4855	2647
Balkh	Chahar Bolak	799	-	-	-	-	-	-	10	-	9	316	4,007	1515	1363
Balkh	Chahar Kent	16	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Chimtal	2,074	-	-	-	-	-	-	400	-	195	1,764	5,768	1974	2782
Balkh	Dowlat abad	181	-	-	-	-	-	-	-	-	-	-	1	7	12
Balkh	Dehdadi	307	-	-	-	-	-	-	-	-	-	-	6	154	125
Balkh	Kaldar (Shahrak-i-Hairatan)	123	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Khulm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Kishindeh	189	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Marmul	12	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Mazar-i-Sharif	78	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Nahr-i-Shahi	833	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Sholgah	245	-	-	-	-	-	-	-	-	-	-	-	27	113
Balkh	Shortepa	401	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Sharak-e-Hayratan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh	Zari	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkh Total		7,233	p-f	p-f	p-f	p-f	p-f	p-f	410	P-f	204	2,085	12,116	8,532	7,042

Province	District	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Bamyan	Bamyan (Provincial Center)	17	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan	Kahmard	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan	Panjab	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan	Saighan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan	Shebar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan	Waras	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan	Yakawlang	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bamyan Total		17	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Day Kundi	Gizab	2,243	1,054	665	810	722	621	684	727	Part of Uruzgan	Part of Uruzgan	Part of Uruzgan	Part of Uruzgan	Part of Uruzgan	Part of Uruzgan
Day Kundi	Ishtarlay	-	535	214	239	9	9	9	6	8	16	-	35	34	0
Day Kundi	Kajran	2,581	366	357	704	622	153	288	700	320	124	273	442	310	318
Day Kundi	Khedir	-	531	289	160	5	8	9	4	6	24	6	53	15	0
Day Kundi	Kili	-	282	168	284	134	151	14	-	-	13	-	290	74	0
Day Kundi	Mir Amor	-	512	281	703	19	22	5	12	16	72	15	34	56	9
Day Kundi	Nili (Provincial Center)	-	-	214	5	5	9	16	3	-	-	13	141	117	33
Day Kundi	Sang-i-Takht	-	2	1	68	10	15	8	30	150	43	-	47	50	7
Day Kundi	Shahristan	2,220	64	85	29	21	13	25	53	87	89	67	466	91	216
Day Kundi Total		7,044	3,346	2,273	3,002	1,547	1,003	1,058	1,536	587	381	374	1,508	747	583
Farah	Anar Darah	143	16	239	79	1	9	3	314	104	-	2	1	1	-
Farah	Bakwah	1,093	3,458	3,090	3,570	1,936	800	5,822	8,844	12,651	5,567	1,503	2,040	907	445
Farah	Bala Buluk	1,669	5,312	1,509	2,705	2,586	3,157	3,951	1,947	2,730	7,033	2,062	3,490	3887	3102
Farah	Delaram	-	-	-	3,011	4,404	4,263	8,899	Part of Nimroz						
Farah	Farah (Provincial Center)	905	1,328	1,013	1,142	51	-	129	4,451	4,760	128	72	47	34	5
Farah	Gulistan	202	1,132	4,756	1,355	2,661	4,565	3,920	3,759	2,000	1,065	841	1,102	558	318
Farah	Khaki-Safed	537	99	609	232	645	1,103	2,220	1,186	1,726	4,562	2,715	3,998	4265	1589
Farah	Lash-i-Juwayn	215	233	109	45	3	6	2	179	27	7	10	8	1	5
Farah	Pur Chaman	363	1,549	1,046	96	2,175	3,512	2,164	230	930	365	315	642	292	0
Farah	PushtRod	1,709	1,314	1,588	46	61	46	505	2,521	2,214	2,192	1,517	1,499	968	1560
Farah	Qala-i-Kah	506	337	888	47	11	39	117	914	354	186	64	17	3	36
Farah	Shib Koh	352	87	163	77	18	-	-	149	17	1	-	4	-	54
Farah Total		7,694	14,865	15,010	12,405	14,552	17,499	27,733	24,492	27,513	21,106	9,101	12,846	10,916	7,113
Faryab	Almar	338	213	-	-	-	-	-	-	-	-	52	1,448	938	519
Faryab	Andkhoy	31	-	-	-	-	-	-	-	-	-	-	-	-	-
Faryab	Bil Chiragh	322	620	102	-	-	-	-	-	-	-	1	-	-	-
Faryab	Dowlatabad	27	-	-	-	-	-	-	-	-	-	-	-	6	84
Faryab	Gurziwan	-	101	-	-	-	75	-	46	40	108	39	-	214	2
Faryab	Khani ChaharBagh	490	-	-	-	-	-	-	-	-	-	-	-	-	-
Faryab	Khvajah Sabz Posh Wali	375	238	-	-	-	-	-	-	-	-	-	-	27	40
Faryab	Kohistan	84	152	10	-	-	49	-	65	69	69	89	289	571	38
Faryab	Maimanah	218	66	10	-	-	-	-	-	-	-	-	-	-	0
Faryab	Pashtun Kot	60	249	-	-	-	9	-	1	-	-	-	-	587	18
Faryab	Qaram Qul	43	-	-	-	-	-	-	-	-	-	-	-	-	0
Faryab	Qaisar	880	303	168	-	-	13	-	46	102	983	2,742	8,294	1429	221
Faryab	Qurghan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Faryab	Shirin Tagab	172	924	-	-	-	-	-	-	-	-	-	-	468	316
Faryab	Ghormach	Part of Badkhis											12,766	3935	5383
Faryab Total		3,040	2,866	291	p-f	p-f	146	p-f	158	211	1,160	2,923	22,797	8,175	6,621
Ghazni	Ab Band	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Ajristan	-	-	-	-	-	-	-	-	-	-	-	1,022	370	123
Ghazni	Andar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Bahram-e Shahid (Jaghatur)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Deh Yak	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Gelan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Ghazni (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Giro	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Jaghatur *	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Jaghuri	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Khvajah Omari	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Malistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Muqur	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Nawa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Nawur	-	-	-	-	-	-	-	-	-	-	-	5	3	-
Ghazni	Qara Bagh	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Rashidan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Waghaz	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Wali Muhammad Shadi Khug	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni	Zanakhani	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghazni Total		0	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	1,027	373	123
Ghor	Chaghcharan (Provincial Center)	1,233	910	-	-	-	-	71	72	222	397	356	886	1191	0
Ghor	Chahar Sadah	-	41	-	-	-	-	-	64	95	-	182	13	0	0
Ghor	Dowlatabad	-	132	-	-	-	-	5	82	117	154	235	251	390	142
Ghor	Do Laimah	-	131	-	-	-	-	16	9	9	17	11	83	127	1
Ghor	Lal Wa Sarjantal	771	200	-	-	-	-	-	-	9	280	-	192	221	139
Ghor	Pasaband	241	17	-	-	-	-	-	-	-	633	258	1,426	781	907
Ghor	Saghar	283	18	-	-	-	-	-	-	8	-	6	0	0	0
Ghor	Shahrak	1,398	-	-	-	-	-	33	37	41	62	99	214	231	106
Ghor	Taywara	608	39	-	-	-	-	-	-	-	126	82	1,019	523	574
Ghor	Tulak	145	16	-	-	-	-	-	-	-	44	-	138	112	92
Ghor Total		4,679	1,503	p-f	p-f	p-f	p-f	125	264	493	1,721	1,222	4,228	3,574	1,960

Province	District	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hilmand	Baghran	2,890	4,287	4,279	3,343	4,049	6,739	2,788	4,037	4,553	2,190	4,408	4,318	3,255	1857
Hilmand	Dishu	851	1,160	688	475	119	481	1,601	4,161	3,338	3,528	4,391	6,675	5,772	105
Hilmand	Carm Ser	6,168	6,523	8,000	5,789	6,333	4,342	1,246	4,527	8,394	10,406	10,574	13,211	11,665	6388
Hilmand	Kajaki	6,760	5,807	6,240	3,696	3,299	6,435	9,065	10,611	10,836	11,564	8,490	14,447	14,782	9861
Hilmand	Lashkargah (Provincial Center)	4,008	6,320	7,857	4,379	2,014	649	1,469	1,828	2,562	2,089	1,935	4,669	3,620	2039
Hilmand	Musa Qala	6,371	8,854	12,687	8,603	8,415	10,340	7,235	10,586	8,320	6,974	6,112	13,474	15,522	12444
Hilmand	Nad Ali	11,652	20,045	20,824	17,063	18,646	5,413	8,038	19,136	22,256	17,022	12,429	27,398	21,396	15091
Hilmand	Marja	-	-	-	-	-	2,629	2,046	part of Nad Ali						
Hilmand	Naher-i-Saraj	10,386	22,769	13,270	9,598	11,517	12,638	22,468	18,701	16,984	11,759	11,050	18,464	17,981	14733
Hilmand	Nowzad	2,707	6,192	3,863	6,473	2,845	4,694	10,822	11,944	9,839	5,576	7,256	16,972	20,366	13848
Hilmand	Nawa-i-Barukzai	10,168	6,314	13,978	4,416	1,328	1,610	41	97	319	2,176	559	4,064	444	561
Hilmand	Reg-i-Khan Nishin	3,765	8,484	4,720	2,056	2,292	2,120	2,718	5,912	6,781	7,352	8,352	10,251	10,445	2235
Hilmand	Sangin Qala	2,862	5,150	5,532	2,754	2,631	2,941	2,882	3,709	5,349	3,731	2,955	5,667	5,421	4194
Hilmand	Washer	735	865	1,653	1,188	1,555	2,275	2,757	5,445	3,710	2,076	1,759	4,409	6,128	7371
Hilmand Total		69,323	102,770	103,590	69,833	65,045	63,307	75,176	100,693	103,240	86,443	80,273	144,018	136,796	90,727
Hirat	Adraskan	99	196	22	1	-	-	-	3	10	5	1	0	1	0.3
Hirat	Chiisht-i-Sharif	42	-	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Fersi	111	-	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Ghoryan	204	302	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Gulran	32	-	-	-	-	-	-	-	-	-	-	-	8	-
Hirat	Guzara	233	-	-	-	-	-	-	-	-	-	-	-	1	0.3
Hirat	Hirat	16	-	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Enjil	382	-	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Karrukh	121	-	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Kohsan	73	146	-	-	-	-	-	-	-	-	-	-	-	-
Hirat	Kushk (Rabat-i-Sangi)	50	367	43	-	-	-	-	-	-	-	-	575	394	284
Hirat	Kusk-i-Kohnah	15	-	-	-	-	-	-	-	-	-	-	11	-	0
Hirat	Obe	131	-	-	-	-	-	-	-	-	-	-	-	28	19
Hirat	Pashtun Zarghun	242	-	-	-	-	-	-	-	-	-	-	-	65	7
Hirat	Shindand	408	516	201	555	360	366	1,080	949	729	280	207	517	98	57
Hirat	Zendah Jan	129	-	-	-	-	-	-	-	-	-	-	-	-	-
Hirat Total		2,288	1,526	266	556	360	366	1,080	952	738	285	208	1,104	595	368
Jawzjan	Aqchah	30	-	-	-	-	-	-	-	-	-	-	20	15	72
Jawzjan	Darzab	16	803	-	-	-	-	-	-	-	-	85	327	73	267
Jawzjan	Faizabad	473	21	-	-	-	-	-	-	-	-	7	396	17	72
Jawzjan	Khanyab	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Jawzjan	Khanaqa	-	-	-	-	-	-	-	-	-	-	-	8	0	7
Jawzjan	Khawajah DuKoh	271	-	-	-	-	-	-	-	-	-	-	10	0	16
Jawzjan	Mardyan	348	62	-	-	-	-	-	-	-	-	-	399	12	13
Jawzjan	Mingajik	38	-	-	-	-	-	-	-	-	-	-	37	0	33
Jawzjan	Qarqin	17	-	-	-	-	-	-	-	-	-	-	6	0	4
Jawzjan	Qush Tepah	-	43	-	-	-	-	-	-	-	-	316	1,168	121	620
Jawzjan	Sheberghan (Provincial Center)	828	156	-	-	-	-	-	-	-	-	1	867	100	228
Jawzjan Total		2,023	1,086	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	409	3,237	338	1,332
Kabul	Bagrami	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Chahar Asyab	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	DehSabz	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Farzah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Gulara	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Estalef	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Kabul	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Kalakan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Khak-i-Jabar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Mir Bacha Kot	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Musahi	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Paghman	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Qara Bagh	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Shakar Dara	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabul	Surubi	80	500	310	132	152	220	120	298	233	321	398	435	484	199
Kabul Total		80	500	310	132	152	220	120	298	233	321	398	435	484	199
Kandahar	Arghandab	735	1,016	57	158	22	84	114	18	512	247	381	1,183	832	218
Kandahar	Arghistan	784	310	28	43	7	42	90	155	1,515	178	58	16	648	16
Kandahar	Daman	183	375	19	119	-	-	-	-	1,227	37	43	157	106	1
Kandahar	Ghorak	336	1,445	232	628	1,466	1,165	952	676	269	691	565	573	494	800
Kandahar	Kandahar (Provincial Center)	1,367	1,220	590	425	108	262	11	46	-	56	74	113	466	12
Kandahar	Khakrez	217	132	1,224	1,474	1,215	1,190	794	1,006	867	433	459	416	360	482
Kandahar	Maruf	464	914	182	36	33	31	28	49	275	8	91	408	84	33
Kandahar	Maiwand	1,362	2,878	3,375	6,524	9,966	10,114	12,690	16,382	16,228	9,112	7,287	9,284	8389	7463
Kandahar	Miya Neshin	-	322	1,603	158	44	45	30	162	632	4	9	410	841	0
Kandahar	Nesh	-	432	3,284	1,717	2,842	2,096	620	1,057	405	1,065	1,986	2,257	2397	1418
Kandahar	Panjwayee	4,714	-	-	1,564	2,982	4,914	4,780	984	3,315	1,735	1,565	2,141	1689	783
Kandahar	Reg	-	4	-	-	-	-	-	-	-	-	-	-	0	0
Kandahar	Shah Wali Kot	1,593	1,258	560	911	813	615	242	474	1,471	541	818	1,568	675	124
Kandahar	Shorabak	409	308	4	-	-	-	-	102	-	-	-	-	0	0
Kandahar	Spin Boldak	454	768	541	650	1,359	1,368	121	207	1,889	2,027	1,857	1,880	1281	41
Kandahar	Zhire	-	5,232	2,923	5,405	4,978	5,288	3,867	7,017	5,108	4,886	5,282	7,605	5147	2561
Kandahar Total		12,618	16,615	14,623	19,811	25,835	27,213	24,341	28,335	33,713	21,020	20,475	28,010	23,410	13,954

Province	District	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Kapisa	AlaSai	-	367	-	-	-	3	34	33	125	71	103	254	137	-
Kapisa	Hisah-i-Awal Kohistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapisa	Hisah-i-Duwuni Kohistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapisa	Koh Band	-	-	-	-	-	9	16	20	46	10	25	29	16	-
Kapisa	Kohistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapisa	Mahmood-i-Raqi (Provincial Ce	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Kapisa	Nijrab	-	-	-	-	-	14	21	20	30	21	26	57	25	-
Kapisa	Tagab	282	468	436	-	-	155	219	508	270	358	454	628	207	-
Kapisa Total		282	835	436	p-f	p-f	181	290	582	472	460	608	968	386	p-f
Khlost	Bak	14	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Gurbuz	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Juji Maidan	16	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Khlost Matun (Provincial Cente	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Manduzay (Ismyel Khel)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Musa Khel (Mangal)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	NadirShah Kot	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Qalandar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Sabari (Yaqubi)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Shamul (Dzadran)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Spera	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Tanay	88	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost	Terayzai (Ali Sher)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Khlost Total		133	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Kunar	Asad Abad (Provincial center)	356	42	252	4	-	-	61	342	209	1	1	0	2	57
Kunar	Bar Kunar (Asmar)	10	111	7	9	7	18	62	83	57	58	73	112	79	62
Kunar	Chapa Dara	23	-	-	-	12	42	-	-	-	-	4	5	7	1
Kunar	Dangam	9	90	-	9	-	43	30	46	46	28	15	140	134	62
Kunar	Dara-i-Pech	183	-	0	1	5	170	298	254	82	30	39	128	97	24
Kunar	Ghazi Abad	-	5	-	0	4	13	-	-	-	5	30	31	103	29
Kunar	Khas Kunar	18	8	1	-	-	-	57	79	21	116	36	127	305	278
Kunar	Mara warah	33	6	-	84	-	2	4	1	-	28	11	1	13	49
Kunar	Narang wa Badil	25	57	-	4	1	1	41	22	4	5	31	58	12	1
Kunar	Nari	-	80	15	1	-	-	21	18	7	20	25	26	50	11
Kunar	Noor Gal	88	7	-	4	20	20	101	-	79	9	241	346	100	2
Kunar	Sar Kani	75	11	6	1	-	-	14	25	-	476	359	282	427	305
Kunar	Shigal wa Shektan	-	5	-	36	73	102	459	212	155	71	242	182	212	85
Kunar	Sawkai	111	19	9	4	33	30	124	-	50	8	6	14	11	0
Kunar	Watapoor	-	3	-	6	-	137	7	46	45	132	163	183	180	0
Kunar Total		931	446	290	164	155	578	1,279	1,127	754	987	1,276	1,634	1,732	967
Kunduz	Ali Abad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz	Dashti-i-Archi	102	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz	Chahar Darah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz	Hazrati Imam Sahib	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz	Khanabad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz	Kunduz (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz	Qala-i-Zal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunduz Total		102	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Laghman	Alingar	259	23	13	1	48	343	303	503	477	277	546	575	442	141
Laghman	Alisheng	192	237	370	1	65	124	335	472	278	285	471	962	881	408
Laghman	Dowlat Shah	118	124	3	0	31	52	158	142	5	90	180	301	250	123
Laghman	Mehterland (Provincial Center)	-	-	16	43	90	104	69	119	137	123	175	281	319	189
Laghman	Qurghayee	140	177	23	90	-	12	-	5	4	8	137	200	200	47
Laghman Total		709	561	425	135	234	624	877	1,236	901	779	1,380	2,257	2,092	908
Logar	Aza	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar	Baraki Barak	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar	Charkh	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar	Kharwar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar	Khoshi	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar	Muhammad Aghah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar	Pul-i-Alam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logar Total		0	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Nangarhar	Achin	1,274	1,797	-	14	10	254	580	2,224	3,004	1,090	698	1,364	1,692	0
Nangarhar	Bati Kot	550	1,774	-	-	-	-	-	-	-	4	193	757	952	2
Nangarhar	Behsud	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Nangarhar	Chaparhar	209	878	-	-	-	12	19	1,452	1,866	1,504	2,472	2,337	402	50
Nangarhar	Darah-i-Noor	-	322	-	-	-	-	-	-	162	11	326	700	866	89
Nangarhar	Deh Bala	68	1,075	-	-	-	-	14	-	-	275	55	112	8	6
Nangarhar	Dur Baba	19	36	-	-	-	-	-	-	-	-	-	-	-	-
Nangarhar	Goshta	41	109	-	-	-	-	-	19	95	6	3	-	44	43
Nangarhar	Hesarak	283	295	-	18	5	178	89	-	775	424	581	937	1002	81
Nangarhar	Jalalabad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nangarhar	Kama	-	-	-	-	-	-	-	-	14	-	-	-	-	-
Nangarhar	Khugyani	750	3,253	-	108	131	557	1,481	5,746	4,755	2,996	4,204	4,728	2958	396
Nangarhar	Kot	-	-	-	-	-	-	-	993	2,040	872	80	49	972	33
Nangarhar	Kuzkunar	151	153	-	-	-	-	-	-	-	-	1	133	299	0
Nangarhar	Lalpoor	68	356	-	5	59	185	-	798	712	218	344	728	171	184
Nangarhar	Mohmand Dara	221	995	-	-	1	1	-	155	175	19	213	505	595	45
Nangarhar	Nazyan	160	266	-	1	-	-	-	-	-	-	-	-	-	-
Nangarhar	Pachir wagam	143	594	-	-	-	3	418	1,672	1,588	1,066	1,160	1,231	1130	-
Nangarhar	Rodat	-	3,755	-	-	-	-	-	11	946	389	1,426	1,802	2126	886
Nangarhar	Sherzad	430	864	-	148	513	1,510	550	2,650	1,876	884	1,393	1,534	1499	730
Nangarhar	Shinwar	504	2,218	-	-	-	-	-	-	-	70	379	1,245	1865	464
Nangarhar	Surkh Rud	-	-	-	-	-	-	-	-	219	188	818	816	594	59
Nangarhar Total		4,871	18,739	p-f	294	719	2,700	3,151	15,719	18,227	10,016	14,344	18,976	17,177	3,067
Nimroz	As-i-Chakhansur	-	-	1	-	183	855	98	9	-	57	34	41	0	0
Nimroz	Chahar Burjak	1,119	87	4	84	144	181	696	511	250	698	1,305	4,167	3562	91
Nimroz	Kang	40	-	-	-	10	31	36	-	-	-	-	2	0	0
Nimroz	Khash Rod	661	6,421	6,197	326	1,621	1,323	2,536	15,731	14,334	8,046	3,962	7,256	5552	1911
Nimroz	Zaranj (Provincial Center)	135	-	-	17	81	102	442	1	-	4	2	0	0	0
Nimroz Total		1,955	6,507	6,203	428	2,039	2,493	3,808	16,252	14,584	8,805	5,303	11,466	9,115	2,002

Province	District	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2,016	2,017	2,018	2,019
Nuristan	Barg-i-Matal	522	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuristan	Du Ab	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuristan	Kamdesh	262	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuristan	Mandol	713	-	-	-	-	-	-	-	-	-	-	4	-	-
Nuristan	Noor Gram	-	-	-	-	-	-	-	-	-	-	-	117	-	-
Nuristan	Nuristan Paroon (Provincial Center)	19	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuristan	Wama	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuristan	Waygal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuristan Total		1,516	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	121	p-f	p-f
Paktika	Barmal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Dilah wa Khwoshmand	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Giyar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Gomal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Jani Khel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Mata Khan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Nika	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Omna	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Sar Rowza	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Sharan (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Sarubi	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Turwo	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Urgun	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Wazahkhwah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Wor Mamay	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Yahya Khel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Yosuf Khel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Zarghun Shahr	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika	Ziruk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktika Total		0	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Paktya	Ahmadabad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Ali Khail	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Samkani	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Dand Patan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Gardez (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Woza Jadran	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Jaji	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Jani Khel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Laja Ahmad Khel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Lija Mangal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Sayyid Karam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Shamul *	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Shwak	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya	Zurmat	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paktya Total		0	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Panjshir	Bazarak (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Darah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Hissa-i-Awal(Khinj)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Hissa-i-Duwumi	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Panjshir	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Paryan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Rukhah	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Shutul	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir	Unaba	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panjshir Total		0	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Parwan	Bagram	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Charikar (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Syahgird (Chorband)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Jabalussaraj	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Koh-i-Safi	124	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Salang	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Sayyid Khel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Shaykh Ali	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Shinwari	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan	Surkh-i-Parsa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parwan Total		124	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Samangan	Aybak (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samangan	Darah-i-Soo-f-i-Bala	1,182	-	-	-	-	-	-	-	-	-	-	58	198	-
Samangan	Darah-i-Suf-i-Payin	-	-	-	-	-	-	-	-	-	-	-	185	40	-
Samangan	Fayroz Nakhcheer	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samangan	Hazrat-i-Sultan	90	-	-	-	-	-	-	-	-	-	-	-	-	-
Samangan	Khuram wa Sar Bagh	99	-	-	-	-	-	-	-	-	-	-	-	-	-
Samangan	Roi-Do-Ab	589	-	-	-	-	-	-	-	-	-	-	-	-	-
Samangan Total		1,960	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	243	238	p-f
Sari Pul	Balkhab	188	-	-	-	-	-	-	-	-	-	-	-	-	-
Sari Pul	Gosfandi	-	-	-	-	-	-	-	-	-	-	-	-	4	0
Sari Pul	Kohistanat	377	-	-	-	-	-	-	-	-	-	-	-	96	7
Sari Pul	Sangcharak	1,122	16	-	-	-	-	-	-	-	-	-	-	181	223
Sari Pul	Sari Pul (Provincial Center)	415	203	-	-	-	-	-	-	-	-	72	212	80	280
Sari Pul	Sayyad	25	41	-	-	-	-	-	-	195	331	1,614	3,338	239	1623
Sari Pul	Sozma Qala	124	-	-	-	-	-	-	-	-	-	-	-	61	0
Sari Pul Total		2,251	260	p-f	p-f	p-f	p-f	p-f	p-f	195	331	1,686	3,550	660	2,134

Province	District	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Takhar	Baharak	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Bangi	-	79	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Chahab	70	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Chal	15	9	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Darqad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	DashtiQala	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Farkhar	118	32	-	-	-	-	-	22	-	-	-	7	18	-
Takhar	Hazar Sumuch	-	32	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Eshkamish	2	47	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Kalafgan	609	318	-	-	-	-	-	21	-	-	-	17	40	-
Takhar	Khawja Bahawuddin	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Khawja Ghar	109	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Namak Ab	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Rustaq	816	118	-	-	-	-	-	25	-	-	-	23	193	-
Takhar	Talogan (Provincial Center)	77	577	-	-	-	-	-	2	-	-	-	-	1	-
Takhar	Warsaj	46	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar	Yangi Qala	317	-	-	-	-	-	-	-	-	-	-	-	-	-
Takhar Total		2,179	1,211	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	251	p-f
Uruzgan	Chorah	2,024	71	316	306	221	301	349	611	502	275	454	1,263	1128	312
Uruzgan	Dihrawud	1,704	3,538	2,849	2,038	145	3,438	4,375	3,321	2,214	3,382	4,743	5,648	5479	3258
Uruzgan	Khas Uruzgan	886	173	304	407	230	384	38	123	1,074	172	2,492	2,680	1059	762
Uruzgan	Nesh *	614	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruzgan	Shahidi Hasas	1,127	3,109	4,403	2,445	3,635	3,601	3,617	3,888	2,296	3,489	1,951	3,062	2707	2064
Uruzgan	Tirin Kot (Provincial Center)	3,348	2,312	2,067	4,028	3,106	2,895	2,129	1,936	3,042	3,852	5,574	8,368	7873	5050
Uruzgan	Cizab *	-	-	-	-	-	-	-	-	148	107	290	520	417.2	-
Uruzgan Total		9,703	9,203	9,939	9,224	7,337	10,620	10,508	9,880	9,277	11,277	15,503	21,541	18,662	11,446
Wardak	Chak-i-Wardak	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Daimirdad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Hisah-i-Awal Behsud	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Jaghathu	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Jalrez	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Markaz-i- Behsud	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Maidan Shahr (Provincial Center)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Nerkh	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak	Sayyidabad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wardak Total		0	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f	p-f
Zabul	Arghandab	346	79	55	103	91	47	79	32	256	24	56	56	0	0
Zabul	Atghar	36	16	3	2	16	1	5	12	12	-	3	52	9	0
Zabul	Daychopan	742	389	422	147	122	26	25	259	178	25	35	93	294	0
Zabul	Kakar Kak-e Afghan	-	104	110	219	44	40	38	50	403	122	4	-	24	0
Zabul	Mizan	123	129	289	309	140	74	155	858	544	171	150	759	806	146
Zabul	Naw Bahar	-	63	44	33	4	2	12	-	-	-	-	-	0	0
Zabul	Qalat (Provincial Center)	657	78	310	19	20	56	10	28	146	37	-	10	18	0
Zabul	Shah Joi	538	320	237	175	20	11	69	96	146	-	-	-	0	0
Zabul	Shemel Zayi	35	159	153	46	15	1	5	-	41	-	-	202	32	0
Zabul	Shinkai	228	139	105	87	-	-	-	-	-	-	-	-	39	37
Zabul	Tarnak wa Jaldak	506	136	608	5	10	5	26	-	1,168	265	1,115	959	1359	0
Zabul Total		3,211	1,611	2,335	1,144	482	262	424	1,335	2,894	644	1,363	2,131	2,581	183
TOTAL		164,969	192,981	157,253	123,095	122,515	131,065	154,436	209,450	224,337	182,566	201,312	328,302	262,588	163,339
Rounded Total		165,000	193,000	157,000	123,000	123,000	131,000	154,000	209,000	224,000	183,000	201,000	328,000	263,000	163,000

Methodology

Area estimates

Remote sensing methodologies have been used by UNODC since 2002 to monitor the extent of opium poppy cultivation in Afghanistan. Changes in the location of opium poppy cultivation and the increased security difficulties involved in accessing the area of interest require continuous improvements of the survey designs.

A sampling approach is used to cover those provinces where most of the poppy is found, whereas a targeted approach is used in provinces with a low level of opium poppy cultivation. “Targeted approach” means that a certain area of a province is fully covered by satellite imagery. Provinces without indication for opium poppy cultivation are covered by the village survey only.

In 2019, out of 34 provinces in Afghanistan, 17 were sampled and 11 were targeted. The remaining 6 provinces were considered to be poppy-free based on information from the field. These provinces were not covered by the remote sensing survey but were covered by the village survey.

AREA ESTIMATION METHOD, BY PROVINCE, 2019

Region	Targeted approach	Sampling approach	Village survey only
Central	Kabul, Parwan, Logar, Kapisa	Daykundi	Bamyan, Panjshir, Wardak
Eastern	Nuristan	Kunar, Nangarhar, Laghman	
Northern	Samangan	Faryab, Jawzjan Balkh, Sari-Pul,	
North-eastern	Baghlan, Takhar, Kunduz	Badakhshan	
Southern	Ghazni		Khost, Paktika, Paktya
South-Western		Hilmand, Kandahar, Nimroz, Uruzgan, Zabul	
Western	Hirat	Badghis, Farah, Ghor	

Sampling frame

The sampling frame was established by extracting the area of land potentially available for opium poppy cultivation in 17 provinces. This area was divided into regular 5 km by 5 km grids, which constituted the sampling frame. The final sampling frame, from which the satellite images were randomly selected, consisted of 7,477 cells. In the case of images that cut across provincial boundaries, only the part falling into a particular province was considered to be in that province.

The area available for agriculture in the sampling frame covers irrigated and rain-fed land. The total area in the 17 provinces was 41,791 km², which is equivalent to 38% of all potential agricultural land in Afghanistan. Potential land refers to all land available for cultivation and also includes land that is currently fallow.

Cells containing less than 0.25 km² of potential agricultural land were excluded from the sampling frame in order to reduce the likelihood of choosing cells with very little arable land. In total, the exclusions represented less than 1% of the total potential agricultural land.

Sample size determination

The total number of images to be selected in the sampled provinces was determined in 2015 with the goal to increase accuracy of the estimates and to save cost when compared to previous years.

The accuracy of area estimates depends on the proportion of land covered by satellite imagery and even more so on the number of images than can be acquired. With opium poppy cultivation being concentrated

in hot spots and thus unevenly distributed across the agricultural land, information from a large, contiguous piece of land has less value than geographically evenly distributed, smaller pieces information. Costs associated with satellite imagery depends mainly on the total area covered (and not on the number of images). By using 5 x 5 km instead of 10 x 10 km images, at same costs four times the number of images can be acquired. Further details on the sample size determination methodology can be found in *Opium Survey, December 2015*, page 42.

Sample size allocation

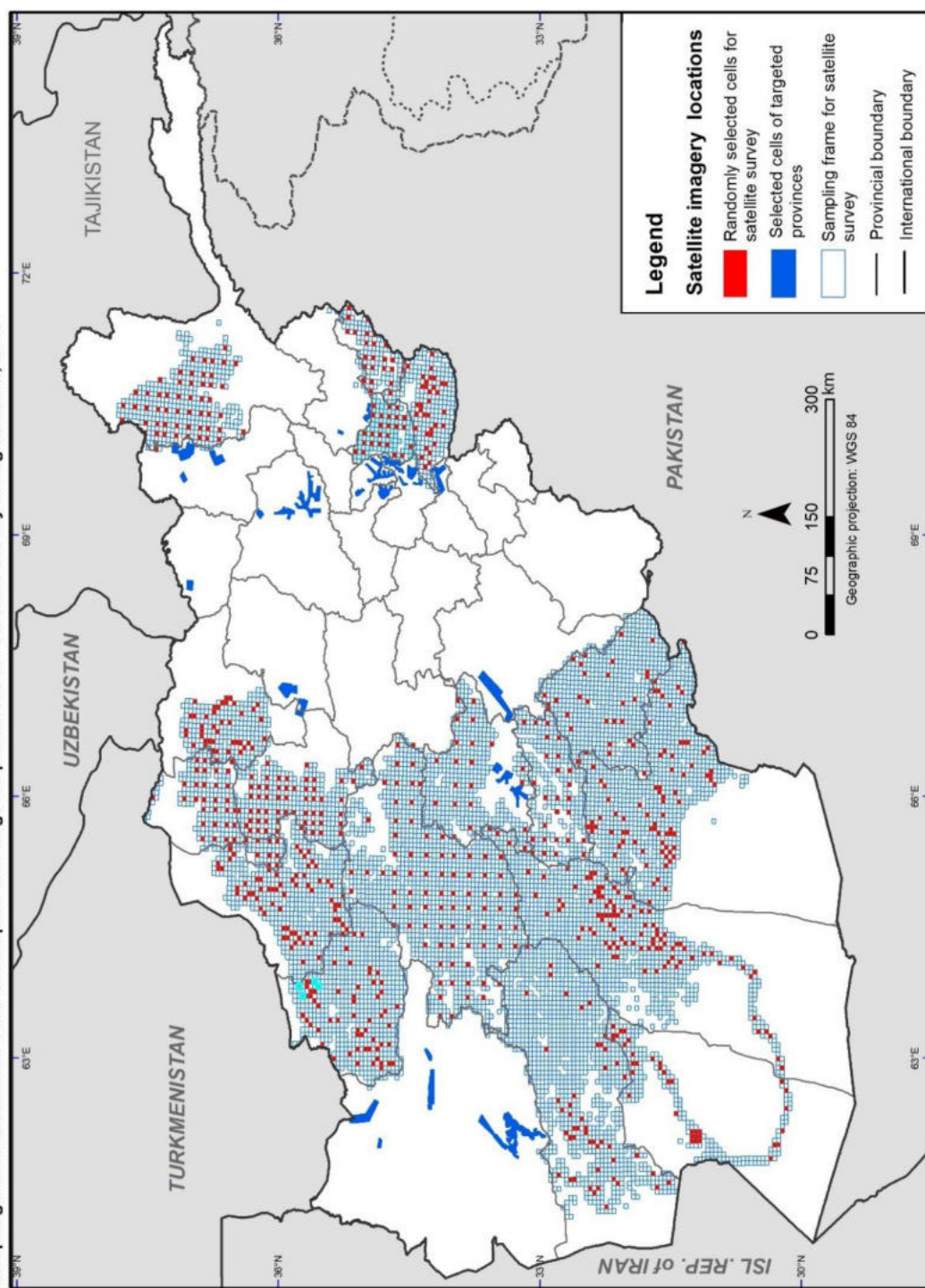
The available number n of images has been distributed to provinces h according to a so-called power allocation, which uses agricultural area as size measure. For provincial sample size n_h ,

$$n_h = n \frac{X_h^q CV_h}{\sum_{h=1}^H X_h^q CV_h}$$

where CV_h is the coefficient of variation of area under poppy cultivation in province h and X_h land available for agriculture in province h . This approach ensures that sample size depends on both the variability of poppy and the size of the province measured by agricultural land. After an empirical assessment, the smoothing parameter q , $0 \leq q \leq 1$, was set to 0.2. In addition, a minimum of 20 samples per provinces was set, which took effect in Day-Kundi and Kunar.

In 2018, high-resolution satellite images were acquired for 821 sampled locations 5 km by 5 km in size covering a total of 17 provinces.

Sampling frame & selected cells of sampled and targeted provinces for satellite survey in Afghanistan, 2019



Source: Government of Afghanistan - National monitoring system implemented by UNODC/INSIA
 Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.
 The dotted line represents approximately the line of control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

SAMPLE SIZE AND AGRICULTURAL LAND AND SAMPLING RATIO, BY PROVINCE, 2019

Province	Total arable land (km2)	Frame (# cells)	Effective sample size (# cells)	Arable land in selected cells (km2)	% of arable land represented by selected cells
Badakhshan	3,490	396	53	456	13%
Badghis	6,168	636	50	820	13%
Faryab	6,068	532	86	1181	19%
Jawzjan	3,504	294	39	530	15%
Laghman	263	103	25	61	23%
Ghor	1,615	1144	83	114	7%
Day Kundi	544	406	20	25	5%
Farah	2,700	675	48	469	17%
Hilmand	4,940	804	96	1,179	24%
Kandahar	3,203	736	80	728	23%
Kunar	246	124	24	42	17%
Nangarhar	1,053	206	35	337	32%
Nimroz	1,03	222	36	343	34%
Balkh	3923	256	40	865	22%
Saripul	3282	379	56	587	18%
Uruzgan	787	277	30	83	11%
Zabul	1,071	541	29	124	12%
Total	42,857	7,731	830	7,944	19%

Sample design

In 2015, MCN/UNODC undertook an extensive simulation study which compared various sampling designs and estimation methods in order to determine the best (most accurate with a given number of samples) design for a certain situation.

Case studies were undertaken for Hilmand and Kandahar province. The sampling designs considered have been used in the past by MCN/UNODC:

- simple random sampling,
- probability proportional to size sampling (PPS), using agricultural area as a size measure,
- stratified random sampling using compact geo-strata of equal size as strata,
- systematic random sampling.

Two estimation methods have been compared: a ratio estimator using agricultural area as auxiliary variable and the Horvitz-Thompson estimator.

The study concluded that for the two cases considered

- PPS performed best, and
- The ratio estimator is to be preferred for simple random sampling, systematic random sampling, and stratified random sampling. For PPS, it does not yield any improvements in accuracy.

The PPS builds on the correlation between the size measure and the variable of interest. In provinces where poppy and agricultural land are highly correlated, PPS is expected to perform best. In provinces, however, where poppy and agricultural land are only weakly correlated, PPS does not bring any advantages and might reduce accuracy.

In more detail, in a PPS design without replacement a unit has a probability to be selected in the first draw of

$$p_i = \frac{x_i}{\sum_{i=1}^N x_i}$$

where x is the size variable (agricultural land) in unit i , and N is the number of units that can be selected. The subsequent units have slightly modified inclusion probabilities. For drawing the samples and for calculating the inclusion probabilities the statistical software *R* (package *sampling*) was used.

Since agricultural area tends to be concentrated in one or more clusters in a province, PPS sampling without further stratification would lead to a concentration of samples in a few spots and possibly do not cover every district. Therefore, in all PPS provinces, the sample was stratified by district.

In the remaining provinces, a one-stage systematic random sampling approach was employed in which a sampling rule was applied that ensured good geographic coverage. Starting from a randomly chosen cell, every k th element from then onwards was chosen, where k is determined by the number of cells in the frame and the desired sample size (the actual sample size might differ slightly).

Area estimation in sampled provinces

The estimation of the extent of opium poppy cultivation is a ratio estimate⁴² for each of the provinces, using potential agricultural land as an auxiliary variable. The national estimate was obtained by adding up the provincial estimates in what is known as a separate ratio estimate.

In provinces where systematic random sampling was applied, the area of opium poppy cultivation, Y_k , within province k , is estimated as:

$$Y_k = X \frac{\sum_{i=1}^{n_k} y_i}{\sum_{i=1}^{n_k} x_i}$$

where n_k is the number of satellite image locations within the province; y_i is the area of poppy cultivation in image i ; x_i is the area of land potentially available for poppy cultivation in image i , and X is the total potential land available for poppy cultivation in province k .

In PPS provinces, where units are selected with unequal inclusion probability, a slightly different ratio estimate was used that incorporates the inclusion probability (Horvitz-Thompson estimator).

Uncertainty

In the PPS provinces the confidence intervals were calculated following statistical practice.⁴³ In all remaining provinces (simple random sampling or SRS) no unbiased estimator for the variance was available; confidence intervals were approximated by assuming simple random sampling. The confidence intervals therefore slightly overestimate the uncertainty of the estimates.

⁴² The ratio estimator did not outperform the Horvitz Thompson estimator in the PPS provinces. The ratio estimator was applied in all provinces for reasons of consistency and to account for possible updates of the agricultural area in future years.

⁴³ See, e.g. Cochran, W. G., *Sampling techniques*, John Wiley & Sons (2007).

AREA ESTIMATES OF SAMPLE PROVINCES WITH 95% CONFIDENCE INTERVAL, 2019 (HECTARES)

Province	Estimate	Lower CI	Upper CI	Sampling method
Badakhshan	4,702	1,702	7,701	SRS
Badghis	7,631	4,036	11,226	PPS
Balkh	7,042	1,926	12,157	PPS
Daykundi	583	25	1,309	SRS
Farah	7,113	2,591	11,635	PPS
Faryab	6,621	4,273	8,969	PPS
Ghor	1,960	680	3,240	SRS
Hilmand	90,727	80,149	101,305	PPS
Jawzjan	1,332	299	2,364	SRS
Kandahar	13,954	11,469	16,440	PPS
Kunar	967	235	1,700	SRS
Laghman	908	140	1,676	SRS
Nangarhar	3,067	2,062	4,072	PPS
Nimroz	2,002	1,154	2,850	PPS
Sar-e-Pul	2,134	732	3,536	SRS
Uruzgan	11,662	7,662	15,661	SRS
Zabul	183	107	259	PPS

Note: Method refers to probability-proportional to size sampling (PPS) and simple random sampling (SRS). CI is the 95% confidence interval.

Area estimation in target provinces

The consensus view of those working in Afghanistan was that the MCN/UNODC surveillance system developed in the provinces can identify sites where poppy was grown, with further inputs being obtained from the survey of village headmen. Fieldworkers visited potential poppy-growing sites to confirm the situation and provided GPS references for the sites. If geographical clusters of sites were identified, targeted satellite images were obtained to measure the areas involved. The total poppy area of a target province is equal to the poppy area measured on the imagery without any further calculation.

In provinces where satellite images were targeted, the estimated area under opium poppy cultivation is not affected by sampling errors, although they may be affected by the omission of areas with very little cultivation. Area estimates of target provinces should therefore be considered as a minimum estimate.

District level estimation

District level results are indicative only. For district level estimation all cells are used which have the majority of agricultural area in that district. That means that in certain cases, agricultural area and poppy cultivation is accounted for in a neighbouring district and not within the district where cultivation occurred. This is, however, in most cases set off by those cells, where the contrary is the case.

Accuracy assessment

Due to the difficult security situation in many parts of Afghanistan, which prevented surveyors from carrying GPS and mapping equipment, an insufficient number of ground segments could be visited in order to conduct a systematic accuracy assessment.

Estimation of the net cultivation area

The area figure presented is the net harvestable opium poppy cultivation area. The effect of poppy eradication activities was accounted for based on data from the eradication verification survey, which provides exact GPS coordinates of all eradicated fields supplemented with additional information. The gross cultivation areas would be the net cultivation plus eradication.

In provinces where the poppy area is estimated with a sampling approach, the first step is to calculate the gross poppy cultivation area. The total area eradicated in those provinces is then deducted from the mid-point estimate of the provincial cultivation estimate to obtain the net cultivation area. If eradication activities were carried out after the date of the image acquisition, no adjustment is necessary as the poppy present in the image reflects the gross poppy area. If eradication activities were carried out in a sample block before the date of the image acquisition, the area interpreted as poppy would not reflect the gross area. Therefore, the eradicated fields are added to the interpreted fields. The adjusted poppy area figure for the block is then used for the provincial estimate.

In provinces where poppy areas are estimated with a targeted approach (census), eradication activities that happened before the date of the image acquisition are already reflected, as these fields no longer appear as poppy in the image. Fields that were eradicated after the date of the images acquisition are simply deleted.

Satellite image interpretation

Acquisition of satellite images

The acquisition of satellite images at the appropriate growth stage of the opium poppy is key to the successful identification of opium poppy fields on satellite images. Satellite data is collected at two stages: the pre-harvest (flowering) stage and the post-harvest (post-lancing) stage. In recent years, detailed information on the crop growth cycle of each district has been collected in the form of a phenological chart, which is useful for deciding on appropriate dates for satellite data acquisition. First-dated images of the Southern, Eastern and Western regions are collected during March and April due to the early cultivation and maturity of crops in those regions. The crop growth cycle begins later as one goes northward. Images of the North and North-eastern region are acquired during May, June and July. Second-dated satellite images are collected approximately two months after the first images are collected.

The normal time window for satellite data acquisition is one month, depending on the scheduled passing of satellite and weather conditions. The time window for first-dated image acquisition begins at the full flowering stage and continues through the capsule stage. Second-dated image acquisition begins towards the end of the lancing stage and continues until the opium poppy fields are ploughed. Images acquired in the middle of the prescribed time window facilitate optimum discrimination between opium poppy and other crops.

The figure below illustrates the spectral characteristics (Normalized Difference Vegetation Index; NDVI) of opium poppy and other crops between February and June. Wheat and opium poppy have the same growth cycle between March and June, as illustrated. The spectral differences between those two crops are more pronounced in February, which marks the beginning of the capsule stage of the crop in this example. Poppy fields are ploughed immediately after the harvest, whereas wheat fields are not. That is why two-dated images (pre-harvest and post-harvest) are collected for the same location.

Interpretation of opium poppy cultivation from satellite images

First-dated images were acquired during the flowering or capsule stage and second-dated images were acquired after the opium harvest. For example, wheat appears mostly in bright red on the first date image in false colour composite (full coverage with vegetation appears in red; bare soil in grey/green), while opium poppy fields are shown in tones of pink. Although there can be some confusion between opium poppy and wheat in the first-dated images, the acquisition of second-dated images makes it possible to distinguish opium poppy from other crops, because the opium poppy crop has been harvested and the fields appear in grey/green.

Visual interpretation was used to delineate opium poppy fields by interpreting PLEIADES images covering a 5 km by 5 km area. Ortho-rectified PLEIADES images of 0.5 m resolution (PAN-sharpened) were used for this purpose. Opium poppy was initially identified using first-dated high-resolution images. Ground truth information collected in the form of segment maps and GPS points was also useful in identifying opium poppy fields. The interpretation based on first-dated images was improved using patterns of observation in second-dated images. Ground photos of the poppy fields were used in the provinces of in Kabul, Kapisa, Kunar, Laghman, Nangarhar Faryab, Baghlan, Badakhshan, Jawzjan and Sari-Pul provinces. These photographs were tagged by latitude and longitude and facilitated to locate the poppy areas on satellite images and were very helpful in confirming the poppy areas in the satellite images. Poppy field boundaries were delineated by an on-screen digitization method.

Band combination for opium poppy identification

Two kinds of band combination were used to detect opium poppy. True-colour combination (blue, green, red) was used in areas where land use is dominated by opium (for example, Hilmand and Kandahar) and in cases where images were obtained during the flowering and lancing stages of opium poppy. False-colour combination (infra-red, red, green) was used in almost all cases. Analysts used both combinations simultaneously to optimize discrimination between opium poppy and other crops.

Some of the images could not be acquired at the appropriate time due to weather conditions and/or the time at which the satellite passed. The delayed acquisition of images makes it difficult to detect opium poppy, since fields may be at the senescence stage due to the lancing of capsules and can therefore be confused with fallow fields. In such cases, second-dated images are often useful in confirming opium poppy fields, since harvest patterns are different for wheat and opium poppy.

Ground reference information

Ground reference data were collected in the form of GPS points. Some 3,900 GPS points of poppy fields, supported with pictures, were collected from the provinces of Sari-Pul, Baghlan, Balkh and Faryab.

GPS point data were superimposed over the ortho-rectified satellite images to facilitate identification of poppy fields during visual interpretation.

Quality control

A quality control mechanism was applied to the image interpretation process, with each analyst's work being checked by two other experts. Both first-dated and second-dated images were cross-checked.

All fields determined as likely to be under opium poppy cultivation (potential opium poppy fields) were delineated based on the interpretation of first-dated satellite imagery. In some cases, a second-dated image was acquired for the purpose of confirmation. The corrections involved a few commissions and omissions.

Verification of Governor-led eradication (GLE)

MCN/UNODC has improved field-based verification activities since 2010 by enhancing the control mechanism. The areas verified by eradication verifiers were randomly checked by the team leader and MCN/UNODC survey coordinators for validation of the reported figures. A total of 100 eradication verifiers

were trained in eradication verification techniques and deployed in a phased manner to provinces where eradication activities were envisaged. The eradication verifiers were part of the eradication teams led by the respective provincial governor.

Verification methodology for GLE:

- Eradication verifiers were part of the Governor-led eradication teams.
- The verifiers take measurements of each eradicated field with two different methods, one using pace length converted them into metres and calculated the area in jerib (1 jerib=2000 m²) and the other using GPS tracking system, this provides the location, area and shape of the eradicated fields facilitating verification by satellite imageries.
- Coordinates and photographs of all eradicated fields are collected by verifiers using GPS cameras.
- The reported eradication figures by field verifiers are compiled at provincial centers and sent to Kabul weekly.
- Quality of eradication is assessed by verification using satellite imageries and field pictures. The quality of eradication is assessed separately for fields eradicated more than 80% and less than 80%.
- The verifiers filled in hardcopy survey forms and submitted them to UNODC regional offices. The forms were then sent to the Kabul office for data entry. Quality control was undertaken by MCN/UNODC survey coordinators at the regional level. Eradicated fields were revisited randomly by team leaders and MCN/UNODC survey coordinators to check the accuracy of the reports. Further validation of the results was done using data obtained from satellite imagery, to calculate the final area of eradicated poppy fields wherever possible.
- The area calculations of the eradicated poppy fields were facilitated by calculating the area of fields automatically using a standard template in Excel file, thus avoiding manual calculation errors at the field level.
- NSIA/UNODC published periodical reports on a weekly basis to inform stakeholders of eradication activities. The eradication figures provided in these reports were considered provisional until they were finalized based on field checks and/or checks based on the satellite image interpretation.

Village survey methodology

The 2019 village survey, including surveyor training, surveyor deployment and data collection, was carried out between the beginning of September and the end of December 2019. 143 surveyors were employed nationally, supervised by NSIA and UNODC. Surveyors were selected based on prior experience with this type of work, knowledge of local customs and their acceptance by the surveyed communities. As in previous years, security remained an issue, but the risks to surveyors were reduced by the selection of locals for performing the data collection.

Sample selection and obtained samples

The sample of villages visited was a nationally representative sample. It was drawn by means of a simple random sampling approach. The estimates are considered to be representative at the regional level. Provincial level estimates are to be seen as indicative.

Sample size was allocated according a so-called *power allocation* which compromises between similar accuracy across strata and importance of strata for poppy cultivation (the power allocation is also used for allocating samples in the satellite survey).

In the power allocation, n samples will be distributed to strata h using

$$n_h = n \frac{X_h^q CV_h}{\sum_{h=1}^H X_h^q CV_h}$$

With CV_h being an assumed coefficient of variation in stratum h (0.5), and X_h being the area under poppy cultivation. q (set at 0.2) is a smoothing parameter that determines the influence of area under cultivation.

Region	Number of villages visited
Central	138
Eastern	224
North-eastern	197
Northern	226
South-western	344
Southern	104
Western	231

In 2019, data was collected from a total of 1,464 villages. Surveyors sought to interview three farmers in each village: the village headman, one opium-growing farmer; one who never cultivated opium poppy; and one person who worked on poppy fields during the harvest. Interview partners were recruited by opportunity sampling.

This resulted in 3,281 interviews with farmers, 1,464 interviews with village headmen and 1,324 interviews with lancers. The selection of farmers in the village was based on opportunity and not on a random sampling procedure. NSIA and UNODC are working on improving the selection of interview partners in future surveys to be in line with standard survey methodology.

The interviews were conducted by following a questionnaire developed jointly by NSIA and UNODC.

Surveyor training

The training of surveyors was conducted in the regional offices of NSIA over a three-day period. Survey training sessions were extended to the regional level, a milestone in the building of the national capacity to conduction opium poppy surveys.

Data collection and quality assurance

Data collection can be difficult and dangerous due to the legally and culturally sensitive nature of opium poppy cultivation in Afghanistan. Intensive theoretical and practical trainings were held for surveyors where techniques in conducting interviews and approaching community members were taught. Deployment to the field followed the trainings, during which the survey was carried out.

High-quality data are the keystone for evidence-based decision making. To ensure the validity, precision and reliability of the data, coordinators from both NSIA and UNODC closely monitored the data collection. As in previous years, these tasks were performed through random field visits by field coordinators as well as verifications of the field visit through calls made by the coordinator to the village headmen.

The survey methodology was improved in 2019 with the implementation of the Open Data Kit (ODK) platform. The use for ODK was dual: it was used for georeferencing as well as verifying that the surveys had been carried out in the sample locations. This allowed coordinators to keep track of the survey progress in real time, which increased the quality of the data. The data were also validated by cross-checking against original sample locations. Data that could not be validated were marked as suspicious for further verification.

Debriefing

Surveyors were debriefed by survey coordinators following the survey. This served to inform about the situation in the field and difficulties faced by surveyors such as a hazardous security situation or if questions were understood correctly by respondents.

Heroin production estimates

Estimating the amount of heroin that one year's opium production can yield, requires knowledge on a set of critical components:

- The share of raw opium that is consumed in the form of opium (demand for opium) and the remainder that is available for conversion to heroin within and outside of Afghanistan,
- the amount of heroin/morphine that can be produced from one kilogram of raw opium (conversion ratio),
- and the purity of the heroin considered.

There is a clear understanding of the amount of opium produced, which is a compound estimate of area under cultivation and annual opium yield per hectare. The factors that define annual heroin production estimates are much less clear as only secondary data can be used as a proxy. For example, the purity of the heroin is often unclear and only little is known about the conversion of opium to morphine and heroin.

Demand for raw opium in the region

Data reported to UNODC by member states, as well as academic sources, indicate substantial consumption of raw opium in Afghanistan, the Islamic Republic of Iran and Pakistan. By using information from drug use surveys,⁴⁴ it was estimated that some 950 to 1,200 tons of opium are consumed annually in Iran and Pakistan, and some additional 160-200 tons are consumed in Afghanistan, totalling in approximately 1,100 – 1,400 tons of opium used for consumption.

⁴⁴ Sources: Afghanistan Ministry of Counternarcotics/Ministry of Health/UNODC: Drug Use in Afghanistan 2009 Survey (average daily consumption and drug users in Afghanistan); UNODC/Pakistan Ministry of Interior and Narcotics Control: "Drug use in Pakistan 2013"; Ali Nikfarjam et al. (2016), "National population size estimation of illicit drug users through the network scale-up method in 2013 in Iran", International Journal of Drug Policy, Volume 31, 2016 (opium users in Iran).

A detailed discussion can be found in the Afghanistan opium survey report 2017.⁴⁵

ESTIMATED OPIUM CONSUMPTION IN AFGHANISTAN, PAKISTAN AND IRAN

	Iran and Pakistan	Afghanistan
Number of opium users	1,432,000 (1,257,000 – 1,607,000)	230,000 (210,000 – 260,000)
Average annual consumption	0.77 kilograms	0.77 kilograms
Estimated consumption in tons (range)	1,100 (970 – 1,230)	175 (160 – 200)

Sources: Afghanistan Ministry of Counter Narcotics/Ministry of Health/UNODC: *Drug Use in Afghanistan 2009 Survey* (average daily consumption and drug users in Afghanistan); UNODC/Pakistan Ministry of Interior and Narcotics Control: *“Drug use in Pakistan 2013”*; Ali Nikfarjam et al. (2016), *“National population size estimation of illicit drug users through the network scale-up method in 2013 in Iran”*, *International Journal of Drug Policy*, Volume 31, 2016 (opium users in Iran).

Conversion ratio of opium to pure heroin base

The amount of raw opium needed for producing pure heroin base depends on two main factors:⁴⁶

- the average morphine content of opium, which is the base for heroin,
- the efficiency of the heroin laboratory in extracting morphine from opium and in converting the yielded morphine to pure heroin base (laboratory efficiency).

Morphine content of opium is very well researched. Annual investigations undertaken from 2010 to 2015⁴⁷ resulted in an average morphine content of 12.35 per cent (95 per cent confidence interval ± 0.71 per cent). However, only little is known about the laboratory efficiency of heroin laboratories in Afghanistan.

To date, only one study⁴⁸ is available that has investigated laboratory efficiency in Afghanistan under local conditions. In this experiment, a laboratory efficiency⁴⁹ of 34 per cent was achieved in the conversion of raw opium of low quality (8.5 per cent morphine content) to pure heroin base. The study has some limitations, including a limited number of experiments performed by only two “heroin cooks”. The main uncertainty surrounding the conversion ratio of opium to pure heroin base is thus due to a lack of information on the average efficiency of heroin laboratories in Afghanistan.

Using a 12.35 per cent morphine content together with 34 per cent of laboratory efficiency results in a conversion ratio of 18.5:1 for opium to pure heroin base, meaning that 18.5 kilogrammes of opium are needed to produce one kilogramme of pure heroin base.

⁴⁵ <https://www.unodc.org/unodc/en/crop-monitoring/index.html>

⁴⁶ For more details on the heroin production process in Afghanistan, please see *Bulletin on Narcotics*, vol. LVII, Nos. 1 and 2, 2005, pp. 11-31.

⁴⁷ In 2013 and 2014, UNODC/MCN also collected samples. These samples have been dried and stored and their analysis is in progress.

⁴⁸ *Bulletin on Narcotics*, vol. LVII, Nos. 1 and 2, 2005, pp. 11-31.

⁴⁹ In the study, 70 kilograms of raw opium with 8.5% morphine content were converted to 2.9 kilograms of pure heroin hydrochloride, which is equivalent to 2.64 kilograms of pure heroin base – assuming no further losses.

OPIUM CONVERSION TO PURE HEROIN BASE, ASSUMPTIONS AND RATIO

	Value
Average morphine content of opium	12.35 per cent (± 0.71 per cent)
Laboratory efficiency	34 per cent
Chemical constant	1.29
Conversion ratio to pure heroin base	18.5:1 (17.5:1 – 19.6:1)

Note: range of the conversion ratio reflects the 95% confidence interval of the average morphine content. The chemical constant reflects the weight morphine gains when being converted to heroin base.

Purity of heroin in the market

Heroin base is hardly ever pure. At all stages of the conversion process impurities remain in the product and increase its volume. Heroin of higher purity is easier to traffic, which is one of the reasons why traffickers undertake the effort to purify the product. High quality heroin is predominantly found close to the source and at wholesale trade level. At later stages of the supply chain, at retail level, heroin is adulterated to increase its volume and thus its sales value.

Purity of heroin of export quality can vary greatly. Based on the available data (see UNODC World Drug Reports), a range of 50-70 per cent purity is used for estimating the amount of heroin produced from the opium harvest and a laboratory efficiency of 34 per cent.

OPIUM CONVERSION TO HEROIN OF EXPORT QUALITY, ASSUMPTIONS AND RATIO⁵⁰

	100 per cent pure heroin	70 per cent purity	50 per cent purity
Conversion ratio to heroin of a certain quality	18.5:1 (17.5:1 – 19.6:1)	12.9:1 (12.2:1-13.7:1)	9.2:1 (8.7:1-9.8:1)

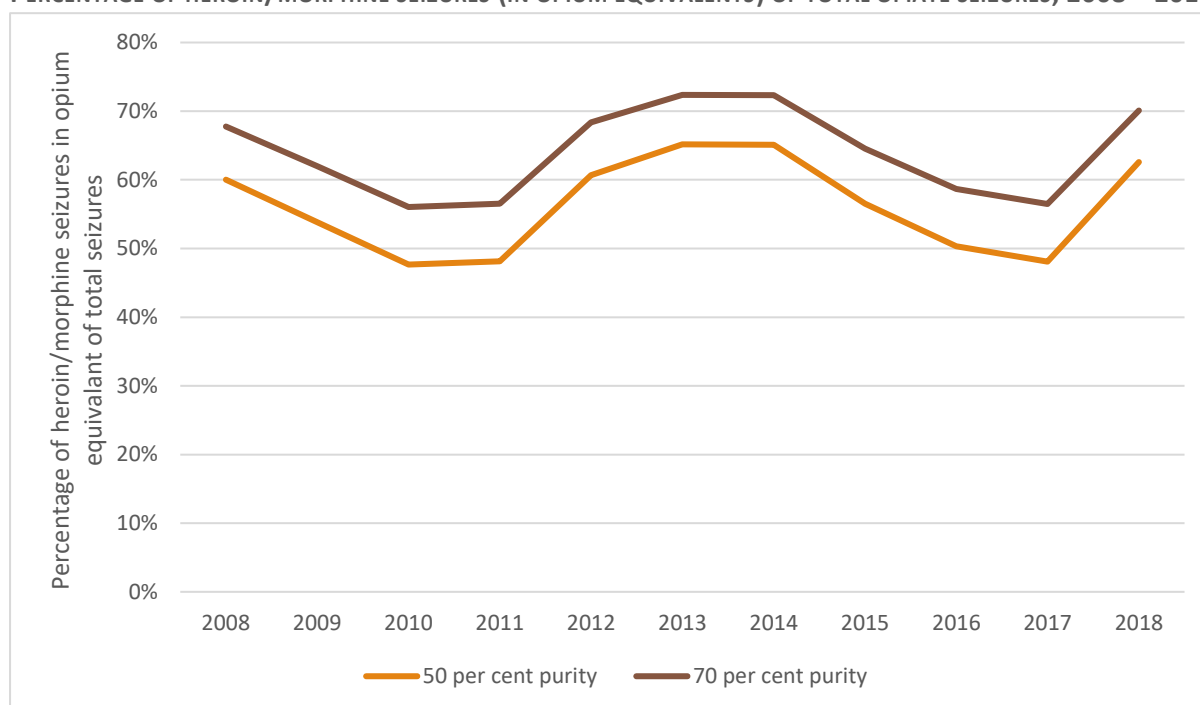
The above is calculated by using 12.35% ($\pm 0.71\%$) morphine content and 34% laboratory efficiency.

Ratio of opium and heroin/morphine seizures in Afghanistan and neighbouring countries

Data presented is 3-year moving average of the percentage of heroin/morphine seizures (converted to opium equivalent) of total opiate seizures in Afghanistan and neighbouring countries with two different purity assumptions for the conversion of heroin/morphine to opium equivalents.

⁵⁰ Estimates have been updated with the latest available data and thus differ from the figures published in "Afghanistan opium survey-cultivation and production report 2017".

PERCENTAGE OF HEROIN/MORPHINE SEIZURES (IN OPIUM EQUIVALENTS) OF TOTAL OPIATE SEIZURES, 2008 – 2019



Farm-gate value and value of the opiate economy

Average farm-gate price and farm-gate value of opium production

Since 2009, farm-gate prices at harvest time have been derived from the opium price monitoring system and refer to the month when opium harvesting took place in the different regions of the country, which is thought to reflect opium prices at harvest time better. To calculate the national average price, regional price averages were weighted by regional opium production. The opium price in the Central region is approximated by the national average, as there is no monthly opium price monitoring in that region.

The farm-gate value of opium production is the product of potential opium production at the national level multiplied by the weighted average farm-gate price of dry opium at harvest time. The upper and lower limits of the range of the farm-gate value were determined by using the upper and lower opium production estimate.

Illicit gross income

Illicit gross income (or illicit gross output) from opiates is generated by the domestic (final) consumption of opium and heroin (domestic use market) and from the export of opiates. The illicit gross output is the sum of the value of domestic consumption of opiates and the value of export of opiates.

The term “opiates” summarises opium, morphine and heroin. Morphine is a psychoactive ingredient of opium. To produce heroin, morphine is extracted from opium and then converted into heroin by adding certain chemical substances. In the following calculations, heroin and morphine are grouped together, unless otherwise stated.

Income generated from the domestic use of opiates

The amount of substances consumed domestically depends on two main factors: the number of persons who have used the drug in a given period (usually calculated by using estimates of annual prevalence of

drug consumption together with population numbers) and the average annual amounts of (pure) substance consumed per user.⁵¹

The gross income from domestic opiate consumption is calculated by multiplying the amounts consumed with the latest available street-level price for heroin and opium, respectively. In these calculations, the purity of drugs needs to be considered: if amounts consumed refer to pure substance, then street-level prices (referring to street level quality) need to be adjusted for purity.

Income generated from the export of opiates

The gross income generated from the export of opiates is calculated by multiplying the amounts exported in various forms (notably opium, heroin/morphine)⁵² with the respective export prices from countries where the opiates are exported to.

All the opium produced in a year is either exported as raw opium or heroin/morphine, consumed domestically in various forms, seized, stored for later use or lost (for example, due to mould, disposal to avoid seizures, etc.). Afghanistan, being a major producer of opiates, meets its domestic demand for opiates with domestic production, imports are therefore not considered.

With that, the components needed for estimating the illicit gross income from opium and heroin exports are:

- The amount of opium produced in a year (P_t)
- The amounts of opiates seized by law enforcement measured in opium equivalents⁵³ (S_t) or lost (L_t)
- Changes in inventories (I_t): opiates produced in earlier years but exported in the current period, or opiates from the current period stored for later sale (in opium equivalents)
- The amounts of opiates consumed in opium equivalents (C_t)
- Relevant price data

Using the notation from above, the following equation holds, with E being the amount of opium available for export as opium or heroin/morphine:

$$E_t = P_t - C_t - S_t - \Delta I - L_t.$$

Opium production is estimated by UNODC and the Afghan government on an annual basis and there is data available to estimate the amounts consumed each year. There is a clear understanding of the approximate amounts of opiates seized by law enforcement. Losses and changes in inventories are not considered in the estimation due to lack of data.

UNODC has several data collection instruments, one of which is the annual report questionnaire on drugs data. Member states report data on drug demand, drug supply, seizures, purity and price data at the wholesale and retail level of drugs on an annual basis. The data are disseminated through UNODC's data portal.⁵⁴

⁵¹ Estimates of amounts consumed per user per year are scarce. A common approach is to use survey data collected in drug use surveys (for example looking at average expenditure per user as done here). More recently, countries applied wastewater analyses to estimate amounts consumed, see e.g., EMCDDA (2019).

⁵² Price data for morphine is not available. Heroin and morphine are thus grouped together in the estimations.

⁵³ Opium equivalents for 1 kg of heroin of a certain purity is the amount of opium needed (in kilograms) to produce that kilogram. See data section for more details.

⁵⁴ <https://dataunodc.un.org/>

With that, the amounts of opium available for export as heroin/morphine or opium can be estimated as the difference between the estimated opium production of a year and seized and consumed amounts.

Omitting changes in inventories and losses yields

$$E_t = P_t - S_t - C_t.$$

Once approximate amounts of opium available for export are established, the share of opium converted to heroin within Afghanistan has to be estimated, as not all the opium available for export is exported as heroin/morphine. Significant amounts of opium are seized in the countries neighbouring Afghanistan, which indicates that more opium is trafficked than is demanded for use in these countries.

The share of opium available for export converted into heroin/morphine is approximated by the ratio of opium to heroin/morphine seized by law enforcement. All seizure data from Afghanistan and neighbouring countries are used for the estimation, which assumes that the shares opium converted into heroin in Afghanistan are reflected in the ratio of opium to heroin/morphine seizures in Afghanistan and its neighbouring countries.⁵⁵

Illicit net income

The illicit net income is gross income minus intermediate costs. Intermediate costs at the farmers' level are inter alia fertilisers and herbicides, irrigation costs (fuel or electricity for pumps), seeds, opium "taxes" paid to insurgent groups, and transportation of opium to markets. For trafficking and manufacturing, relevant costs components are inter alia transportation, bribes, security payments and taxes to insurgents, and chemicals to produce heroin. Intermediate costs constitute IFF if the corresponding transactions cross a border, that is if goods and services are imported.

Intermediate costs at the trafficking and manufacturing stage are less well researched as prices for final products, except for costs for precursor substances needed for producing heroin. The calculations presented here consider only costs for precursor substances.

The most important and costly substance used is acetic anhydride (AA). AA is an internationally controlled chemical that has many applications in the chemical industry. Since 2009, the Government of Afghanistan has prohibited the imports of acetic anhydride and has not granted any exceptional import or transit licenses for this chemical. Thus, the acetic anhydride found in Afghanistan is from illegal sources and all acetic anhydride needed to produce heroin is imported.

In the current calculations, only costs for precursor substances for heroin production are considered in the estimates. UNODC and NSIA work on including further costs in future Afghanistan opium surveys, with the aim to improve the estimates and to make them more compatible with Afghanistan's SNA and BoP statistics.

To produce 1 kilogram of pure heroin base, 1 litre of acetic anhydride is needed.⁵⁶ The price monitoring system collects prices for various qualities of AA, however, the qualities are an assessment of the traffickers and key informants reporting the prices, not based on a chemical analysis. The amount of 'street level' quality AA needed for producing heroin of export quality (heroin base of 50 – 70 per cent purity), is unknown.

As approximation, and to stay on the conservative side for the estimate of the net income from heroin production, the prices for the best quality of AA and 1 litre/kg heroin are used as basis in the calculations.

⁵⁵ Seizure data is not unbiased. Both the overall amounts of opiates seized, and the substances seized can be strongly influenced by policy decisions and changes of focus of law enforcement. To mitigate the potential bias, a three-year average is used in the approximation.

⁵⁶ US Drug Enforcement Administration Special Testing and Research Laboratory analysis – October 2017

Prices

There are two main sources for prices. For domestic prices, the Afghanistan Ministry of Counter Narcotics (MCN) and then the Afghanistan Ministry of Interior collect prices of opium, heroin and precursor substances on a monthly basis from key informants across the country. Prices are collected for different trade levels (farmer, wholesale trade and street level prices) and different qualities of product (as reported by key informants, in absence of chemical testing the actual purity or quality of the products is not known).

For international prices, annual data submitted by member states to UNODC are used, which are disseminated through UNODC's data portal.⁵⁷ In the case of Afghanistan, Iran, Pakistan and Tajikistan have been identified as first point of sale for Afghan residents.⁵⁸ An average wholesale price was calculated from prices reported from these countries to UNODC to calculate the value of the potential exports of opium and opiate products.

⁵⁷ <https://dataunodc.un.org/>. UNODC has several data collection instruments, one of which is the annual report questionnaire on drugs data. Member states report data on drug demand, drug supply, seizures, purity and price data at the wholesale and retail level of drugs on an annual basis.

⁵⁸ UNODC 2018, Afghan opiate trafficking along the Northern Route, 2018.