UNODC
United Nations Office on Drugs and Crime

Islamic Republic of Afghanistan
Ministry of Counter Narcotics

Afghanistan
Opium Survey 2015

Socio-economic analysis

MARCH 2016

UNODC Research

MCN/NSD
Narcotics Survey Directorate

ACKNOWLEDGEMENTS

The *Afghanistan Opium Survey 2015* was prepared by the Research and Trend Analysis Branch (RAB), Division for Policy Analysis and Public Affairs (DPA), United Nations Office on Drugs and Crime, under the supervision of Jean-Luc Lemahieu, Director of DPA and Angela Me, Chief of RAB.

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The implementation of the survey would not have been possible without the dedicated work of the field surveyors, who often faced difficult security conditions.

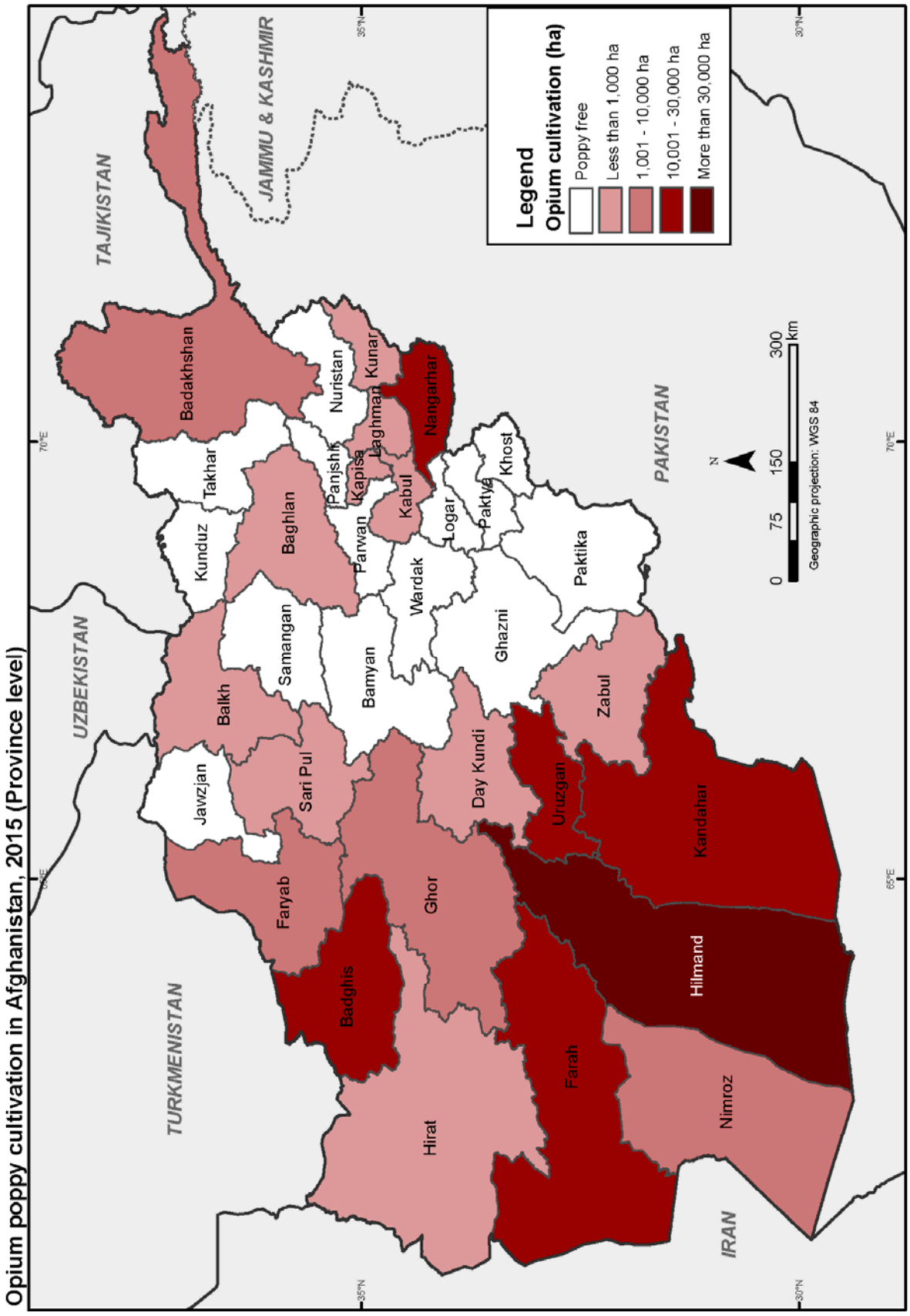
The MCN/UNODC Illicit Crop Monitoring activities in Afghanistan were made possible by financial contributions from the Governments of Germany, the United Kingdom of Great Britain and Northern Ireland and the United States of America.

Contents

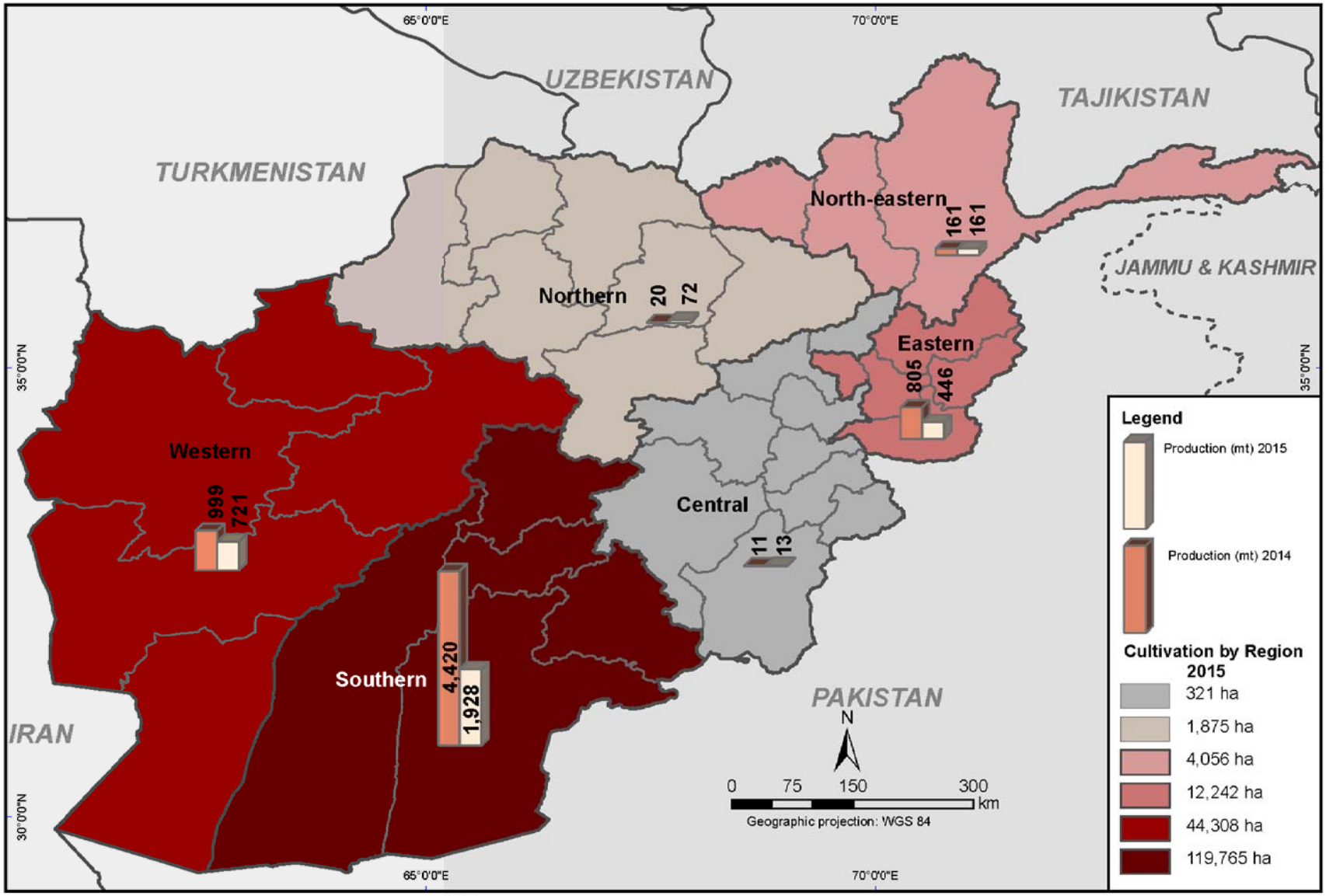
Fact Sheet Afghanistan Opium Survey 2015[1]

	2014	Change from 2014	2015
Net opium poppy cultivation (after eradication)	224,000 ha (200,000 - 250,500)	-19%	183,000 ha (163,000 - 202,000)
Eradication	2,692 ha	+40%	3,760 ha
Average opium yield (weighted by cultivation)	28.7 kg/ha	-36%	18.3 kg/ha
Potential production of opium[2]	6,400 mt (5,100 - 7,800)	-48%	3,300 mt (2,700 - 3,900)
Average farm-gate price (weighted by production) of dry opium at harvest time	US$ 133/kg	+29%	US$ 171/kg
Farmers' gross income[3] from opium per hectare	US$ 3,800	-18%	US$ 3,100
GDP[4]	US$ 21.2 billion	-1%	US$ 21.0 billion
Total farm-gate value of opium production	US$ 0.85 billion	-33%	US$ 0.57 billion
In % of GDP	4%		3%
Potential gross value of opiates	2.84 billion (2.3-3.2 billion)	-45%	1.56 billion (1.2-2.2 billion)
In % of GDP	13.4%		7.4%
Potential net value of opiates	2.68 billion (2.3-2.9 billion)	-44%	1.49 billion (1-2.1 billion)
In % of GDP	12.6%		7.1%

[1] Numbers in brackets indicate the upper and lower bounds of the estimation range.
[2] Refers to oven-dry opium.
[3] Income figures are indicative only as they do not include all expenditure and income components associated with opium cultivation.
[4] Relation to nominal GDP of the respective year. Source: Government of Afghanistan, Central Statistical Office. Figures for 2015 refer to the Solar Year 2014/2015 (1393).


Opium poppy cultivation in Afghanistan, 2015 (Province level)
Legend
Opium cultivation (ha)
Poppy free
Less than 1,000 ha
1,001 - 10,000 ha
10,001 - 30,000 ha
More than 30,000 ha
TAJIKISTAN
JAMMU & KASHMIR
UZBEKISTAN
PAKISTAN
TURKMENISTAN
IRAN
Badakhshan
Takhar
Kunduz
Baghlan
Jawzjan
Samangan
Balkh
Sari Pul
Faryab
Badghis
Hirat
Ghor
Bamyan
Parwan
Panjshir
Kapisa
Nuristan
Kunar
Laghman
Kabul
Nangarhar
Logar
Wardak
Ghazni
Paktya
Khost
Paktika
Day Kundi
Uruzgan
Zabul
Kandahar
Hilmand
Farah
Nimroz
0
75
150
300
km
N
Geographic projection: WGS 84
Source: Government of Afghanistan - National monitoring system implemented by MCN/UNODC
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Regional opium poppy cultivation and production change in Afghanistan, 2014-2015



Source: Government of Afghanistan - National monitoring system implemented by UNODC
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

1 Executive Summary

Afghanistan enters an important phase in its modern history with the completion of the Transition (Inteqal) Process at the end of 2014 and the initiation of the Transformation Decade (2015-2024). This coincided with the inauguration of the new President of Afghanistan on 29 September 2014 as well as the establishment of a National Unity Government (NUG). The Government has stated that it is focusing on rebuilding the country and strengthening the foundations of sustainable peace and development and constitutional democracy. Priorities for Afghanistan for the Transformation Decade were identified in an important development strategic policy document[5], with the goal of improving security and political stability, stabilizing the economy, advancing good governance, and promoting the rule of law and respect for human rights, particularly in relation to women and girls.

An understanding of the impact that opium cultivation, processing and trafficking have in Afghanistan, particularly in certain provinces, is a prerequisite for guiding such policies. Afghanistan is the world's largest producer of illicit opium and heroin. For the past decade, the country has accounted for an estimated 80 percent of global illicit opiates. The significant levels of poppy cultivation and illicit trafficking of opiates have created multiple challenges for Afghanistan, as it has fuelled instability, insurgency and terrorist groups, and drug consumption. It has also made some rural communities economically dependent on the illicit market and prevents the implementation of sustainable social and economic development plans.

The interconnected objectives of drug control, livelihoods, and security are challenging in a country like Afghanistan which is the poorest country in South Asia with over 30% of the population living below the poverty line. Many Afghans depend on the opium economy and are engaged in cultivation, labour on poppy fields or the illicit drug trade. The combination of insecurity, underdevelopment, weak governance, and illicit drug production and use has created a highly unstable environment in many communities. There is also a shared international responsibility for the opiate problem in Afghanistan with hundreds of metric tons of precursor chemicals being diverted from licit international markets and being smuggled into the country each year and billions of dollars made from onwards trafficking from Afghanistan to major consumer markets for example in Europe.

This report, which is one of the outputs of the *Afghanistan Opium Survey 2015,* focuses on the analysis of the opiate economy in Afghanistan and the factors and determinants driving opium poppy cultivation. It looks at opium poppy cultivation from both an economic and social point of view, including information on household income, value of the country's opiate economy, and factors that influence opium poppy cultivation. The aim of the report is to provide evidence to support drug and development policies in Afghanistan.

Opium poppy cultivation decreased by 19% in 2015 and opium harvest was at its lowest since the Taliban: a turning point?

In 2015, the total area under opium poppy cultivation in Afghanistan was estimated at 183,000 hectares, a 19% decrease from the previous year. All three main opium-poppy-cultivating regions saw a decrease in poppy-cultivation levels, with the largest relative decrease being in the Eastern region (-40%; mainly driven by decreases in Nangarhar), followed by the Southern (-20%) and Western (-10%) regions. There is ample evidence to support these decreases but it should be noted that part of these changes have been the result of an improved methodology. [6]

The reduction in opium production was even more drastic. Potential opium production was estimated at 3,300 tons in 2015 (-48% from 2014), which is the lowest level since the Taliban opium ban in 2001. The low production is a result of a reduction in area under cultivation, but more importantly of a reduction in opium yield per hectare, which amounted to an unprecedented low 18.3 kilograms per hectare.

[5] http://www.afghanistan-un.org/wp-content/uploads/2014/12/REALIZING-FINAL-SELF-RELIANCE-25-November-2014.pdf
[6] For details see MCN/UNODC 2015. "Afghanistan opium survey 2015 – Cultivation and Production".

With the multitude of possible reasons for changes in area under cultivation and the complexity of the factors driving opium poppy cultivation, the present reduction of cultivation cannot be related to a single factor or policy measure. Possible explanations may relate to the current economic profitability of opium.

Opium poppy cultivation, as lucrative as it is, is costly. Harvest is labour intensive and requires paying lancers. In desert areas, poppies have to be irrigated, often by using irrigation pumps which need costly fuel to function. In the South, where most of the poppy is cultivated, farmers irrigate more often than in other regions and reported expenses for irrigation (US$ 132) are more than twice as high as in the West (US$ 47.3) and East (US$ 47.7).

In times of high prices and good harvests, investments in making land arable and maintaining fields under unfavourable conditions were profitable. In the past four years, however, yields in the Southern and Western regions were below national average. In 2015, yields in these regions averaged at about 16 kilogrammes per hectare, a record low since the beginning of systematic yield surveys in 2006 (for comparison, in 2015 yields reached up to 41.5 kilogrammes per hectare in the Central and North-eastern regions, which is a level comparable to the nation-wide averages of 2008 or 2011). Four moderate to poor harvests in a row, together with moderate prices, may have led to a situation where making new land arable and keeping high-maintenance fields have become not highly profitable anymore. This explanation is supported also by the 38% of all farmers who named agronomic and ecological reasons (for example poppy diseases or bad yields) for choosing not to cultivate poppy in 2015.

The climatic conditions, such as lack of water or soil degradation, that have affected yields in the South and West might have directly reduced land available for opium poppy cultivation. In Nimroz province, for example the land available for agriculture in general reduced by 19% between 2014 and 2015, which directly affected the area available for opium poppy cultivation. MCN/UNODC analysis have shown that in Nimroz and Farah provinces, more than 40% of the 2014 poppy fields were left fallow in 2015 indicating a large number of abandoned poppy fields. This share was lower but still relevant in Hilmand (17%) and Kandahar (30%).

Opium poppy cultivation thus may have reached a ‘natural exploitation’ peak in the main poppy cultivating provinces in 2014 or may have even exceeded it, providing a possible explanation for the poppy cultivation decrease in the Southern and Western regions. With this assumption, there is a risk of an inner Afghan shift of cultivation. If conditions in the main poppy cultivating provinces continue to deteriorate, cultivation might move to other provinces, where agriculture conditions are favourable. The increases in the Central and Northern regions, which coincided with a deterioration of the security situation, might foreshadow such a development which needs close monitoring and appropriate action to avoid cultivation from spreading.

Reduced income from poppy cultivation has increased the vulnerability of farming households

The farm-gate value of opium (US$ 0.57 billion), an important measure of the income generated in rural communities by the cultivation and harvesting of opium, decreased by 33% in 2015 to its lowest level since 2009 (US$ 0.25 billion; not adjusted for inflation).

Per-hectare income from opium (gross) decreased to US$ 3,100 in 2015 (18% less than its 2014 value US$ 3,800), and was at its lowest levels since 2002 even without adjustment for inflation. In terms of purchasing power, opium poppy was significantly less profitable in 2015 than it was in the past 14 years. This brought a considerable reduction in income for households engaged in opium cultivation as sale of poppy and derivatives accounted for 40% of their annual income.

The reduction of income from poppy went together with a general deterioration of economic conditions in rural Afghanistan. In 2015, all four daily wages monitored in rural communities (labour in construction, poppy lancing, poppy weeding and wheat harvesting) decreased from their 2014 levels by 1% to 21%. The largest reduction was observed for poppy lancing/gum collection, which can be explained by a reduced demand due to reduced area under cultivation.

On average, many if not most Afghan farmers live below the poverty line and a further reduction of disposable income can lead to a worrying deterioration of the socio-economic situation of rural

communities, regardless of their involvement in poppy cultivation. This is a precarious situation that may be taken advantage of by insurgent groups and may drive farmers to further rely on illicit activities – or to become migrant workers abroad, which would further weaken local rural communities.

Opium poppy farming as part of the livelihood strategies of farmers

Opium poppy cultivation is one of the options a farming household has to support its livelihood. With the changing needs and opportunities of a household, the decision to cultivate poppy can change from one year to the next. An absolute divide of farmers into poppy and non-poppy growers is an oversimplification: a farmer might cultivate opium poppy in one year and abstain from it in the next year – depending on the fluctuating economic needs and opportunities.

In 2015, only 50% of all interviewed poppy farmers had cultivated opium poppy for five consecutive years (from 2011 to 2015). The vast majority of farmers (82%) had cultivated for three consecutive years (from 2013 to 2015); 9% took breaks in cultivation, and another 9% could be classified as newcomers/re-starters, as they cultivated in 2014 and 2015 only.

Afghan farmers cultivated licit and illicit crops under a variety of land tenure modalities. Besides cultivating crops in their own land, they cultivated crops in rented land (land tenancy), and used land and returned a share of the crops produced on this land as payment to the owner (sharecropping). Different tenure arrangements may have allowed farmers in the Northern region to increase their areas under poppy cultivation since only 34% of the continuous poppy farmers there used exclusively their own land for cultivating crops.

Economic needs and lack of alternatives as driving force of cultivation

The decision to cultivate opium poppy in a given year is determined by a variety of factors. Most of the poppy growers in 2015 (71%) named economic reasons as major influencing factor for poppy cultivation (e.g., not enough income from other crops, poverty) and 28% suggested similar income-related reasons, but framed them under agronomic and ecological reasons such as good yield from poppy production or favourable ecological conditions for poppy cultivation.

However, 38% of farmers who discontinued cultivation in 2015 also named agronomic and ecological conditions (e.g., poppy pests, diseases and bad yields) as reasons for their decision, which also shows how poppy cultivation may not be a highly profitable cash crop anymore. The majority of farmers who discontinued cultivation or who had never cultivated opium poppy named religious beliefs (54 and 84% of respondents, respectively) as reasons.

Most of the farmers who discontinued poppy cultivation reported that they replaced the income from opium poppy with income from other crops. Mostly with wheat (50% of farmers) or vegetables (42%), but cannabis was also used as replacement (12% of famers), but mostly in the Southern and Central regions. Other sources of income than crops included livestock (5% of famers), daily wages (4% of farmers), or shop keeping (4% of farmers). Remittances replaced poppy income for only 3% of the farmers.

If income from poppy were excluded, the livelihood strategies of poppy farmers in 2015 resembled the livelihood strategies of farmers who abstained from cultivation in terms of number of income-generating activities. Moreover, overall household income was similar across all farmers regardless of their involvement in opium cultivation. A note-worthy difference, however, was a significant lower proportion of poppy farmers benefitting from other crops and salaried labour.

Opium poppy cultivation was associated with a lack of market access and low wages along with low agricultural assistance, no exposure to awareness campaigns, absence of access to basic facilities (boy and girl schools, medical clinics and electricity), and high levels of insecurity.

In many cases farmers' dependency on poppy cultivation does not seem to be related to the income from poppy sales *per se*, but to the lack of continuous, reliable and sustainable market access to sell alternative products, and to the overall development of their villages in terms of social and economic opportunities, governance and security.

This has important policy implications as the mere substitution of opium with other crops (through projects which provide for example improved wheat seeds) is not a sustainable solution. Alternative development interventions need to support alternative livelihoods which are tailored to specific local needs and circumstances. Access to markets is a fundamental component of a diversified alternative development policy, but other issues need equal attention such as off-farm job opportunities, development of physical and social infrastructure and a strategy to reduce crisis and conflict.

Women's perspective on opium poppy cultivation

The women's perspective on opium poppy cultivation can provide a different perspective from the daily life of farming households. Most qualitative and quantitative data on farmers' reasons and motivations to grow illicit crops have been collected only from males and do not incorporate the women's point of view. MCN/UNODC has therefore initiated a strain of research to study the role and contribution of women to all stages of opium poppy cultivation, from the household's decision to engage in opium cultivation to the use of its income.

What transpires when talking to women is that a clear motivation for poppy cultivation is cash income. Poppy, as lucrative cash crop, provides resources to cover daily household needs, to pay debt and to improve living conditions. Large one-time expenditures such as weddings or cars emerged as possible reasons for cultivating intermittently.

"I saw the people who cultivated poppy had good life opportunity, since that time I started to cultivate poppy." (Woman interviewed in Baghlan)

Women seem to be aware of the illicit nature of the crop, but they justify it with the hard work involved or the economic necessity.

"We know that it is harmful for human but we have more [income related] problems, so we have to cultivate poppy to solve our life problems." (Woman interviewed in Faryab)

Medicinal use of opium for both adults and children still seems to be a relevant factor. Interviewed women displayed an awareness of the potential harmfulness of opium use (because alerted by their husbands), but lack of affordable alternatives prevent women from using less harmful remedies. Addiction and dependence was often mentioned as a concern and more research is needed to better understand the nexus of opium poppy cultivation and opium dependence.

An important question in sustainable livelihood programmes is whether the empowerment of women can influence the decision of households to abstain from opium poppy cultivation. The interviews with women provided a mixed picture. While it is obvious that additional cash income from labour of women can reduce the economic pressure to cultivate poppy, it was clearly stated that out of cultural reasons men often do not want women to participate in the work force. Likewise, while some women reported that their voices are heard by their spouses, others reported that husbands are the sole decision makers in all relevant decisions. Thus, the actual influence women can have on the decision to grow poppy might be limited.

The low opium production cuts into revenues of Afghan traffickers and may reduce the income of insurgent groups

By far the largest share of the opium economy in Afghanistan is generated by opiate transformation and exports to neighbouring countries. In addition to farm-gate value, the potential value of the opiate economy includes all income generated after opium leaves the farm. Income is generated whenever opium is traded or modified in some way and includes income generated by opiates (opium, morphine and heroin) consumed domestically, as well as income generated by trading opiates to Afghanistan's borders.

The net value of the 2015 Afghan opiate economy (gross value after subtracting costs for imported precursor substances) amounted to US$ 1.49 billion, a reduction of 44% from 2014 (US$ 2.68 billion).

The net value can be further broken down into the value of the domestic market (US$ 0.08 billion), the farm-gate value of the opiates believed to be exported (US$ 0.5 billion), and the value added by traffickers through the processing of opium into morphine/heroin and through the export

of processed and unprocessed opiates (US$ 0.92 billion), which has reduced by roughly 50% in comparison to its 2014 value (US$ 1.81 billion).

The low value of the 2015 harvest thus did not only cut into the income of Afghanistan's opium farmers, but it also substantially reduced the revenue made from onwards processing and exports.

Opium poppy cultivation finances insurgent and terrorist groups. More than half of poppy farmers in the East and West indicated that they paid monetary contributions (59% and 64%, respectively) from their poppy income, which accounted to at least 10% of the poppy earnings. The major recipients of these contributions were reported to be the insurgents (84% in the East and 68% in the West).

The possible consequences for the illicit and licit economy of Afghanistan are yet to be seen. It has been shown in the past that the cannabis and opiate markets were closely interrelated, therefore an increase in production and trafficking of cannabis could be possible. Traffickers may also substitute their lost opium income by engaging in other illicit activities. A close monitoring of the situation is therefore needed to enable a quick and well targeted policy response.

The way forward

Farmers have complex livelihood strategies and their decision to cultivate opium poppy is driven by various economic and social circumstances. An adequate policy response takes these complexities into account.

Lack of access to reliable and sustainable sales markets for alternative, high quality products has been identified as one of the main drivers of illicit crop cultivation. There is a need for a close examination of market demand for competitive agricultural products. Adequate infrastructure, such as roads, and collection and processing facilities for agricultural produce also need to be provided; otherwise the costs for getting products to the market may become too high and may thus limit the sustainability of development interventions.

Drug-control policies also need to focus on improving rural economic diversification strategies, job creation and skills training for rural workers. Income-generating alternatives to crop cultivation need to be viable and sustainable in order to decrease dependence on illicit crop cultivation. Moreover, illicit crop cultivation was strongly related to low agricultural assistance, no exposure to awareness campaigns, absence of access to basic facilities (boy and girl schools, medical clinics and electricity), and high levels of insecurity. Thus, the development of physical and social infrastructure, as well as a strategy to reduce crisis and is needed for a sustainable reduction of opium poppy cultivation.

A stronger inclusion of women into the work force and the provision of income-generating opportunities for women can reduce the dependency of households on illicit crop cultivation and empower women to play a stronger role in the decision making processes of households.

Long-term political and financial support is essential to the success of alternative development. Direct participation by farmers and communities plays a key role in the design and planning of alternative development activities, especially in areas where no public institutions can fulfil such a role.

Due to the scale and the nature of the drug problem, the elimination of illicit crop cultivation depends on the achievement of broader development goals, such as well-established and strong state institutions for effective governance, and functioning social protection mechanisms. The Sustainable Development Goals[7] (SDGs) can bring a new vision to alternative development in Afghanistan. The SDGs are a guiding a long-term strategy that intends to transform the development paradigm to ensure that all aspects of development are considered, including security, justice, good governance and the rule of law. The new agenda recognizes that sustainable development cannot be realized without peace and security and that peace and security will be at risk without sustainable development.

The Sustainable Development Goals recognize that minimum levels of rule of law and of security need to be established for achieving sustainable results in alternative development, point to the

[7] https://sustainabledevelopment.un.org/

crucial role of environmental protection, and can also provide the framework for linking land tenure more firmly with alternative development, since secure and equitable rights to land and natural resources are central to the achievement of sustainable development.

These goals can be achieved only if development policies can mainstream drug control strategies in those Afghan communities which are heavily affected or are at risk of being affected by opium poppy cultivation. At the same time polices aimed at reducing opium poppy cultivation can achieve sustainable results only if they mainstream development in their objectives.

2 Introduction

The *Afghanistan Opium Survey* is implemented annually by the Ministry of Counter Narcotics (MCN) of Afghanistan in collaboration with the United Nations Office on Drugs and Crime (UNODC). The survey team collects and analyses information on the location and extent of opium cultivation, potential opium production and the socio-economic situation in rural areas. Since 2005, MCN and UNODC have also been involved in the verification of opium eradication conducted by provincial governors and poppy-eradication forces. The results provide a detailed picture of the outcome of the current year's opium season and, together with data from previous years, enable the identification of medium- and long-term trends in the evolution of the illicit opium cultivation problem in Afghanistan. This information is essential for planning, implementing and monitoring the impact of measures required for tackling a problem that has serious implications for Afghanistan and the international community.

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 United Nations (the 53rd session of the Commission on Narcotic Drugs in March 2009). Under ICMP, monitoring activities currently supported by UNODC also exist in other countries affected by illicit crop cultivation: in Asia, Myanmar and the Lao People's Democratic Republic; in Latin America, the Plurinational State of Bolivia, Colombia, Ecuador, Mexico and Peru; in Africa, Nigeria.

The *Afghanistan Opium Survey 2015* was implemented under project AFG/F98, "Monitoring of Opium Production in Afghanistan", with financial contributions from the Governments of Germany, Norway, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

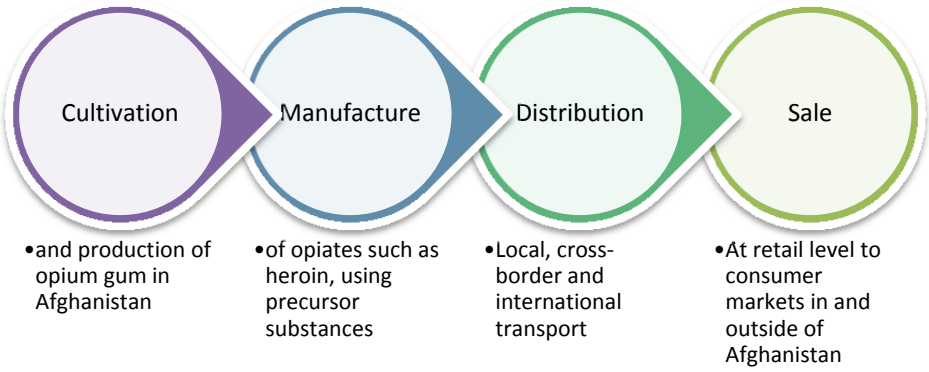
3 The opiate economy in Afghanistan 2015

3.1 Value of the opiate economy 2015

In 2015, the gross value of the Afghan opiate economy was estimated to be US$ 1.56 billion (US$ 2.84 billion in 2014). Despite of the strong decrease of -45% of the gross value, opiates still constitute a sizeable share of Afghanistan's economy in 2015. Corresponding to 7% of the country's GDP, the value of opiates is comparable to the value of the export of illicit goods and services in 2014.

The production and trade with Afghan opiates is a business, primarily motivated by profit. Opiate manufacturing and trade can be divided into four stages: production of opium gum, manufacturing of opiates, distribution and retail.[8] At each stage, income is generated that benefits different players. While cultivation of opium poppy and production of opium occur primarily in Afghanistan, distribution and final retail most often occur in major destination markets such as Europe.

Figure 1: Value chain of Afghan opiates



The potential gross value of the Afghan opiate economy represents all income generated by opium production and manufacturing that is believed to have remained in Afghanistan, and is the sum of the value of the domestic market and the value of opiates available for export. Its net value (US$ 1.49 billion) is considered to be most suitable for comparison with GDP, and is the gross value minus expenditures for imported precursor substances for heroin manufacture.

The value of opiates available for export (gross export value of opium and heroin/morphine exports) was US$ 1.48 billion[9] in 2015. The value of exported opiates only includes the value of opiates traded across Afghanistan's borders. No further income from onward trafficking beyond the country's borders, for example to Europe and other regions, is included.[10] The net value of opiates available for export (US$ 1.41 billion) is the gross value minus expenditure for imported precursor substances.

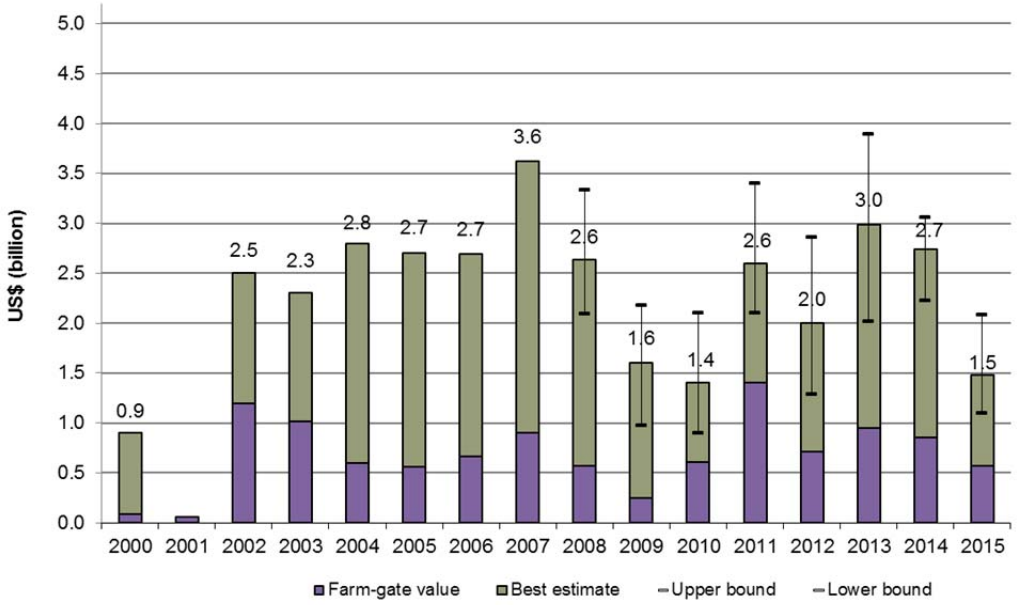
The gross value of the domestic market for heroin and opium was much smaller. In 2015, the estimated worth of opiates consumed in Afghanistan was US$ 0.08 billion, which was slightly lower than in 2014.

[8] See as well Financial Action Task Force (FATF), 2014, *"Financial Flows linked to the production and trafficking of Afghan Opiates"*

[9] Calculating the value of exported morphine/heroin is limited by the fact that the product leaving laboratories in Afghanistan may undergo further processing (for example, adulteration) before reaching assumed points of sale in neighbouring countries. These factors cannot be estimated at present, but it is reasonable to assume that the use of cutting agents increases the profitability of exporting heroin/morphine, and not taking such factors into account could lead to an underestimation of the export value of the opium economy in Afghanistan.

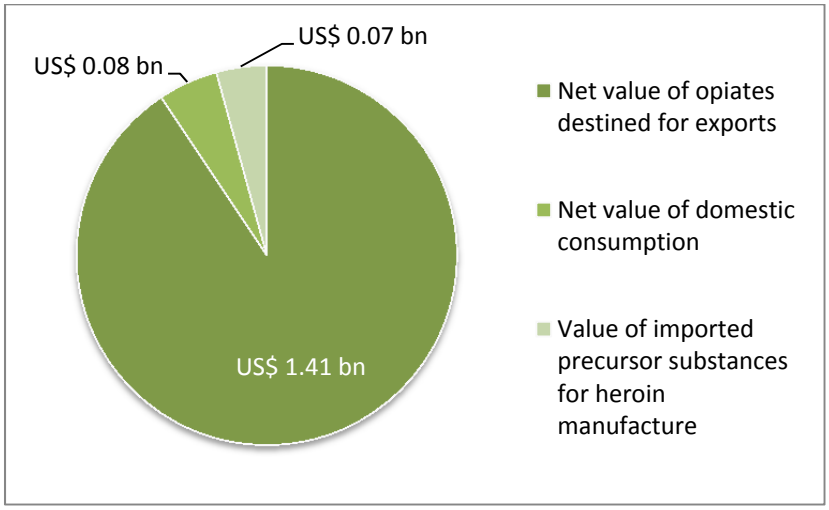
[10] Indeed, Afghan traffickers seem to be heavily involved in shipping opiates over the border, most notably to Iran and Pakistan, but much less so in subsequent trafficking. Thus, the far greater income generated on international trafficking routes does not normally find its way into the pockets of Afghan traffickers and into the Afghan economy.

Figure 2: Potential gross export value of opiate production, and farm-gate value, 2000-2015 (US dollars)



Sources: UNODC (2003): The Opium Economy in Afghanistan; MCN/UNODC: Afghanistan opium surveys 2003-2015. Note: The bars indicate the upper and lower margins of the range of the estimated value.

Figure 3: Breakdown of the potential gross value (US$ 1.56 billion) **of the Afghan opiate economy, 2015**



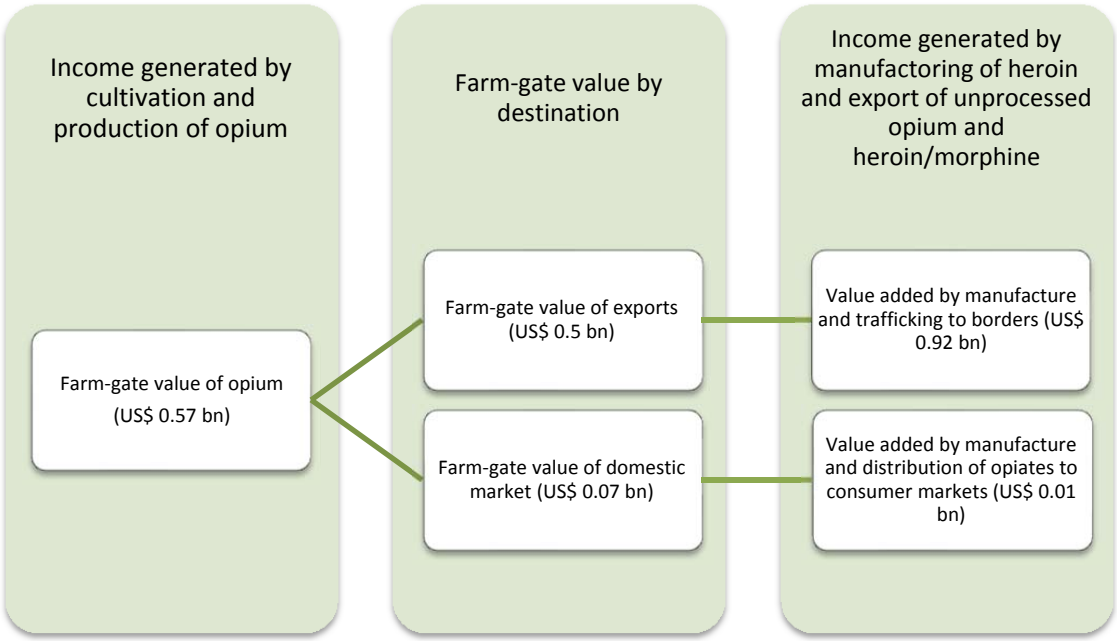
The farm-gate value of opium represents the potential gross amount earned from opium by farmers in a given year. It is the value of the first link of value chain, of cultivation and production of opium gum. The farm-gate value is an important measure of the added value generated in rural communities by the cultivation and harvesting of opium. In contrast to the proceeds of onward processing and trafficking, which benefit external individuals, the proceeds of opium cultivation most likely remain within rural communities.

In 2015, the farm-gate value of opiates was worth US$ 0.57 billion, corresponding to 3% of GDP. The farm-gate value of opium can be further broken down into the value of the opium used for manufacturing opiates for export (US$ 0.50 billion) and the value of opium for domestic consumption in form of opium or heroin/morphine (US$ 0.07 billion).

The proceeds of traffickers through the processing of opium into morphine/heroin and through the export of processed and unprocessed opiates is the net value of all exported opiates after the opium left the farm (US$ 0.92 billion).

It should be stressed that despite ongoing improvements in the estimates of the opiate economy through additional information-gathering activities, economic calculations 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.

Figure 4: Net value of the Afghan opiate economy (US$ 1.49 billion) 2015, by component



Note: Value added represents all the income generated after opium leaves the farm. The net value is the gross value minus estimated expenditure for imported precursor substances for herion/morphine production.

Table 1: Estimated gross and net values, 2015 (US dollars)

	Gross value US$ (rounded)	Net value US$ (rounded)	Net value in relation to GDP
Value of the opiate economy	1.56 billion (1.2-2.2 billion)	1.49 billion (1-2.1 billion)	7.1%
Value of opiates potentially available for export	1.48 billion	1.41 billion	6.7%
Farm-gate value of opium[1]	0.57 billion	-	3%
Value of domestic market	0.08 billion	0.08 billion	0.4 %
Export value of 1 kg of opium[2]	720	720	
Export value of 1 kg of morphine/heroin	4,100	3,750	

Ranges are calculated based on different assumptions on the conversion of opium to morphine/heroin within Afghanistan. "Value of the opiate economy" refers to the sum of the value of the domestic market and the export value of opiates available for export.The net value refers to gross value minus costs for precursor substances needed for heroin manufacture.

[1] In the farm-gate value estimation, no imported goods are considered, therefore no net estimate is available

[2] In the case of export value of opium, no significant import costs were considered (e.g. precursors), thus, in the estimation gross value equals net value.

3.2 Trend analysis

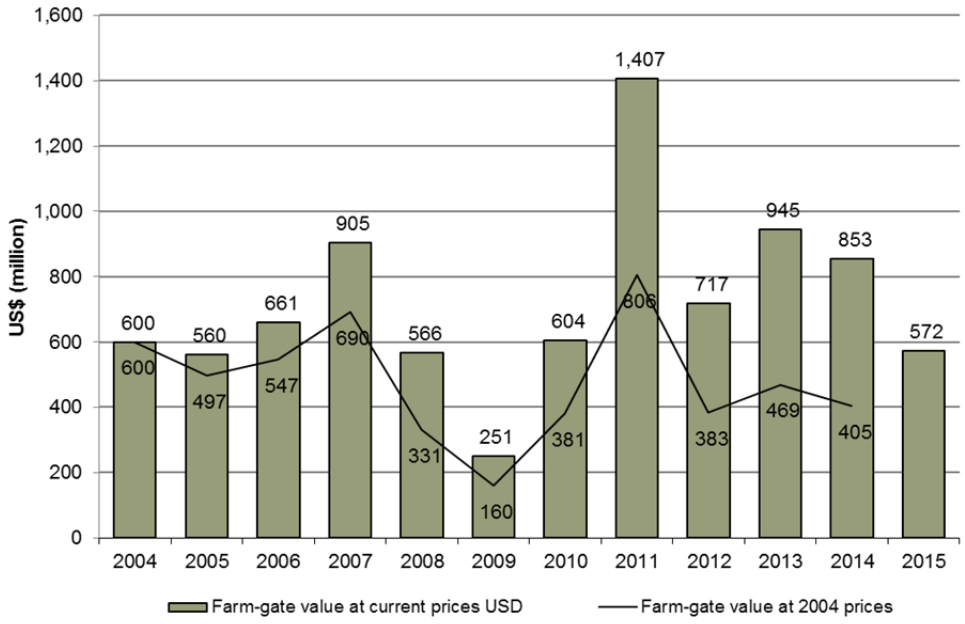
3.2.1 Reduced income from opium poppy cultivation has increased the vulnerability of farming households

Amounting to US$ 572 million (US$ 470-680 million), the farm-gate value of opium production in 2015 decreased by 33% from its 2014 level (US$ 853 million). The decrease in farm-gate value was mainly due to the 48% decrease in opium production this year.

Farmers in Hilmand, the country's largest opium-producing province, earned some US$ 240 million, which was equivalent to 41% of the total farm-gate value of opium production in Afghanistan in 2015; a decrease of 39% from 2014 (US$ 394 million).

The farm-gate value of opium has presented erratic patterns in recent years. The production of opium, like any other agricultural product, is highly dependent on meteorological and climatic conditions. Furthermore, with opium prices being subject to strong market dynamics, particularly supply shocks and price hikes, as in 2002 (Taliban opium ban) and 2011 (crop failure in 2010), due to perceived or real shortages, spikes in the farm-gate value of opium were caused in those years. In 2015, due to very low levels of production, the farm-gate value was at its lowest since 2009.

Figure 5: Nominal (current price) farm-gate value of opium in US dollars (millions: bars)**, together with the farm-gate value adjusted for inflation** (constant price adjusted to 2004 price: line) **in US dollars, 2004 to 2015.**

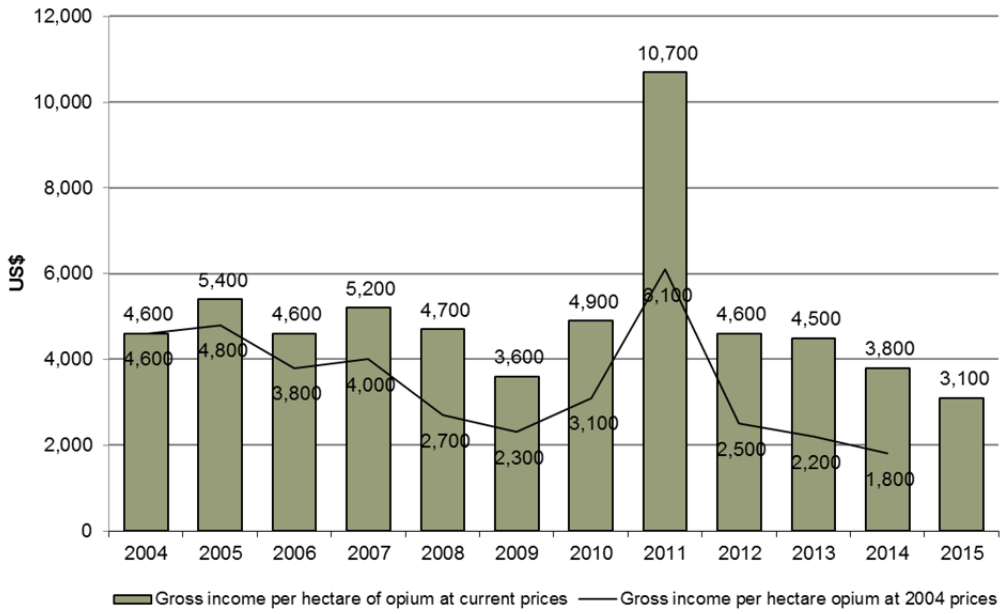


Note: for ease of comparison, the Afghanistan inflation rate has been applied to US dollar prices. Changes in the exchange rates can alter the results (see Afghanistan Opium Survey 2013 for details). At the time of writing 2015 inflation rates were not yet available.

The financial benefits of illicit crops are an important aspect of household decision making. Per-hectare income from opium in the past six years has ranged from US$ 3,100 (2015) to US$ 10,700 (2011).

Per-hectare income from opium (gross) decreased to US$ 3,100 in 2015 (18% less than its 2014 value US$ 3,800), and was at its lowest levels since 2002 even without adjustment for inflation. In terms of purchasing power, opium poppy was significantly less profitable in 2015 than it was in the past 14 years. This brought a considerable reduction in income for households engaged in opium cultivation as sale of poppy and derivatives accounted for 40% of their annual income.

Figure 6: Nominal gross income per hectare opium (US dollars: bars)**, together with gross income per hectare opium adjusted for inflation** (US dollars: line)**, 2004 to 2015**



At the time of writing 2015 inflation rates were not yet available.

Net income per hectare opium is derived by subtracting production costs from gross income. Production costs per hectare, reported by farmers, amounted to US$ 930 in 2015, which is an increase to its 2014 level (US$ 860). Variations in net income are mainly caused by variations in gross income, which are heavily driven by per-kilogram prices of dry opium and yields.

These calculations represent an average value per hectare under poppy cultivation. Farmers whose fields were affected by diseases, lack of water or adverse weather conditions may have made very little income, perhaps not even recovering production costs, while others whose fields were unaffected would have made a good profit.

Table 2: Gross and net income per hectare, 2011-2015[11] (US dollars per hectare)

	2011 (US$/ha)	2012 (US$/ha)	2013 (US$/ha)	2014 (US$/ha)	2015 (US$/ha)
Gross income per hectare of opium	10,700	4,600	4,500	3,800	3,100
Net income per hectare	9,300	3,300	3,600	2,900	2,170
Production costs (rounded)	1,390	1,300	900	860	930
Expenditure as share of gross income	13%	28%	21%	23%	29%

[11] Some caveats should be added. Average production costs for opium do not necessarily apply to small-scale farmers who typically cultivate 1 jerib (= 0.2 hectares) or less in Afghanistan. They can make use of the "free" labour of their household members for ploughing and weeding the fields as well as for lancing and collecting opium. In some provinces, notably those with a strong insurgent presence, some or all farmers reported paying an opium tax, which further reduces their net income. This was not considered in this calculation of net income as it does not apply to all poppy farmers. The expenditure for opium cultivation may also be higher if farmers rely exclusively on pump irrigation.

Table 3: Average expenditure on poppy and wheat, per hectare, 2015 (US dollars per hectare)

Costs per hectare	Fertilizer	Harvesting/ Lancing	Irrigation	Ploughing	Seeds	Weeding	Total costs
Wheat (US$/ha)	128	197	95	72	63	55	456
Poppy (US$/ha)	111	489	201	71	27	68	931

Note: Average over all expenditures named by farmers for each category. Zero expenditure is excluded for the estimates by category. Total cost is the average of the total expenditure reported by farmers.

Table 4: Average expenditure on poppy, per hectare and region, 2015 (US dollars per hectare)

	Fertilizer	Harvesting/ Lancing	Irrigation	Ploughing	Seeds	Weeding	Total costs
Central	187	198	-	60	10	98	532
East	199	353	90	69	20	146	788
North-East	208	183	-	113	54	153	593
North	217	348	28	84	13	111	671
South	80	572	256	74	29	56	1056
West	155	339	90	60	22	68	676
All regions	**111**	**489**	**201**	**71**	**27**	**68**	**931**

Note: Average over all expenditures named by farmers for each category. Zero expenditure is excluded for the estimates by category. Total cost is the average of the total expenditure reported by farmers.

The deterioration in the economic situation of farmers was also reflected in daily wage rates in rural communities: all four wage types monitored (labour e.g. in construction, poppy lancing, poppy weeding and wheat harvesting) decreased from their 2014 levels by between -1% and -21% in 2015. The largest reduction was observed for poppy lancing/gum collection, which can be related to the reduced demand due to reduced area under cultivation. The daily wage for opium lancing/gum collection remained higher than other daily wages.

Table 5: Daily wage rates for different activities in Afghanistan, 2011-2015[12]

Activity	Daily wage rate (US dollars)					Change 2014-2015
	2011	2012	2013	2014	2015	
Labour (roads, construction, etc.)	5.6	5.7	5.6	5.4	5.0	-7%
Lancing/gum collection	12.6	11.7	9.8	9.4	7.4	-21%
Poppy weeding	6.6	5.7	6.2	5.7	5.2	-9%
Wheat harvesting	6.6	6.4	5.9	5.6	5.6	-1%

Another important source of income is wheat. Almost all farmers in the village survey reported the cultivation of wheat and 50% of those farmers who stopped opium poppy cultivation in 2015 reported that they replaced poppy by wheat. Sales of wheat and wheat straw accounted for 26% of the annual income of opium poppy farmers. For more details, see the next chapter on livelihood strategies of Afghan farmers.

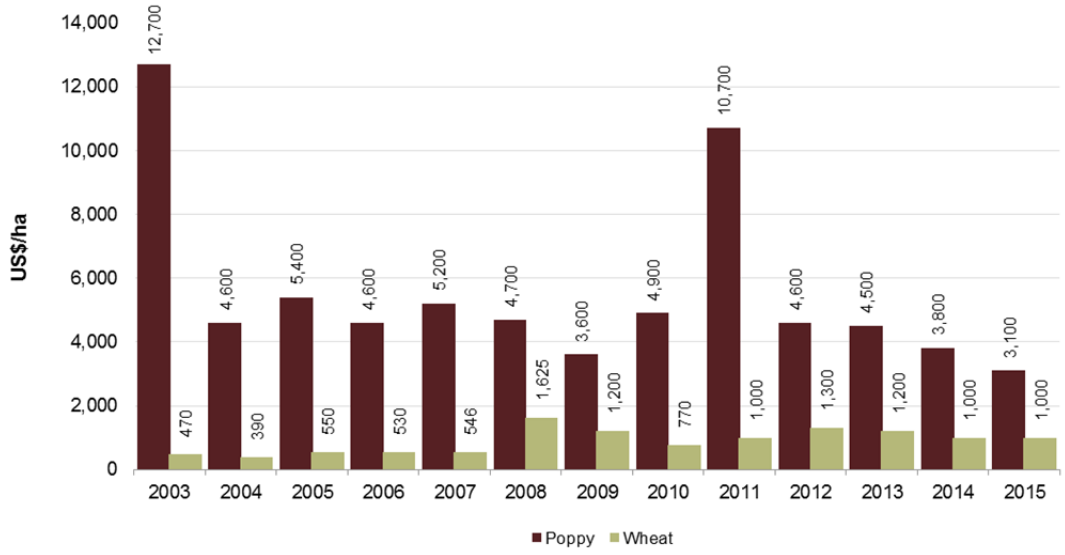
[12] Local wages were reported in a number of different currencies, including AFN, Pakistani rupees and Iranian rials, which complicates any year-on-year comparison as exchange rates can be subject to significant variations.

Opium remains an attractive alternative to other crops and the comparison of the per-hectare income from wheat and opium poppy is an indicator of just how attractive poppy cultivation can be. Opium poppy and wheat are planted during the same season in Afghanistan and, as most poppy is grown on irrigated land, wheat yield on irrigated land is used to make the comparison.

In 2015, at roughly 3:1, the ratio between gross income from opium and wheat is smaller than its 2014 level (4:1). In 2003, for example, farmers earned 27 times more gross income per hectare of opium than per hectare of wheat.

The estimated per-hectare income from wheat was based on information provided by village headmen about wheat yield and price. The wheat price reported reflects the price level and expectations at the time of the survey (April/May 2015). The average reported wheat yield was 2,600 kilograms per hectare on irrigated land and farmers made an estimated average gross income of US$ 1,000 per hectare from wheat (the average price per kilogram of wheat was US$ 0.39). In contrast to average yields and income from opium poppy and daily wages, wheat yields and income did not change significantly from 2014 to 2015.

Figure 7: Gross income per hectare from opium and wheat, 2003-2015 (US dollars per hectare)



3.2.2 The low opium production cuts into revenues of Afghan traffickers and may reduce the income of insurgent groups

By far the largest share of this income is generated by opiate transformation and exports to neighbouring countries. The gross export value of the Afghan opiate economy amounted in 2015 to US$ 1.48 billion, a reduction of 45% when compared to 2014 (US$ 2.7 billion).

The potential gross export value of the opiate economy includes all income generated after opium leaves the farm. Income is generated whenever opium is traded or modified in some way and includes as well the income generated by trading opiates to Afghanistan's borders.

The net proceeds made by Afghan traffickers after opium left the farm, US$ 0.92 billion, were reduced by 50% when compared to 2014. The low harvest thus did not only cut into the income of Afghanistan's opium farmers, it also reduced the revenue made from onwards processing and exports substantially.

Net export value (and the net value of the domestic market) accounts for import costs associated with the production of morphine and heroin. It therefore provides a proxy for the net amount of revenue entering Afghanistan generated by opiate exports. Import costs, as far as they are known,

are deducted from the gross export value of Afghan opiates. However, since many import cost factors are not well understood or known, net value only considers the costs of imported precursors that constitute an important cost element of morphine and heroin production.

The revenue from exporting 1 kilogram of heroin/morphine has reduced by 44%. It has to be noted that heroin revenue is not the net revenue of traffickers, but rather the value generated per kilogram of heroin along production and trafficking chains beginning at the farm-gate. From the difference, all production costs (including laboratories, labour, trader mark-ups, etc.) other than for precursor substances have to be financed.

Table 6: Overview of different values/revenues per kilogram of opium/heroin (rounded), 2010-2015 (US dollars)

	2010	2011	2012	2013	2014[13]	2015[14]
Export price per kilogram of heroin in US$	3,300	4,500	6,800	5,900	5,110	4,140
Cost per kilogram of heroin in US$ (precursor and dry opium)	1,600	2,400	1,700	1,530	1,690	2,270
Revenue from exporting 1 kilogram of heroin/morphine in US$	1,600	2,100	5,100	4,380	3,400	1,900

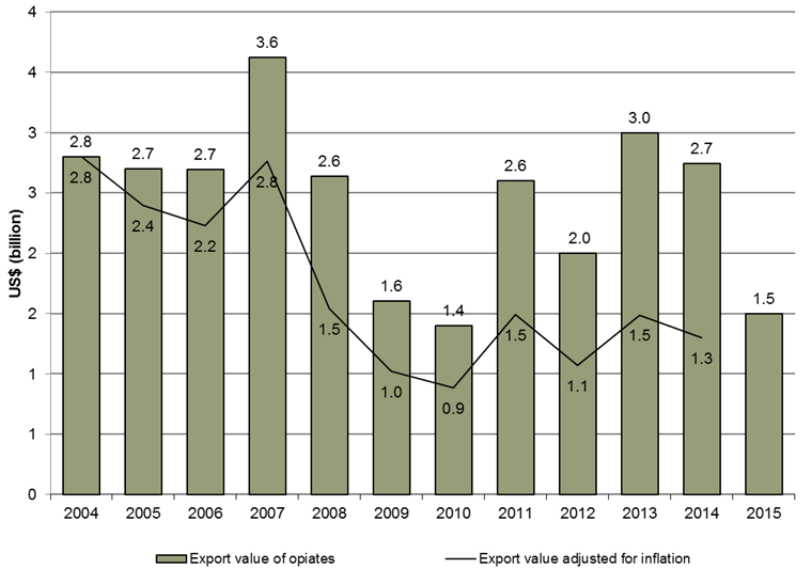
**Note: Costs other than the farm-gate price or precursor costs are not considered. Values before 2015 were calculated with an opium to heroin conversion ratio of 7:1; values in 2014 and 2015 were calculated with the updated ratios of 9.6:1 and 11.0:1, respectively.*

The possible consequences of the reduction of the Afghan opiate economy are yet to be seen. In the past, it has been shown that the cannabis and opiate markets are closely interrelated; an increase in production and trafficking of cannabis and its products is therefore possible. However, traffickers can substitute their lost income by engaging in other, not drug based, illicit activities. A close monitoring of the situation is therefore needed to enable a quick and well targeted policy response.

Moreover, in the long run, opium prices and production have a negative relationship with each other: the higher the level of production, the lower the price. This relationship is strongest[15] when comparing opium production in one year with prices in the next, which implies that prices react to production in the previous year and shows that the Afghanistan opium market presents the characteristics of a competitive market, meaning that prices do not seem to be driven by cartels or other forms of monopoly. It can therefore be expected that the low production levels of 2015 further increase prices, which might lead to an increase opium production in the future.

[13] Calculated with the updated conversion ratio from opium to heroin of export quality of 9.6:1.
[14] Calculated with the updated conversion ratio from opium to heroin of export quality of 9.6:1.
[15] The respective Pearson correlation coefficient is without time lag -0.337, with opium production values being one year ahead -0.583; with two years -0.541. The year 2001 (Taliban opium ban has been excluded from the analysis).

Figure 8: Nominal gross export value of opiates (US dollars: bars), together with the gross export value of opiates adjusted for inflation (US dollars: line), 2004 to 2015



Note: for ease of comparison, the Afghanistan inflation rate has been applied to US dollar prices. Changes in the exchange rates can alter the results (see Afghanistan Opium Survey 2013 for details).

4 Opium-poppy farmers in 2015: livelihood strategies and implications for alternative development

There is an increasing recognition that illicit crop cultivation needs to be treated primarily as a development issue. Current drug-control policies mainly aim at addressing illicit crop cultivation through alleviating poverty and ensuring sustainable alternative livelihood opportunities. Previous experience has showed that unless the principal drivers of illicit crop cultivation are properly identified and addressed, illicit cultivation will not be reduced in a sustainable manner. However, the drivers of illicit crop are mostly diverse, complex, and context specific.

Afghanistan is the world's largest producer of illicit opium poppy and heroin. Opium poppy constitutes in some provinces an important source of income for large parts of the rural population. However, rural livelihood strategies are multifaceted, and opium-poppy cultivation represents only one component of these strategies. With the changing needs and circumstances of a household, the decision to cultivate opium poppy and the extension of area under opium-poppy cultivation can change from one year to the next. It is important to recognize the complexity behind the decision to cultivate opium poppy, and to identify who the opium-poppy farmers are and their characteristics to support policies which can address their particular needs, risks and vulnerabilities.

Farmers' dependency on opium-poppy cultivation is in many cases not simply related to the income generated by opium-poppy sales; but rather to the lack of continuous, reliable and sustainable access to markets for selling alternative products. The current alternative development approach has recognized access to markets as a fundamental component of a diversified alternative development policy and thus differs from the (over-simplistic) crop substitution model used in the past. In order to better target alternative development programmes is important to address all factors that influence opium-poppy cultivation including the lack of non-farm job opportunities, crisis and conflict, and absence of physical and social infrastructure.

This chapter centres on the issues outlined above by addressing and generating evidence-based insights[16] into the following policy-relevant questions: who were the opium-poppy farmers in Afghanistan in 2015?; to what extent did farmers depend on opium-poppy income in Afghanistan in 2015?; and what were the risk and vulnerabilities that prevented farmers from ceasing opium-poppy cultivation in Afghanistan in 2015? The underlying motivation is that these insights help to design and achieve sustainable outcomes, based on a holistic development approach that tackles the major root causes of illicit crop cultivation in Afghanistan.

4.1 Who were the opium-poppy farmers in Afghanistan in 2015?[17]

Opium poppy, as lucrative cash crop, constitutes an important source of income for large parts of the rural population in some provinces of Afghanistan. However, rural livelihoods are complex and opium-poppy cultivation is one of the many elements that a rural household may consider for its livelihood[18]. Livelihood strategies adopted by a household are not constant and change over time, and new strategies are continuously developed and adopted in response to changes in internal (family-related) and external (outside of the family-sphere, such as adverse weather in the crop growing season) circumstances. With the changing needs and circumstances of a household, the decision to cultivate opium poppy can change from one year to the next.

Data from the socio-economic survey were used to identify the characteristics of farmers who cultivated opium poppy in 2015. One relevant aspect analyzed was if these farmers were engaged

[16] The evidence comes from a national representative sample of 1399 villages included in the socio-economic survey in 2015. The surveyors interviewed the 1399 headmen of each of these villages. They also interviewed different types of farmers inside these villages: 616 farmers who were growing opium poppy in 2015, 569 farmers who had stopped opium poppy cultivation, and 2897 farmers who had never grown opium poppy. Details of the sampling and data collection are included in the appendix.

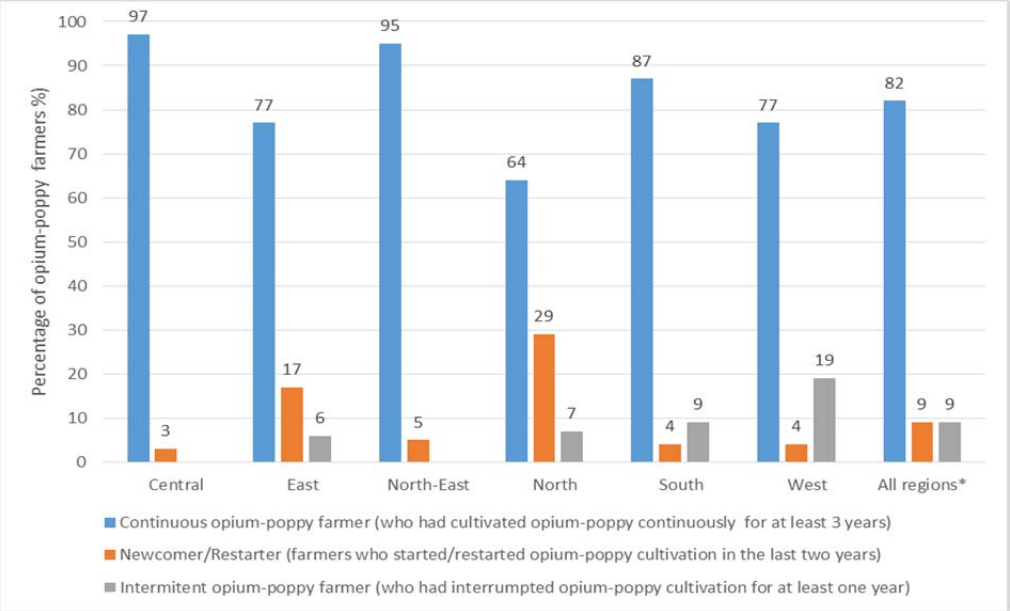
[17] Characterization of opium-poppy farmers focuses on opium-poppy cultivation patterns (in terms of continuity of opium-poppy cultivation, geographical-related patterns, and changes of opium-poppy areas over time). UNODC currently does not collect household-level data on educational level, food security conditions, or other socio-economic characteristics of opium-poppy farmers.

[18] With "livelihood" being more than just the activities that generate income, it is rather all activities and the decisions undertaken, which enable a family / household to live.

in opium-poppy cultivation before 2015. Eighty two percent of the farmers who grew opium poppy in 2015 had continuously cultivated opium poppy for at least three years ("continuous opium-poppy growers"); 9% interrupted opium-poppy cultivation for at least one year during the last 5 years ("intermittent opium-poppy growers"); and 9% had started or restarted opium-poppy cultivation in the last 2 years ("newcomers/ restarters").

Farmers' engagement in opium-poppy cultivation differed by region. For example, in the Central and Southern regions, the majority of opium-poppy growers cultivated opium poppy continuously (97% and 87%, respectively), which can be related to the long standing opium-poppy cultivation in these regions. In contrast, in the Northern and Eastern regions, an important percentage of opium-poppy farmers were newcomers / restarters (29% and 17%, respectively), which is in line with the trend in these regions of increasing levels of opium-poppy cultivation, especially during the last couple of years.

Figure 9: Type of opium-poppy farmer per region in Afghanistan (percentage), 2015[a]

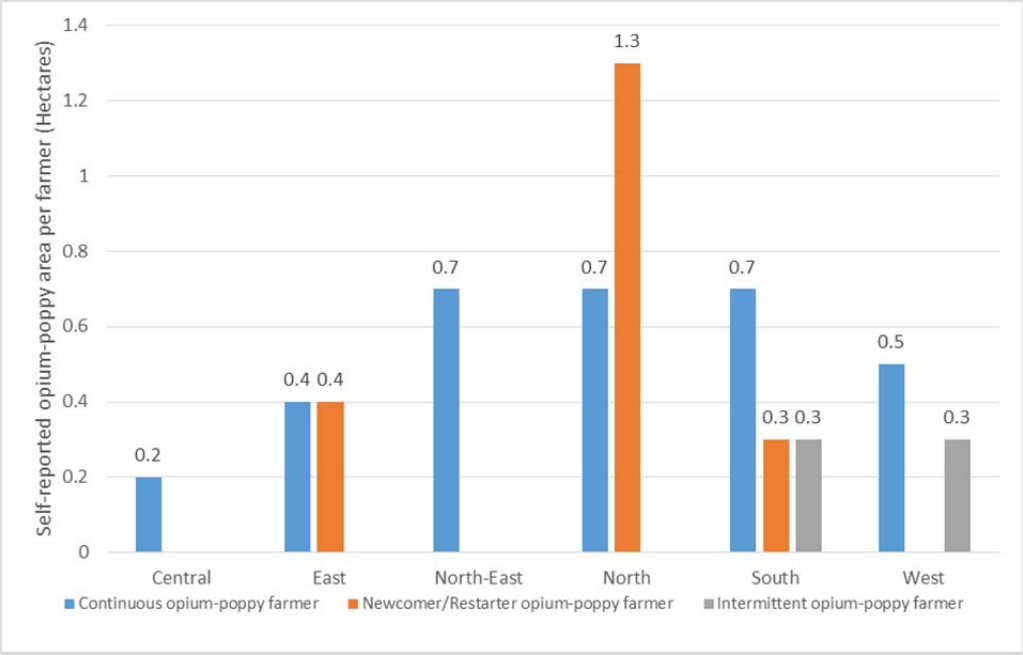


[a] *Based on self-reported data from a convenience sample of opium-poppy farmers (n=617).*
** Weighted average based on the actual number of villages per region.*
Total number of surveyed opium-poppy farmers = 617

Continuous, intermittent and newcomer/restarter opium-poppy farmers showed different attitudes toward the risk associated with opium-poppy cultivation and different opium-poppy cultivation patterns in terms of average area under cultivation and number of opium-poppy fields per farmer. In long-standing opium-poppy regions, such as the South, continuous opium-poppy farmers, who may generally have more experience growing opium poppy, seemed to have a lower perception of the risks associated with this activity (e.g., losses due to eradication activities) than the other types of opium-poppy farmers. In this region, continuous opium-poppy farmers self-reported larger opium-poppy areas (0.7 hectares per opium-poppy farmer) than newcomers/restarters or intermittent opium-poppy farmers (0.3 hectares each). Also the number of opium-poppy fields per farmer was similar for all types of opium-poppy farmers (1 opium-poppy field per farmer).

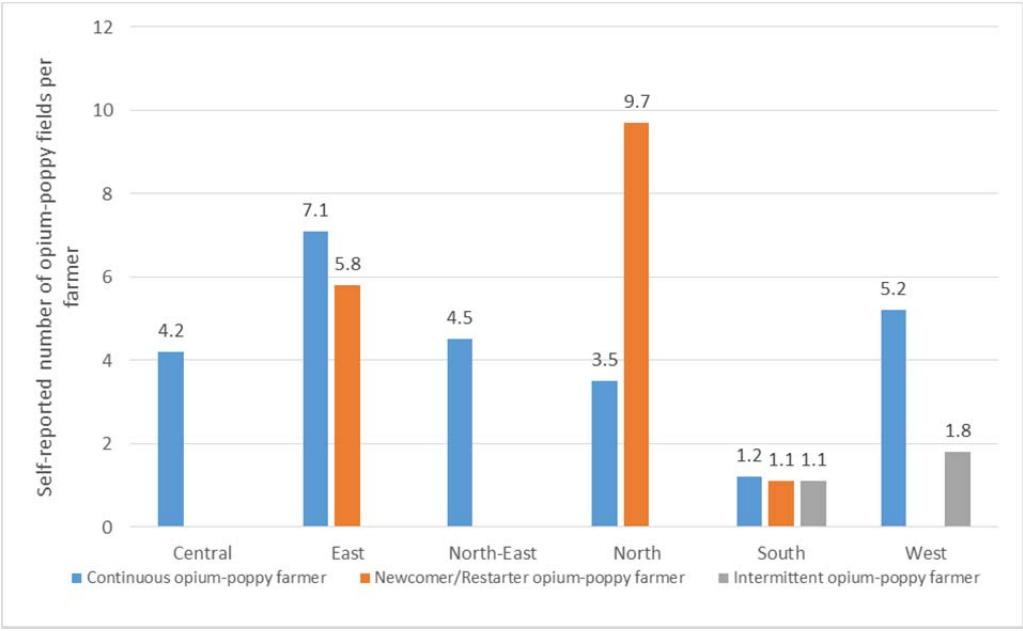
In relatively new opium-poppy regions, such as the North, newcomers/restarters dedicated larger land resources to opium-poppy cultivation than continuous opium-poppy farmers; however, distributed in multiple opium-poppy fields. In this region, newcomers/restarters self-reported that they cultivated 1.3 hectares of opium poppy in an average of 10 opium-poppy fields, while continuous opium-poppy farmers self-reported 0.7 hectares in 4 opium-poppy fields. More research is needed to understand whether this is related to a desire to reduce potential losses in case of eradication or rather rooted in local agricultural practices.

Figure 10: Self-reported opium-poppy area per type of farmer and region in Afghanistan, 2015 [a, b, c]



[a] *Data not available for all type of opium-poppy farmers in all regions.*
[b] *Based on self-reported data from a convenience sample of opium-poppy farmers (n=617).*
[c] *There was high variation on the responses related to opium-poppy areas and number of opium-poppy fields in the North. One of the reasons may be that surveyors in this region had access to opium-poppy farmers with large total opium-poppy areas, which are not representative of the whole region.*

Figure 11: Self-reported number of fields under opium-poppy cultivation per type of farmer and region in Afghanistan, 2015 [a, b, c]

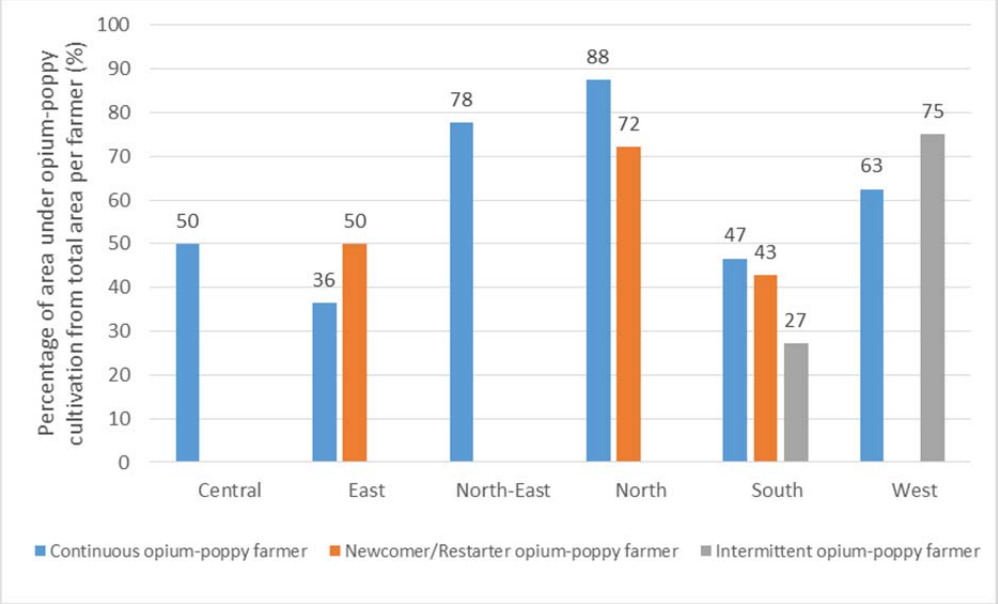


[a] *Data not available for all type of opium-poppy farmers in all regions.*
[b] *Based on self-reported data from a convenience sample of opium-poppy farmers (n=617).*
[c] *There was high variation on the responses related to opium-poppy areas and number of opium-poppy fields in the North. One of the reasons may be that surveyors in this region had access to opium-poppy farmers with large total opium-poppy areas, which are not representative of the whole region.*

In general opium-poppy farmers used less than 50% of their total agricultural land for growing opium poppy (particularly in the South, where most of the opium-poppy cultivation is concentrated). The North was an exception as opium-poppy farmers there dedicated almost all their land resources to cultivate opium poppy in 2015 (72-88%). However, over the years, opium-poppy farmers have often changed the distribution and size of the area under opium-poppy cultivation. Among the "continuous" opium-poppy growers[19], there were variations of the area under opium-poppy cultivation between 2014 and 2015: in the South, North, and North-East there was a general increase on the opium-poppy areas; while in the Central, Eastern and Western regions, most of the continuous opium-poppy growers maintained the same opium-poppy areas.

Afghan farmers cultivated licit and illicit crops under a variety of land tenure modalities. Besides cultivating crops in their own land, they cultivated crops in rented land (land tenancy), and used land and returned a share of the crops produced on this land as payment to the owner (sharecropping). As for all crops, individual farmers may cultivate opium poppy in a land they do not own. This seems to be particularly the case in the North, where 66% of the opium-poppy farmers operated under more than one land use modality, and only 34% used exclusively their own land for cultivating crops.

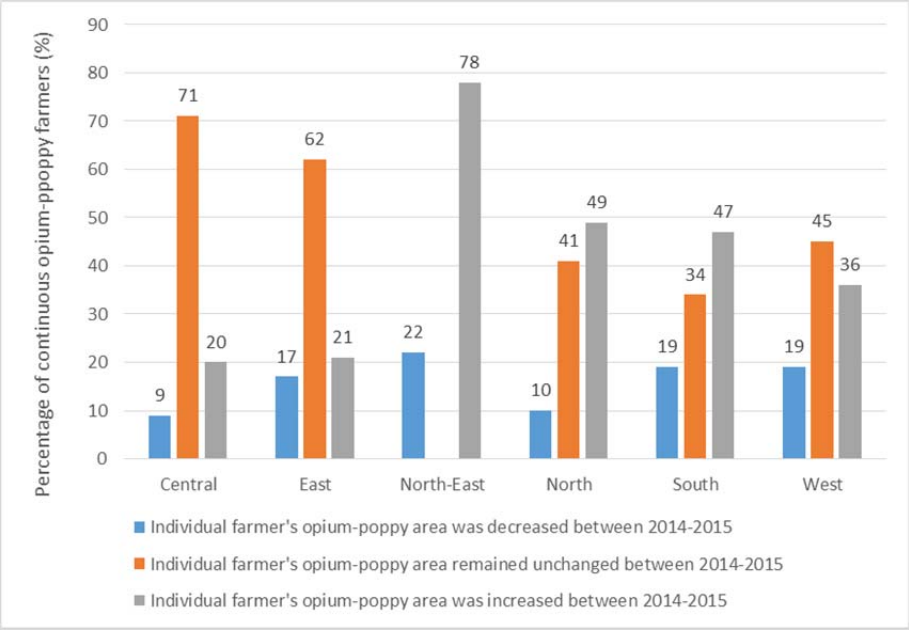
Figure 12: Percentage of area under opium-poppy cultivation of total agricultural area per type of farmer and region in Afghanistan, 2015 [a, b]



[a] *Data not available for all type of opium-poppy farmers in all regions.*
[b] *Based on self-reported data from a convenience sample of opium-poppy farmers (n=617).*

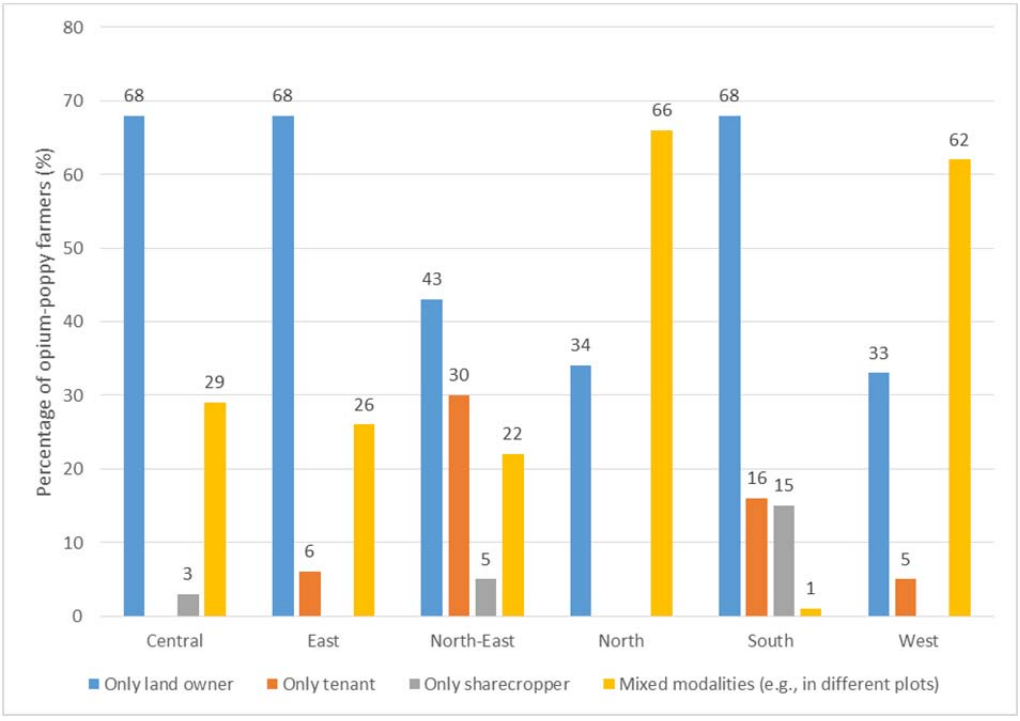
[19] No data available or applicable for newcomers / restarters or intermittent poppy farmers.

Figure 13: Changes of individual area under cultivation of continuous opium-poppy farmers in 2015 with respect to 2014 by region (percentage of farmers) [a]



[a] *Based on self-reported data from a convenience sample of opium-poppy farmers (n=617).*

Figure 14: Percentage of opium-poppy farmers per land use modality for cultivating legal and illicit crops in Afghanistan, 2015[a]



[a] *Based on self-reported data from a convenience sample of opium-poppy farmers (n=617).*

In summary, opium-poppy farmers are not homogeneous, and there is evidence for differences in terms of their decisions to cultivate opium poppy over time, which is at least partially associated with regional characteristics. Some farmers grow opium-poppy every year, while others may stop

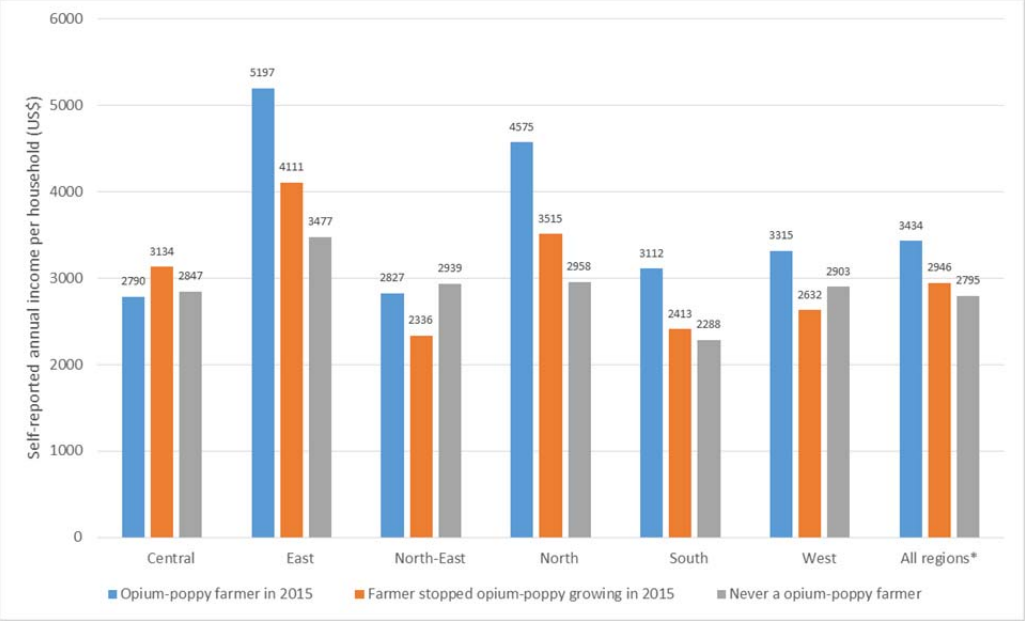
cultivation in a particular year, only to restart when the conditions change. In addition, opium-poppy farmers vary their total areas under opium-poppy cultivation over time, either by using their own land or other modalities (tenancy or sharecropping). As such, it is important to identify the circumstances that influence the decision to grow opium poppy or not and the amount of land dedicated to opium-poppy cultivation in the different types of opium-poppy growers, but equally important is to focus on the conditions that promote resilience (capacity to remain outside the illegal crop production).

4.2 To what extent did farmers depend on opium-poppy income[20] in Afghanistan in 2015?

Incomes per person/day of opium-poppy farmers and non-opium-poppy farmers were similar

At first sight, opium-poppy farmers in Afghanistan appeared to be better off than non-opium-poppy farmers in 2015. On a national average, opium-poppy farmers self-reported an annual income per household 14% higher than the income of farmers who stopped opium-poppy cultivation in 2015 and 19% higher than the income of farmers who had never grown opium poppy.

Figure 15: Self-stated annual income per household in US Dollars by type of farmer and region in Afghanistan, 2014 (reported in 2015)



** Weighted average based on the actual number of villages per region. Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.*

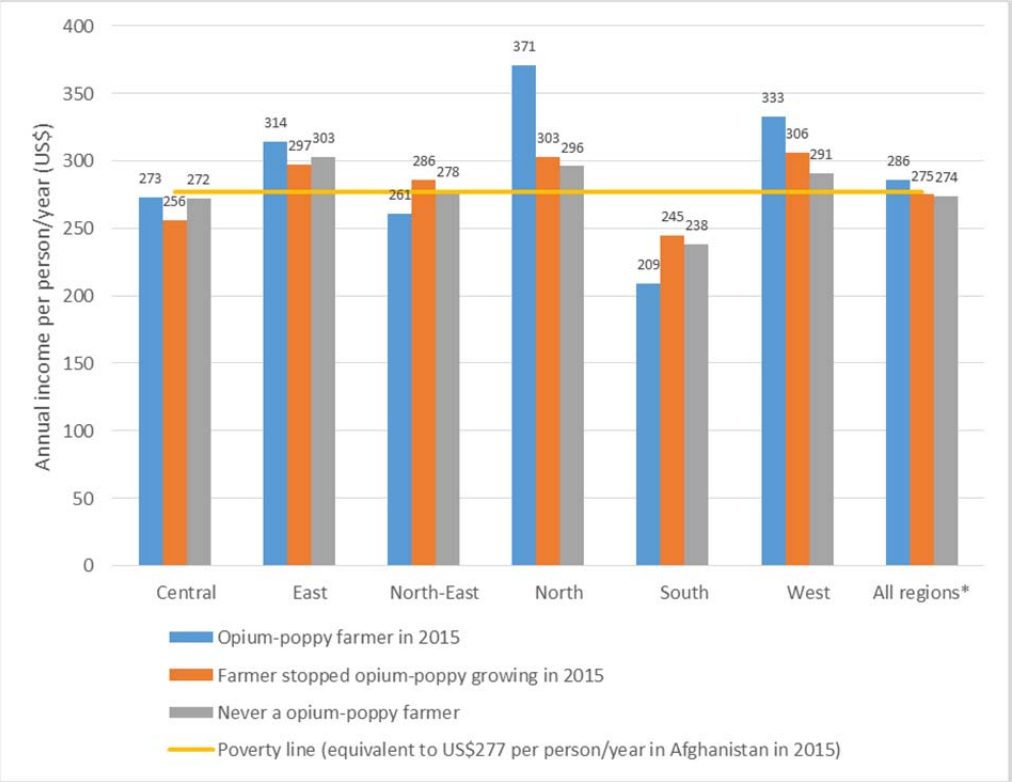
This picture changes when considering average household size, since opium-poppy-growing households tend to be larger than non-poppy-growing households. The household income of those who grew opium poppy had to sustain on average more persons than the household income of non-opium-poppy farmers.

Adjusting for household size, opium-poppy farmers were only slightly better off than non-opium-poppy farmers in 2015, as their annual income per person was only 4% higher than the income per person from farmers who stopped opium-poppy cultivation or farmers who had never grown opium poppy.

[20] Mentions to income in this section refers to net income.

Considering household sizes has further implications. When comparing the annual income per person against the poverty line of US$1.9 per person per day[21] (equivalent to US$0.76 per person per day or US$277 per person per year after correcting for the differences between US and Afghanistan currencies[22]); many of the surveyed farmers remained - on average - below the poverty line[23], especially the farmers in the South.

Figure 16: Calculated annual income per person (US Dollars) by type of farmer and region in Afghanistan, 2014 (based on data reported in 2015)[a, b]



** Weighted average based on the actual number of villages per region.*

[a] In 2015, UNODC collected farm-level data on annual income but not on household size. The annual income per person/year was calculated based on the information provided by the village headmen about the total number of inhabitants and households in the village (number of inhabitants/number of households = average number of members per household in the village).

[b] As reported in the previous section, the surveyed opium-poppy farmers in the North in 2015 are not representative of the opium-poppy farmers in this region. Several of the surveyed opium-poppy farmers were large landlords with large areas under opium-poppy cultivation. The farmer's data is collected using convenience samples, according to the method described in the methodology section of this report.

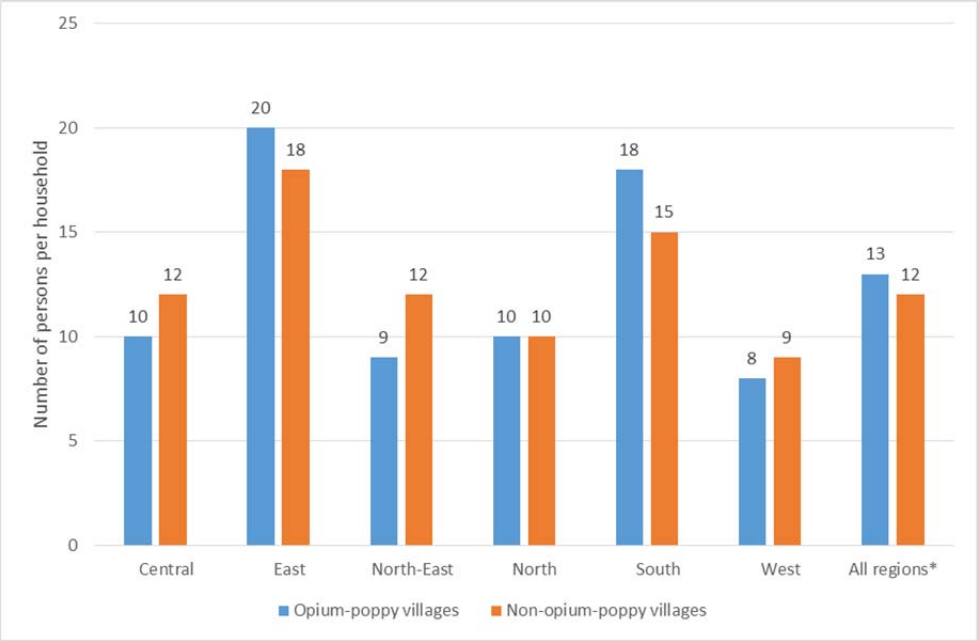
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

[21] Source: World Bank; international poverty line of US$1.90 a day as of October 2015 (www.worldbank.org).

[22] No data available for the value of purchasing power parity (PPP) of 2015 in Afghanistan. The average of the last for years (2011-2014) was used for the calculation instead (equivalent to 0.4; World Bank, data.worlbank.org, 2015).

[23] A notable exception were the opium-poppy farmers in the North. As reported in the previous section, the surveyed opium-poppy farmers in the North in 2015 are not representative of the opium-poppy farmers in this region. Several of the surveyed opium-poppy farmers were large landlords with large areas under opium-poppy cultivation. The farmer's data is collected using convenience samples, according to the method described in the methodology section of this report.

Figure 17: Average household size per village by type of village and region in Afghanistan, 2015[a]



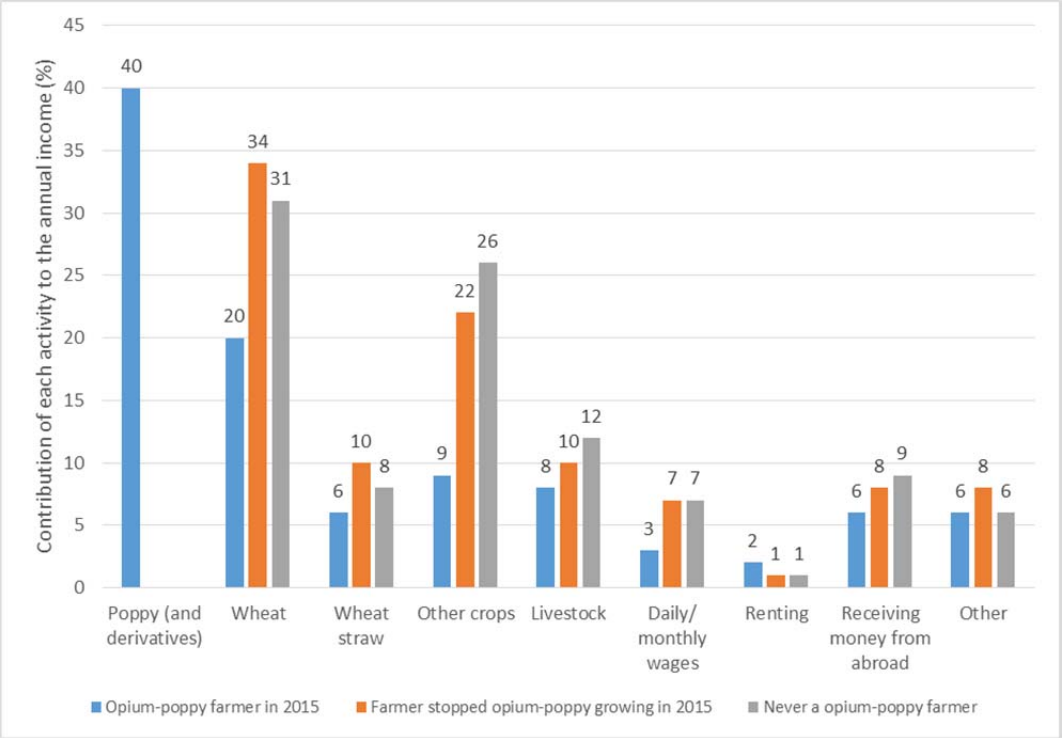
[a] *Weighted average based on the actual number of villages per region.*
Opium-poppy village= village where the village headman reported opium-poppy growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

Major source of income for opium-poppy farmers was opium-poppy while for non-opium-poppy farmers was wheat and other cash crops

The livelihood strategies of farmers in Afghanistan are complex and involve multiple income-generating activities performed through the year. However, for opium-poppy growers, the sales of opium poppy and derivatives represented the main source of income and on average accounted for 40% of their annual income. Other important sources of income for opium-poppy growers were sales of wheat and wheat straw (26% of their total annual income), sales of other crops (9%), and livestock related activities (8%).

For farmers who stopped opium-poppy growing in 2015 and farmers who had never grown opium poppy, the major source of income was wheat sales, including wheat straw, which represented 44% and 39% of their total income, respectively; followed by the sales of other crops, which contributed with 22% and 26% of their total income, respectively.

Figure 18: Percentage from total annual income per income-generating activity by type of farmer in Afghanistan, 2014 (reported in 2015)[a]

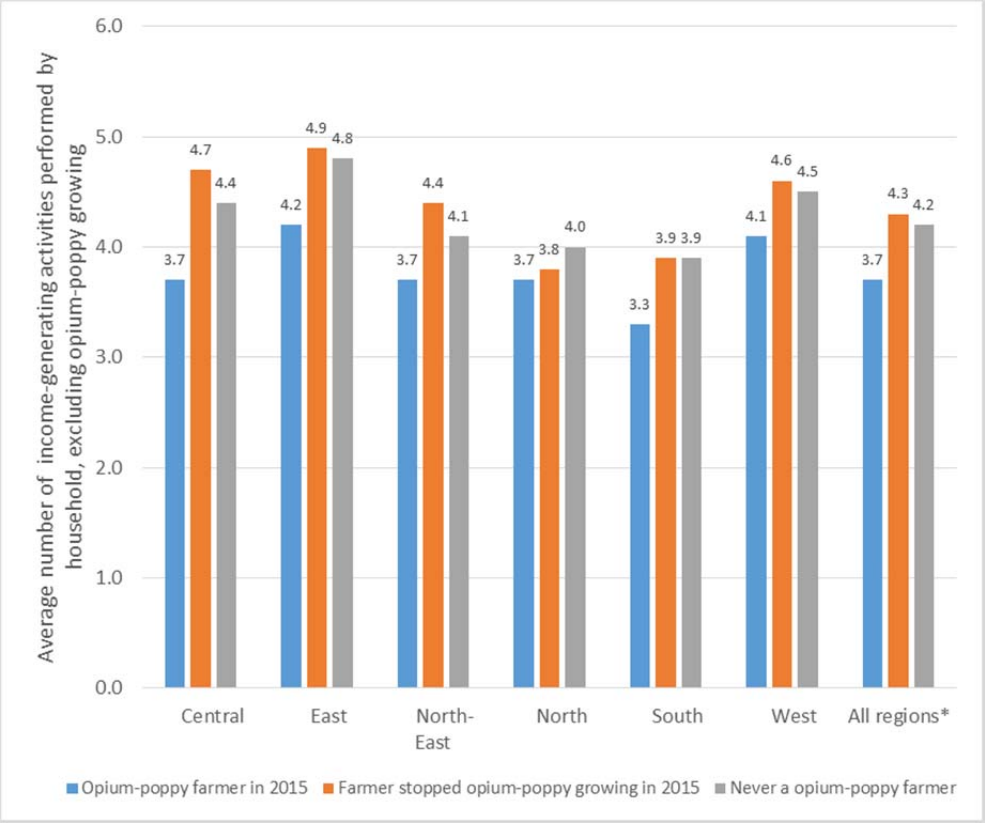


[a] *Weighted average based on the actual number of villages per region.*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Livelihood strategies of opium-poppy and non-opium-poppy farmers were similar, but fewer opium-poppy farmers participate in cultivating other crops and earning wages

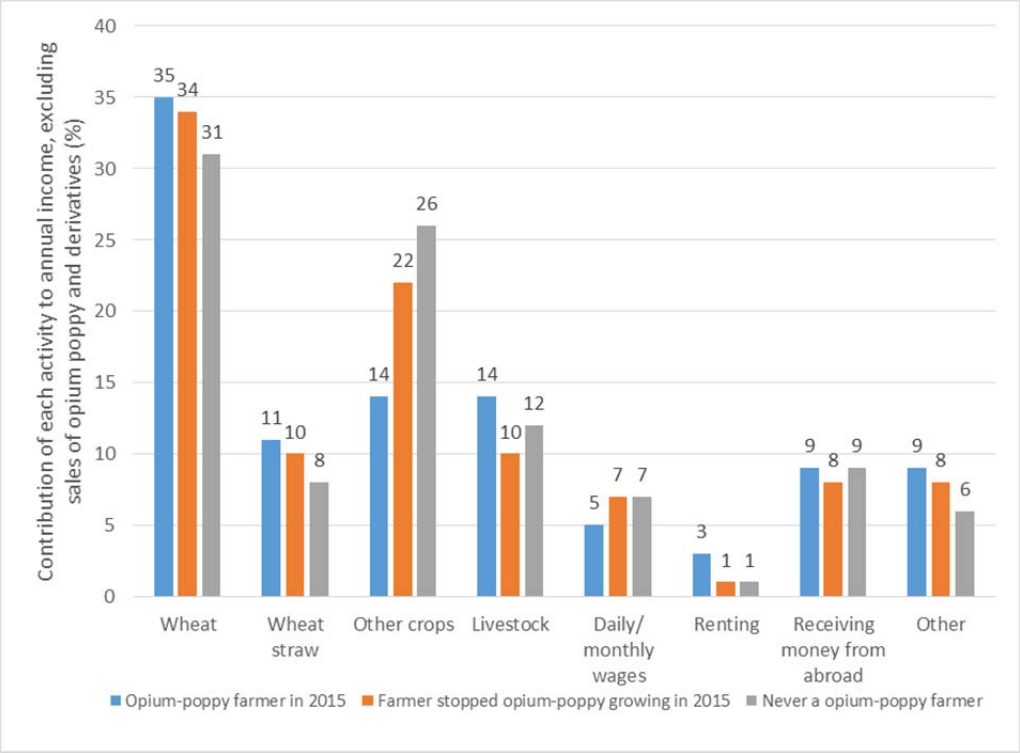
If opium-poppy income were excluded, the livelihood strategy of opium-poppy growers resembled the livelihood strategies of other farmers in terms of the average number of income-generating activities performed per household (about 4) and the contribution of each income-generating activity to the total income of the household in 2015. An exception was the income derived from other crops, whose contribution to total income was larger for farmers who stopped opium-poppy growing and farmers who had never grown opium poppy (22 and 26% of the total income, respectively) than in the case of opium-poppy growers (14%).

Figure 19: Average number of income-generating activities performed by household, excluding sales of opium poppy and derivatives, by type of farmer and region in Afghanistan, 2015[a]



[a] *Weighted average based on the actual number of villages per region.*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Figure 20: Percentage from total annual income per income-generating activity, excluding sales of opium poppy and derivatives, by type of farmer in Afghanistan, 2014 (reported in 2015)[a]

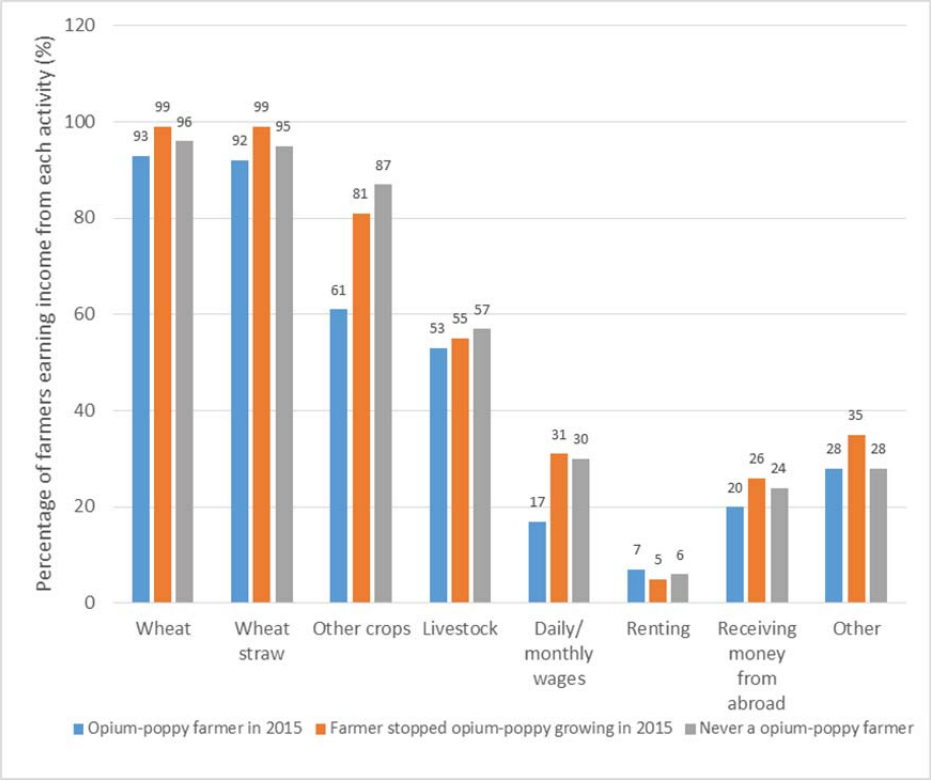


[a] *Weighted average based on the actual number of villages per region.*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

When looking at the proportion of farmers that engage in a certain activity, more similarities than differences could be observed, as well. The majority of opium-poppy farmers earned income from wheat and wheat straw sales (at least 92%) just like the other two types of farmers: 99% of farmers who stopped opium-poppy growing and 96% of farmers who had never grown opium poppy earned income from wheat and wheat straw in 2015.

A difference, however, was found in the proportion of farmers selling other crops and earning a wage. Among opium-poppy farmers 61% and 17%, respectively, reported income from these activities, which was significantly lower than the proportions of non-opium-poppy farmers engaging in these activities (81-87% and 30-31%, respectively).

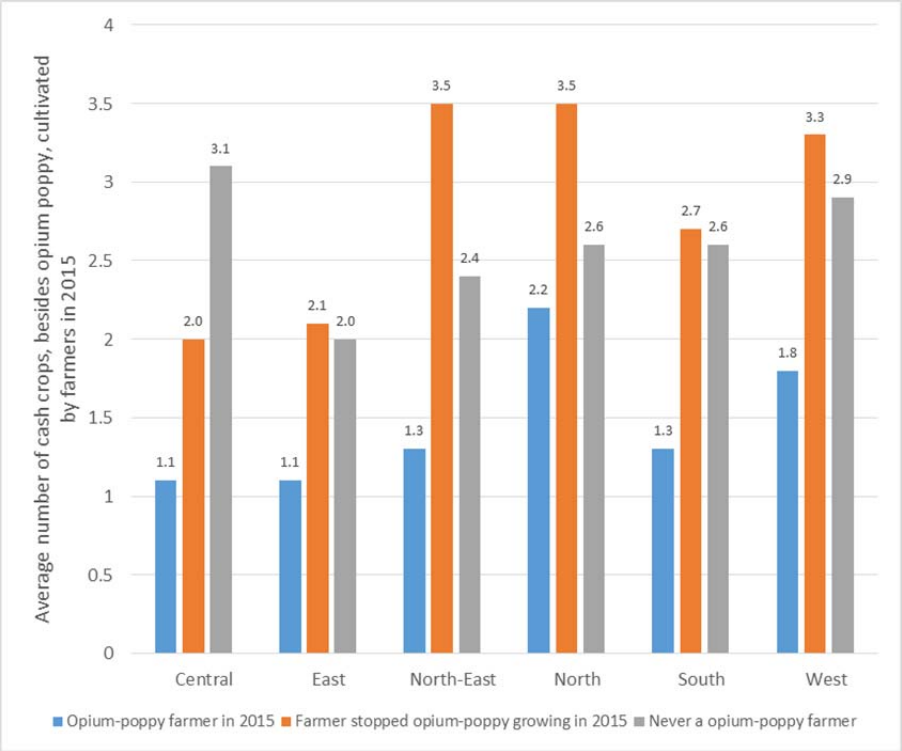
Figure 21: Percentage of farmers engaging in an income-generating activity, excluding sales of opium poppy and derivatives, in Afghanistan, 2015*



** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Cash crops play an important role in the livelihood strategies of all farmers. However opium-poppy farmers displayed less diversified agriculture practices and cultivated on average less number of cash crops than the other type of farmers. On average, opium-poppy growers cultivated 1.8 cash crops, besides opium poppy, while farmers who stopped opium-poppy growing cultivated 3.3 cash crops and farmers who had never grown opium poppy 2.9 cash crops.

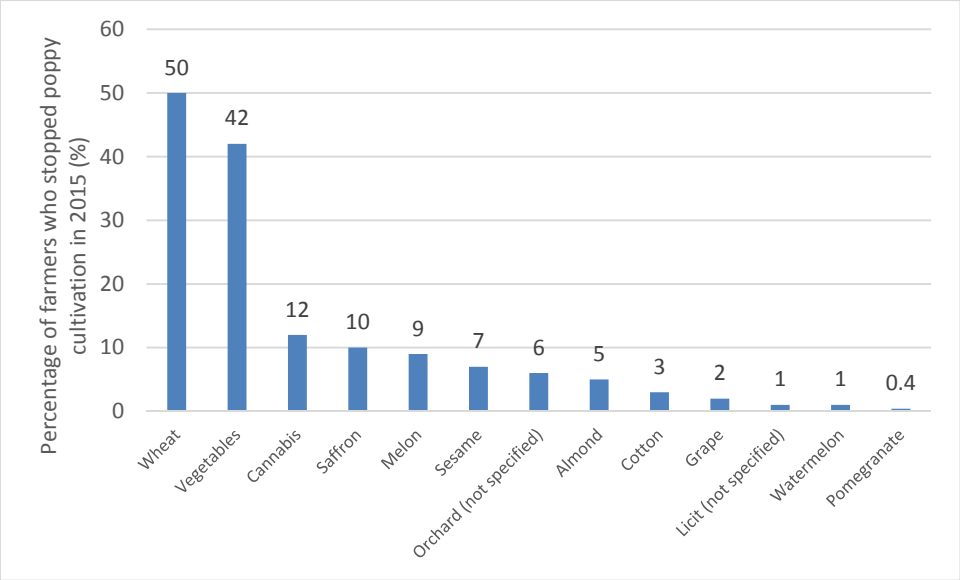
Figure 22: Average number of cash crops, besides opium poppy, cultivated by type of farmer in Afghanistan, 2015*



[a] *Weighted average based on the actual number of villages per region.*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

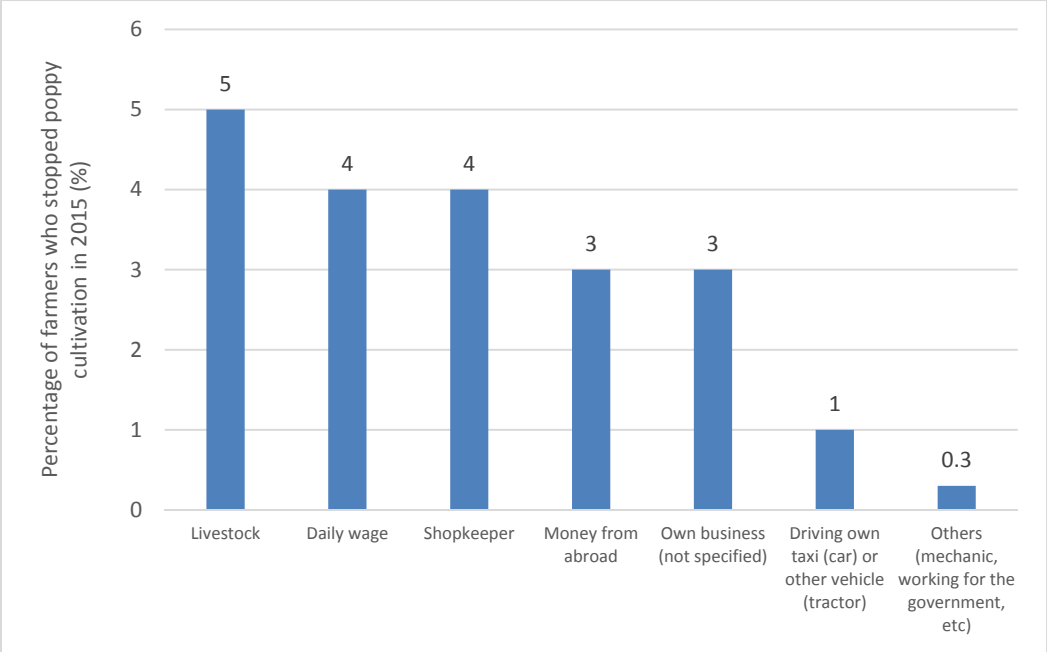
Looking at the opium-poppy replacement strategies of farmers who stopped cultivating opium poppy, it can be noted that the overwhelming strategy used to replace opium-poppy income was to cultivate alternative crops; few farmers reported replacing opium-poppy income with a non-crop related activity. Fifty percent of the farmers who stopped opium-poppy cultivation indicated they replaced opium poppy with wheat, and 42% with vegetables. Cannabis was also used as replacement (12%), but mostly in the South (25%) and the Central (20%) regions. Other sources of income not related with crop substitution included livestock (5% of farmers), daily wage (4%), or shopkeeper (4%), but were less common. Transferences of money from abroad replaced opium-poppy income for only 3% of the farmers.

Figure 23: Percentage of farmers who stopped opium-poppy cultivation and replaced opium-poppy income with an alternative cash crop in Afghanistan, 2015*,**



** Weighted average based on the actual number of villages per region*
*** Options not mutually exclusive*
Number of surveyed farmers who stopped opium-poppy growing in 2015 = 569. Not all surveyed farmers replied all questions of the questionnaire.

Figure 24: Percentage of farmers who stopped opium-poppy cultivation and replaced opium-poppy income with an alternative (non-crop related) activity in Afghanistan, 2015*,**



** Weighted average based on the actual number of villages per region*
*** Options not mutually exclusive*
Number of farmers who stopped opium-poppy growing in 2015 = 569. Not all surveyed farmers replied all questions from the questionnaire.

Contribution of other crops and activities to household income and reasons for opium-poppy farmers' dependency on opium-poppy income

Besides the sales of opium poppy and derivatives, which directly benefitted only those farmers who cultivated opium poppy, the highest income – generating activity for most of the farmers, especially for farmers who had never grown opium poppy, was receiving money from abroad (US$ 927-1,383 per year), although on average, only a quarter of all farmers reported this source of income.

The second highest income-generating activity was wheat and wheat straw sales (US$ 927-1,196 per year). In contrast to remittances, almost all farmers benefited from this activity (93% of opium-poppy farmers and 95-99% of the other farmers).

The third highest income-generating activity was the sales of other crops (US$ 523-857 per year). Only 61% of opium-poppy growers engaged in it; whereas slightly more than 80% of farmers who stopped opium-poppy growing and farmers who had never grown opium poppy engaged in this activity.

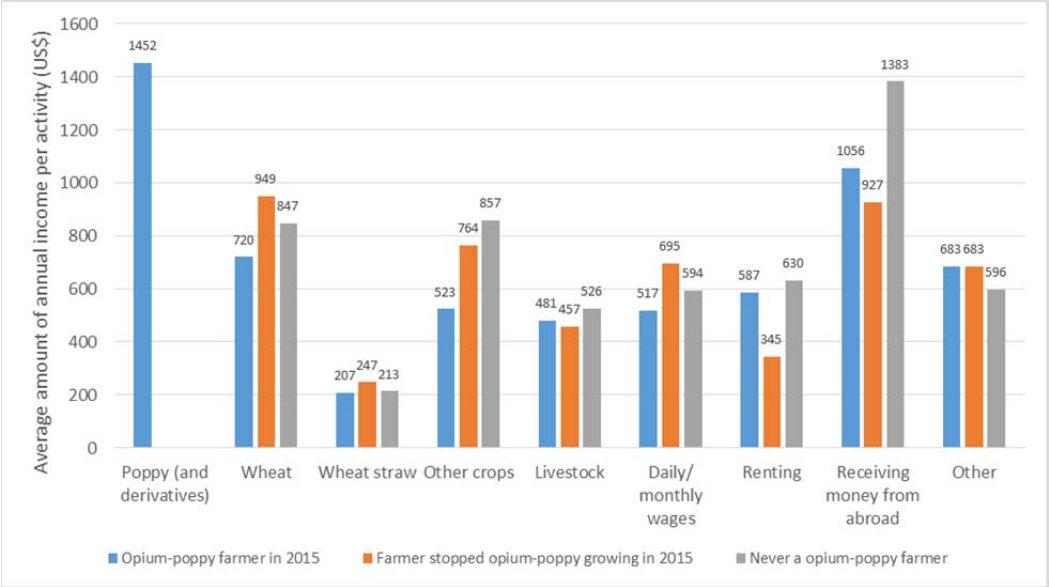
A possible explanation of the more limited basket of crops cultivated by opium-poppy farmers could be a lower per-hectare income from wheat and other crops in comparison to non-opium-poppy farmers. However, opium-poppy farmers obtained 16% more income per hectare in the case of wheat and 60-80% in the case of other crops than the other farmers. The reasons for these marks up do not seem linked to efficiency gains in cultivating crops in larger areas because opium-poppy farmers reported smaller areas under wheat and other crop cultivation than non-opium-poppy farmers.

Therefore, the higher income per hectare of opium-poppy growers could be a result of more fertile land or better irrigation methods (most of the opium-poppy growers indeed had access to irrigation)[24]. Nevertheless, the higher income per hectare from other crops was also partially related with cannabis cultivation[25]. The cultivation and sales of opium poppy and cannabis are related. A higher percentage of villages where opium-poppy growing took place also reported the cultivation of cannabis (29% and 20% of villages, respectively). The South is where most of the cannabis cultivation seems to happen with 73% of both opium-poppy and non-opium-poppy villages having been engaged in cannabis cultivation.

[24] Other possible explanation is that non-poppy-opium farmers consume a larger proportion of the (staple) crops they cultivate than opium-poppy farmers, which decreases the total amount from these crops that non-poppy-opium farmers can sell in the market and therefore also reduces the income per hectare obtained from cultivating these crops. Some opium-poppy farmers may have found more convenient to buy at least part of the staple crops needed for the household in the market instead of using land and resources for cultivating them. This could be particularly the case of staple crops that are consumed often in the household and can be stored for long time such as wheat.

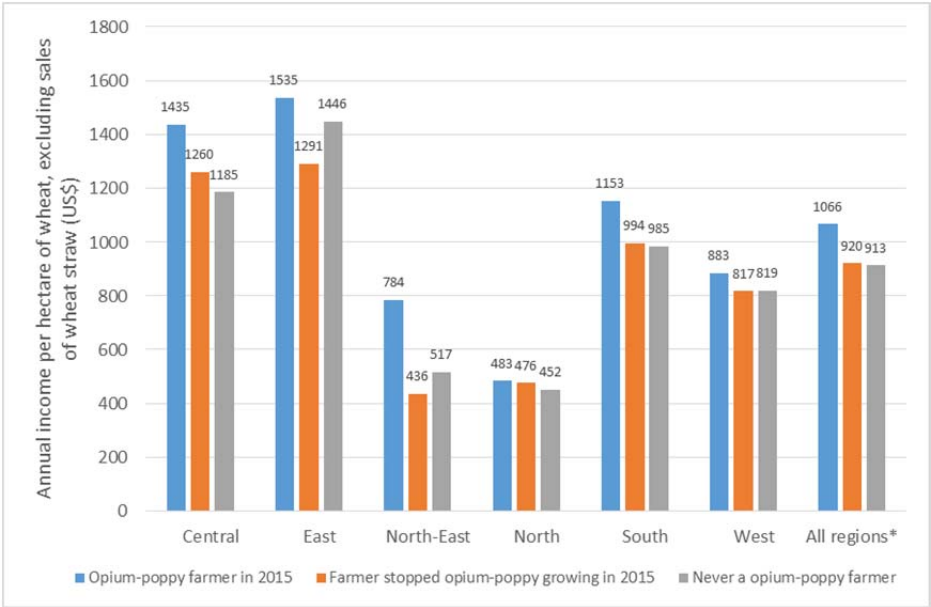
[25] It is not possible to conduct a more detailed analysis on this issue, as the available data do not allow to isolate the income obtained from cannabis from the income obtained from the other crops, besides opium poppy.

Figure 25: Self-reported average amount of annual income per activity (US$) by type of farmer in Afghanistan, 2014 (reported in 2015)[*,]**



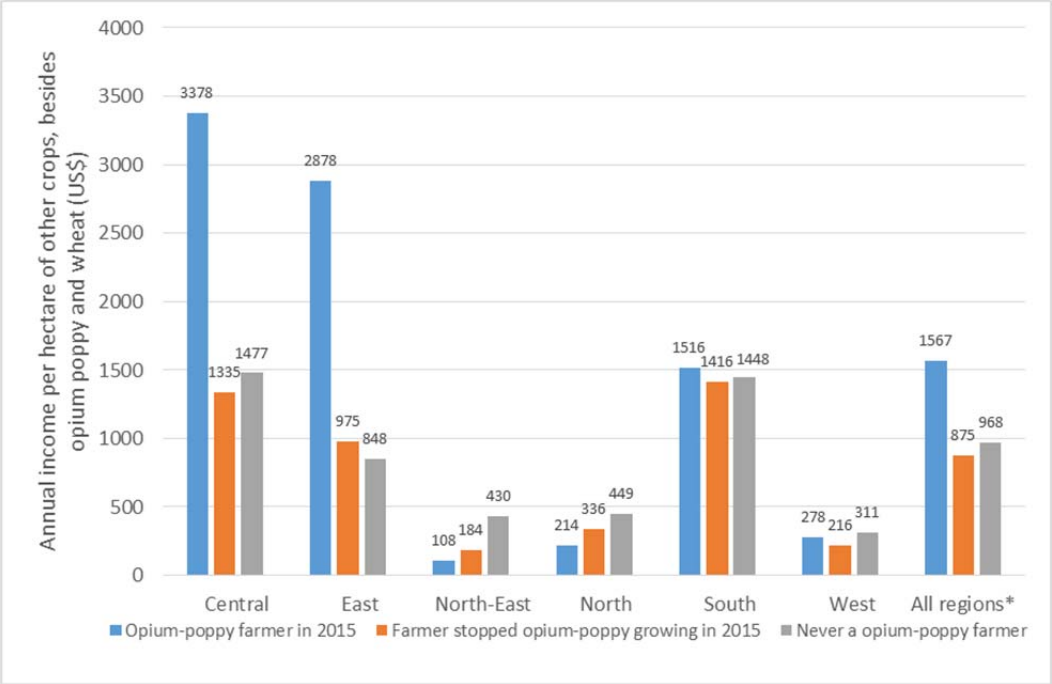
** Weighted average based on the actual number of villages per region*
*** Average areas under crop cultivation differ among type of farmer. Data not reported as US$/Hectare in the graph.*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Figure 26: Annual income per hectare of wheat, excluding sales of wheat straw (US$), by type of farmer and region in Afghanistan, 2014 (reported in 2015)[a]



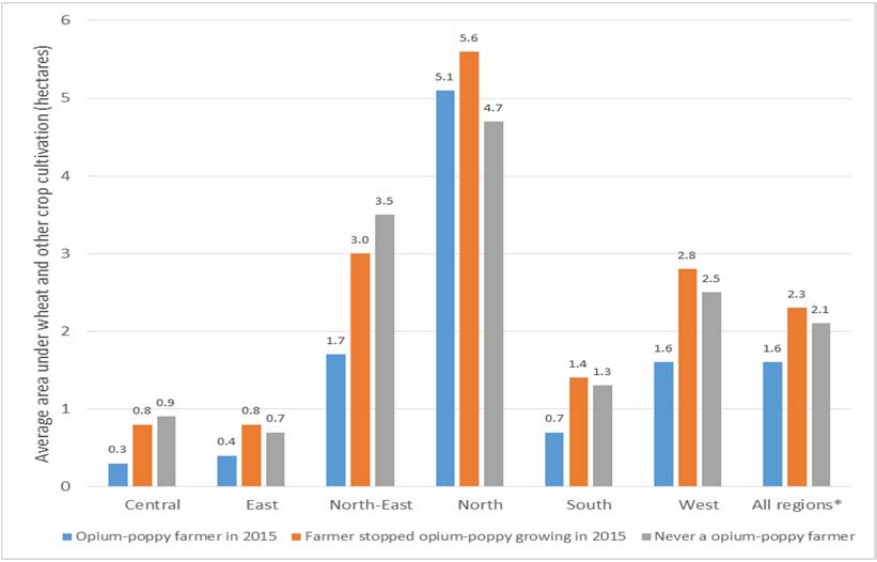
[a] Calculated based on self-reported farmers' data on income obtained from wheat sales and area under wheat cultivation (hectares).
** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Figure 27: Annual income per hectare of other crops, besides opium poppy and wheat (US$) by type of farmer and region in Afghanistan, 2014 (reported in 2015)[a]



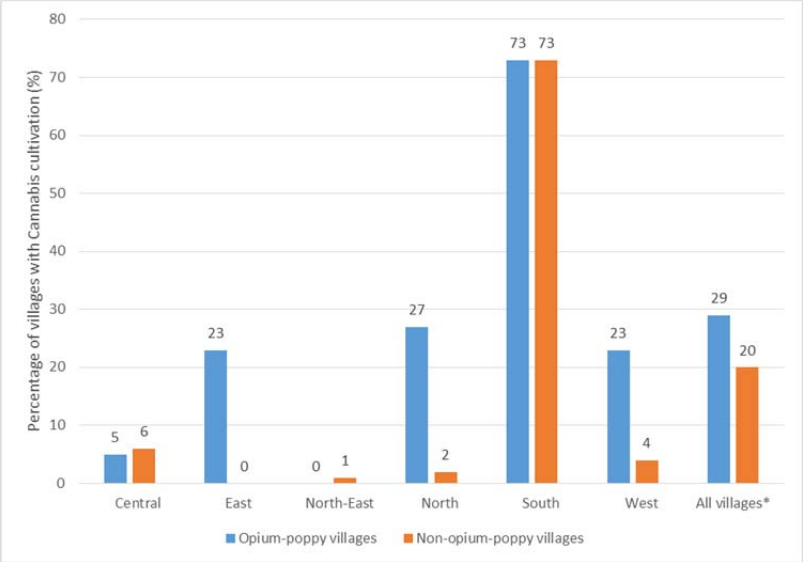
a Calculated based on self-reported farmers' data on income obtained from sales of other crops and area under other-crops cultivation (hectares).
** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Figure 28: Self-reported average area under wheat and other crop cultivation (hectares) by type of farmer and region in Afghanistan, 2015



** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Figure 29: Percentage of villages with cannabis cultivation by region in Afghanistan, 2015*



** Weighted average based on the actual number of villages per region*
Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

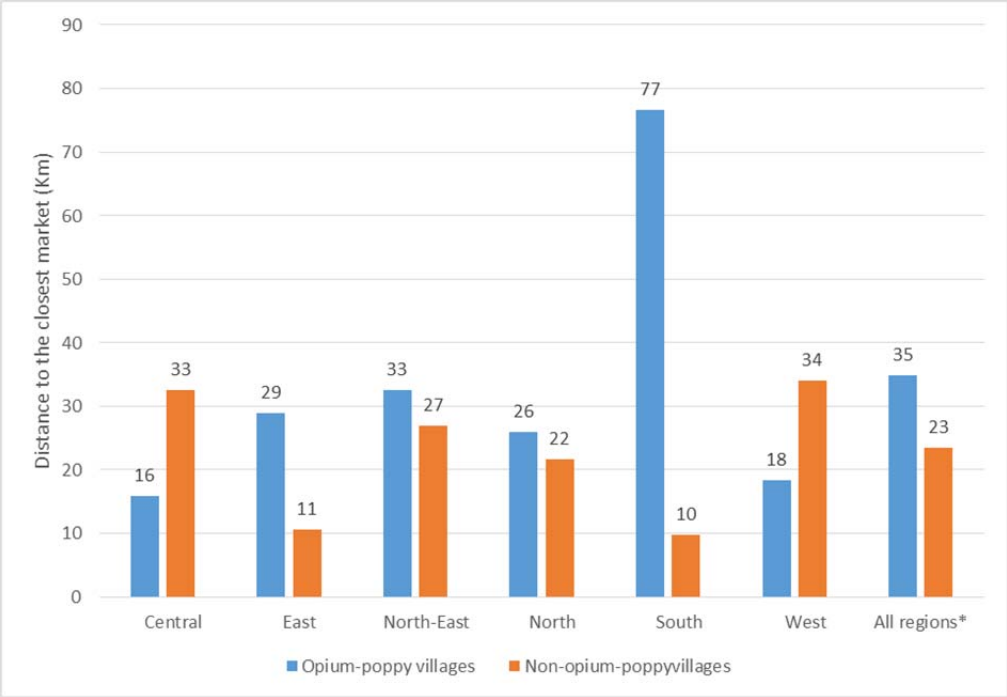
Despite the higher return opium-poppy farmers may have enjoyed on licit crops, they faced more challenges in relation to market access, which restricted their participation in this activity[26]. On average, opium-poppy-growing villages were located further away from markets than non-poppy-growing villages. This is particularly true in the Southern region where the average distance to the closest market was 77 km for opium-poppy-growing villages, and 10 km for non-poppy-growing villages.

Who else benefited from opium-poppy cultivation in Afghanistan in 2015?

The income from opium cultivation does not always benefit only the involved farmers. Indeed, more than half of opium-poppy farmers in the East and West indicated that they paid monetary contributions (59 and 64%, respectively) to external beneficiaries amounting around 10% of their opium-poppy earnings. The major recipients of these contributions were insurgents (84% in the East and 68% in the West).

[26] Opium-poppy farmers do not need to transport opium-poppy to the market after harvesting as it is collected directly from their fields.

Figure 30: Distance from the village to the closest market (Km) by region in Afghanistan, 2015



** Weighted average based on the actual number of villages per region*
Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

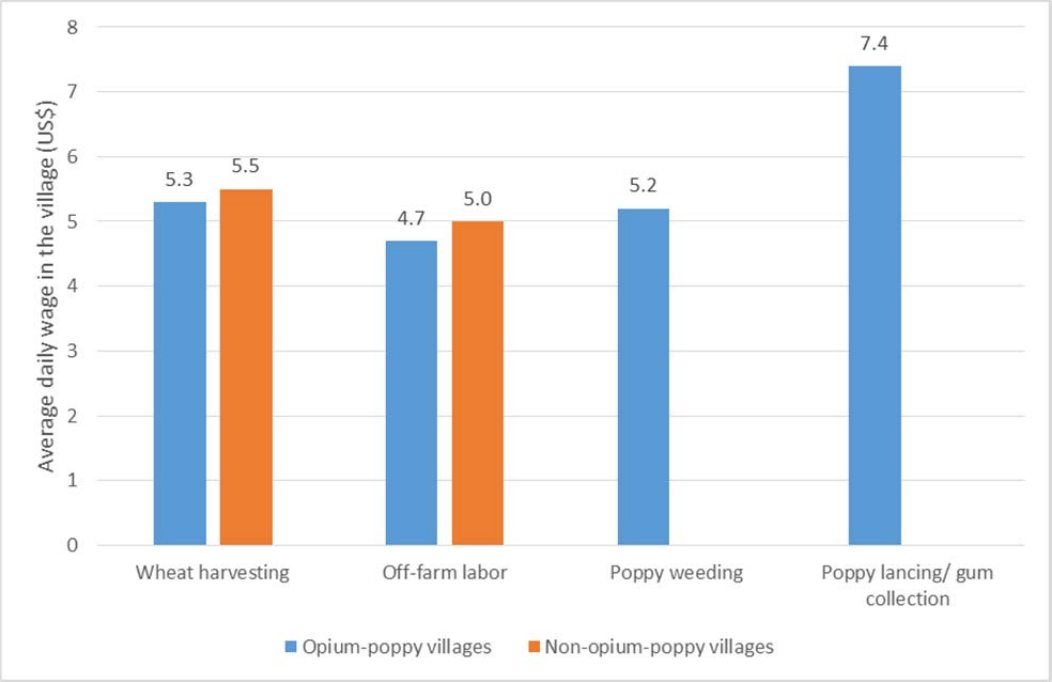
Besides cultivating crops, farmers can also engage in salaried labour in rural Afghanistan. Nevertheless, salaried labour did not seem to be a viable substitute for opium-poppy income as only a small number of farmers who stopped opium-poppy cultivation in 2015 mentioned it as alternative. Off-farm daily wages were relatively low for supporting a household alone, as they were 4.7 US$ per day and the average household size was 13 persons for opium-poppy farmers. So one or two wage labourers in the household working at the same time would not have been sufficient for bringing the household above the poverty line of US$ 0.76 per person per day.

In addition to the low profitability, access to off-farm job opportunities was limited in most of the regions. On average, only about 30% of the headmen from opium-poppy-growing villages reported the availability for off-farm employment inside their villages and 40% of headmen from non-poppy-growing villages.

Opium-poppy farmers seemed to have very limited opportunities to replace their opium-poppy income. With difficult access to markets for legal crops, low wages, and low availability of off-farm employment, many opium-poppy farmers depended on opium-poppy cultivation - even if their total annual income was almost equal to the total annual income earned by non-opium-poppy growers in 2015.[27]

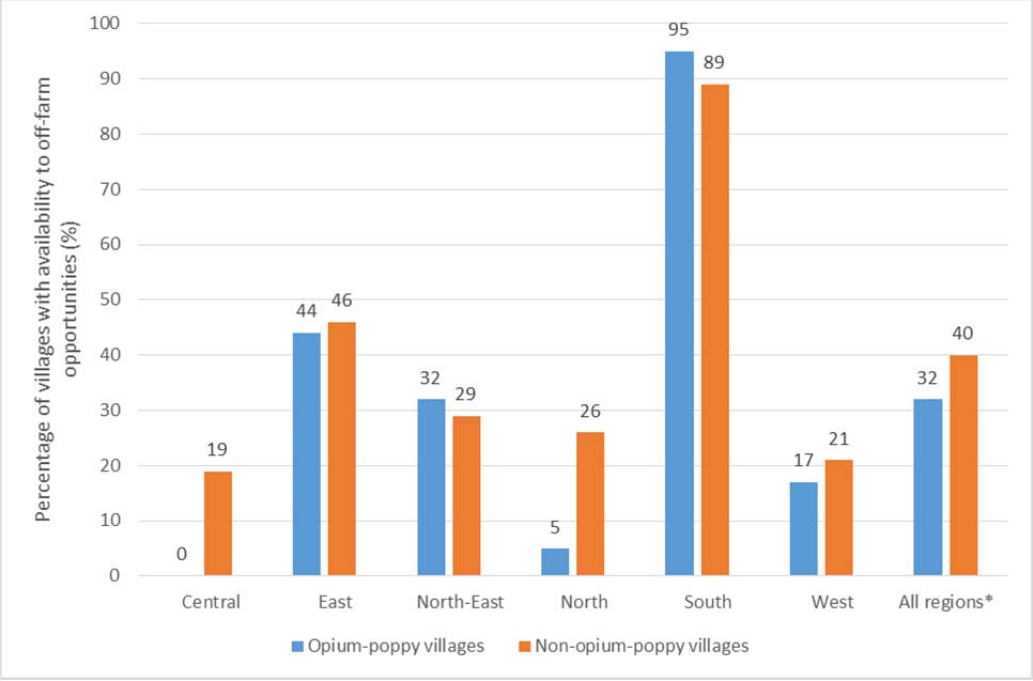
[27] Future assessments would focus more on collecting and analysing data on market access for other crops, as well as off-farm opportunities available to poppy and non-poppy farmers to provide a more complex overview of the alternative development opportunities that could be promoted among poppy farmers.

Figure 31: Average daily wage (US$) in opium-poppy and non-opium-poppy villages by region in Afghanistan, 2015*



** Weighted average based on the actual number of villages per region*
Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

Figure 32: Percentage of villages with availability of off-farm opportunities by region in Afghanistan, 2015*



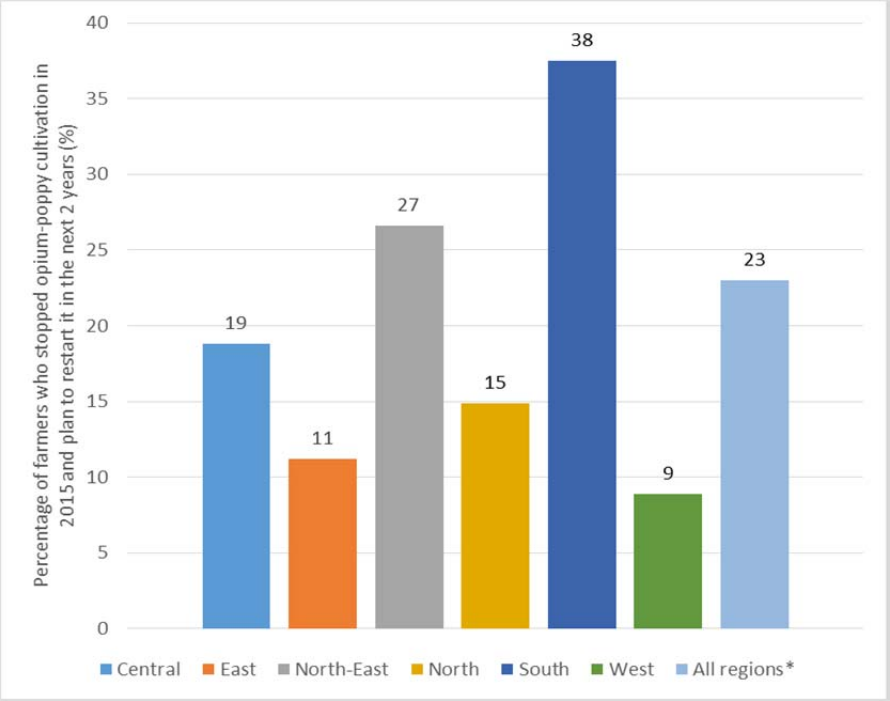
** Weighted average based on the actual number of villages per region*

Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

A group of "intermittent" opium-poppy farmers not dependent on opium-poppy income

Almost a quarter of the farmers who stopped opium-poppy cultivation in 2015 indicated their intention to restart opium-poppy cultivation in the next two years. This suggests that there was a group of farmers who were not totally dependent on opium-poppy cultivation, but that they may cultivate opium poppy intermittently to increase their household income or accumulate capital when considered profitable enough.

Figure 33: Percentage of farmers who stopped opium-poppy cultivation and plan to restart opium-poppy cultivation in the next two years by region in Afghanistan, 2015



** Weighted average based on the actual number of villages per region*
Number of surveyed farmers who stopped opium-poppy growing in 2015 = 569. Not all surveyed farmers replied all questions from the questionnaire.

4.3 What were the risks and vulnerabilities that prevented farmers from ceasing opium-poppy cultivation in Afghanistan in 2015?

Economic conditions remain the largest concern among farmers and a driver of opium-poppy cultivation in Afghanistan. In an open question about the reasons for growing opium, most of the opium-poppy growers (about 71%) indicated that the main reason was economic-related (e.g., not enough income from other crops, poverty, others); 28% identified similar income-related reason, but framed their answer under agronomic and ecological reasons, such as good yield from opium-poppy production or favorable ecological conditions for opium-poppy cultivation; very few respondents (1%) mentioned a social or religious reason such as "Opium-poppy cultivation is a common practice" or "I have experience cultivating opium poppy".

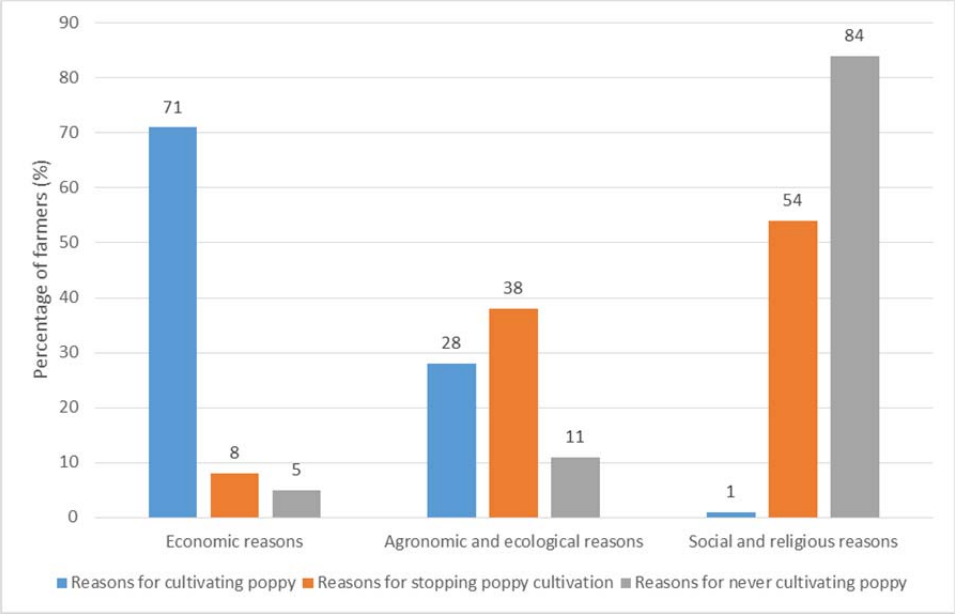
The main reasons leading farmers to stop opium-poppy cultivation or never cultivate opium poppy were of social and religious nature (54 and 84% of respondents, respectively). Farmers who stopped opium-poppy cultivation declared to have been afraid of eradication campaigns; while farmers who had never cultivated opium poppy mainly indicated that they believed "opium-poppy cultivation is against Islam".

Thirty-eight per cent of farmers who stopped opium-poppy cultivation also indicated that adverse agronomic and ecological conditions (e.g., opium-poppy pests and diseases, and bad yields)

experienced directly or indirectly in previous years were a major influence in their decision to abstain from cultivating opium poppy. One-tenth of the farmers who had never cultivated opium poppy cited similar reasons (e.g., low opium-poppy yields in the region, which would not economically compensate the efforts).

Improvements or maintenance of economic conditions (e.g., by cultivating other crops instead of opium poppy) were only stated by 8% and 5% of the farmers as reasons for stopping or never cultivating opium poppy, respectively.

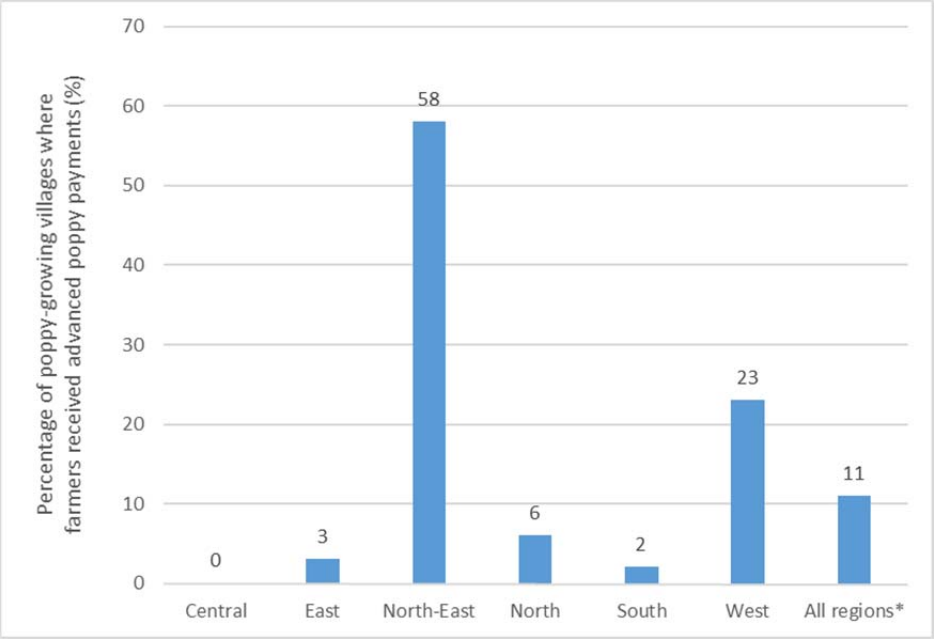
Figure 34: Reasons for cultivating, stop cultivating and never cultivating opium poppy among farmers in Afghanistan (percentage), 2015*,**



** Weighted average based on the actual number of villages per region*
*** Reasons for cultivating opium poppy collected from opium-poppy growers; reasons for stopping opium-poppy cultivation collected from farmers who stopped opium-poppy cultivation in 2015: and reasons from never cultivating opium poppy collected from farmers who had never cultivated opium poppy.*
**** Economic reasons for cultivating opium poppy: poverty and high income from other crops, others*
Economic reasons for stopping or never cultivating opium poppy: obtaining income from other crops or sources, others
Agronomic and ecological reasons for cultivating opium poppy: good yield and suitable conditions, others
Agronomic and ecological reasons for stopping or never cultivating opium poppy: opium-poppy diseases, not good yield, others
Social and religious reasons for cultivating opium poppy: it is common, have experience, others
Social and religious reasons for stopping or never cultivating opium poppy: it is against Islam, fear of eradication, others
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

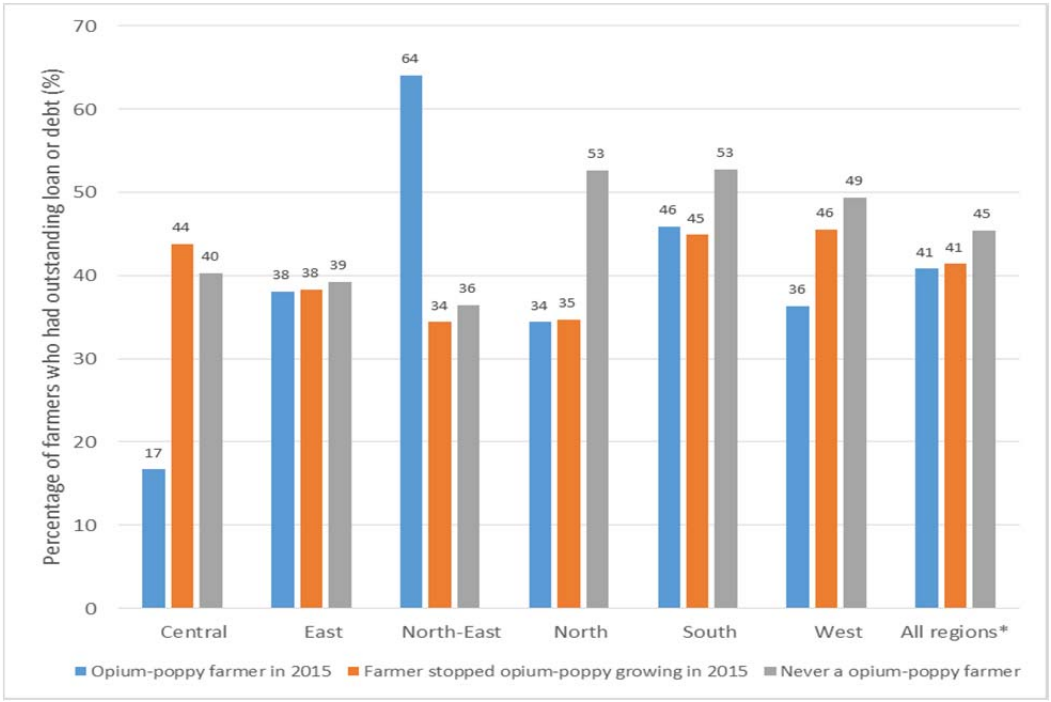
One element which makes opium cultivation attractive is the practice of advance opium-poppy payments. About one-tenth of the headmen from opium-poppy villages reported that farmers in their villages received advanced payments for opium-poppy cultivation in 2015. However, having outstanding loans did not emerge as a differentiating factor for cultivating opium since the percentage of farmers under debt or with outstanding loans were similar (slightly above 40% for all three type of farmers). Only in the North-East opium-poppy farmers were more likely to have obtained a loan.

Figure 35: Percentage of opium-poppy villages where farmers received advanced opium-poppy payments by region in Afghanistan, 2015



** Weighted average based on the actual number of villages per region*
Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514). Not all surveyed village headmen replied all questions from the questionnaire.

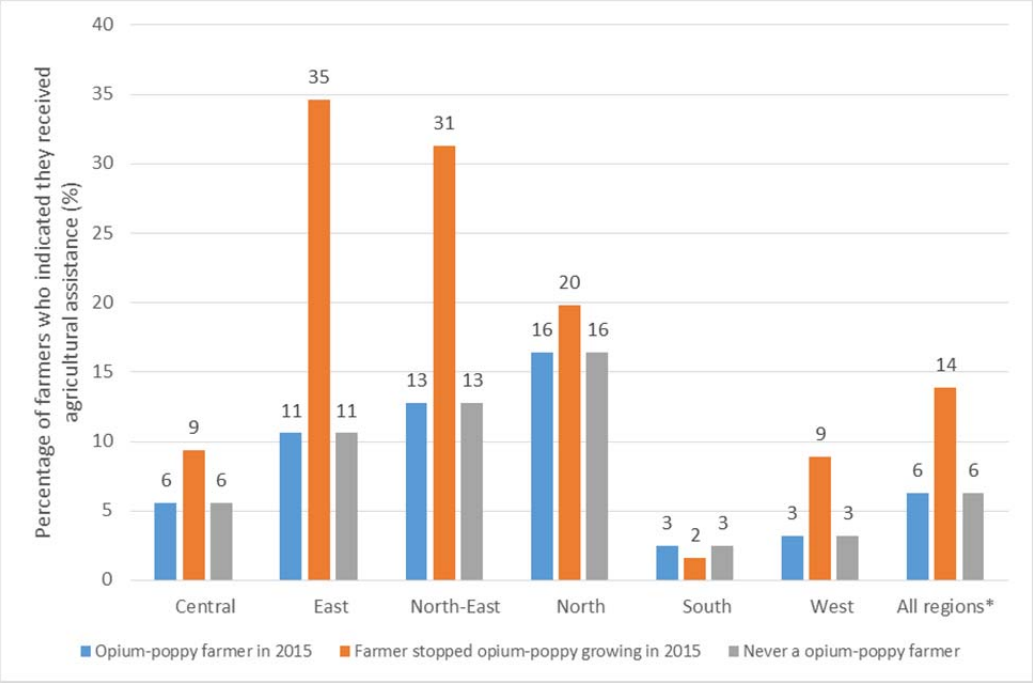
Figure 36: Percentage of farmers who had outstanding loan or debt by type of farmer and region in Afghanistan, 2015*



** Weighted average based on the actual number of villages per region.*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Agricultural assistance was received in general by a small percentage of farmers, but the highest percentage was among farmers who stopped opium-poppy cultivation (14%), with the highest percentage (more than 30%) in the East and North East. This suggesting that the provision of agriculture assistance may have played a role in the decision of farmers to discontinue opium-poppy cultivation.

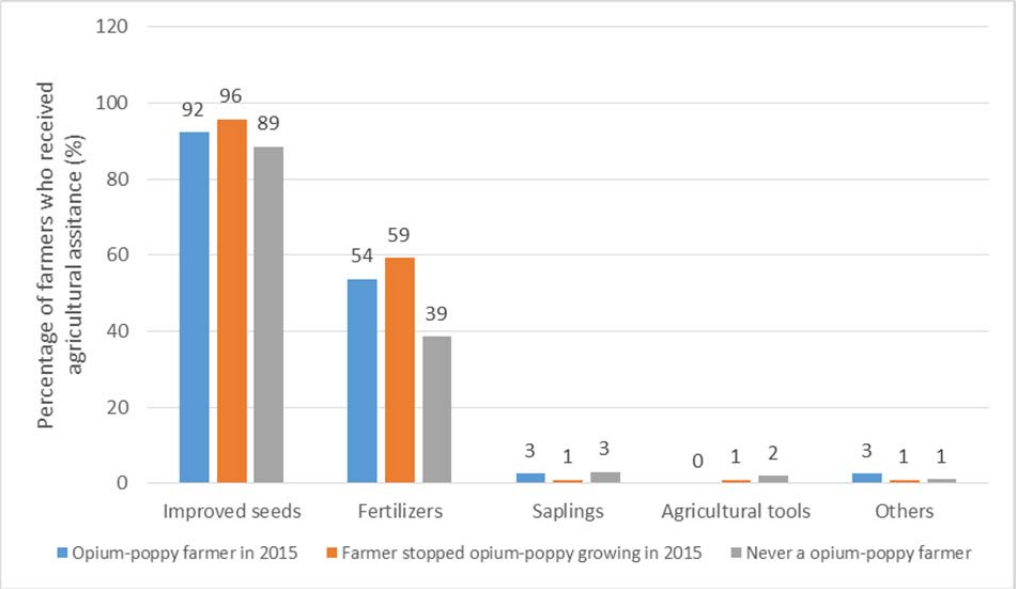
Figure 37: Percentage of farmers who indicated they received agricultural assistance by type of farmer and region in Afghanistan, 2015



** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

The type of agricultural assistance received strongly focused on improved seeds (89-92% of farmers) and fertilizers (39-54%). A small number of farmers indicated that they received agricultural tools, agro-chemicals, a dam, greenhouse, wheat storage facility, protection walls, and saplings.

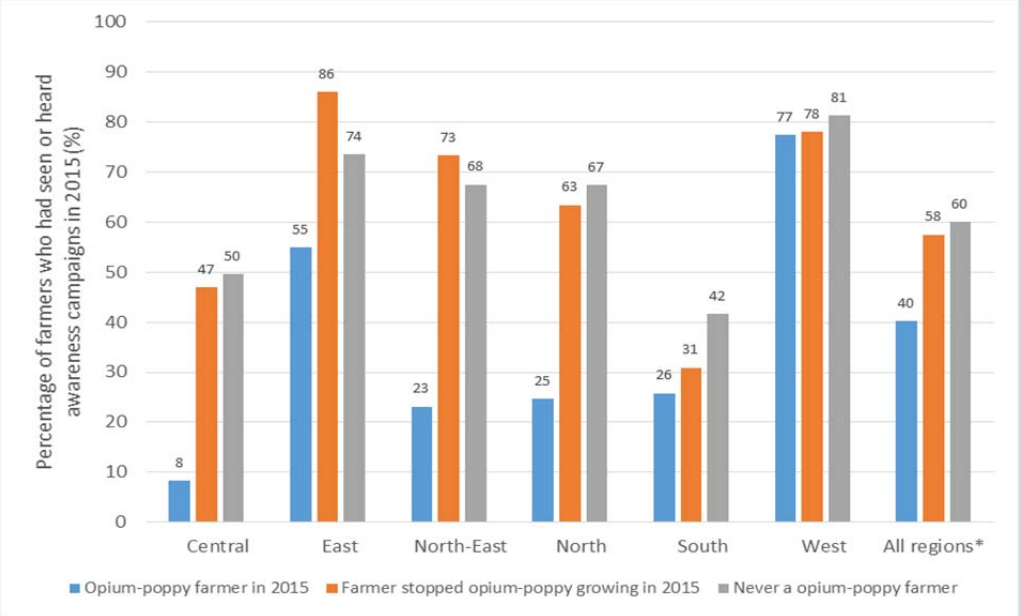
Figure 38: Percentage of farmers receiving each type of agricultural assistance from the total of farmers who received agricultural assistance in Afghanistan, 2015*



** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

Lower exposure to awareness campaigns was also associated with opium-poppy growing . On average, farmers who had never cultivated opium poppy were more exposed to awareness campaigns than opium-poppy farmers or farmers who stopped opium-poppy cultivation. Most of the farmers were exposed to awareness campaigns through the radio (71%). Other important sources of information were the mosque/mullah (45%) and television (41%).

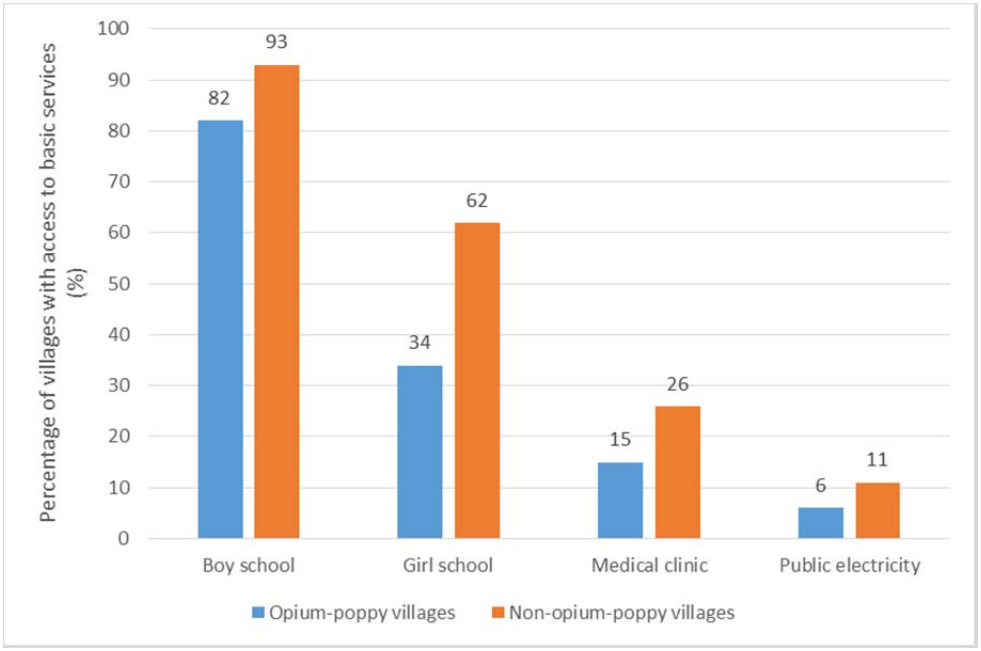
Figure 39: Percentage of farmers who had seen or heard awareness campaigns by type of farmer and region in Afghanistan, 2015



** Weighted average based on the actual number of villages per region*
Number of surveyed farmers: opium-poppy farmers= 616; farmers who stopped opium-poppy growing in 2015 = 569; and farmers who had never grown opium poppy = 2897. Convenience sample. Not all surveyed farmers replied all the questions from the questionnaire.

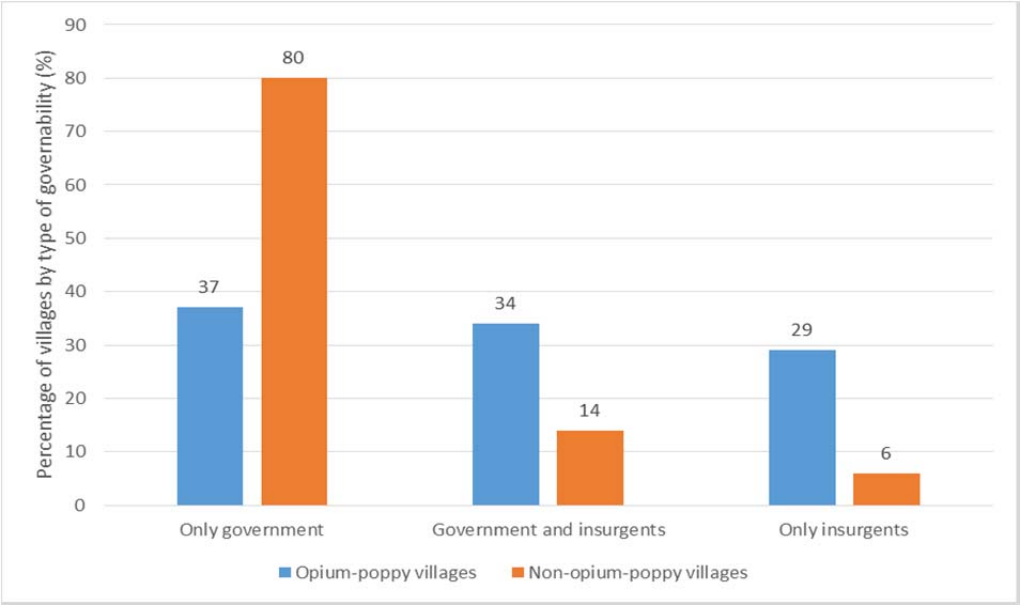
Low availability of basic services in the village and the presence of insurgent groups seem to be also associated with opium-poppy growing. Opium-poppy villages had less availability to basic services, including boy schools, girl schools, medical clinics, and public electricity (from the grid) than non- opium-poppy villages. The largest difference was observed in the case of availability of girl schools (a difference of -82% between opium-poppy and non-opium-poppy villages). Almost five times the number of the opium-poppy villages than non-opium-poppy villages reported the exclusive presence of insurgents inside the villages (29% and 6%, respectively).

Figure 40: Percentage of villages with access to basic services by type of village and region in Afghanistan, 2015*



** Weighted average based on the actual number of villages per region*
Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

Figure 41: Percentage of opium-poppy and non-opium-poppy villages by type of governability in Afghanistan, 2015*

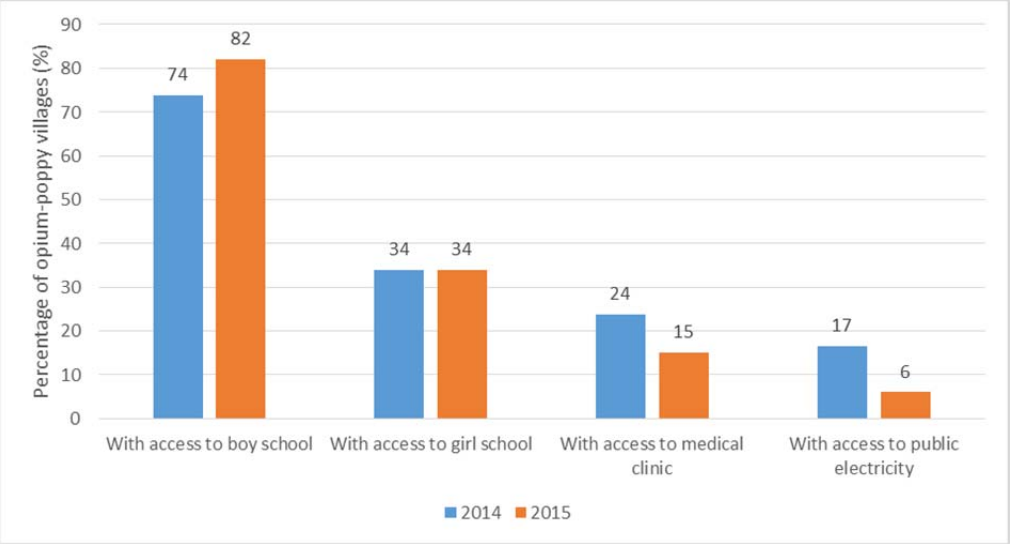


**Weighted average based on the actual number of villages per region*
** Weighted average based on the actual number of villages per region*

Opium-poppy village= village where the village headman reported opium-poppy-growing activities (n=514)
Non-opium-poppy village= village where the village headman indicated the absence of opium-poppy-growing activities (n=885)
Not all surveyed village headmen replied all questions from the questionnaire.

The availability of some basic services in rural Afghanistan has deteriorated between 2014 and 2015, in particular the percentage of opium-poppy villages with access to medical clinics decreased by 37% and public electricity by 64%. The availability of services in the village in the previous year (2014) may have influenced opium-poppy growing in villages during the current year (2015). A detailed analysis of villages, which were included in both samples of 2014 and 2015, indicated that the lack of basic services in 2014 and opium-poppy growing in the same villages in 2015 were related. Hence, a decrease of the availability of basic services may influence farmers' decisions to grow opium poppy in the village in the next year[28].

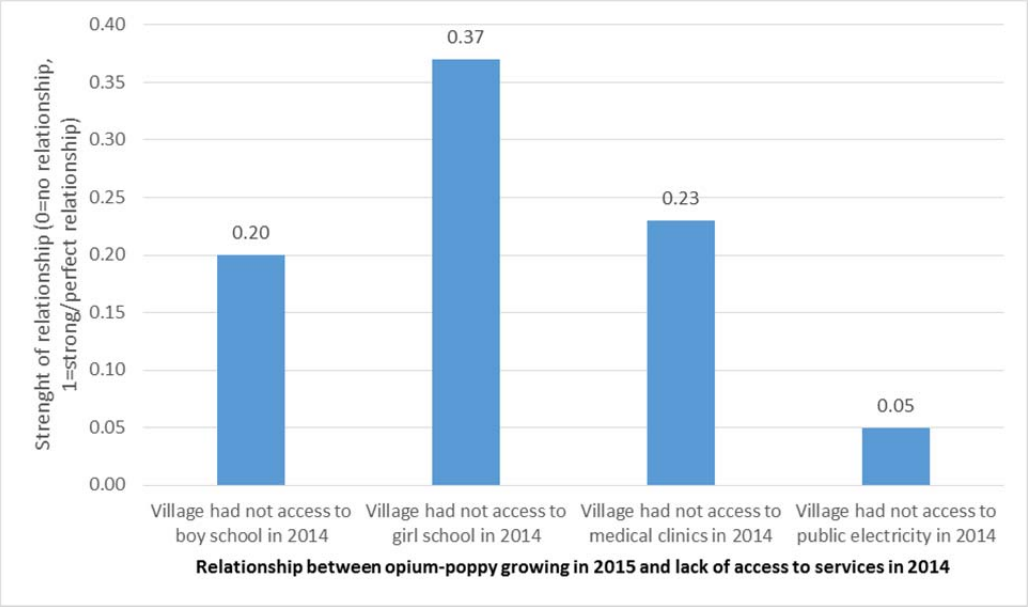
Figure 42: Percentage of opium-poppy villages with access to basic services (2014-2015).



Opium-poppy village= village where the village headman reported opium-poppy-growing activities
Number of opium-poppy villages surveyed in 2014 = 476; number of opium-poppy villages surveyed in 2015 = 514
Not all surveyed opium-poppy village headmen replied all questions from the questionnaire.

[28] The underlying reasons could be presence of conflict and violence in the villages. More research is needed to elucidate the potential underlying motivations.

Figure 43: Relationship between opium-poppy growing in the villages in 2015 and lack of access to services in the same villages in 2014 (values between 0=no relationship to +1=strong/perfect relationship)



Number of villages surveyed both in 2014 and 2015 = 66

4.4 Summary and conclusions

Opium-poppy growers are farmers with different preferences and needs. Farmers follow complex livelihood strategies, which may include opium-poppy growing or not in any given year. Opium-poppy-growing decisions are shaped by temporal and regional circumstances. However, most of the opium-poppy farmers in Afghanistan (80%) seem to cultivate opium poppy in a continuous way (for at least the last 3 consecutive years). On average, their area under opium-poppy cultivation represented less than 50% of their total area under crop cultivation, and contributed to 40% of their annual income.

In general, the livelihood strategies of opium-poppy and non-opium-poppy growers were similar and opium-poppy and non-opium poppy farmers relied on wheat as one of the main sources of income. A major difference was the diversification of other crops. Only 60% of opium-poppy farmers cultivated other crops in addition to wheat, compared to more than 80% of non-opium-poppy farmers. Given the low availability of off-farm opportunities and low wages, non-opium-poppy growers relied on other cash crops for their livelihood. Opium-poppy growers are located further away from markets than non-opium-poppy farmers, and this may have affected their decision to retain opium cultivation.

In 2015, opium-poppy growers were not economically better off than non-opium-poppy growers. Opium-poppy growing is an illegal activity associated with some degree of risk, therefore the most reasonable strategy for opium-poppy farmers would have been to switch to licit crops, if they had the opportunity of doing so. The current situation suggests that many farmers depend on opium-poppy cultivation to make a living due to the absence of viable alternatives.

Lack of access to reliable and sustainable agricultural markets was one of the main drivers of illicit cultivation suggesting the importance to examine existing market demands and options for high-quality products for competitive markets that are integrated into well-defined value-chains inside and outside Afghanistan. Although the issue of physical infrastructure was not included in the survey, adequate infrastructure such as secure roads, collection and processing facilities, must also be provided; otherwise the costs to bring the products to the market may become unbearable and the sustainability of potential development interventions would be greatly diminished.

Drug supply-control policies in Afghanistan need to focus on improving the design of rural economic diversification strategies and the promotion of decent work creation and skills training for rural workers together with addressing security and governance. No single element alone is sufficient for achieving sustainable rural poverty reduction. Interventions for rural poverty and illicit crop reduction thus will have to be cross-sectoral and may need to focus on several dimensions simultaneously.

Alternative development interventions are aimed at contributing to an enabling context for long-term rural development without illicit cultivation. However, due to the scale and the nature of the drug problem, in addition, to the creation of licit on-farm and off-farm income opportunities; the elimination of illicit drug cultivation depends on the achievement of broader development goals, such as well-established and strong state institutions for an effective governance, and functioning social protection mechanisms (e.g., by the reduction of the farmers' exposure to risk or farmers' enhancement to cope with risks).

Importantly local communities can contribute significantly to the formulation of effective and sustainable alternative development policies and their active participation should be encouraged in order to truly address their needs. However, in order to move forward, financial, political and social resources will have to be made available to provide real alternatives to communities involved in illicit crop cultivation.

5 Women's perspective on opium cultivation: attitudes, perceptions and practices

In the rural economy of Afghanistan, there are distinct male and female roles. The role of women in agricultural production is largely determined by the daily life in the household, the location of fields and reproductive and productive tasks that women undertake during the year.[29]

In certain regions, women and men spent the same amount of time on all agricultural tasks, but in other regions (in particular in the South) women's work is restricted to the household where they are involved in crop processing (threshing, cleaning, drying, preserving) and household-based activities like water and fuel collection, cooking, cleaning, sewing, tailoring, weaving, and child rearing. In general, women play an important role in livestock production and processing of dairy products.[30]

Opium poppy, an agricultural product that constitutes a noteworthy source of income of large parts of Afghanistan's rural population, is most often discussed from a purely male perspective. Most qualitative and quantitative data on farmers' reasons and motivations to grow illicit crops have been collected only from males and do not incorporate the women's point of view. Incorporating opinions and perceptions of women can yield novel insights on the complex nature of the factors influencing the decision to grow opium poppy.

The design and effectiveness of programmes fostering sustainable and alternative development for farmers benefits from the perspective of both genders: if elements are included that lead to an increased monetary income for women, it can reduce the income gap, the economic vulnerability of rural households and thus stimulate agricultural growth in general. Hence, women's income can contribute to an equitable distribution of assets and ultimately improve the livelihoods of farmers.[31]

The method explained: Focus group discussion

Focus group discussions are a qualitative research tool which is used to explore a topic in a non-statistical way. A group of up to ten participants is guided by a moderator who introduces topics for discussion. The format allows participants to talk freely with other group members and to engage in a natural group conversation.

This method enables the interviewer to collect a wide range opinions, beliefs, ideas and attitudes towards a certain topic from its participants. The data collected are not (and not meant to be) representative for other persons than the participants themselves.

The Afghan setting presented many challenges to the organisation of focus group interviews. Security allowed to organise interviews in selected provinces only. Women had to be recruited through village headmen, which might have introduced a certain bias in the outcome. Out of cultural reasons, women did not allow their voices to be recorded by an electronic device, so the interviewer had to take notes, which may have reduced the variability in answers. For analysis, all answers were translated, which again may have had an impact on the meaning of some statements.

MCN/UNODC have therefore initiated a strain of research to study the role and contribution of women to all stages of opium poppy cultivation, from the household's decision to engage in opium cultivation to the use of its income. The research aims at capturing a female perspective on poppy cultivation and at informing alternative development programmes on gender specific aspects of it. To that end, as part of the annual MCN/UNODC Opium Survey, focus group discussions with women were held in four Northern and North-eastern provinces. A total of 10

[29] World Bank (2014). Islamic Republic of Afghanistan Agricultural Sector Review : Revitalizing Agriculture for Economic Growth, Job Creation and Food Security. Washington, DC. © World Bank.
World Bank (2005). Afghanistan National Reconstruction and Poverty Reduction — the Role of Women in Afghanistan's Future. Washington, DC. © World Bank.
[30] Ibid.
[31] World Bank (2005); World Bank (2014).

focus group discussions took place in Badakhshan (4), Balkh (2), Baghlan (2) and Faryab (2). Each group consisted of up to 10 locally recruited women, coming from both poppy and non-poppy cultivating households.

5.1 Women's view on motivation for initiating and continuing opium poppy cultivation

The participating women were asked about the reasons that led to engaging in opium poppy cultivation. The reported reasons were a combination of the economic need to cover basic household expenditure, expenditures to improve living conditions, and the opportunity to do so.

Economic needs and improved living conditions included covering expenditures for food and home appliances, for paying debt, and for larger investments like children's weddings and education, as well as cars. Furthermore, participants mentioned that the income from poppy farming was needed for avoiding homelessness and to avoid having to send male relatives to work abroad. One participant mentioned her household initiated cultivation to cover costs for the medical treatment of her daughter.

In terms of opportunities, participants mentioned the availability of seeds *("We cultivate poppy again, because we had poppy seeds. We don't have improved seeds [of other crops] and we don't have money to buy seed of other crops."; Badakhsan*), good yields in comparison to other crops, customs in the village *("All residence of our district cultivate poppy, that's why we also cultivate."; Badakhsan*), as well as that poppy can be easily grown on rain-fed land and the lack of a market for other produce.

"I saw the people who cultivated poppy had good life opportunity, since that time I started to cultivate poppy." (Baghlan)

Overall women considered that there were fewer economic opportunities or alternatives – such as alternative crops or off-farm employment – that could bring enough finances and help meet their different needs:

"Cultivation of poppy is good and has many benefits - it rescues us from poverty and also there is no need to send our family members abroad for working. After harvesting they [Note: the men] give us an amount of money to spend for our daily life needs and also we buy jewelleries, cloths and meet other needs."[32] *(Faryab)*

5.2 Women's awareness of the illicit nature of poppy

Overall, the women participating in the group discussions were aware and expressed remorse that opium poppy cultivation was an illicit activity and had the perception that it was not permitted by their religion. However, women expressed as well that there are certain circumstances that legitimate opium poppy cultivation: for example the hard work involved ("*The mullah said it is against Islam but we work hard and therefore it is licit."; Badakhshan*), economic need or the absence of viable alternatives.

Participants were aware that the opium gum was illegal and produced dependence. Concerns were expressed that their next generations could become addicted to it, however, solving their current economic problems was of more immediate concern. As sources information on the illegal nature of opium and opium poppy cultivation the participants mentioned their male partners and/or the local Mullah.

"We know that it is harmful for human but we have more [income related] problems, so we have to cultivate poppy to solve our life problems." (Faryab)

[32] Jewellery seems to be an asset that belongs to the women themselves and – in contrast to most other household financial assets – not to the male partner.

5.3 Participation in decision-making on opium cultivation and household expenditure

When looking at the gender distribution in the decision making process on opium poppy cultivation women reported strongly differing degrees of participation. The answers ranged from taking decisions jointly with their spouses, being consulted by their husbands (*"[…] our men consult us on what we should cultivate on our land, we suggest them to cultivate poppy"; Badakhsan*), to being excluded from decision making (*"In our village, men are taking the decision to cultivate poppy, we are only helping them with the weeding and gum collection."; Faryab*).

Two statements collected explicitly referred to a change in the role of women in the household by stating that an increased awareness of women's rights through access to schools led to an increased inclusion into all household relevant decision making processes (not only for poppy cultivation):

"Earlier our awareness was low since there was no road connectivity and there were no other facilities. However now we have schools, and there is more awareness and now we know our rights. Because of these changes now our family members are consulting with us for issues like growing poppy and other social activities." (Balkh)

Regarding the use of the income earned by the household, women generally reported to have a certain amount of money they could decide upon themselves: *"I have full authority to spend money for our daily needs." (Badakhshan)* The additional income earned from opium cultivation added in general to the cash income accessible to women: *"Our husbands are giving us money from the income earned from poppy."(Balkh)*

5.4 Women's labour in opium poppy cultivation

Women reported to be involved in activities in the household, for example in the production of oil made from poppy seeds or in preparing the opium gum for sale. Women are as well involved in work in the fields, such as weeding and lancing. In one village, however, women reported to not participate in opium poppy cultivation, because *"our land is far away from our home so our men don't let us to go to the land" (Badakhshan)*, which fits to the general finding that Afghan women face at times stringent restrictions on work and mobility.[33] However, it was mentioned as well, that some women cultivate separate poppy fields *"for buying clothes and jewelleries." (Faryab)*

While it was not expressed explicitly during the focus group interviews, it is understood that female labour on land can be attached with a stigma, "as it denotes that the family is poor". [34] During the focus group interviews, women expressed that labour on the fields was being harmful to health and appearances, thus participation in the cultivation process was not necessarily desired:

"It is too hard for women and children to work in the sun every day. We lose nails, beauty and it is harmful for the health."(Baghlan)

5.5 Medicinal use of opium in rural households

One topic during the interviews was access to medical treatment and in particular pain medication, where opium often plays a role.

Here, two main approaches emerged: some women reported to use the money earned from poppy cultivation for purchasing commercial medicine such as paracetamol and for seeking treatment abroad, e.g. in Pakistan. Other women reported self-medication with opium to treat body aches, sleeplessness and "chest pains" – probably for respiratory illnesses, as well as treating children with opium tea or other opium based remedies.

"My daughter is crying all the time so I give her little opium then she sleeps and I can help my husband in the cultivation of poppy." (Badakhsan)

[33] World Bank (2005)
[34] E.g. Grace, J., 2004, „Gender Roles in Agriculture. Case Studies of five villages in northern Afghanistan", AREU (Afghanistan Research and Evaluation Unit), Kabul, March 2004.

In one village, opium for medication was reportedly used only by "the elderly" while the younger women tend to rely on "modern medicines" for treatment of common illnesses.

In the interviews, participants expressed awareness that the regular use of opium could cause dependence. As source of information, the male partners were mentioned:

"Until recently we used poppy capsules for chest pain of children, but now our men don't let us use poppy capsule for treatment, they say that if one uses poppy capsules for treatment one will get addicted. Now, when we get sick our men say that we should go to a clinic."(Badakshan)

Figure 44: Afghan women preparing opium poppy tea (2010)

5.6 Multiple uses of opium poppy

From the women's perspective opium poppy cultivation not only brought cash income to the household; they used the poppy plant for producing a number of important by-products: poppy seeds are used to extract oil for cooking, poppy straw is used for burning fire in the kitchen, and parts of the poppy plant are used for making tea or soup.

5.7 Summary and conclusions

The women's perspective on opium poppy cultivation can provide a different perspective from the daily life of farming households.

What transpires when talking to women is that a clear motivation for poppy cultivation is cash income. Poppy, as lucrative cash crop, provides resources to cover daily household needs, to pay debt and to improve living conditions. Large one-time expenditures such as weddings or cars emerged as reasons for cultivating intermittently.

Women seem to be aware of the illicit nature of the crop, but they justify it with the hard work involved or the economic necessity.

Medicinal use of opium for both adults and children still seems to be a relevant factor. Interviewed women displayed an awareness of the potential harmfulness of opium use (because alerted by their husbands), but lack of affordable alternatives prevent women from using less harmful remedies. Addiction and dependence was often mentioned as a concern and more research is needed to better understand the nexus of opium poppy cultivation and opium dependence.

An important question in sustainable livelihood programmes is whether the empowerment of women can influence the decision of households to abstain from opium poppy cultivation. The

results of interviews with women provided a mixed picture. While it is obvious that additional cash income from labour of women can reduce the economic pressure to cultivate poppy, it was clearly stated that out of cultural reasons men often do not want women to participate in the work force. Likewise, while some women reported that their voices are heard by their spouses, others reported that husbands are the sole decision makers in all relevant decisions. Thus, the actual influence women can have on the decision to grow poppy might be limited.

6 Outlook for new research

6.1 Understanding land use dynamics and crop rotation used by opium poppy farmers

Crop rotation is the practice of growing a series of different crops in the same area in subsequent seasons. It helps to maintain or to improve soil fertility, to avoid pests and diseases and therefore to sustain crop yields.

The understanding of crop rotation patterns in Afghanistan's opium poppy cultivating provinces can yield insight on farmer's agricultural practices, income strategies (what replaces opium poppy?), and may shed light on the reasons behind the reduced yields of recent years, since one of the possible causes is a too high concentration of poppy fields (monoculture) with too little field rotation, which can lead to soil degradation and increase the likelihood of poppy diseases.

To get a better understanding of the land use dynamics and land management strategies, MCN/UNODC started a pilot study and analysed crop rotation by using overlapping satellite imagery from 2014 and 2015 in 5 Southern and Western provinces. Within the available imagery, all 2014 poppy fields in 2015 were analysed. The purpose of the study to identify the extent of crop rotation from one year to the next and to assess the potential for further research of this kind.

In the study almost 26,000 fields were analysed in five Southern and Western provinces, namely Farah (2,338 fields), Hilmand (16,257 fields), Kandahar (1,734 fields), Nimroz (5,317 fields), and Uruzgan (220 fields). Most of the 2014 poppy fields were either re-cultivated with poppy, rotated to wheat or left fallow in 2015. Very few poppy fields were used for other crops like alfalfa or vegetables, etc.

In Hilmand, Kandahar and Farah provinces, more than 40% of fields were re-cultivated as poppy. In Nimroz, however, a province where lack of water was reported as one of the reasons of the decline of cultivation, the largest share of fields (42%) were left fallow. This share was lower, but still relevant, in Hilmand (17%) and Kandahar (30%) provinces.

There are thus indications for a significant share of poppy fields that are re-used for opium poppy. Without information over multiple years, however, no strong conclusions of the extent and the possible impact of the seemingly limited rotation patterns can be drawn.

Figure 45: Results from a pilot study on crop rotation patterns in selected Southern and Western provinces (% of land cover classes in 2015 of the fields that were cultivated with poppy in 2014)

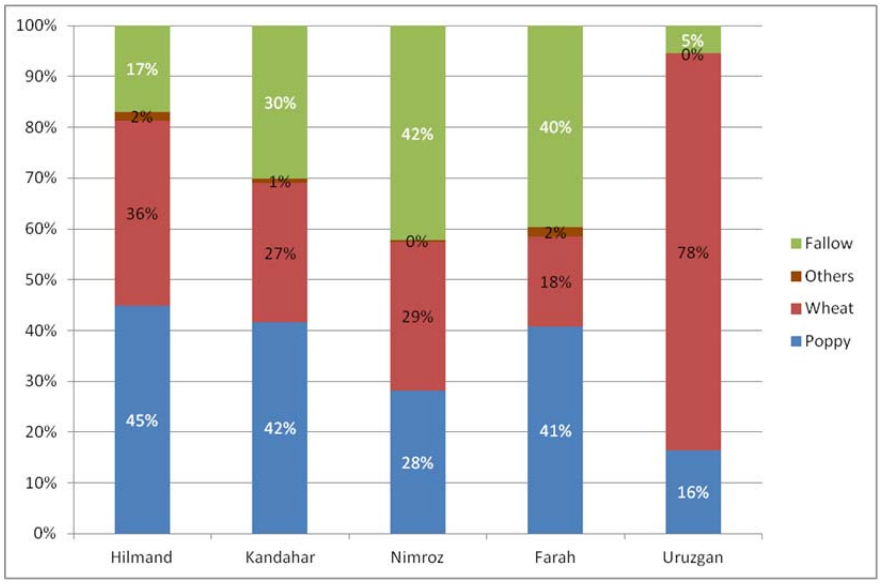


Figure 46:

In Uruzgan only a limited number of fields were analysed, so these shares have to be taken with caution.

A multi-year study on the crop rotation patterns can be used:

- To assess how long a field is cultivated with a certain crop and what the crop rotation cycle looks like. This can be used as an indicator of soil-fertility loss, salinization or the occurrence of diseases
- To quantify the re-use of opium poppy fields to assess the potential impact on the health of poppy plants and their productivity.
- To better understand yearly fluctuations of area under cultivation of both poppy and other crops
- To analyse the effectiveness of alternative development projects and eradication

MCN/UNODC look into the possibilities to include this type of analysis in the survey.

Figure 47: Satellite image showing 2014 poppy fields (yellow lines with green dot) **and 2015** (blue lines) **poppy fields**

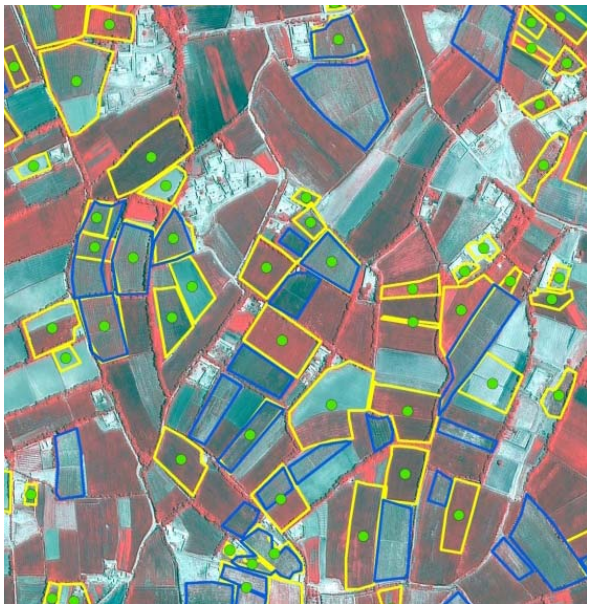
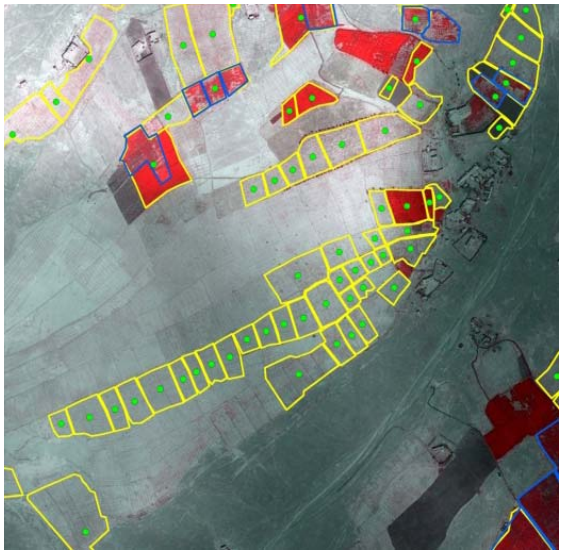


Figure 48: A 2015 satellite image from Nimroz province with delineations of opium poppy fields in 2014 (yellow) and 2015 (blue), demonstrating fields abandonment in 2015



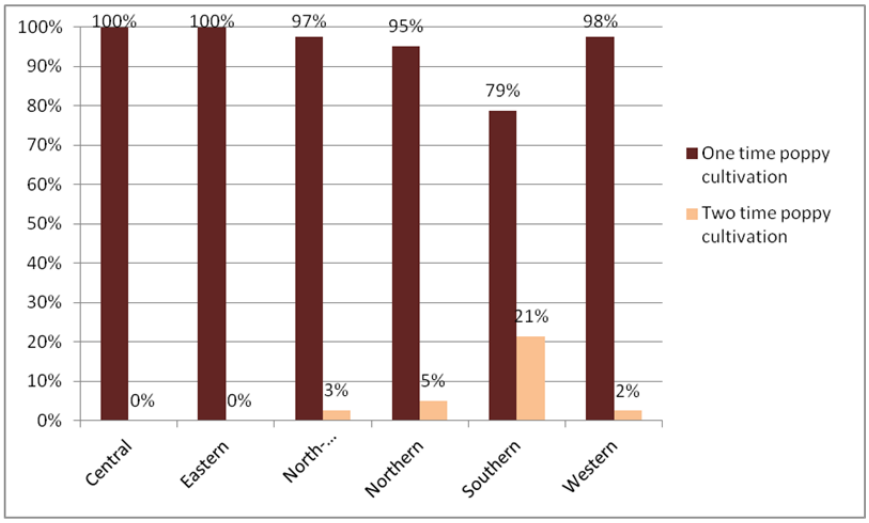
6.2 Cultivation of opium poppy as summer crop

In the many provinces of Afghanistan, two harvest are possible during the agricultural year. It is therefore possible, that farmers sow and harvest opium poppy twice a year. So far the MCN/UNODC opium surveys did not take the cultivation of a second opium poppy crop in the same year into consideration, all estimates refer to the main opium poppy growing season.

In 2015, MCN/UNODC has asked village headmen, whether opium poppy is cultivated as second crop in the summer months in the village.

Opium poppy was mentioned as a second crop in the Northern, North-eastern, Southern and Western regions. However, only in the South a noteworthy share of headmen reported poppy as summer crop.

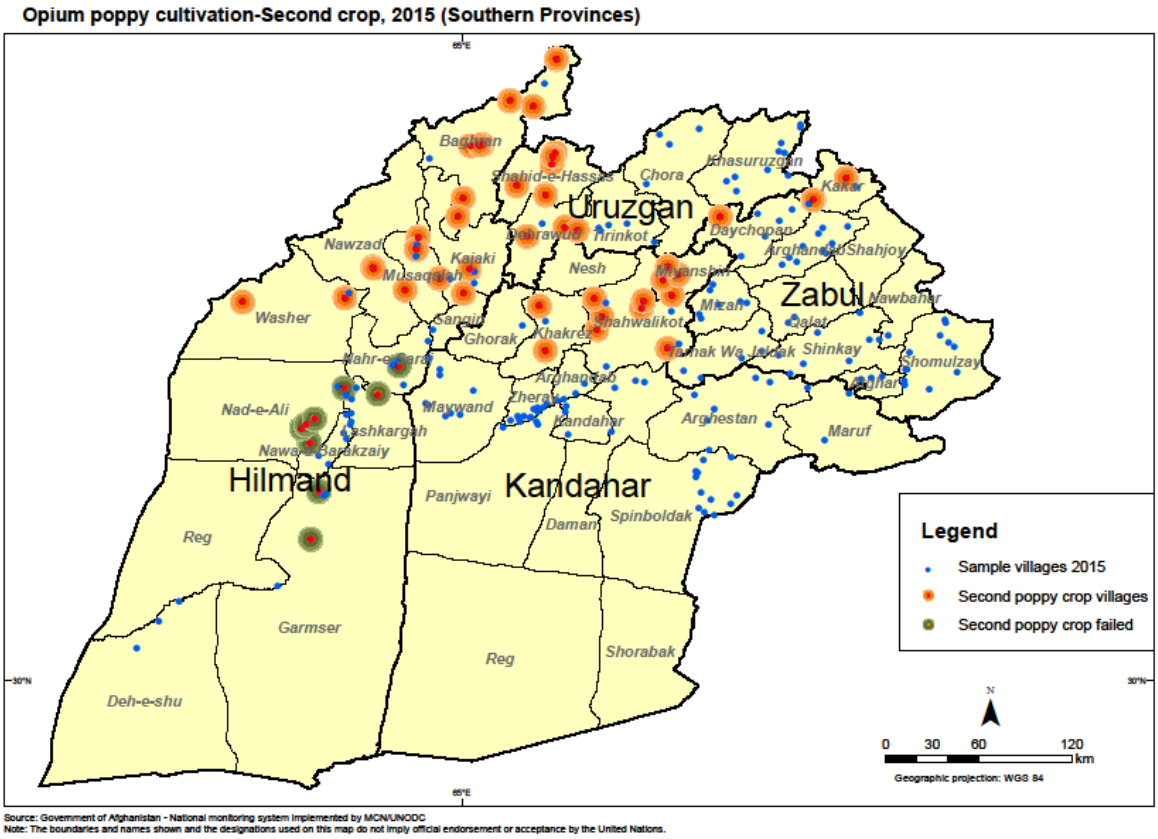
Figure 49: Shares of villages with one or two opium poppy crops in one year, by region



The geographical distribution (see the map) shows that poppy as second crop is in particular prevalent in the North of Helmand, in Uruzgan, in the North of Kandahar and to some extent in Kabul. In central Hilmand (e.g. Nad-e-ali), farmers attempted a second harvest, however, according to the headmen interviews the crop failed.

While this information does provide evidence for the occurrence of a second opium poppy harvest, it does not allow for any cultivation or yield estimates. Future research on the number of farmers involved, the area under cultivation and the potential production of these fields would be needed to include an estimate into the yearly national cultivation and production estimates.

Figure 50: Opium poppy cultivation as second crop in the agricultural year in the Southern provinces



7 Methodology

This chapter covers various methodological aspects regarding survey design and estimation procedure.

7.1 Village survey methodology

Village survey activities (such as training, deployment and data collection) were carried out from the end of March to the end of April 2015 by 136 local field surveyors across all provinces. These activities were supervised jointly by MCN and UNODC. The surveyors were selected on the basis of their experience in opium poppy surveys, knowledge of local customs and their acceptance by local communities. Security was generally problematic for the surveyors, but the selection of surveyors actually from the regions surveyed helped to reduce security risks.

7.1.1 Sampling framework and village frame

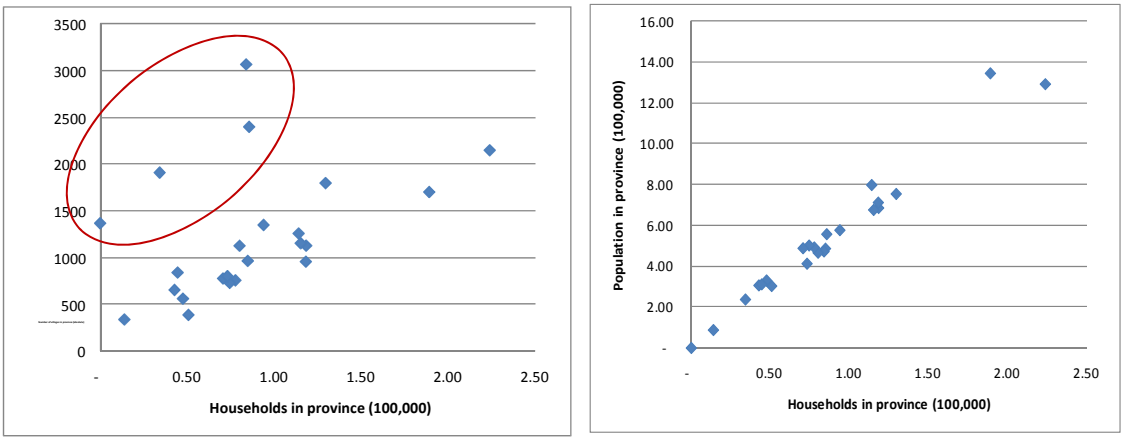
The sampling frame for the village survey data is comprised of a list of 41,419 villages in Afghanistan, which is based on information from the Central Statistical Office and UN databases. It contains the village name, district, province and location and, for most provinces, also the number of households and average household size of the villages listed. The village frame has not been updated since 2010. In addition to the sampled villages, the surveyors, using their knowledge of the local situation, visited other areas in their provinces to complement their assessment of opium cultivation trends and the security situation throughout the province.

The sample of villages visited was a nationally representative sample. It was drawn by means of a systematic random sampling approach stratified according to regions that assured the sample followed the distribution of village sizes in the frame. The sample size was allocated proportionally to the square root of the size of the region (measured by the number of villages).

Surveyors sought to interview three farmers in each village: one opium-growing farmer; one who had discontinued opium cultivation; and one who had never grown opium. In poppy-free villages, less than three farmers were interviewed. Interview partners were recruited by opportunity sampling.

The following two figures show scatter plots of the numbers of households (x-axes) together with the numbers of villages (left) and with the population size (right).

Figure 51: Scatter plots of household data, village data and population data of the village frame



As one can see, the total population is highly correlated with total numbers of households (all dots align along one line), whereas the number of villages compared to the numbers of households in the province has four remarkable outliers in Day Kundi, Kandahar, Nangarhar and Zabul

provinces (all within the red circle). When compared to household numbers a relatively larger number of villages can come from a significantly smaller size of village. However, double counting of villages or other problems with the database cannot be excluded. Deeper analyses of these issues are out of the scope of this survey, but the discrepancies between the number of villages and the number of households in some provinces should be taken into consideration when interpreting the results. Too large a number (relatively) of villages can lead to an overestimation of indicators of interest.

7.1.2 Surveyor training

In order to prepare for the village survey, and as part of a capacity-building exercise for national staff, regional survey coordinators and their assistants were trained in Kabul over a two-day period. They, in turn, trained surveyors in their respective regions. The extension of survey training sessions to the regional level is one of the milestones reached in building national capacity to conduct opium poppy surveys.

During the training period, a total of 136 surveyors were trained in the use of the survey form and techniques by MCN survey coordinators and supervised by UNODC survey coordinators. Surveyor training began in March 2015. The training included practical (use of GPS, etc.) and theoretical aspects (interviewing and dialogue with village headmen and farmers).

Data collection

Opium cultivation is illegal in Afghanistan and is considered to be forbidden by Islam. Given the sensitive nature of the issue, data collection is difficult and can be dangerous. Surveyors are thus selected from different regions of Afghanistan by means of a very careful process. MCN and UNODC regional offices and coordinators recruit surveyors according to survey specifications and the surveyors' skills. Most of those selected already have experience of conducting UNODC surveys.

Surveyors were trained in techniques for approaching local community members and conducting interviews. Following intensive theoretical and practical training, they were deployed to the field where they interviewed village headmen and conducted other survey-related activities. MCN and UNODC coordinators closely monitored data quality and the progress of the survey. Fortunately, the surveyors did not encounter any security problems.

Debriefing

After the survey, surveyors were debriefed by survey coordinators. This helps understand the difficulties surveyors may have encountered (for example, due to the difficult security situation) and whether questions were properly understood by respondents.

7.2 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 actually 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 was calculated from the annual village survey, 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.

7.3 Estimating the value of the Afghan opiate economy

7.3.1 Key components and underlying assumptions

Conversion factors. The yearly updated factor used refers to the conversion of opium into heroin of export quality. The heroin figures calculated here refer to "brown" heroin base. More opium is needed for the production of 1 kilogram of pure white heroin (heroin hydrochloride). However, the export of such high-quality white heroin from Afghanistan appears to be very limited in comparison to that of brown heroin, thus the production and export of white heroin were not considered in this estimation. For details of the calculation of the conversion ratios please refer to the *Afghanistan Opium Survey 2015: Cultivation and Production*.

Precursor substances. For the production of 1 kilogram of heroin, 1.5 litres of the costly precursor substance acetic anhydride is needed (updated in 2011 from 2.5 litres).

Purity. The calculation of the value of the opium economy is limited by the fact that the drug products leaving laboratories in Afghanistan may undergo further processing, such as adulterations, before reaching assumed points of sale in neighbouring countries. Indeed, there is evidence that heroin is already mixed with cutting agents in Afghanistan. This is done to increase profitability but can also be done for other reasons, such as tailoring the drug product for specific usages,[35] which not only alters the volume of the drug exported but also influences costs.

Amounts of opium converted to morphine/heroin. When estimating the amount of opium converted to heroin, seizures in Afghanistan and in neighbouring countries, such as the Islamic Republic of Iran, Pakistan and Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan), are considered in the model. There are indications of direct drug exports to China and India as well as to other countries by air or land, but the amounts trafficked through those routes are thought to be comparatively small and are not considered in the model. All seizure data from Afghanistan and neighbouring countries is used for the estimation, which implicitly assumes that the shares converted in and exported from Afghanistan are proportional to all seizures made in those countries. For details of the calculation please refer to the *Afghanistan Opium Survey 2015: Cultivation and Production.*

Morphine/heroin exports. Recent morphine seizures bear evidence of morphine exports from Afghanistan to neighbouring countries. No difference is made between morphine and heroin in their estimation. Morphine and heroin are both treated as heroin in the calculations of the ratio of opium converted to heroin.

Income from trafficking. The value of exported opium (partly transformed into morphine/heroin) was based on its value at border areas with neighbouring countries. Opiates are usually trafficked to neighbouring countries by Afghan traffickers who, in general, are involved in shipping opiates over the borders, from where traffickers from neighbouring countries take over the consignments. The total gross value of exported Afghan opium can therefore be estimated by multiplying wholesale prices of opium and heroin in the border regions of neighbouring countries by estimated amounts of drugs trafficked.

Domestic market. The calculation of opiates consumed within Afghanistan uses the drug use estimates from the 2009 Drug Use Survey implemented by the Government of Afghanistan and UNODC, as well as more recent price data. The average quantity of opiates typically consumed per day was 0.35 grams; the quantity of opium consumed was 3.1 grams per day. The underlying assumption is that the quantity used has not changed since 2009, which is a simplification due to the lack of more recent data.

Gross and net export value. For the calculation of gross export value, the potential volumes of opium and heroin exported to neighbouring countries were multiplied by the corresponding average cross-border prices. The total gross export value is the combined gross export value of opium and morphine/heroin exports. As indicated above, morphine exports are not considered separately and all processed opium exports are assumed to be in the form of heroin. To estimate

[35] See UNODC (2009): *World Drug Report 2009*, p. 61, where evidence from the forensic laboratory of CNPA is presented confirming the use of various cutting agents in Afghanistan in 2008.

the net value, the value of imports has to be subtracted from the gross value of all final goods, since this is income lost to the exporting country (Afghanistan). There are many imports necessary for opiate production but only imports of the main precursor substance for heroin production were considered in the calculation.

7.3.2 Components of the estimation

The opium economy estimation process includes the following steps:

- Estimation of the gross value of the domestic market for heroin/morphine and opium;
- Estimation of the gross export value of the remaining opium in the form of opium or heroin/morphine, after deducting seizures and domestic consumption. The respective value is calculated by multiplying quantities by prices in respective neighbouring countries;
- Estimation of the net value of the economy by subtracting the costs of imported precursors used for the production of domestically consumed opiates and the gross export value of remaining opiates;
- Therefore, up-to-date cross-border (for the export value) and end-consumer market (for the domestic market value) prices are needed, as well as the prices of the main precursor substances;
- Furthermore, in order to estimate the amount of opium needed for each of those markets a conversion factor for opium into morphine and heroin is needed.

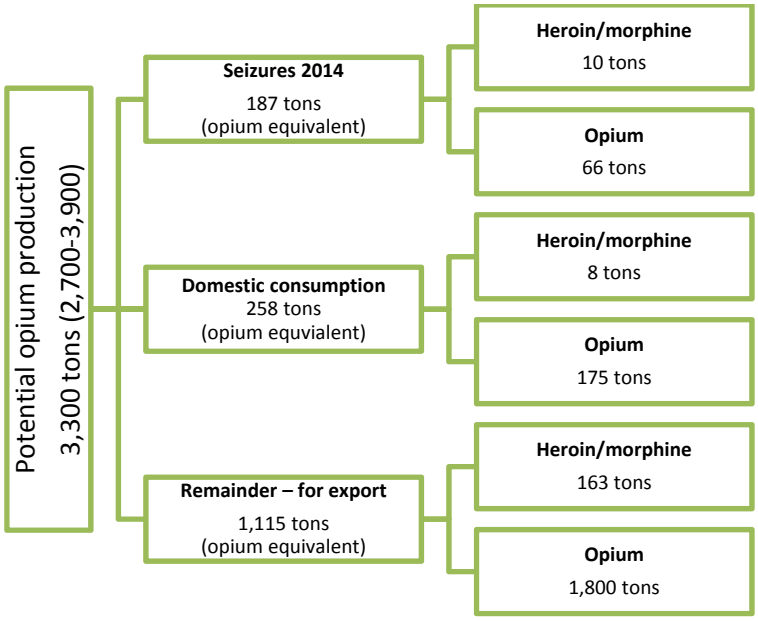
The gross value of Afghan opium production at end-consumer level and at the country's borders is calculated by the amounts consumed and traded multiplied by their respective prices. The net value of opiate production is the gross value minus all expenditure for imports from abroad needed for processing opium into morphine and heroin and results in a net gain for the Afghanistan economy. Net value is considered to be more suitable for comparison with GDP than gross value.

Seizures are not represented in these calculations, as the income that would be generated by seized products is lost. The value of the domestic market at end-consumer level is calculated by multiplying the amounts consumed by the street-level price for heroin/morphine and opium, respectively. The cross-border price was used to calculate the value of the potential exports of opium and opiate products.

The calculation of a possible range in the potential value of the Afghan opiate economy is based on different assumptions about the portion of opium converted to heroin or morphine for export. In the case of the upper bound, it is assumed that all opium available for export is converted to morphine or heroin in Afghanistan. For the lower bound it is assumed that all opium available for export is exported unprocessed and that no conversion to morphine/heroin takes place in Afghanistan.

The resulting ranges are not meant to provide a confidence interval or any other statistical measure, but rather they constitute a what-if analysis that offers results on the basis of different assumptions about the further processing of opium in Afghanistan.

Figure 52: Opiates in Afghanistan, by destination, 2015



Seizures in 2014 are taken as a proxy for 2015 since the total amount of drugs seized in the current year is not yet known. Consumption estimates are based on 2009 drug use data. With the exception of potential opium production, ranges have been omitted for brevity.

7.3.3 Prices

For Pakistan, the cross-border price of opium was the simple average of the average monthly wholesale price in Peshawar, Pakistan (between March and December 2013) and the average monthly wholesale price in Quetta, Pakistan (between March and December 2013).[36]

Similarly, heroin prices were calculated from the monthly wholesale prices of best-quality heroin in Peshawar and Quetta. The higher best-quality price for heroin of injection quality was used to account for adulterations and other profit-increasing methods. All these prices were collected by UNODC in the framework of its monthly drug price monitoring.

For Central Asia, prices from Tajikistan, as reported by the *Paris Pact Drug Situation Report*, were used. The same report was the source of the prices for the Islamic Republic of Iran in 2013.

The simple average of the average prices (Central Asia, Islamic Republic of Iran and Pakistan) was used for estimating the value of exported opiates. It should be noted that price information obtained from all three countries has strong limitations and needs to be improved in order to enhance the reliability of the estimate.

7.3.4 Estimation of domestic consumption

In 2009, the Ministries of Health and Counter Narcotics, in collaboration with UNODC, implemented an extensive national drug use survey in Afghanistan,[37] in which the number of opium and heroin users in the country was estimated to be 230,000 (210,000-260,000) and 120,000 (110,000-140,000), respectively. These numbers account for poly-drug use, i.e. one person is counted in both groups if using both opium and heroin.

The report provides information on the numbers of days that both groups consume the drugs. This information, together with the average amount spent on each drug per day, can be used to calculate the total amount spent on opium and heroin in Afghanistan in a given year. This total amount divided by the average end-consumer price gives the total quantity consumed. As there were no end-consumer prices available for 2009, the earliest (and lowest) data available, which

[36] Ministry of Counter Narcotics and UNODC: Afghanistan Opium Price Monitoring, 2012.
[37] Ministry of Counter Narcotics/Ministry of Health/UNODC: Drug Use in Afghanistan: 2009 Survey (in print).

was the price average of October 2010, was used. The price of 1 kilogram of heroin was reported to be US$ 6,300 and of 1 kilogram of opium to be US$ 530. Combining the price data with the other estimates yields the results shown in the following table.

Table 7: Domestic opiate market, 2009

	Days consumed, 2009*	Total expenditure (US$), 2009	Total consumption (tons)	Average daily consumption (grams)
Opium	58,045,000	92,872,000	175	3
Heroin/ Morphine	34,142,000	75,113,000	12	0.4

**Source: Ministry of Counter Narcotics/Ministry of Health/UNODC: Drug Use in Afghanistan: 2009 Survey.*

The resulting average daily consumption is a sensible magnitude for Afghanistan and is confirmed by regular non-representative use surveys undertaken by MCN/UNODC among heavy users in Afghanistan. It should be noted that there are indications that the quality of heroin/morphine at street level is very poor. When multiplying these quantities consumed by current end-consumer level prices, the value of the domestic opiate market can be calculated.

7.4 Adjusting for inflation

Inflation is measured by a consumer price index and reflects the annual percentage change in the cost to an average consumer of acquiring a basket of goods and services.

Afghanistan has experienced high annual inflation rates in recent past years, reaching a low of -8% in 2009 and a high of 31% in 2008. Inflation rates are retrieved from the World Bank – World Development Indicators.

The price-monitoring system and the annual opium surveys usually show prices and values at current prices, which means, for example, that the farm-gate value reflects the value of all opium produced in a given year at the price level in that given year. It does not take into account that the price level and thus the amount of goods and services that could be purchased for a certain amount of money has changed over the years.

Due to the availability of data, the base year is 2004 and the time period considered is from 2004 to 2015. With a 2004 base year, inflation adjustment looks at all values in terms of the purchasing power of the equivalents of local currency to 1 US$ in 2004. Inflation rates usually refer to local currencies. However, for ease of comparison, US dollar values are kept, to which the Afghan inflation rate is applied.