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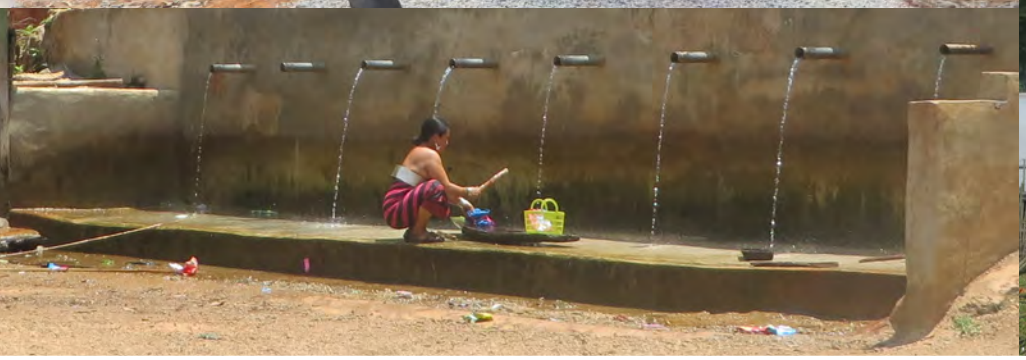

Opium poppy cultivation and sustainable development in Shan State, Myanmar

2019

Socio-economic analysis

UNODC Research

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Abbreviations

CCDAC	Central Committee for Drug Abuse Control
GOUM	Government of the Republic of the Union on Myanmar
ICMP	UNODC Illicit Crop Monitoring Programme
RAB	Research and Analysis Branch (UNODC)
PDMU	Programme Management and Development Programme
SR	Special Region
UNODC	United Nations Office on Drugs and Crime

Acknowledgements

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Central Committee for Drug Abuse Control

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The implementation of the survey would not have been possible without the support of the local administrations and the dedicated work of 86 surveyors

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Executive summary

Poppy-growing villages face serious challenges to meet Sustainable Development Goals

About one in nine households in Shan State were directly involved in opium poppy cultivation in 2018, a similar situation to 2016. This means opium poppy continues to be an integral part of the state's economy. The result is one of the findings from UNODC's expanded data-gathering operation in Myanmar. For the first time, this report can draw on more than 1,500 households interviewed, as well as interviews with the headmen in 599 villages. The extra information has enabled a socio-economic analysis of opium cultivation in the context of the Sustainable Development Goals (SDGs).

The research reveals that villages where opium poppy is cultivated have lower levels of development than other villages. Disparities are most noticeable with regards to security, environment, job opportunities and infrastructure. And there is a broad link between levels of development and poppy cultivation – East Shan is the least developed area and has the highest levels of engagement in poppy cultivation. However, a closer look shows that there are important variations within the region that are key to understanding drug control and development challenges.

Non-state groups control many poppy villages, suggesting a link between governance and opium poppy cultivation

Poppy villages were in general more likely than non-poppy villages to be under the control of militias and other non-state groups, according to surveys of village headmen. Some 18 per cent of poppy-growing villages were beyond government control, compared with 9 per cent of non-poppy villages. This link was strongest in North Shan, where reported conflicts between government and anti-government forces were most frequent. In North Shan, more than half of poppy villages were controlled by militias or other forces, compared with 12 per cent of non-poppy villages.

There was no significant difference in the level of perceived safety between poppy and non-poppy villages – less than half of village headmen said their village was 'safe' or 'very safe' regardless of the presence of opium poppy.

Challenges of isolation

Poppy villages tend to be more cut off from main road network, restricting opportunities for farmers

Villages where opium poppy is cultivated tend to be more remote than non-poppy villages. The analysis builds a picture of remoteness using indicators including access to paved roads and distance to the main road network. There were signs of improvement between 2016 and 2018, most notably the proportion of villages with access to paved roads increased from 29 per cent to 34 per cent for non-poppy villages, and from 16 per cent to 22 per cent for poppy villages. However, this means that poppy villages are still far less likely to have access to paved roads.

As a result, farmers in poppy villages face longer travel times to the nearest market and less access. Longer travel times result in higher transaction costs and potentially higher crop losses, which restricts the opportunities for income-generation from agriculture.

Formal institutions are more difficult to access in poppy villages

Access to money, schools and medical facilities are all more difficult in poppy villages. For example, most farmers who grow poppy said they needed money to fund a large expense, suggesting that they had no access to financial institutions or other lines of credit.

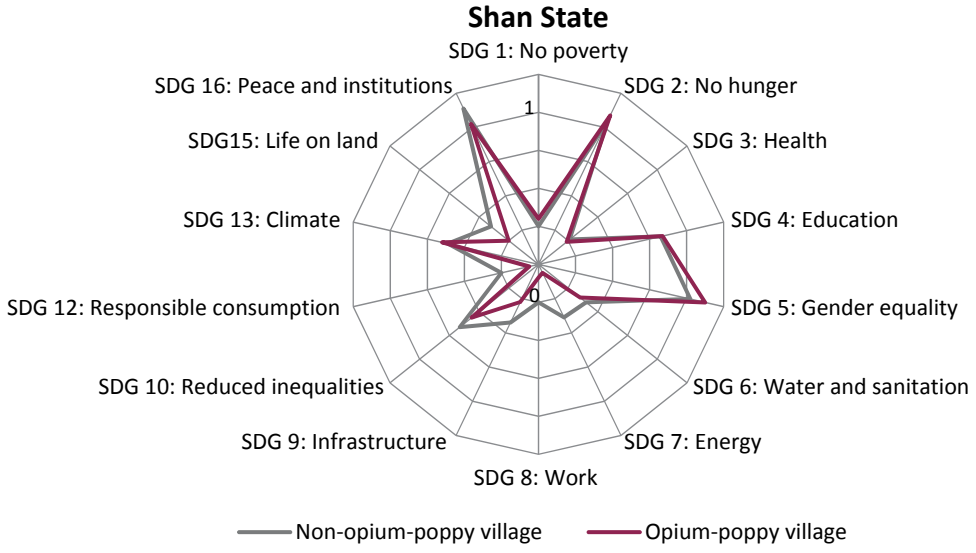
While neither type of village was well served by medical facilities – just 19 per cent of poppy villages and 21 per cent of non-poppy villages had a local clinic – residents of poppy villages with no clinic of their own faced longer walks to the closest practice. In another indication of a serious development challenge, sanitary facilities were found less frequently in poppy villages. One quarter of poppy village headmen reporting that locals practised open defecation, compared with just 1 in 20 in non-poppy villages. Although the situation has improved, with more households having access to flushing toilets in 2018 than 2016, past studies suggest that rural households without access to sanitation will still lose more working days to ill health and spend more on health.

A similar picture emerges with schools. More than 30 per cent of villages had no local school, but average walking times were longer for children from poppy villages. A more detailed analysis suggests an ingrained disparity in education levels – more than half of the heads of poppy growing households had no education at all, compared with 31 per cent in non-poppy growing households.

Reliable sources of electricity are rarer in poppy villages

Farmers in non-poppy villages are far more likely to have access to the main power grid – and this gap is widening. Just 5 per cent of poppy villages had access to the public grid in 2018, a similar proportion to two years earlier. By contrast, 31 per cent of non-poppy villages had access to the public grid in 2018, jumping from 22 per cent two years earlier. Although alternative sources of electricity such as solar panels are becoming more widely available, one in six poppy villages still relies on candles for lighting.

Spider chart demonstrating the development gap between poppy villages and non -poppy villages



** The indicators for SDG2, SDG 5, SDG 8 and SDG 9 were changed in 2018 and therefore the values for these four indicators are not directly comparable with the 2016 results. In 2018, there were insufficient data to update the estimate for SDG 1 and therefore the 2016 values were used. See Appendix 1 for details.

New Insights

Greater environmental strains

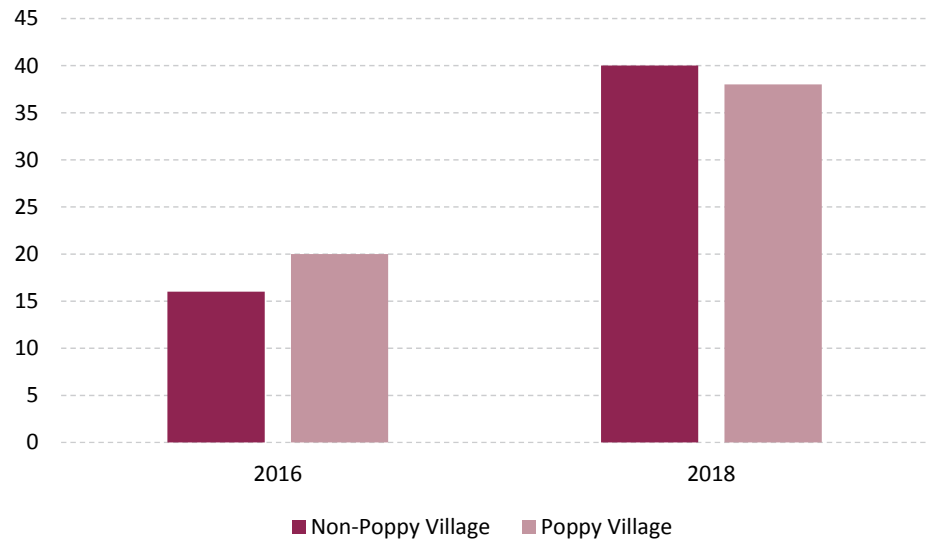
Most villages in Shan State depended on wood from local forests for cooking, particularly in poppy villages. This pressure on local resources is reflected in the reported deterioration of forests. More village headmen from poppy villages reported declining local forest quality in the last two years than their peers from non-poppy villages.

In addition, poppy growing households reported significantly worse soil quality. In North Shan 22 per cent of non-poppy growing households reported good quality of soil, compared with only 2 per cent among poppy growing households. In South Shan, 8 per cent of non-poppy growing households reported good soil quality, compared with 2 per cent among poppy growing households

This is even more vital in the context of a rising rate of climate-related shocks in the region. Some 40 per cent of village headmen reported that the most severe shock faced by villagers was lower crop yield due to adverse climate conditions – more than double the 2016 figure.

The increased pressure on local resources between 2016 and 2018 suggests a lack of environmental sustainability, especially in poppy growing villages.

Figure 1: Percentage of village headmen reporting climate-related shocks to be the most severe shock reducing crop yield.



Falling opium prices create opportunities to entice farmers to switch crops

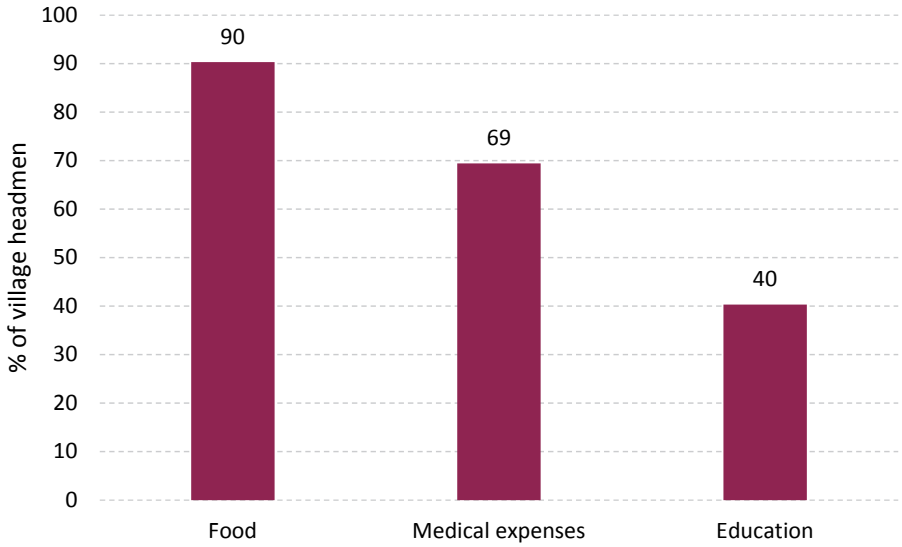
Life for farmers who continue poppy cultivation appears to be getting harder amid steep falls in the price of fresh opium – it declined by almost a half between 2016 and 2018. Many farmers seem to have reduced the amount of land they dedicate to poppy cultivation. The average reported area under opium poppy cultivation decreased from 0.6 hectares per household in 2016 to 0.5 hectares in 2018.

Table 1: Opium prices (Kyat) adjusted for inflation for Shan State in 2016 and 2018

	2016	2018	% Change
Dry Opium	295,460	139,653	-53%
Fresh Opium	319,393	157,495	-51%

This trend gives momentum to those wanting to encourage farmers to switch to other crops. Several other indicators support this argument. For example, average daily wages in villages that do not grow poppy were significantly higher than those in poppy villages in 2018. UNODC's assessment suggests a farm labourer would earn US$3.7 a day in non-poppy villages, falling to US$3.0 in poppy villages. Perhaps as a result of higher wages, a larger proportion of people in non-poppy villages reported being able to build up savings. The gender pay gap, present in all villages, appeared to be widest among those engaged in non-farm labour in poppy villages with women earning 21 per cent less than men for this type of work.

Figure 2: Percentages of the three most mentioned expenses that village headmen reportedly paid for with income from poppy cultivation



However, it is also clear that many poppy farmers live a precarious existence and would be vulnerable to sudden changes in policy and law enforcement. Roughly 80 per cent use some of the income from cultivation to buy food, with the highest proportions in East Shan and North Shan. The household survey reveals that many of these farmers have only small plots of land with low-quality soil, often on the top of hills. Although extreme levels of hunger are not common, one in seven households still experiences some level of food shortage. If poppy crops were eradicated and no alternative sources of income were offered, these farmers would be likely to suffer from food insecurity and lower development levels. Bearing this out, more than 80 per cent of poppy villages reported a decrease in income after stopping opium poppy cultivation.

The low level of perceived safety, together with the remote location of many poppy villages in all regions, reduces opportunities and increases risk for farmers pursuing alternative livelihoods. This pattern suggests that good governance and security can break the cycle of poverty, lack of opportunities and insurgency that can often lead to farmers choosing opium production.

Implications for policy

Better connectivity and alternative development are vital to reducing reliance on opium cultivation

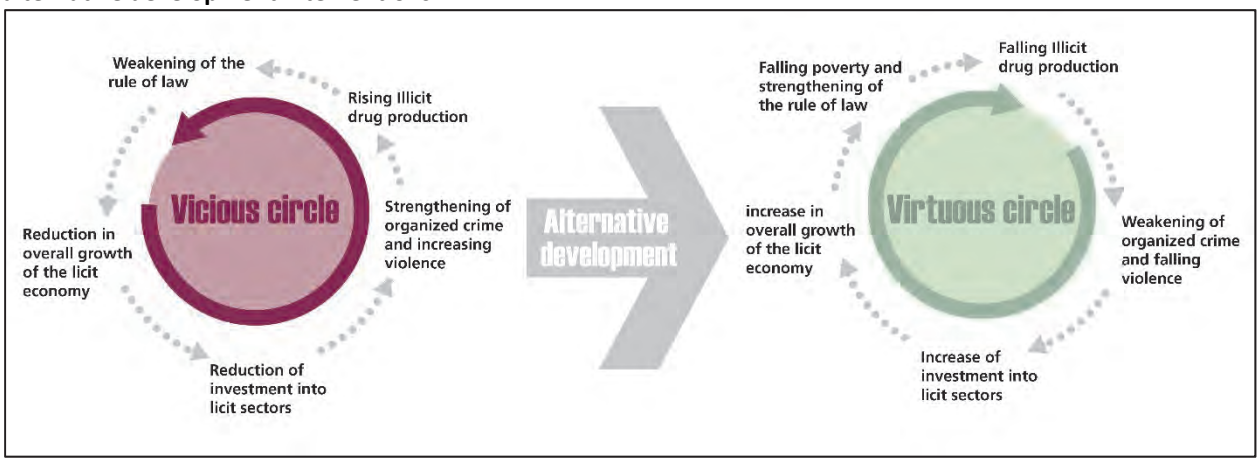
Improvements in infrastructure are difficult to achieve and costly to implement, but they are needed to consolidate development efforts in the long term. It is especially important to improve access to markets, as this gives farmers the opportunity to negotiate prices, which is crucial to their empowerment.

One effect of geographical remoteness is a lack of information, particularly on market prices and availability of cash crops. Reducing the information asymmetry between traders and farmers is critical to empowering

farmers and breaking down the barriers that prevent licit crops from becoming a viable alternative to poppy. The current low level of connectivity in poppy villages would need to be improved if farmers are to be encouraged to grow other crops. In light of the reported stresses on local resources, implemented policies should also consider environmental sustainability.

UNODC has been asked to increase its support to the Government of Myanmar in implementing an alternative development strategy. UNODC has therefore developed several projects to improve short- and medium-term access to food and income.

Figure 3: Schematic showing the transition out of the vicious circle of illegal drug production using alternative development interventions



Law enforcement efforts benefit from being part of a broader strategy

Law enforcement – or the fear of it – plays a central role in discouraging opium cultivation. For villages that have never grown poppy, 37 per cent of headmen reported that a government ban was one of the top three reasons for not starting cultivation. For villages that had stopped growing poppy, 41 per cent said the ban on poppy was a factor in their decision.

Regional differences were observed in the perception of law enforcement action. For example, more than half of headmen in poppy villages in East Shan cited law enforcement as a reason for stopping poppy cultivation even though high profile interventions such as eradication have never been carried out there. Conversely, in South Shan, which has seen the most eradication activities, only 16 per cent said law enforcement had encouraged them to give up cultivation.

It is vital that law enforcement activity is complemented by alternative development strategies to ensure that farmers can make a licit livelihood, especially considering the threat of food insecurity associated with eradication. The success of a national drug control strategy is dependent on international efforts to control drug trafficking and organized crime in the region. Tackling these challenges requires coordinated cross-border collaboration.

Interventions should be based on the best possible evidence

Efforts to improve development will need to be tailored to suit the needs of villagers in Shan State. To do this, more research is needed to understand the requirements of the poorest villages and the variations within the region.

Data collection at the household level has provided better insights into the lives of individual farmers. This research can be used in conjunction with UNODC's extensive historical data from annual village surveys to inform policy choices. Overall, further monitoring and evaluation will delve deeper into the complex

interactions between development, policy interventions and poppy cultivation. This will allow a better understanding of what is happening in Shan State and how progress can be made towards meeting the SDGs and reducing dependence on opium poppy cultivation.

Introduction

Since 1999, UNODC has been monitoring illicit crop cultivation areas and socio-economic conditions in rural villages in different supply countries. In most countries, the results indicate that illicit crop cultivation and poverty are closely interlinked and coupled with other development issues, such as security and governance[1].

This report aims to contribute to this process by providing evidence to assist in improving the resilience of rural communities to opium poppy cultivation. It also aims to identify socio-economic differences between villages that may be driving opium-poppy cultivation and to evaluate the status of poppy and non-poppy villages (villages that cultivate opium poppy are hereafter referred to as "poppy villages" and villages that do not as "non-poppy villages") in relation to the SDGs and their challenges for achieving the SDGs. This report does not include estimates of opium poppy cultivation area, opium production (as reported in the cultivation and production report[2]) or socio-economic analyses outside Shan State.

In 2018, UNODC conducted a survey in a random sample of 599 villages in the opium poppy cultivation risk area in Shan State[3] and gathered socio-economic and other relevant data to compare poppy villages and non-poppy villages. Since 2011, Myanmar has been undergoing a period of political transition and Myanmar's economy has been increasingly opened[4]. In a few years, almost every aspect of life has been affected by fundamental economic and political reforms aimed at improving the living conditions of the population[5].

By disaggregating a range of socio-economic village-level data by opium poppy cultivation status and region (and gender, where appropriate), this report highlights some major differences in living conditions among farmers in Shan State[6].

In launching the 2030 Agenda for Sustainable Development, Member States pledged to "leave no one behind". They recognized that the dignity of the individual is fundamental and that the goals and targets should be met for all nations, peoples, and all segments of society. Furthermore, they declared their endeavour to first reach those who are furthest behind. To support the implementation of the Sustainable Development Agenda, a better understanding of the links between poverty, illicit drug cultivation, production and trafficking is required[6].

[1] UNODC. 2016. World Drug Report.

[2] UNODC. 2018. Myanmar Opium Survey 2018.

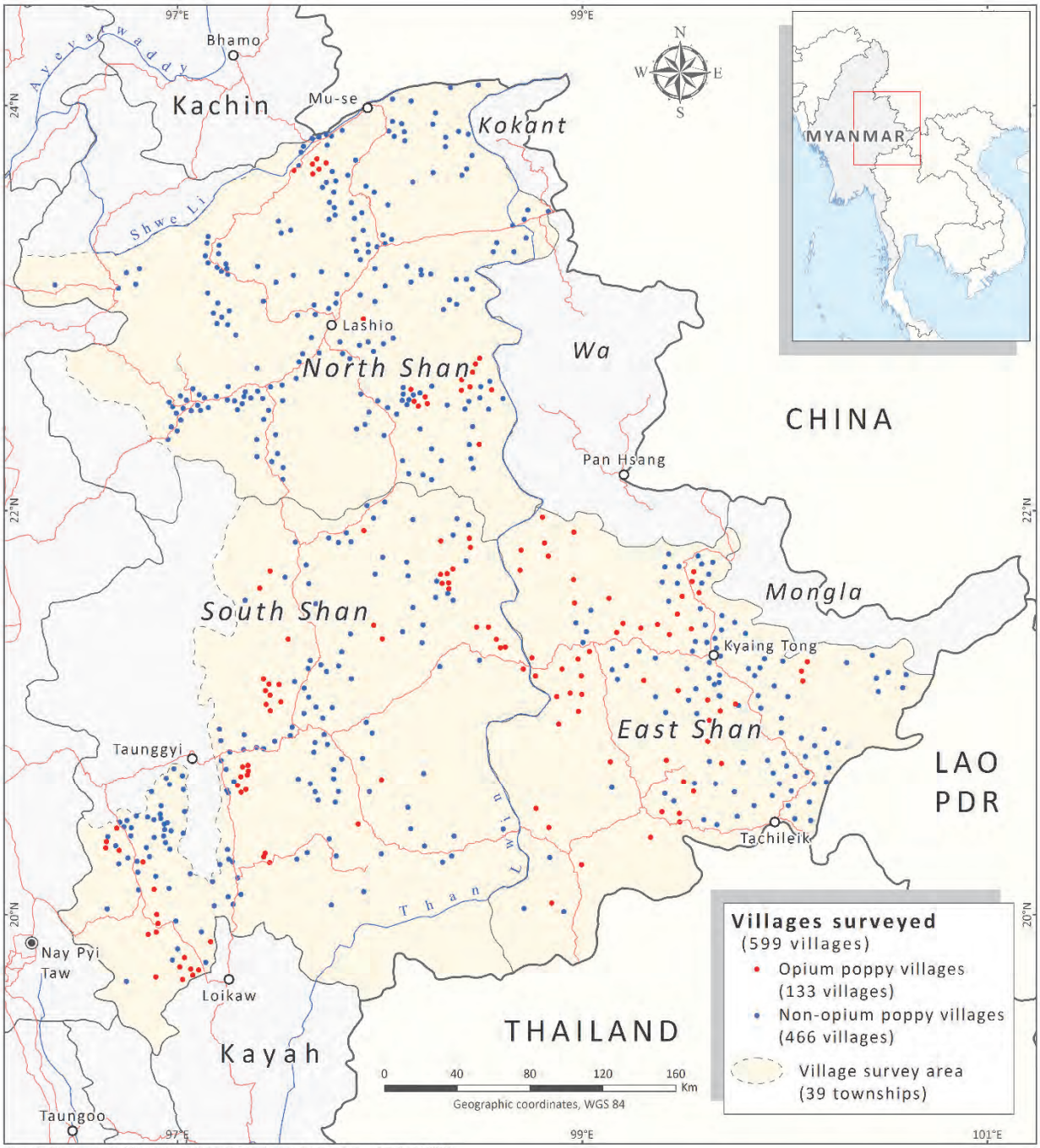
[3] The sampling frame excludes the Western parts of South and North Shan (see methodology).

[4] World Bank. 2014. Myanmar. Ending Poverty and Boosting shared Prosperity in a Time of Transition.

[5] FAO/WFP, 2016. Special report from the crop and food security assessment mission to Myanmar.

[6] UN Economic and Social Council. 2016. Progress towards the Sustainable Development Goals.

Map 1: Location of surveyed villages by poppy growing status, as reported by village headmen, 2018



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

Prevalence and economic indicators of opium poppy cultivation in Shan State

Estimates of the prevalence of opium poppy cultivation

Opium poppy is cultivated in almost one quarter of the villages (22%) in Shan State

Most of the opium poppy villages that were part of the Shan State survey were in South Shan and East Shan. Like in 2016, opium poppy cultivation took place in approximately one third of the villages in these two regions, and in 9% of the villages in North Shan[7]. The proportion of opium growing villages in 2018 remained largely unchanged (22%) compared to 2016 despite a decrease in total opium cultivation areas[8], whereas before 2016 the proportion of opium growing villages declined along with the cultivation decrease.

Figure 4: Percentage of poppy and non-poppy villages, by region, 2018

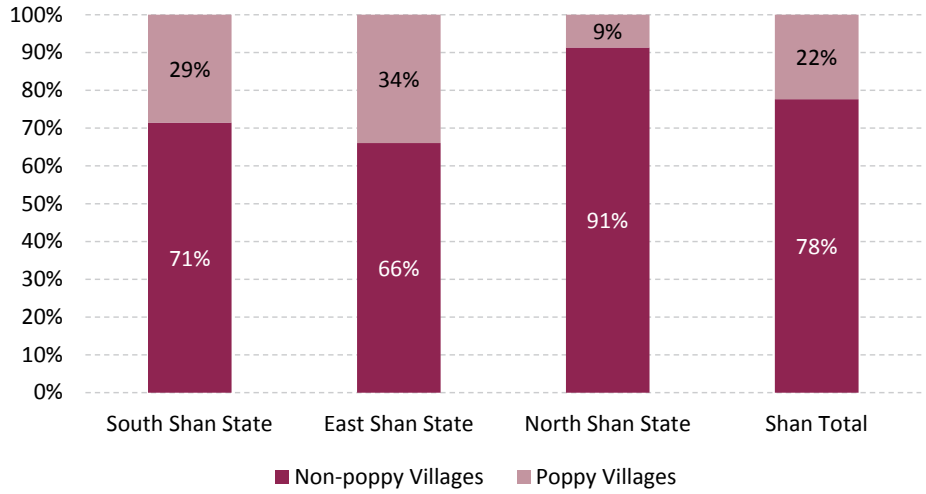
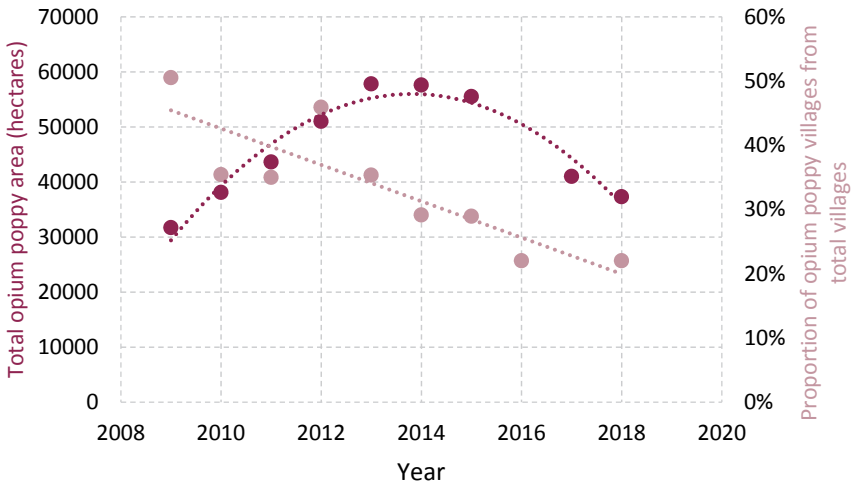


Figure 5: Trends in opium poppy area and proportion of opium poppy villages as percentage of total villages, Myanmar, 2009 - 2018



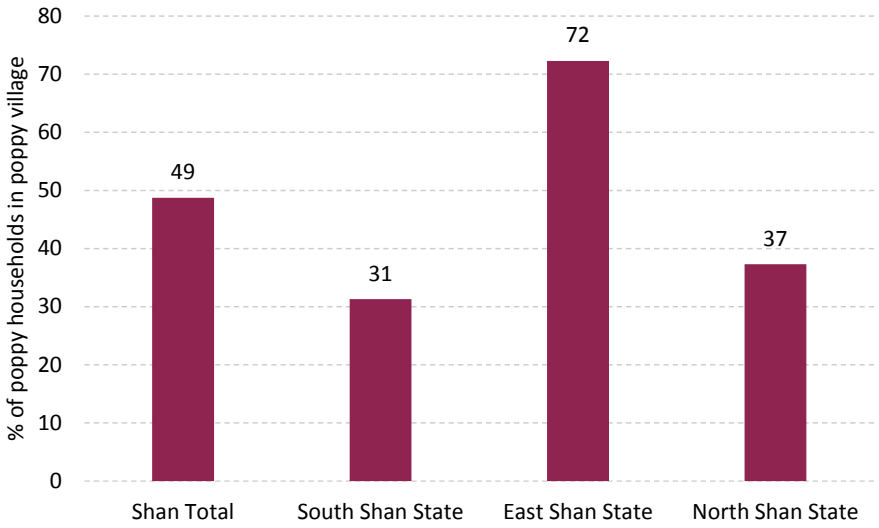
[7] Note that there were only 20 village headmen in North Shan that reported opium cultivation in their villages and the statistics for opium poppy growing villages in this region are based on a statistically low number of samples.

[8] Opium poppy cultivation decreased by 12% in the areas that were comparable. In Myanmar, some 37,300 hectares of opium poppy were cultivated in 2018, of which 32,700 ha in Shan State.

About half of the households in opium-poppy villages are directly involved in cultivation, equivalent to 1 in 9 households in Shan State

In 2018, the responses from the village headmen in opium poppy villages suggested that, on average, almost half of the households (49%) were involved in opium poppy cultivation, which was the same share as in 2016. However, there was large regional variation, with the prevalence of poppy households in East Shan being more than double than that of South Shan. Considering all the villages surveyed (regardless of opium poppy cultivation status), roughly 1 in 9 households (11%) were directly involved in opium poppy cultivation.

Figure 6: Percentage of opium poppy households in opium poppy villages, total and by region, 2018



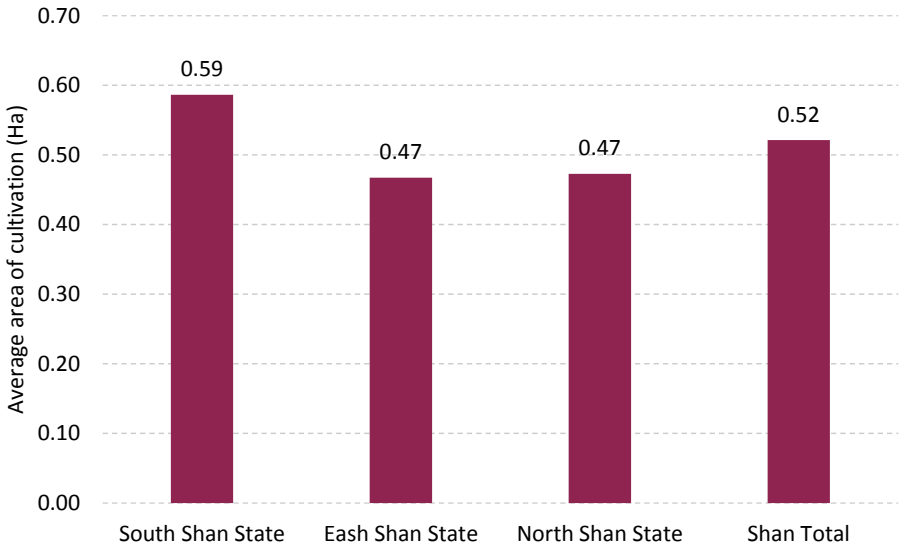
Village headmen report a decrease in cultivated poppy area per household, explaining part of the overall poppy decrease

On average, a household in East Shan and North Shan cultivated a smaller area of opium poppy (0.47 ha) than a household in South Shan (0.59 ha)[9]. In comparison to findings from the 2016 village survey, the average opium poppy area per household decreased by 13%. Since the percentage of poppy villages remained the same, the decrease in cultivated area per household would explain part of the decrease in overall poppy cultivation in Shan State, which was 12% from 2017 to 2018. How this relates to the total number of households cultivating poppy is currently being investigated by UNODC in research that includes remotely sensed data[10].

[9] Calculated as the reported poppy area divided by the reported number of opium-growing households. While remotely sensed individual field data exist for 2018 and are considered to be more reliable, the reported area has been collected for several years and is therefore used for this trend analysis.

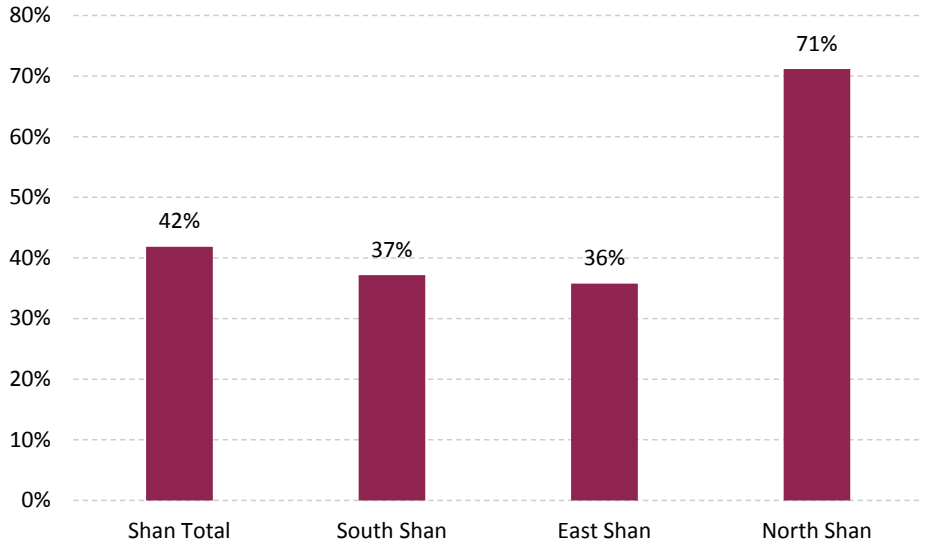
[10] "Estimation of the number of illicit crop households worldwide", in press, UNODC.

Figure 7: Average area of cultivation per opium poppy household (hectares), total and by region 2018



Overall, households growing exclusively poppy were relatively uncommon. Poppy growing households in poppy villages used 42% of their agricultural land for poppy cultivation on average. However, there was significant regional variation. In North Shan, poppy growing households used 71% of their land for poppy cultivation, compared to 37% and 36% in South Shan and East Shan respectively.

Figure 8: Average percentage of agricultural land used for poppy cultivation in poppy growing households, total and by region

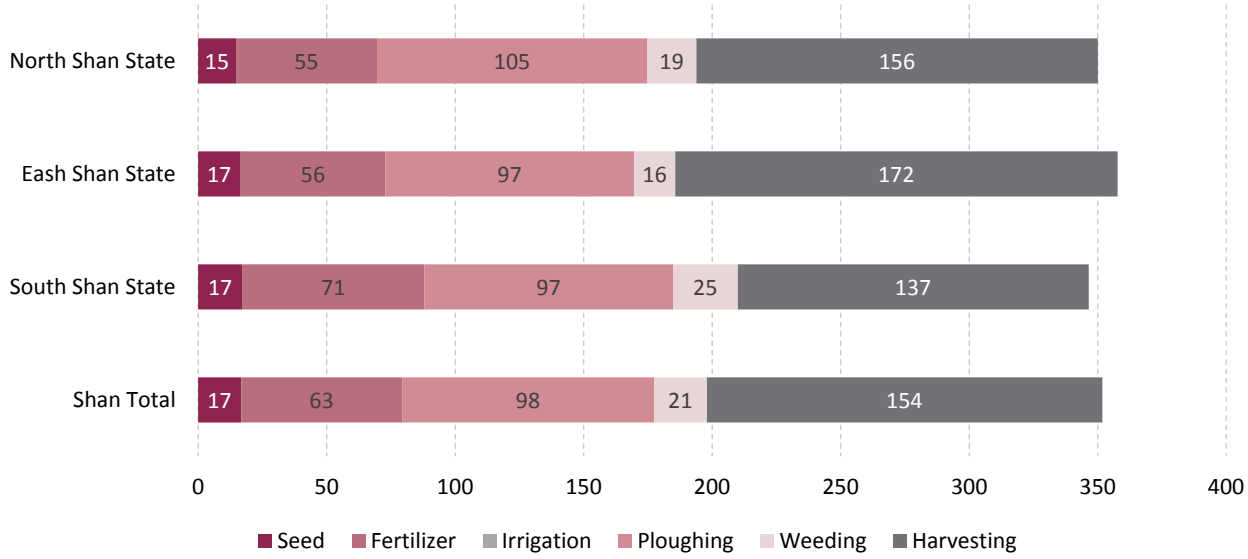


Economic indicators of opium poppy cultivation

The average production cost of opium poppy was US$352 per hectare in 2018

The Shan State production cost (US$352 per hectare) as reported by the village headmen was approximately half of the production costs for Afghanistan in 2017 (US$630). Half of the costs in both Shan State and Afghanistan are related to opium poppy weeding and lancing, for which labour needs to be hired. However, opium poppy farmers in Shan State do not invest in irrigation, while irrigation in Afghanistan comprises almost 9% of the total costs. At the same time, the average yield in Shan State is 14 kg/ha, 50% lower than the average yield in Afghanistan (27 kg/ha). Farm-gate average price of fresh opium poppy in Myanmar (US$136 per kg in 2018) is almost the double average price in Afghanistan (US$76 per kg in 2018).

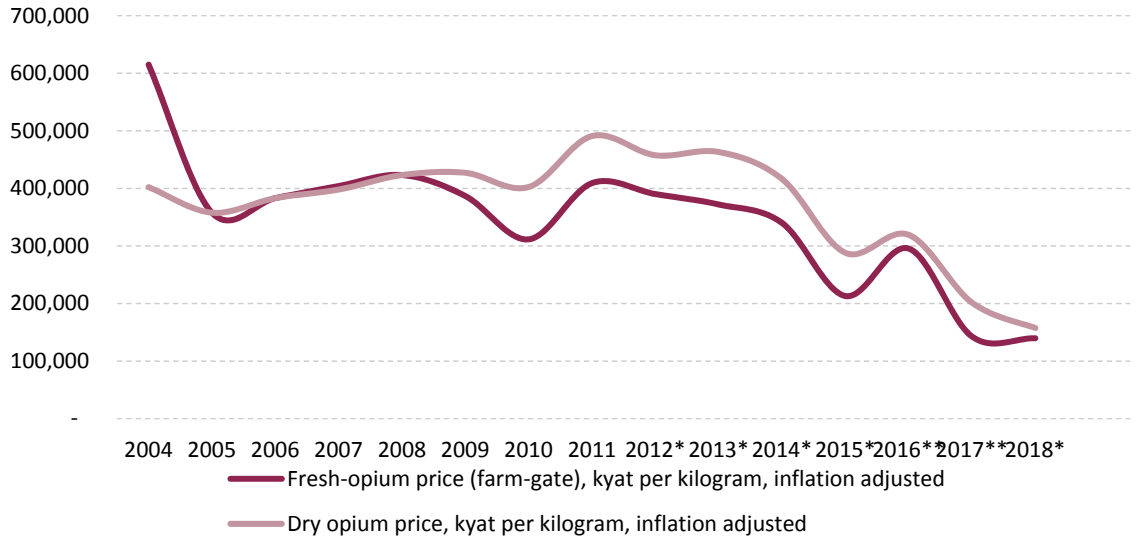
Figure 9: Opium poppy cultivation expenses (for one hectare, in USD), total and by region, 2018



The average (farm-gate) price of fresh opium has decreased dramatically

The average (farm-gate) price of fresh opium corrected for inflation in 2016 was 295,460 kyat per kilogram (in 2010 kyat). The price has been decreasing dramatically since then. In 2018, the inflation adjusted price was 139,653 kyat (in 2010 kyat; 51% lower than in the 2016). Prior to 2014, there was a historical trend where increases in cultivated area were accompanied by decreases in fresh opium poppy prices. However, this trend reversed after 2014 when both the area under cultivation and opium prices started declining, suggesting a decrease in the demand for poppy.

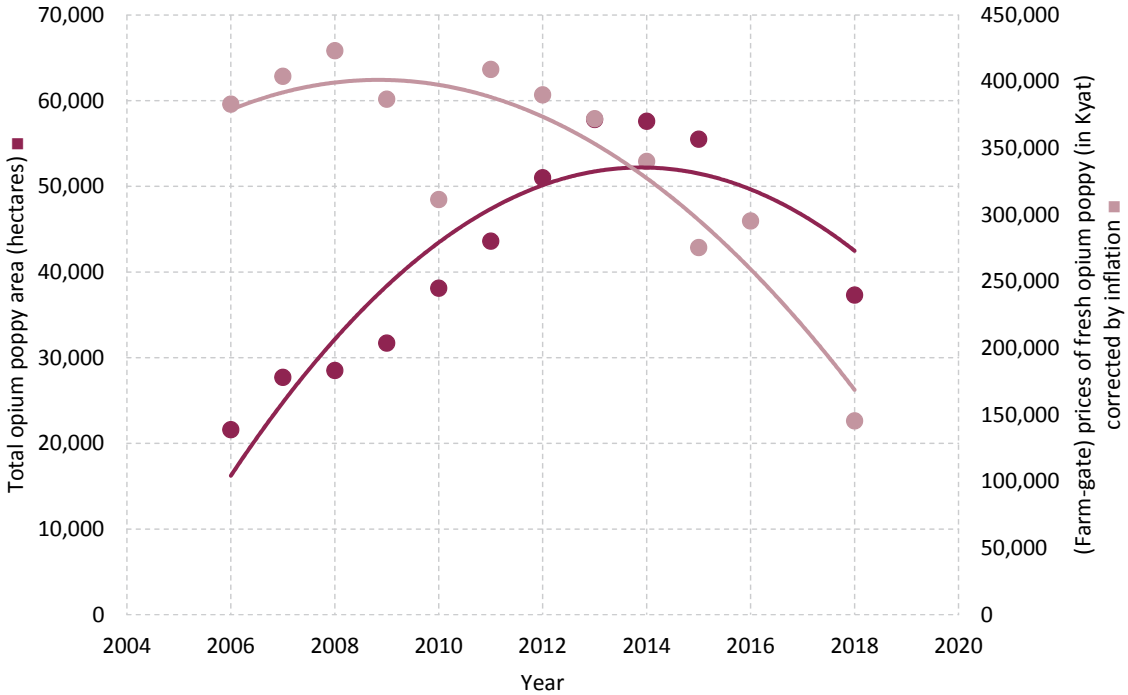
Figure 10: Prices of fresh opium in Myanmar (kyat per kilogram), 2004 – 2018



* For 2012-2015 and 2018, prices reflect data from East, North and South Shan only, weighted by cultivation area (where areas with more cultivation were weighted higher).

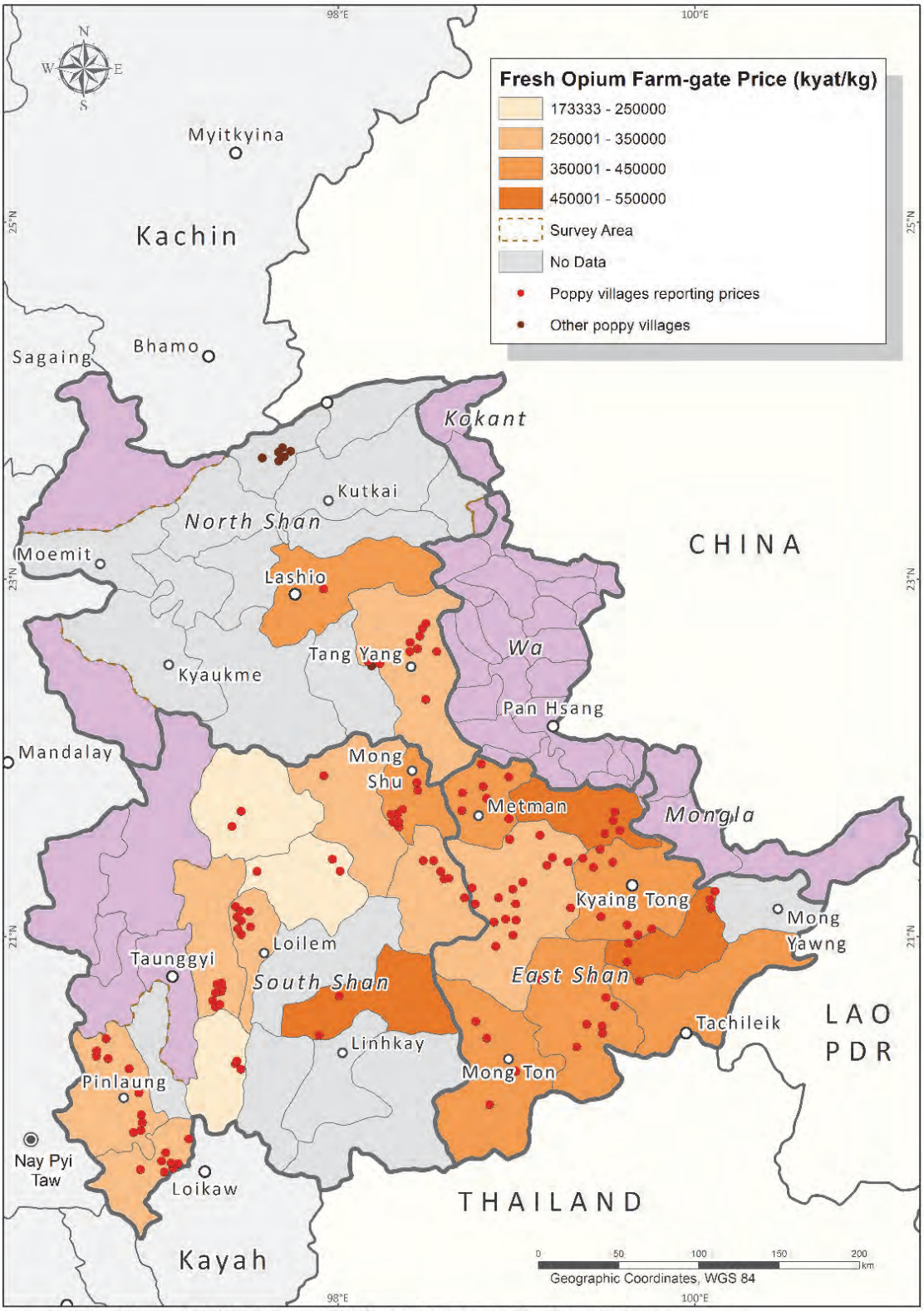
** There was no cultivation data for 2016 and very few villages were surveyed in 2017, so no weighting was applied to these values.

Figure 11: Trends in area of poppy cultivation and farm-gate price of fresh opium poppy



The farm-gate prices of opium, as reported by village headmen, exhibit a spatial pattern in Shan State. The prices in South Shan are generally low, with the exception of the Mongnai township north of Linhkay (it should be noted that only two poppy villages were surveyed here). The farm-gate prices are increasingly higher towards the east and the highest prices are reported in the townships bordering the Special Regions Wa and Mongla, suggesting a higher demand in these areas.

Map 2: Farm-gate prices of fresh opium in each of the surveyed townships

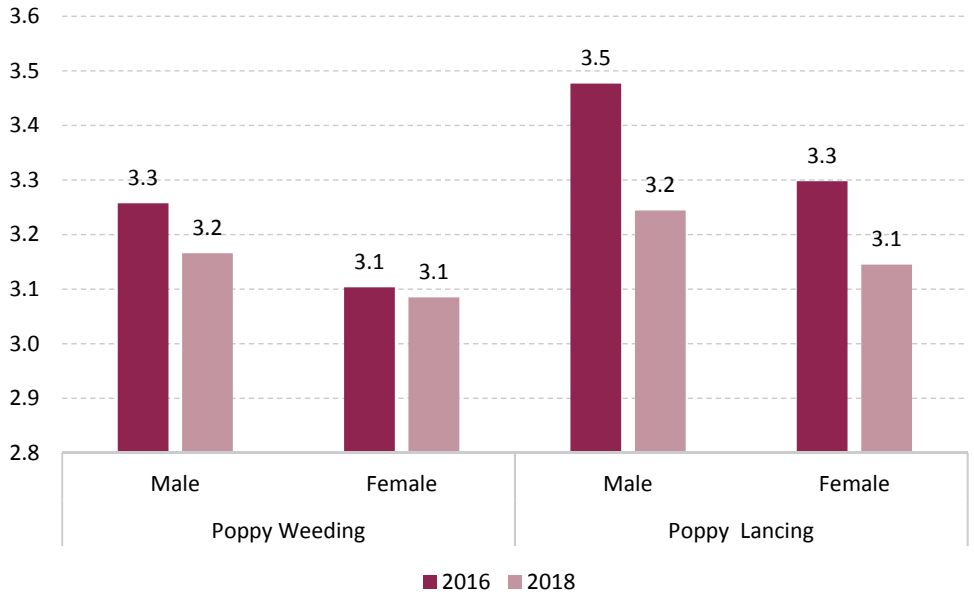


Source: Government of Myanmar - National Monitoring System supported by UNODC; UNODC Country Office, Myanmar; Based on newspaper reports
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

No significant change in wages after adjusting for inflation between 2016 and 2018, except for poppy lancing for male

Myanmar has experienced approximately 10% inflation between 2016 and 2018, and the kyat has depreciated by 16% between mid-year 2016 and mid-year 2018[11]. Adjusting for these factors, the changes in real wages were not significant, except for male labour for poppy lancing, which decreased by 7% in real terms.

Figure 12: Daily wages for opium poppy labour in 2016 and 2018 in Shan State (expressed in 2018 USD)



[11] World Bank. 2018. Myanmar Economic Monitor. December 2018.

Challenges for achieving the Sustainable Development Goals (SDGs) in an opium poppy cultivation environment in Shan State

The 17 Sustainable Development Goals have 169 targets to be achieved by 2030, with 232 associated global indicators [12]. It is expected that the goals and targets will stimulate action over the next decade in areas of critical importance for humanity and the planet. The SDGs will focus development policy globally and the actions of public, private and community sectors by reflecting an overarching ambition of creating a more equal, sustainable, inclusive and secure world.

The SDGs are intended to be action oriented and universally applicable, while reflecting the complex and interconnected challenges of global development. They are intended to cover different realities and to respect national policies and priorities. Each of the goals and targets must reflect national and local conditions while facilitating the sharing of experiences, including successes, challenges and lessons learned at the global level.

Poverty and opium poppy cultivation are interlinked. This section seeks to understand the specific local challenges for achieving the SDGs in an opium poppy cultivation environment, mainly by comparing the circumstances in poppy and non- poppy villages, which can help to understand the difficulties faced by these two different types of villages in Shan State.

Challenges for achieving Sustainable Development Goal 1: "No Poverty"

SDG 1 calls for an end to poverty in all its manifestations by 2030. This SDG reflects the growing acceptance that poverty is a multidimensional concept that reflects multiple deprivations in various aspects of life.

Eradicate extreme poverty*[13]*

In 2016, income per household and individual was calculated based on the village survey. In 2018, income was measured in both the household survey and village survey, but the estimates from these two surveys were not consistent, indicating that more research will be needed to refine the measure. In this report, daily wages were used as a proxy measure for poverty. In 2018, average daily wages in Shan State were below US$5, regardless of whether the job was poppy related or not. Overall, wages in non-poppy villages were significantly higher. Within poppy villages, apart from poppy lancing labour being slightly better paid than other farm labour, there was no substantial difference between other type of labours. These patterns were generally observed across all three regions of Shan State. There was one notable regional difference – the daily wages in non-poppy villages in East Shan were much higher than in North and South Shan, while daily wages in poppy villages in East Shan were relatively similar to those in North and South Shan. Overall, there was no significant change in daily wages between 2016 and 2018, after adjusting for inflation and depreciation of Myanmar kyat.

[12] Source (accessed May 20, 2019): https://unstats.un.org/sdgs/indicators/indicators-list/

[13] This corresponds to Target 1.1 "by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day"

Figure 13: Average non-poppy related daily wages in poppy and non-poppy villages, Shan State total and by region

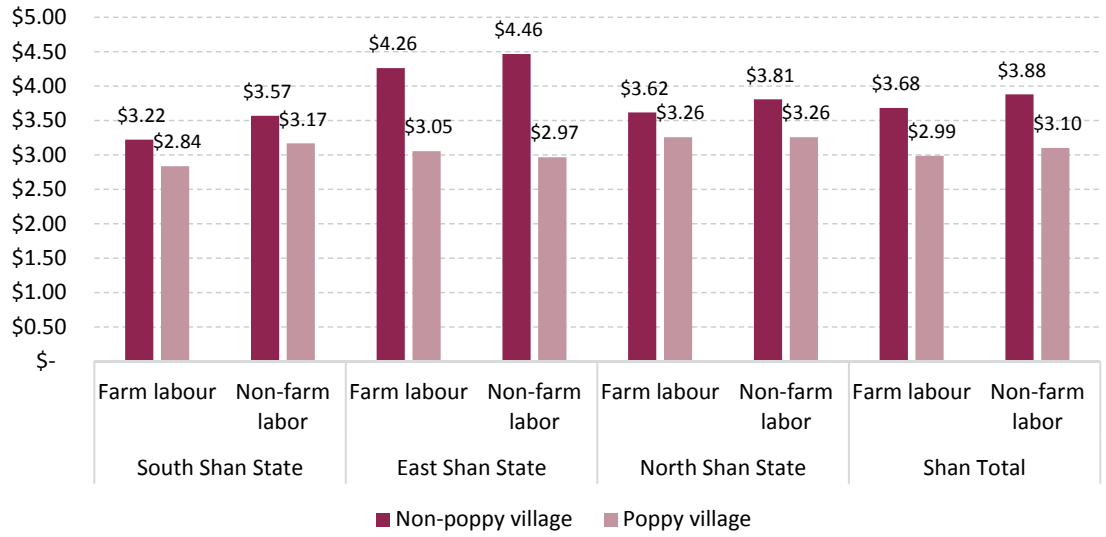


Figure 14: Average daily wages for poppy related labour in poppy villages, Shan State total and by region

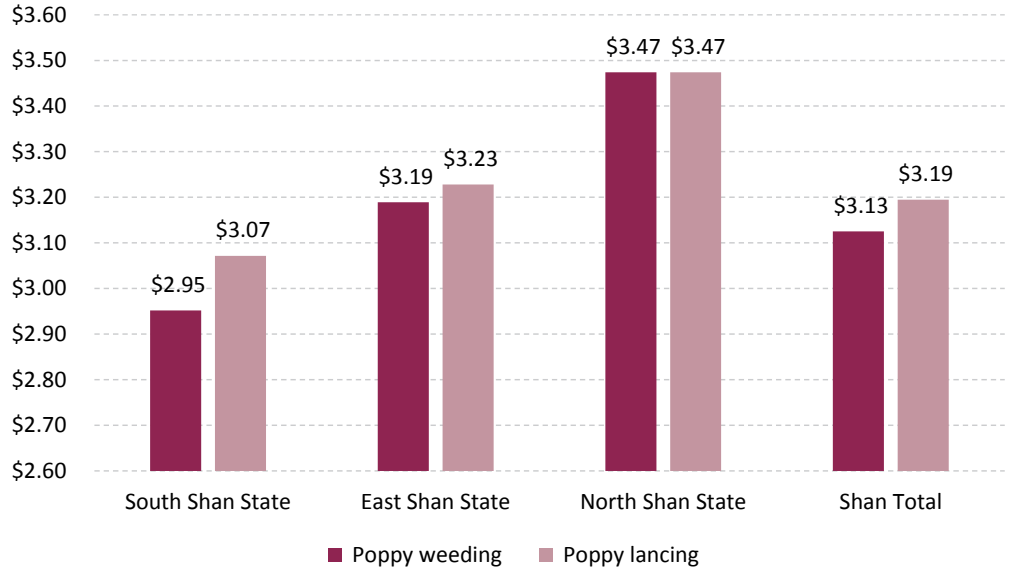
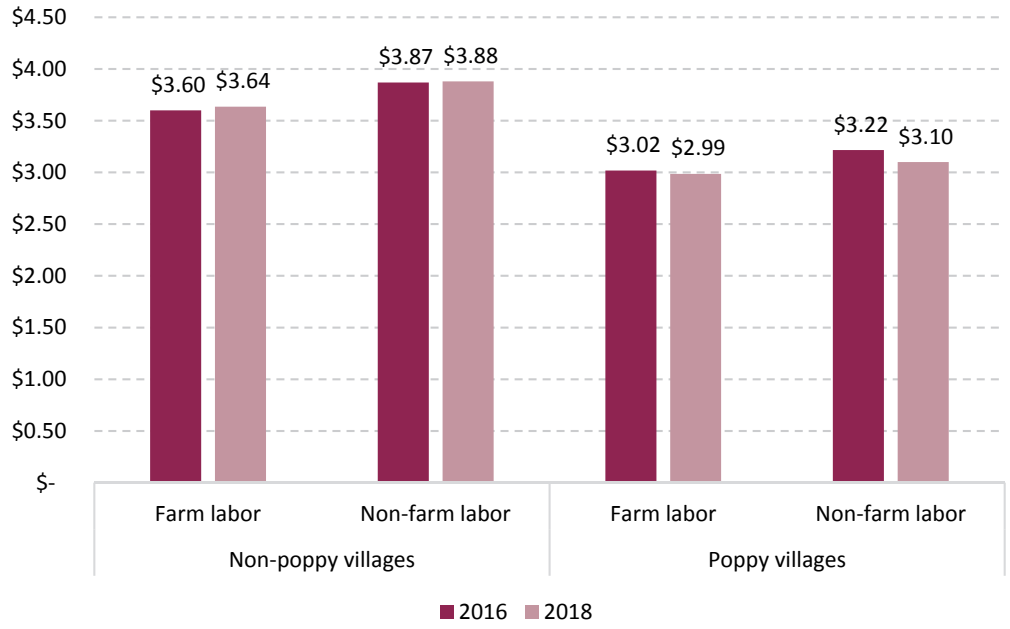


Figure 15: Average daily wages for farm labour (excluding poppy related farm work) and non-farm labour by year and poppy cultivation status (expressed in 2018 USD)



Ensure access to land ownership[14]

Formalising individual land rights may lead to increased investment, credit and efficiency[15]. Land rental for growing opium poppy or sharecropping (a practice whereby the tenant uses the land and returns a share of the crops produced to the landowner as payment) are practically non-existent in Shan State. No major differences on types of involvement and land tenure modalities were found among the regions. However, farmers that grew opium poppy on their own land (over 99%) tended to have customary user rights but no legal property rights. In 2016, 24% of the poppy village headmen indicated that not being the legal owner of the land cultivated was one of the top three reasons why farmers grow opium poppy. This figure decreased to 12% in 2018 according to the village headmen, suggesting that progress may have been made to facilitate the formalization of land rights[16].

Increases in number of farmers with legal land ownership have been associated with less illicit crop cultivation[17], and also is seen as a circumstance to improve living conditions (SDG 1). In the next survey formal land ownership and the importance for opium cultivation will be further investigated.

Ensure access to financial services

A much higher proportion of poppy village headmen indicated that the need for "money for a large expense" was the key reason for poppy cultivation in 2018 (65%) than in 2016 (49%). This can be explained by the limited access to financial services, regardless of whether poppy was grown in the village. Overall, according to village headmen, around 90% of the households did not have a loan while only 74% of village

[14] Corresponding to Target 1.4 "by 2030 ensure that all men and women, particularly the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership, and control over land and other forms of property, inheritance, natural resources, appropriate new technology, and financial services including microfinance".

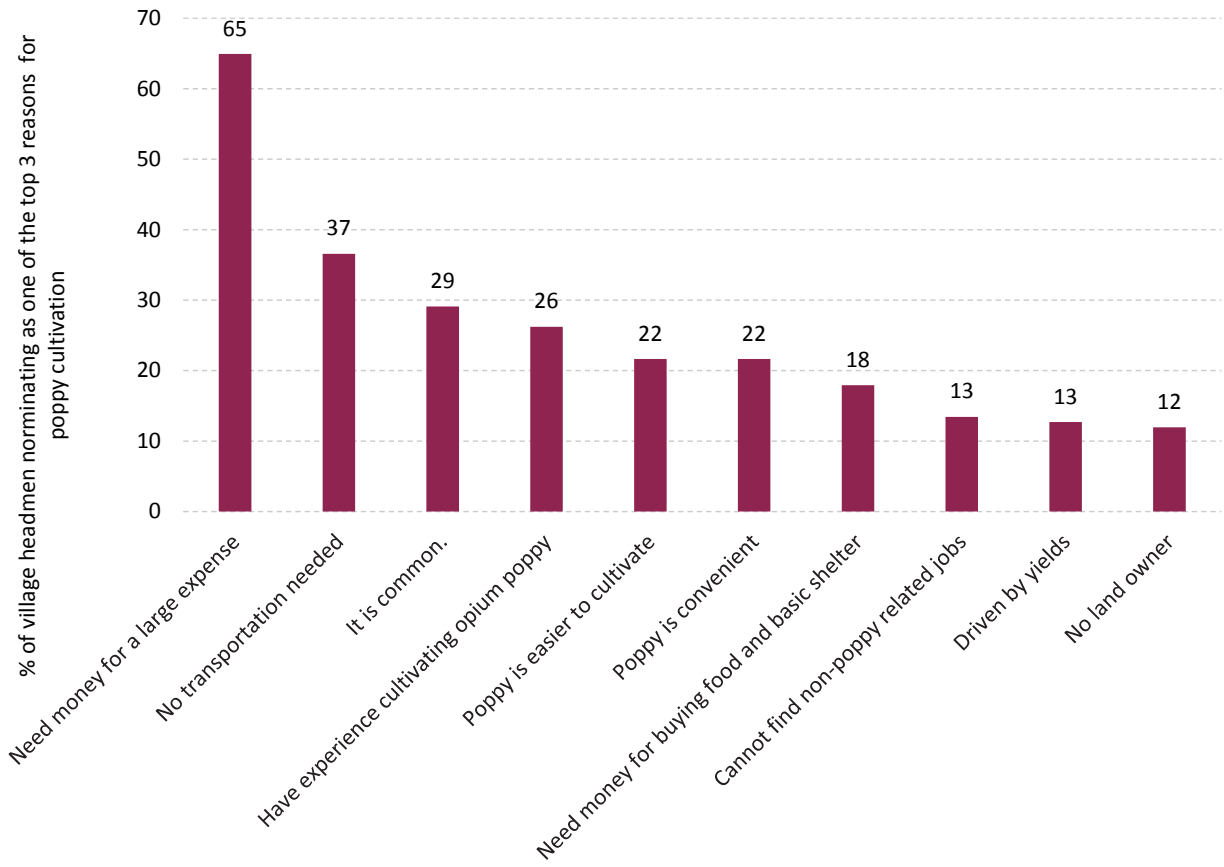
[15] ODI. 2013. Property rights and development briefing: Property rights and rural household welfare. Shaping policy for development.

[16] In 2012, the Farm Land Law was passed, which ended the policy of state ownership and giving farmers rights to their land. See *Evidence for enhancing resilience to opium poppy cultivation in Shan State*, Myanmar, UNODC, March 2017.

[17] UNODC. 2015. World Drug Report.

headmen indicated that the main reason for not borrowing was “No need”. In addition, 11% of the village headmen indicated that it would be too much trouble to borrow.

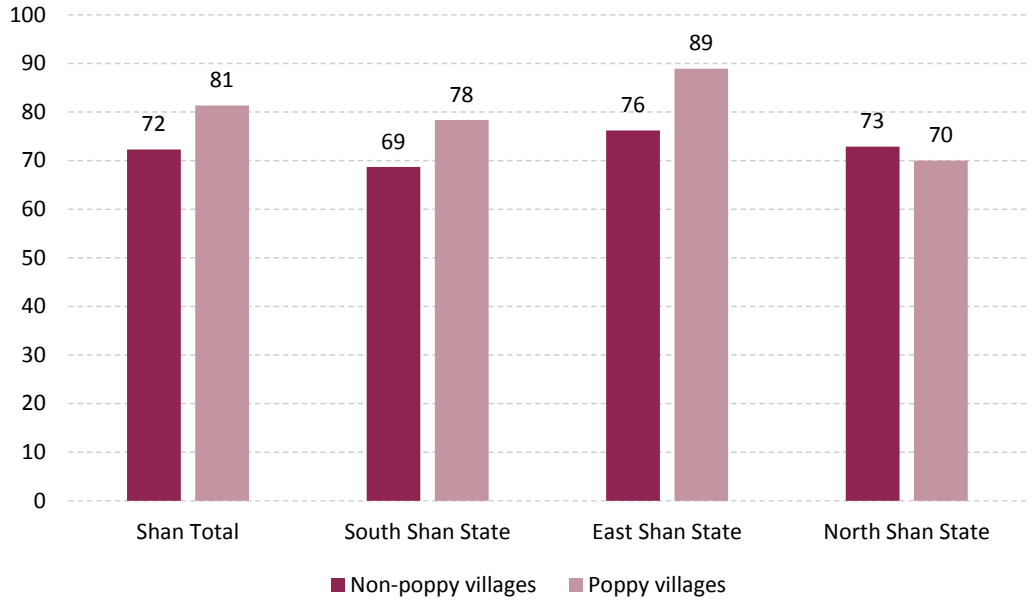
Figure 16: Ten most common reasons (indicated as the top 3 reasons by village headmen) for cultivating opium poppy, Shan State



Other less common reasons included: Advanced cash for poppy cultivation has been provided; higher debt; higher availability of labour for poppy cultivation; small land area; good climate conditions for poppy growing; bad results with alternative crops; self-consumption; being forced to cultivate poppy; not afraid of eradication; high costs of inputs for cultivating non-poppy crops; poppy is easy to sell; opium poppy has high sale prices; and difficult to take non-poppy crops to the market due to bad roads or controls.

Figure 17: Average percentage of indebted households in villages, total and by regions and poppy cultivation status, 2018

Figure 18: Percentage of village headmen who indicated "No need" as the main reason why farmers do not access credit, total, by region and poppy cultivation status, 2018

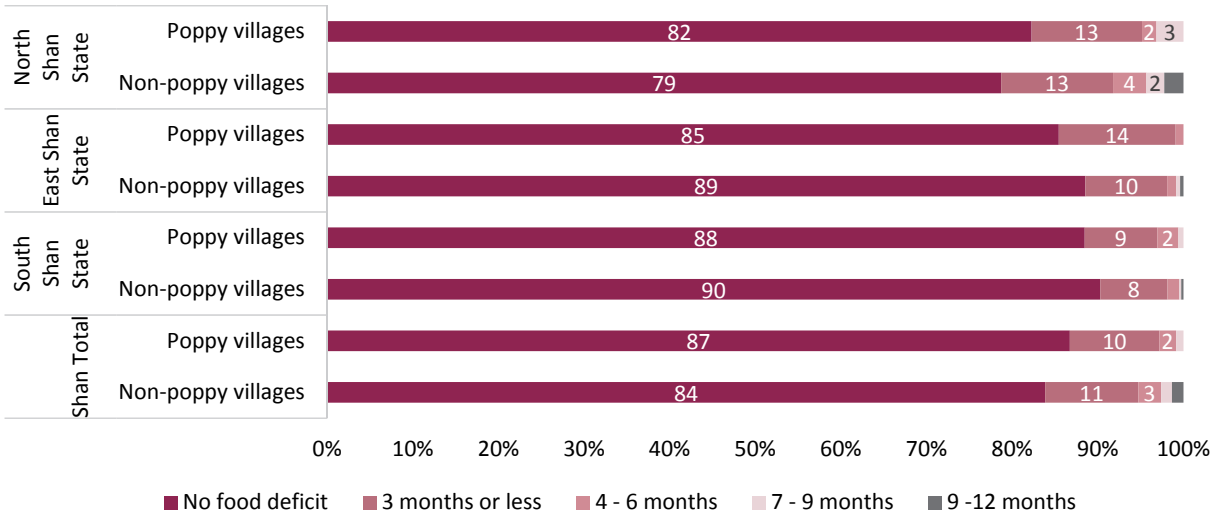


Challenges for achieving Sustainable Development Goal 2 "Zero Hunger"

SDG 2 aims to end hunger and all forms of malnutrition by 2030. It also commits countries to achieving universal access to safe, nutritious and sufficient quantities of food at all times of the year, which includes measures for ensuring sustainable production system and strengthening resilience to climate change.

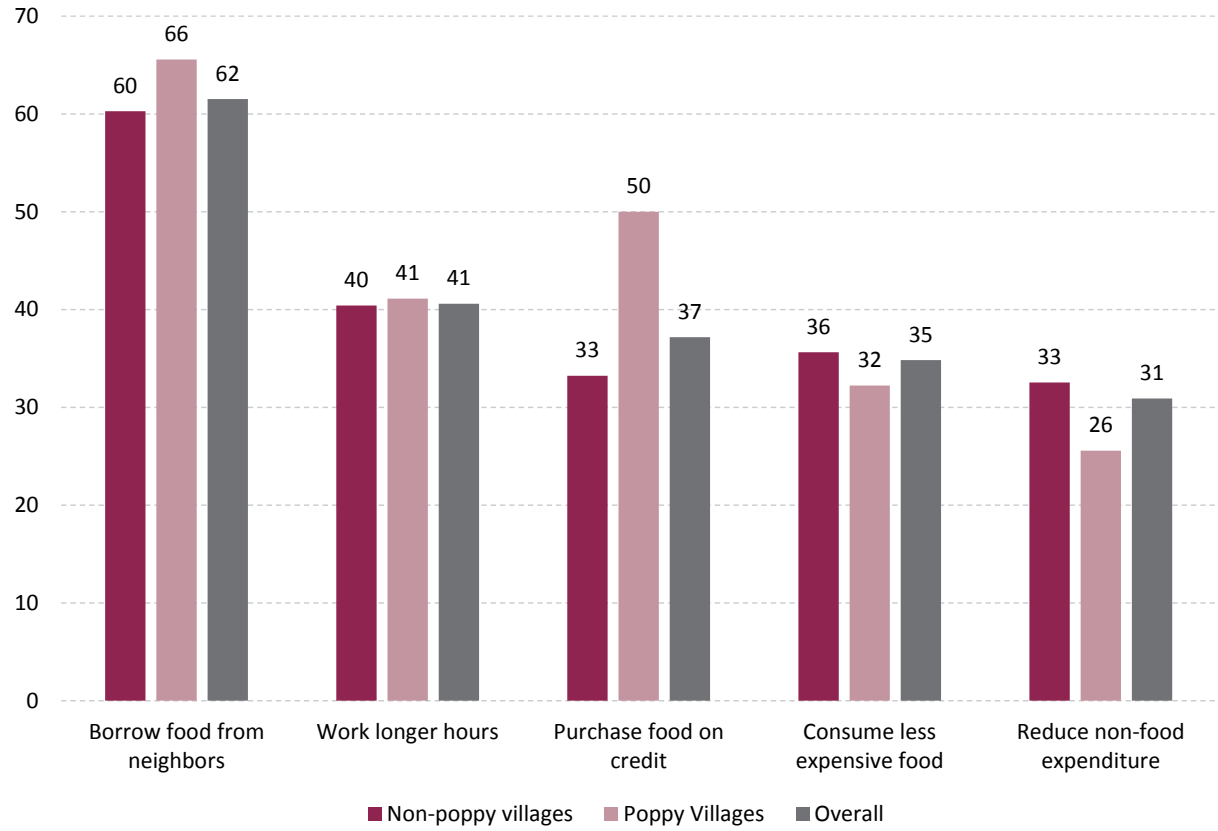
While most of the villages in Shan State did not report any food deficits in 2018, 10% to 21% still faced food deficits to some extent. On average, 60% of the villages reported having more than half of household's buying staples in the market in 2018, and this percentage was higher for non-poppy villages (64%) than for poppy villages (46%).

Figure 19: Percentage of villages reporting food deficits by number of months in the last year, by region and total



The percentage of households reporting food deficits is low in Shan State – 84% of the household reported no food deficit. Overall, when facing food insecurity, the five most common strategies were to borrow food from neighbours (reported by 62% village headmen as one of the top 3 strategies), work longer hours (41%), purchase food on credit (37%), consume less expensive food (35%) and reduce non-food expenditure (31%). Households from poppy villages were more likely to purchase food on credit than households from non-poppy village (50% in poppy village vs 33% in non-poppy village). There was no significant difference in the other four strategies between poppy and non-poppy villages. Drastic measures such as reducing the number of daily meals were much less common (13%).

Figure 20: Strategies indicated by the village headmen among the three main strategies for coping with food deficiency, by cultivation status, 2018



Overall, 90% of poppy villages relied on income from poppy cultivation for food. But there were significant regional differences – villages in East Shan and North Shan nearly universally (96-100%) reported using poppy income on food, compared to 82% in South Shan. This suggests that poppy cultivation in East and North Shan may be more closely linked with subsistence needs. In the other most mentioned uses of poppy income, it was observed that 69% use it for medical expenses, 40% to pay for education, 37% to buy land and 36% for paying off debt.

Figure 21: Percentage of village headmen who indicated buying food as one of the three main uses of poppy income, total and by region, 2018

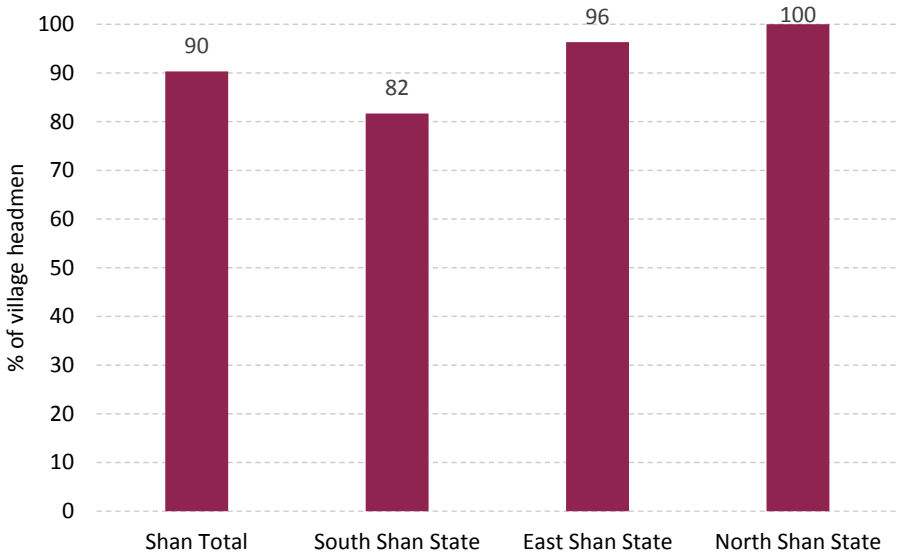


Figure 22: Percentage of village headmen reporting different expenses as one of the three main uses of poppy income for Shan State

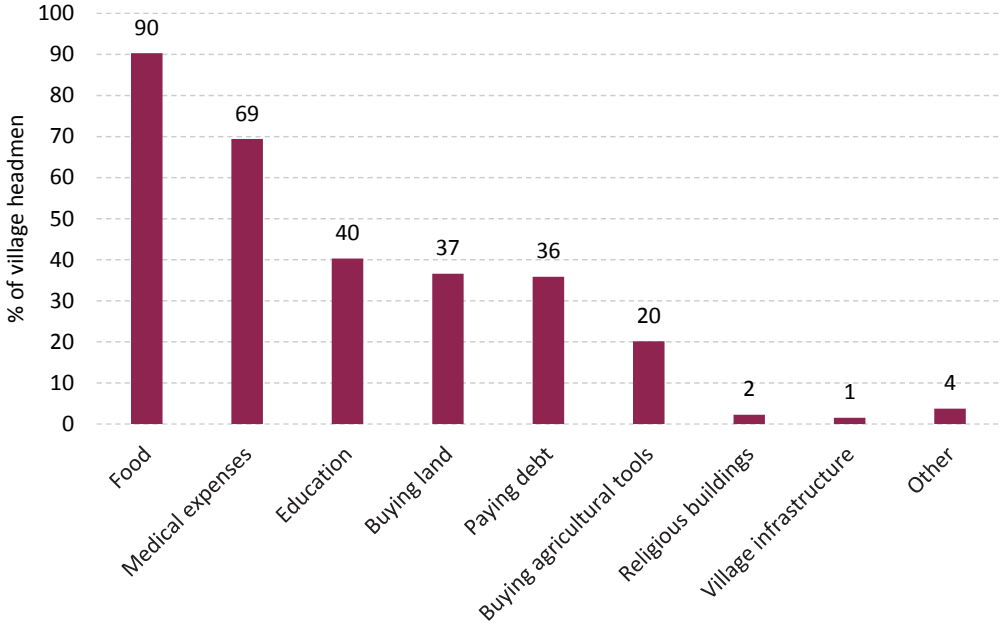


Figure 23: Terrace paddy field in East Shan, 2018

Challenges for achieving Sustainable Development Goal 3: Good Health and Well-being

SDG 3 seeks to ensure health and well-being for all, at every stage of life. Health status is influenced by the availability and access to health services. Overall, there was no significant change in the proportion of village headmen who reported having local access to health clinics between 2016 (18%) and 2018 (21%). On average, the percentages of poppy and non-poppy villages with access to local health services were similar but relatively low in 2018 (19% in poppy villages and 21% in non-poppy villages). When a local clinic was not available, a higher proportion of non-poppy villages (60%) had access to a clinic within 1 hour of walking distance than poppy villages (50%). There were large regional differences, with the highest percentage of villages with clinics among the poppy villages in North Shan (30%), and the lowest among the poppy villages in East Shan (9%).

Table 2: Percentages of villages with clinics, by region and cultivation status

	Non-poppy villages	Poppy villages
South Shan	21%	23%
East Shan	15%	9%
North Shan	25%	30%

Poppy villages with no local clinics had significantly longer walk times to the nearest clinic than non-poppy villages in 2018. There was a significant improvement in clinic access (measured by walking time) in both poppy and non-poppy villages in East Shan between 2016 and 2018[18]. There was no significant change in walking time for South Shan. For North Shan, although there appeared to be a large reduction in the walking times for poppy villages, this change was not significant. For non-poppy villages in this region, the walking time increased significantly from 34 minutes in 2016 to 43 minutes in 2018. However, reliable conclusions about change cannot be drawn because there was only a small number of poppy villages sampled in North Shan in the survey.

[18] Excluding villages with a walking time to the closest clinic of less than 5 mins, assuming these to have a local clinic.

Figure 24: Average walking time to the closest clinic according to village headmen by region, poppy cultivation status and year

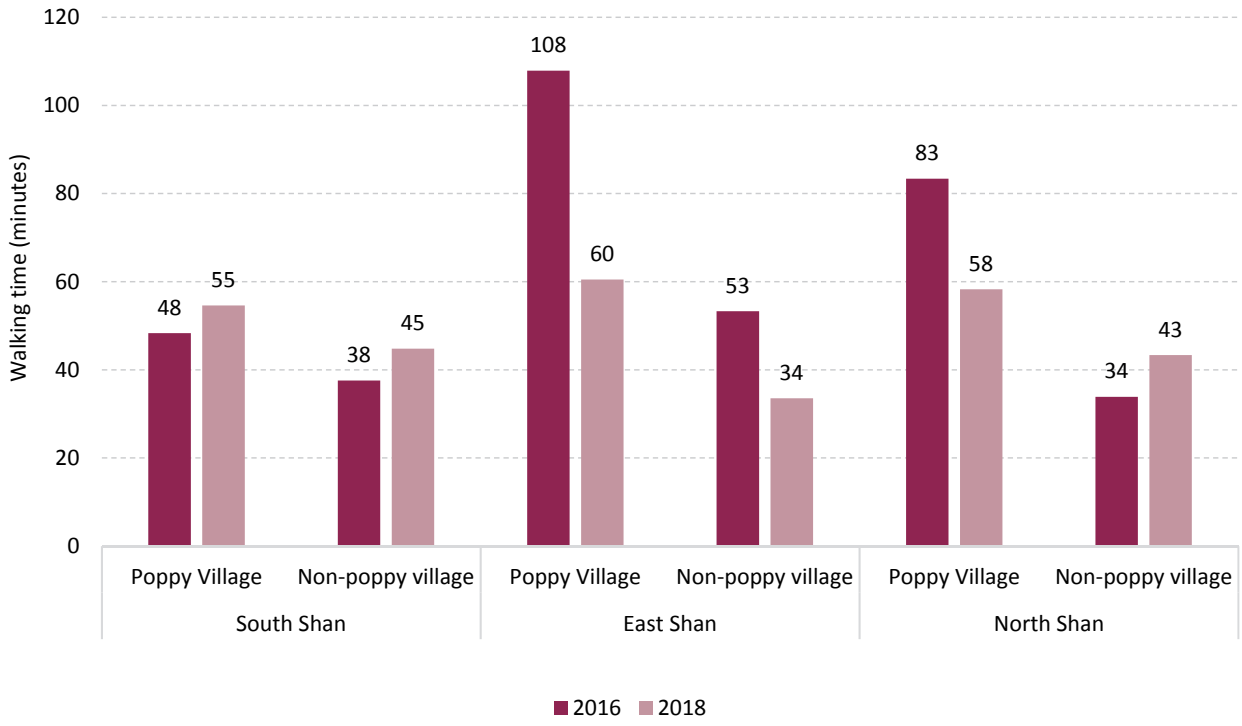


Figure 25: Village clinic in South Shan, 2018

Challenges for achieving Sustainable Development Goal 4: "Quality Education".

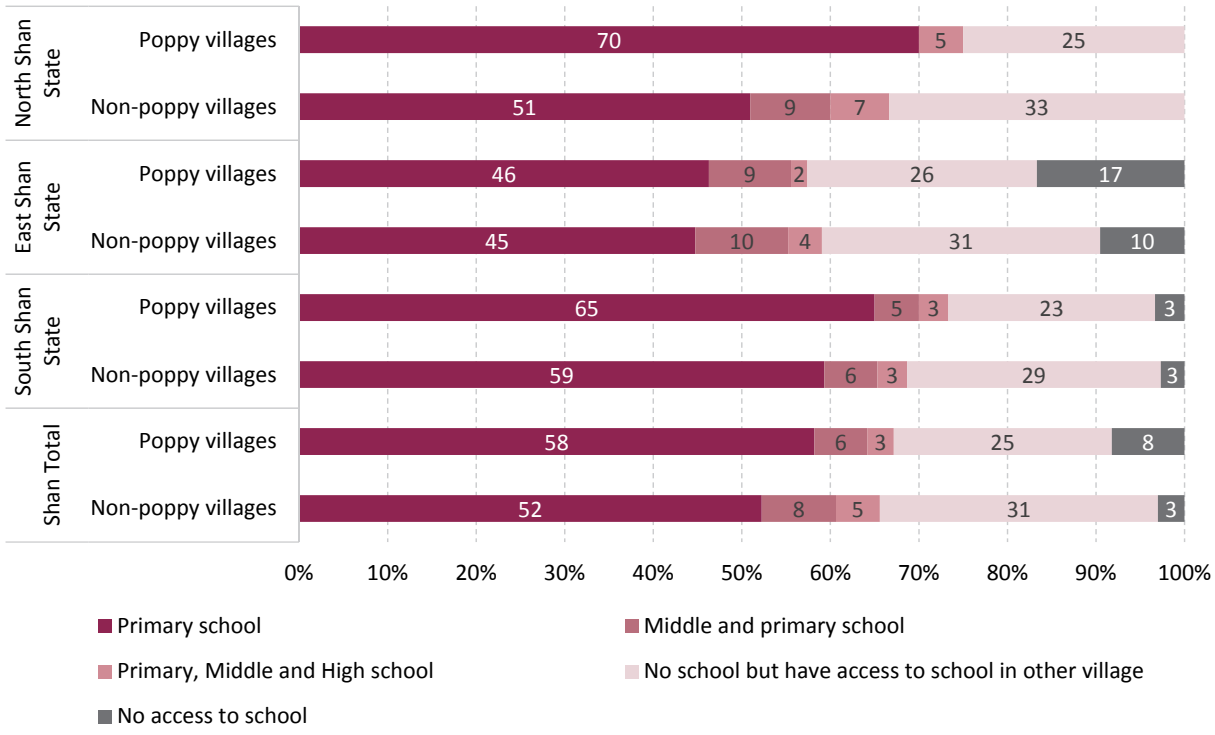
The connection between educational achievements and levels of development is well documented. Education is vital to relieving long-term poverty as less educated parents tend to invest less in their children's schooling. These parents may also be more likely to respond to economic shocks by cutting spending on education or even removing their children from school. Between 2016 and 2018, there was no significant change in the proportion of village headmen who reported having access to a local school (63% in 2016 and 66% in 2018).

Overall, education access in Shan State is limited – 33% of poppy villages and 35% of non-poppy villages had no local school in 2018. Poppy villages without local schools were usually more remote and reported that it took 47% longer (44 minutes) to reach the closest school outside the village on foot in comparison to non-poppy villages without schools (30 minutes). There was a significantly higher percentage of poppy villages (8%) with no access to any school compared to non-poppy villages (3%). There were also large regional differences, with the highest percentage of poppy villages that had schools in North Shan (75%), and the lowest in East Shan (57%), where 17% of the villages also did not have access to a school nearby.

Table 3: Percentage of villages with a local school, as indicated by village headmen, by region and cultivation status, 2018

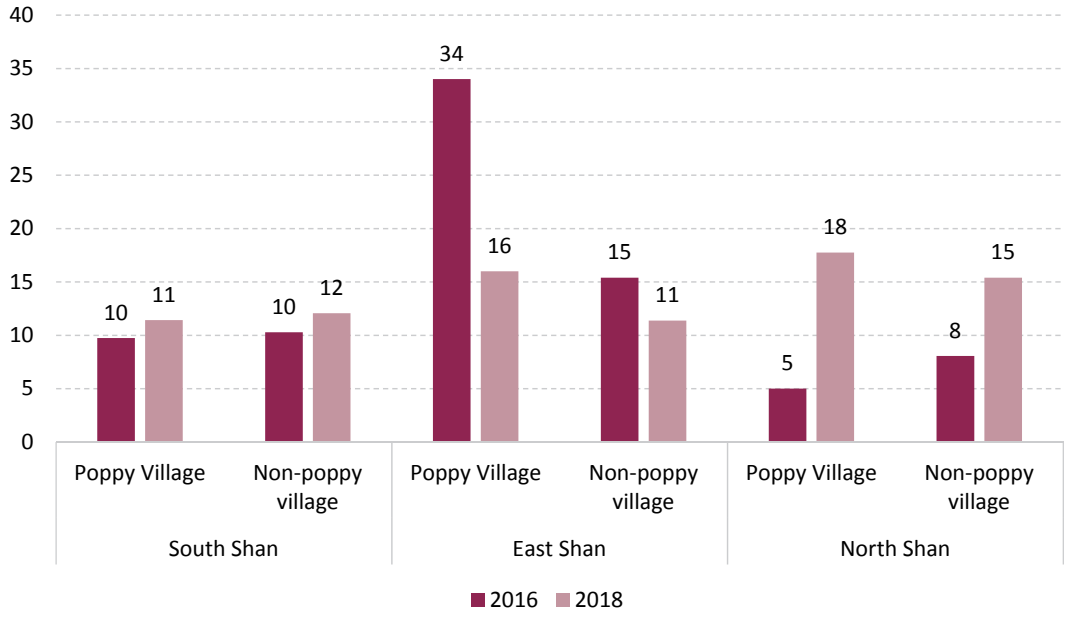
	Non-poppy villages	Poppy villages
South Shan	69%	73%
East Shan	59%	57%
North Shan	67%	75%

Figure 26: School access by region, poppy cultivation status and school level, 2018, as indicated by village headmen



Assuming the walking time to the closest school was 5 minutes for villages with a local school, there was a significant reduction in the walking time in poppy villages, but not in non-poppy villages in East Shan between 2016 and 2018. For South Shan there was no significant change, but for North Shan walking time significantly increased in both poppy and non-poppy villages between 2016 and 2018. Further research is required to understand this increase.

Figure 27: Average walking time to schools according to village headmen, by region, poppy cultivation status and year



Overall, a significantly higher proportion of household heads had no education among poppy growing households (55%) than non-poppy growing households (31%). There was also a significant difference across regions, with a significantly higher proportion of household heads from East Shan having no education than those from South Shan and North Shan.

Figure 28: Proportion of household heads without education, Shan State total, by region and poppy cultivation status, 2018

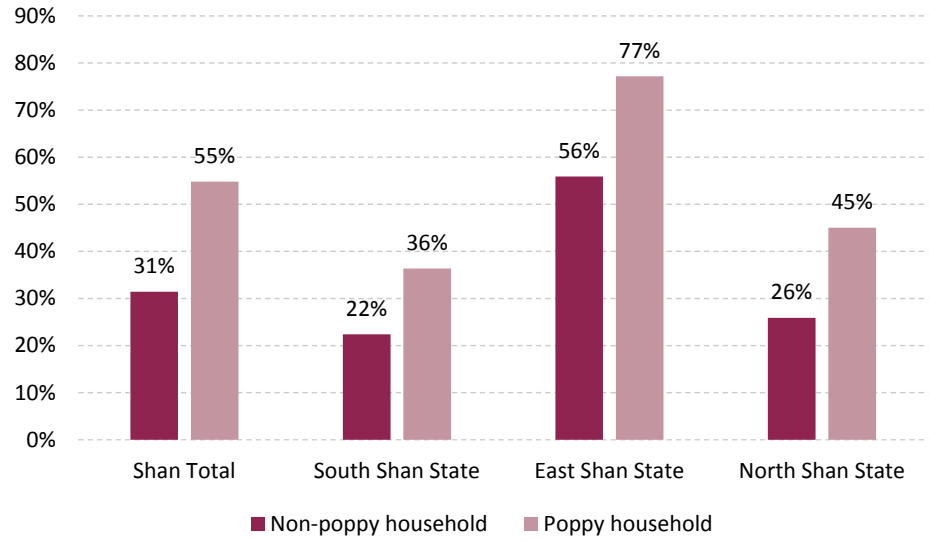


Figure 29: Inside the classroom of a primary school, South Shan 2018

Challenges for achieving Sustainable Development Goal 5: "Gender equality"

The lack of gender equality is a major obstacle to sustainable development. The female labour force participation rate in Myanmar is among the highest in South-East Asia[19], but women in the survey area earned significantly less than men for all types of labour in 2018 (poppy and non-poppy related; farm and non-farm related). This gender pay gap was largest for non-farm labour in poppy villages (US$4.24 for men vs US$3.51 for women; a 21% difference) and smallest for poppy weeding (3.17 for men vs 3.08 for women; a 3% difference). The relatively smaller gender pay gap in poppy related labour could be associated with a shortage of labour during the opium poppy weeding and harvesting times. There was also a substantial difference across regions, with the largest pay gap observed in North Shan for non-farm labour (US$4.15 for men vs US$3.37 for women; a 23% difference) and essentially no gap in farm labour in East Shan (US$3.98 for men and US$4.00 women). There was no significant change in the gender pay gap between 2016 and 2018.

Figure 30: Daily wages (USD) by type of labour and poppy cultivation status, 2018

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International Labour Organisation (ILO). 2011. KILM, 7th edition. Geneva.

Figure 31: Daily wages (USD) for poppy-related labour by gender and region, 2018

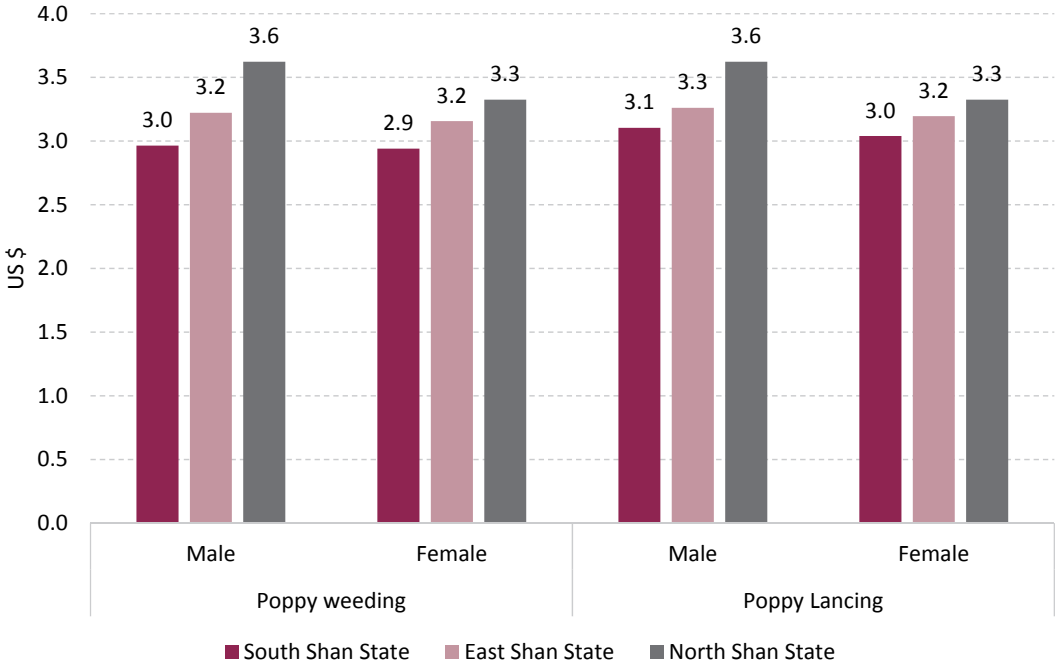


Figure 32: Daily wages (USD) for non-poppy-related labour by gender and region, 2018

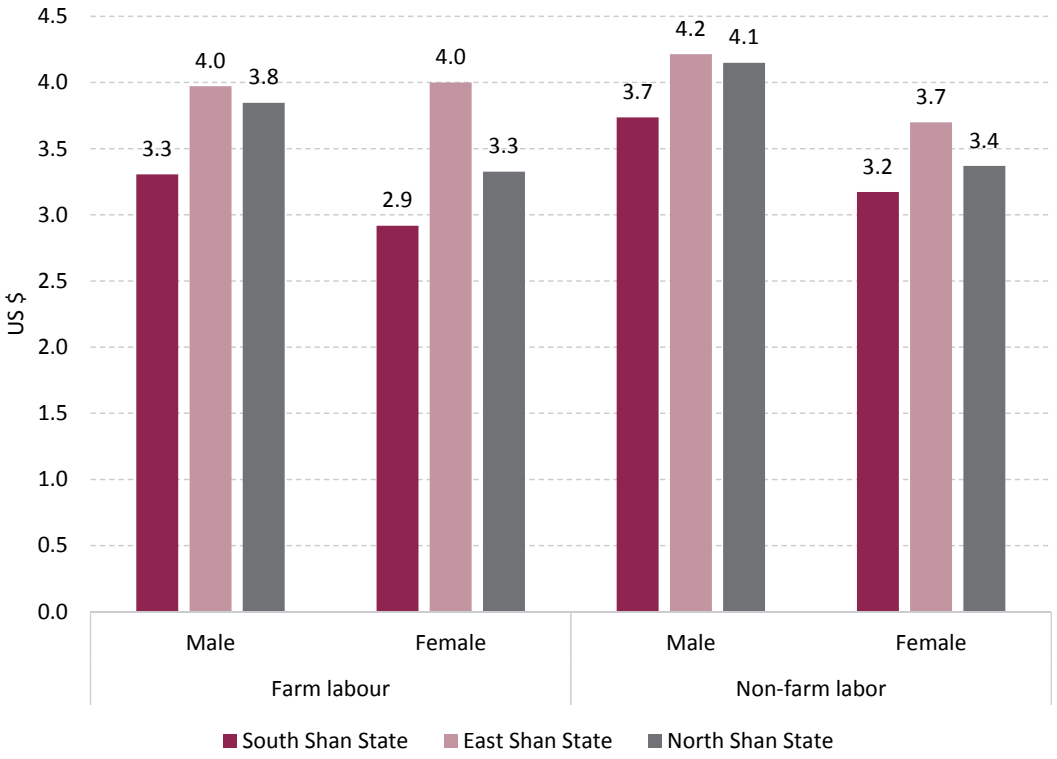


Figure 33: Ratio between female and male wages by type of labour and year, for Shan State. Male wage was the denominator and a ratio of 1 indicated equal wages between male and female

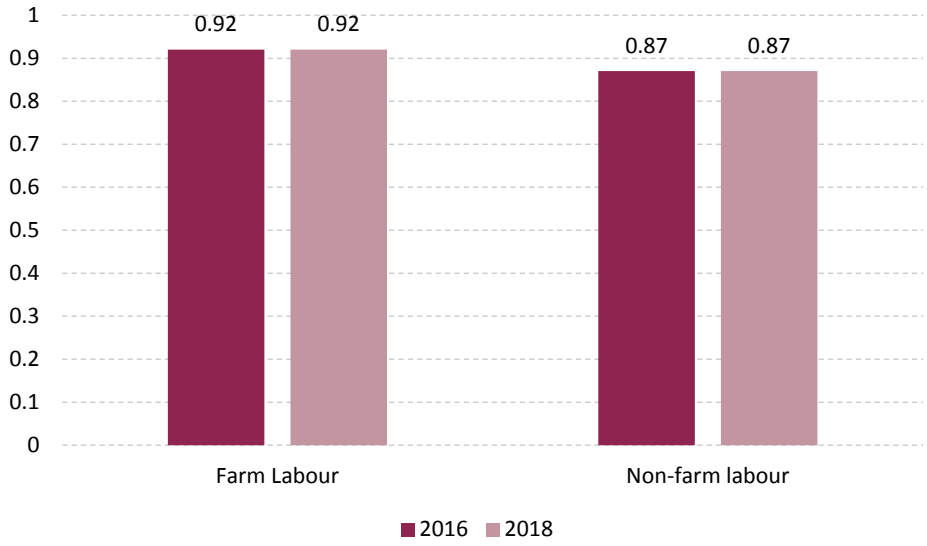
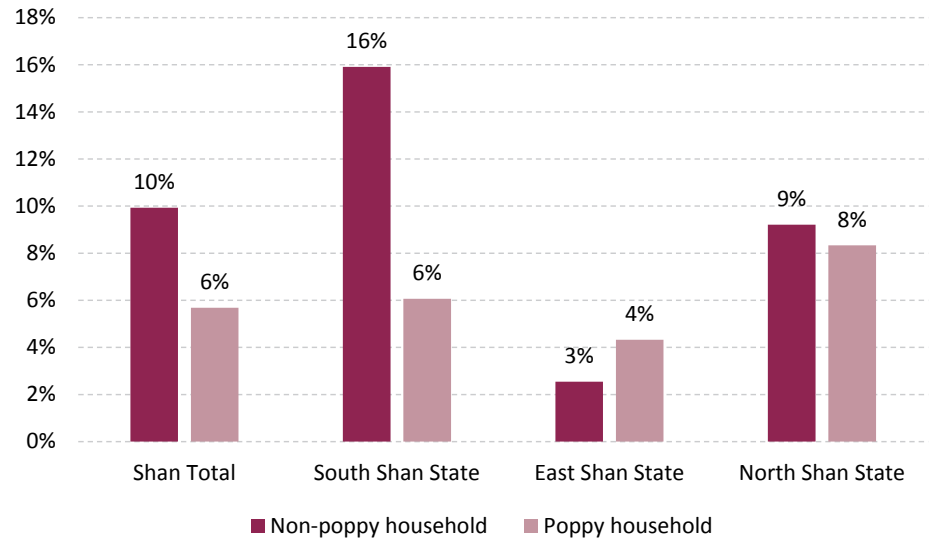


Figure 34: Small grocery store in South Shan, 2018

Overall, only a very small proportion of households had a female head (9%). However, it should be noted that there were significant differences across regions and by poppy cultivation status. Non-poppy growing households in South Shan had the highest proportion of female heads (16%), while the proportion of

female heads was very low among East Shan households regardless of poppy cultivation status (3% in non-poppy and 4% in poppy households).

Figure 35: Proportion of households with a female head, Shan total, by region and poppy cultivation status



Challenges for achieving Sustainable Development Goal 6: "Clean Water and Sanitation"

Goal 6 not only addresses issues relating to drinking water, sanitation and hygiene, but also the quality and sustainability of water resources worldwide. Overall, there was no significant difference in the perception of water quality between poppy and non-poppy villages. There was a significant regional difference, where 60%, 64% and 81% of village headmen from East, North and South Shan respectively reported a lack of access to good or very good quality water.

Figure 36: Percentage of villages by quality of drinking water, as perceived by village headmen, total, by region and poppy cultivation status, 2018

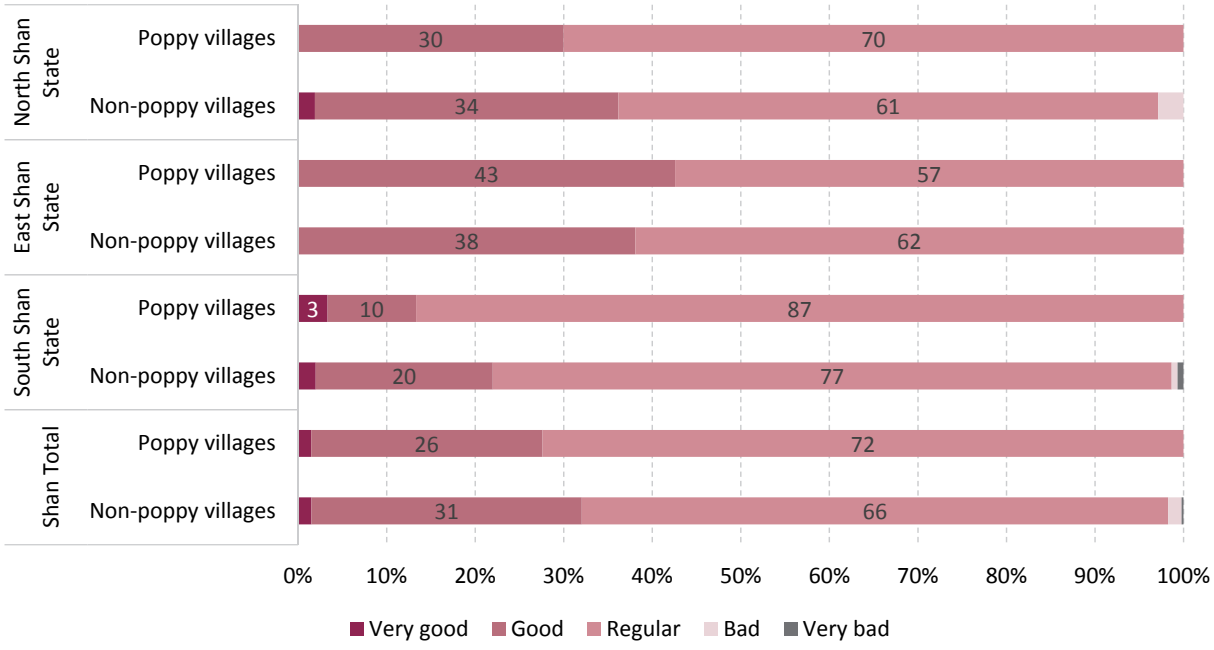


Figure 37: Personal water pipe outside dwelling in East Shan, 2018

Target 6.2 states: "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation…". Illness caused by inadequate sanitation can generate significant health costs. Previous studies conducted in Myanmar suggest that rural households without access to sanitation lost more days to ill health and spent more on health than households which had toilets[20]. The village survey showed that compared to 2016, there was a significant increase in the proportion of villages with access to flush toilets in 2018. Overall, the percentage of poppy villages with access to flush toilets (53%) was significantly lower than non-poppy villages (67%). Open defecation was practiced in 25% of poppy villages and 5% of non-poppy villages. There were significant regional differences, with more than half of poppy villages in East Shan practicing open defecation whereas no villages in South Shan reported using this practice.

[20] FAO, 2015. Report of the Workshops to Present the Initial Research Findings from a Nation-Wide Survey and Analysis on Social Protection and Poverty Dimensions in Support of Rural Development and Poverty Reduction on Myanmar.

Figure 38: Percentage of village headmen who reported having access to flush toilet, by year and poppy cultivation status in Shan State

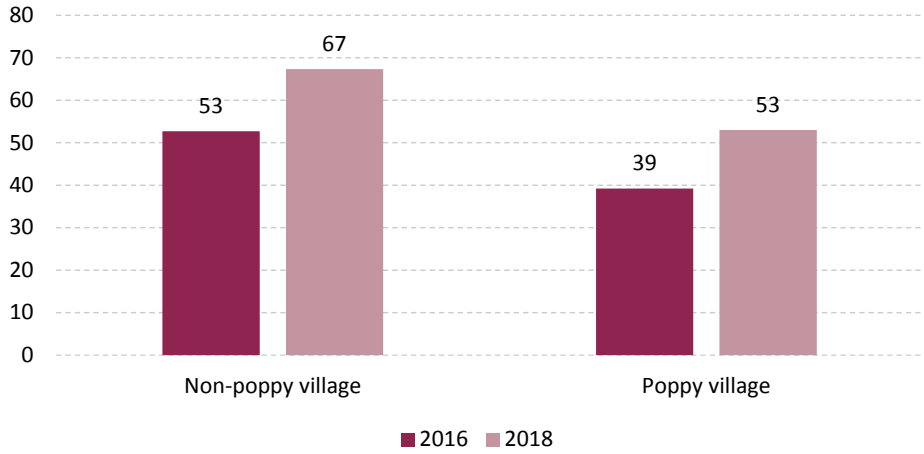


Figure 39: Percentage of villages by main type of toilet facilities, as indicated by village headmen, total, by region and poppy cultivation status, 2018

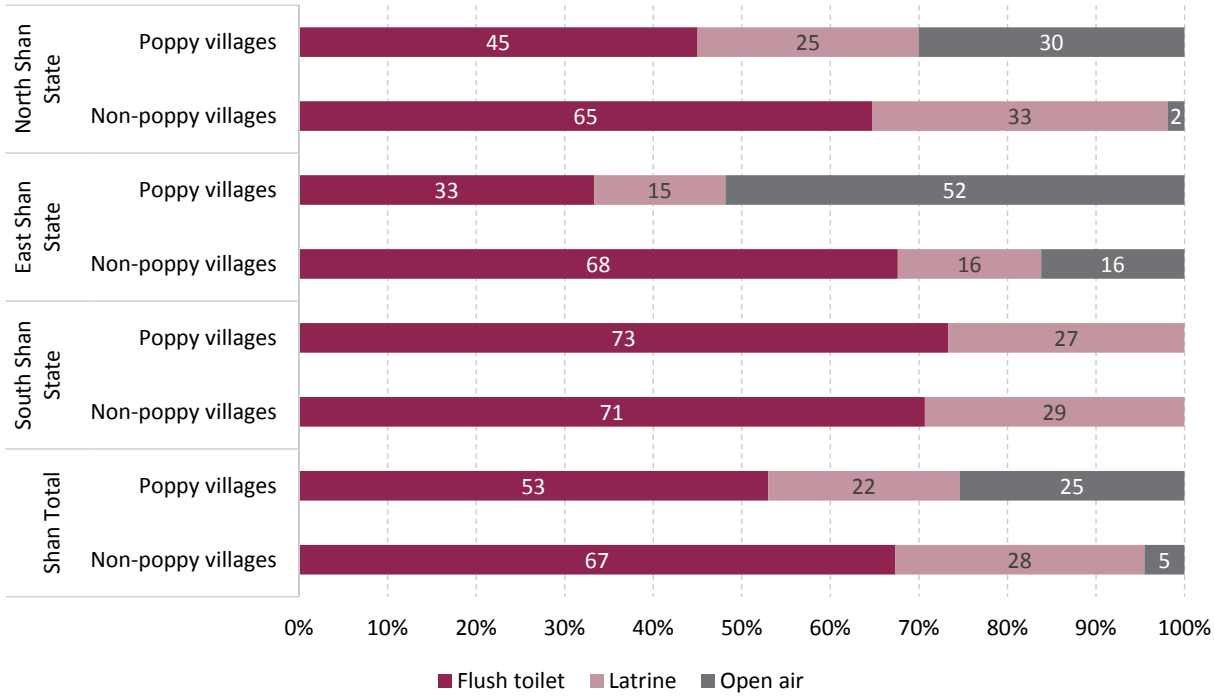


Figure 40: Latrine in North Shan, 2018

Challenges for achieving Sustainable Development Goal 7: "Affordable and Clean Energy"

The availability of usable energy is crucial for achieving development. Overall, the percentage of villages with access to public electricity was significantly higher in non-poppy villages (31%) than in poppy villages (5%). There was an important regional difference – the highest percentage of villages with public electricity was in non-poppy villages in North Shan (37%) and the lowest was in poppy villages in East Shan (2%). Significant progress has been made in relation to access to solar panel energy, especially in non-poppy villages. However, on average about one in six poppy villages still relied on candles as the main source for household lighting. Compared to 2016, there was a significant increase in the access to public electricity in non-poppy villages but not in poppy villages in 2018.

Figure 41: Percentage of villages by main type of energy for lighting, as indicated by village headmen, by region and village type, 2018

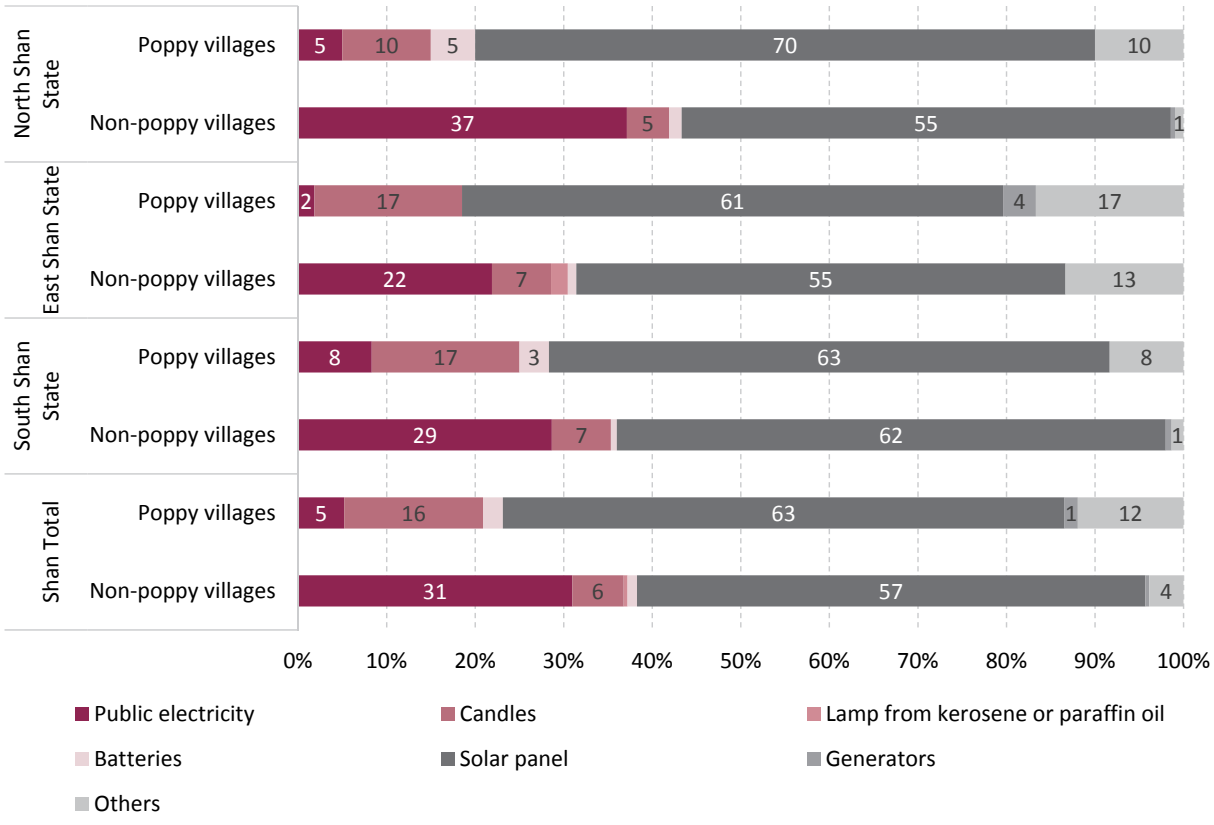


Figure 42: Proportion of village headmen who reported having access to public electricity, by year and poppy cultivation status in Shan State

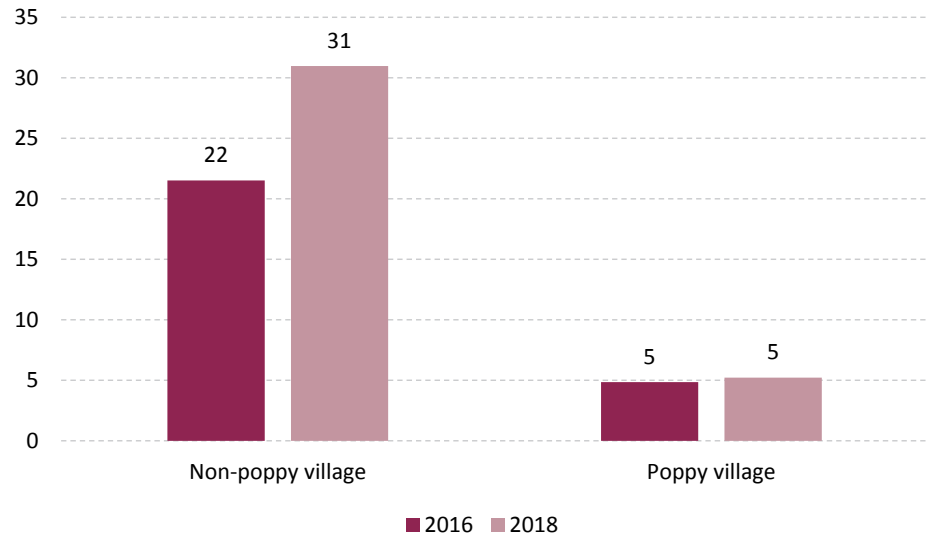
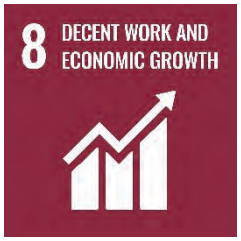


Figure 43: Solar panel in East Shan, 2018

Figure 44: Public grid electricity in South Shan, 2018

Challenges for achieving Sustainable Development Goal 8: "Decent Work and Economic Growth"

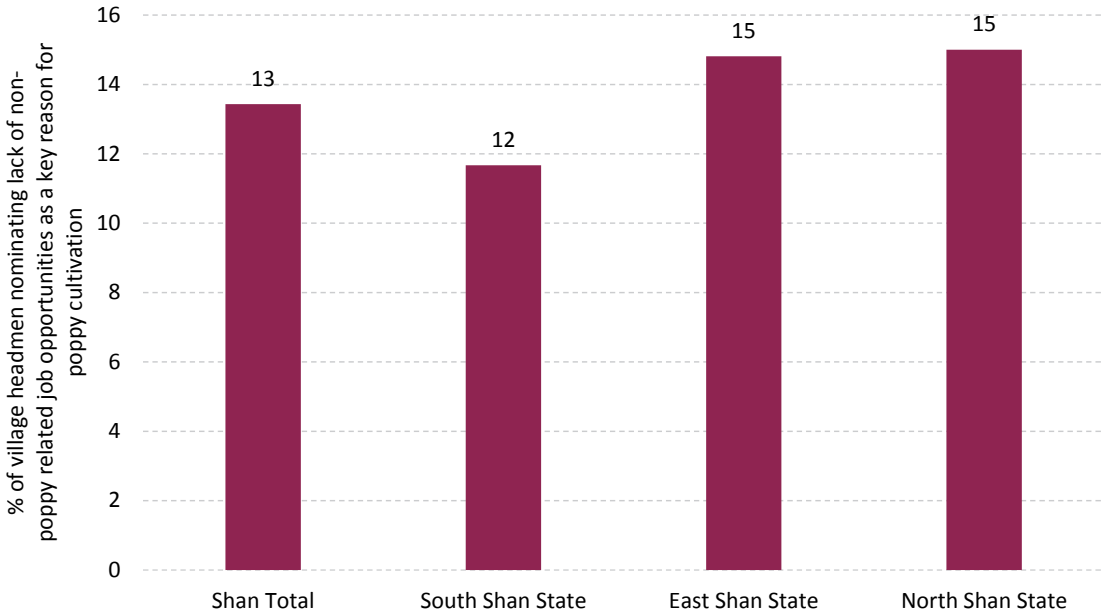


SDG 8 aims to achieve full and productive employment and decent work for all women and men. Livelihood diversity has been strongly linked to higher economic status, lower poverty rates, and higher levels of social capital. Diversification of livelihoods has long been promoted as a key element of increasing resilience to opium poppy cultivation and reducing vulnerability to poverty in rural households.

Availability of stable and well-remunerated non-opium poppy-related jobs

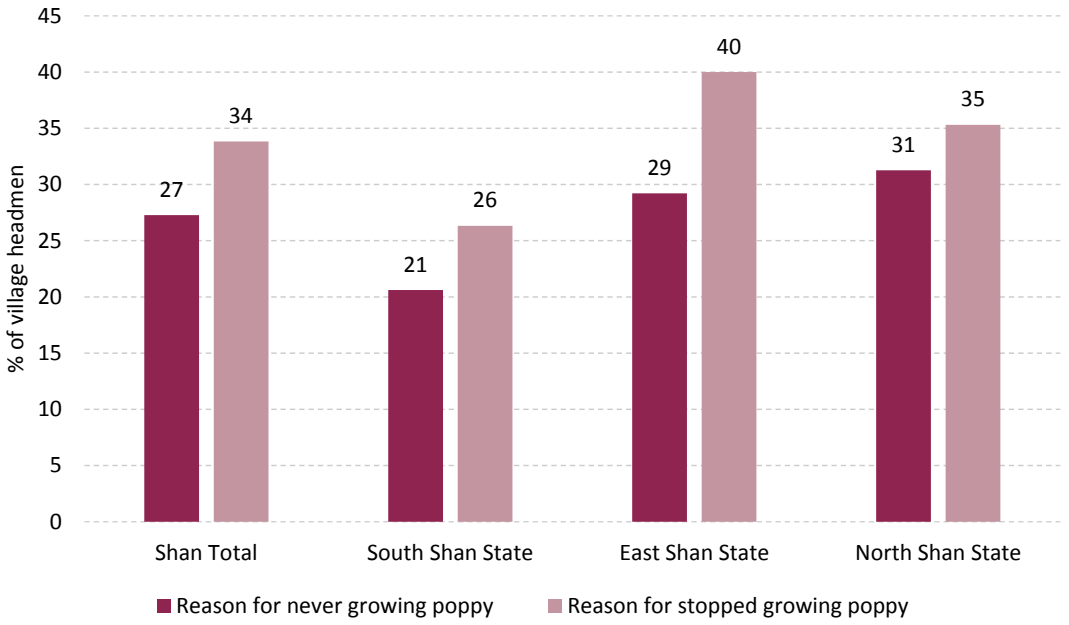
One of the most acute problems in remote areas is the lack of stable and reasonably well remunerated employment opportunities. Casual labour is still an important source of income in rural areas worldwide, and it is the main source of income for a third of the rural population in Myanmar[21]. Adequate availability of off-season employment can help to improve material conditions in Shan State. The lack of non-poppy-related job opportunities was indicated as one of the top three reasons for the cultivation of opium poppy in 13% of poppy villages in 2018. In addition, the availability of non-poppy job opportunities was reported as a reason for not growing poppy by one third of village headmen whose village never grew poppy or stopped growing poppy. In East Shan, 40% reported this to be the main reason for not growing poppy.

Figure 45: Percentage of village headmen who indicated the lack of non-poppy related job opportunities as one of the three main reasons for cultivating opium poppy, total and by region, 2018



[21] FAO, 2015. Report of the Workshops to Present the Initial Research Findings from a Nation-Wide Survey and Analysis on Social Protection and Poverty Dimensions in Support of Rural Development and Poverty Reduction on Myanmar.

Figure 46: Percentage of village headmen who indicated the availability of non-poppy jobs as one of the three main reasons for not cultivating poppy (in villages where poppy never was grown) or stopped growing poppy, total Shan State and by region, 2018



Alternatives to opium poppy income

According to the village headmen, 11% of the surveyed villages cultivated poppy in the past. Almost half of the villages (44%) reported a decrease in income after stopping opium poppy cultivation, and only 18% reported an increase in income from other sources. There were significant differences in the reported decreases between regions: 80% in East Shan, 26% in North Shan and 47% in South Shan. Over 50% of the village headmen in East Shan indicated the government ban on poppy cultivation was the key reason for stopping poppy cultivation (see Section Challenges for achieving Sustainable Development Goal 16). These results suggest that farmers in East Shan might have been forced to give up growing poppy without much alternative development opportunity in place, resulting in large reductions in income.

Figure 47: Percentage of villages by change in household income after stopping opium poppy cultivation, as perceived by village headmen, total and by region, 2018

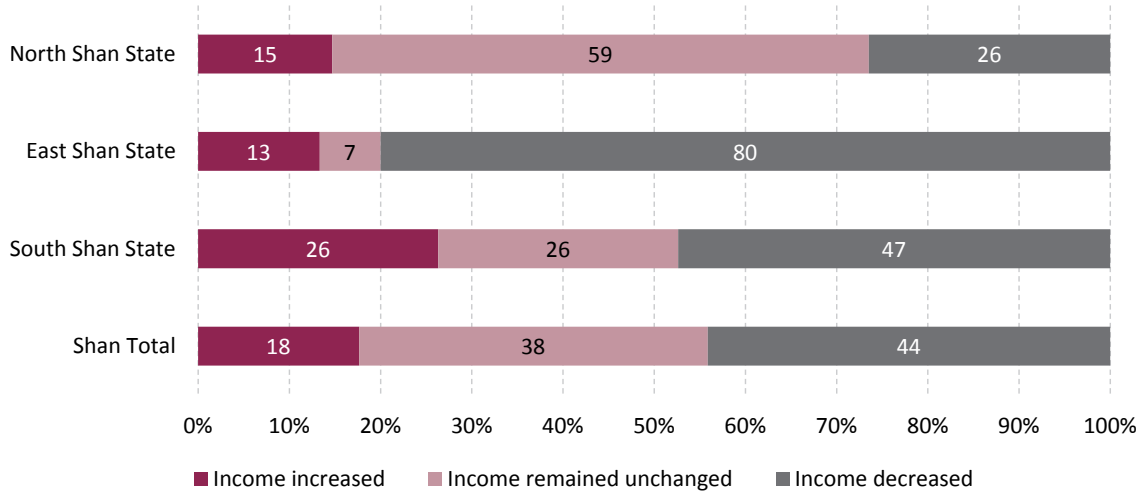


Figure 48: Cattle pen in South Shan, 2018

Figure 49: Weekly market in South Shan, 2018

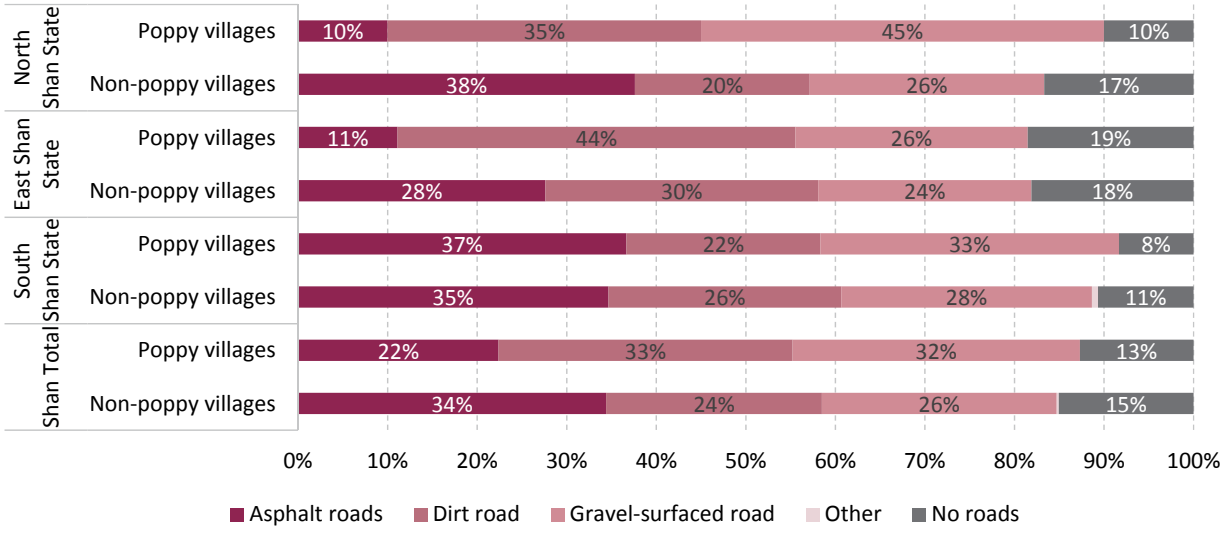
Challenges for achieving Sustainable Development Goal 9: "Industry, innovation and infrastructure"

SDG 9 encompasses infrastructure and industrialization. Infrastructure is essential to the operation of a society, and industrialization and innovation drive economic growth, creating job opportunities and reducing income poverty. Access to roads and markets, communication technology, new agricultural practices and farmers' empowerment could improve productivity and profits made by farmers in Shan State.

Develop infrastructure to support economic development[22]

Road density in Myanmar is the lowest in Asia, with only 2 km per 1000 population[23], moreover road conditions are often poor. The availability of asphalt roads was very limited in Shan in 2018 and only 34% of non-poppy villages and 22% of poppy villages had access to asphalt roads. Non-poppy villages had significantly better access to asphalt roads, however, there were significant regional differences. Non-poppy villages in North Shan (38%), poppy (36%) and non-poppy villages (35%) in South Shan had a similar level of access to asphalt roads. Access to asphalt roads was extremely limited in poppy villages in East Shan (11%) and North Shan (10%). Although asphalt roads were still relatively uncommon in Shan State in 2018, there was a small but significant improvement in the access to asphalt roads since 2016, and the magnitude of improvement was similar for poppy and non-poppy villages (16% to 22% and 29% to 34% respectively).

Figure 50: Proportion of villages with different road infrastructure, total, by region and poppy cultivation status, 2018



[22] In accordance with SDG target 9.1 "Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all".

[23] Asian Development Bank. Country Operations Business Plan: Myanmar, 2015 – 2017.

Figure 51: Percentage of villages having access to asphalt road in 2016 and 2018 by poppy cultivation status

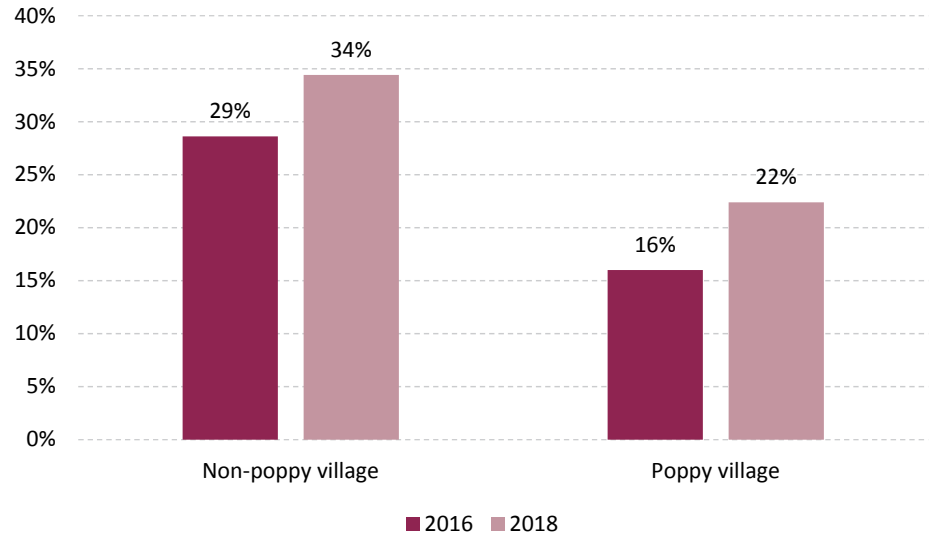


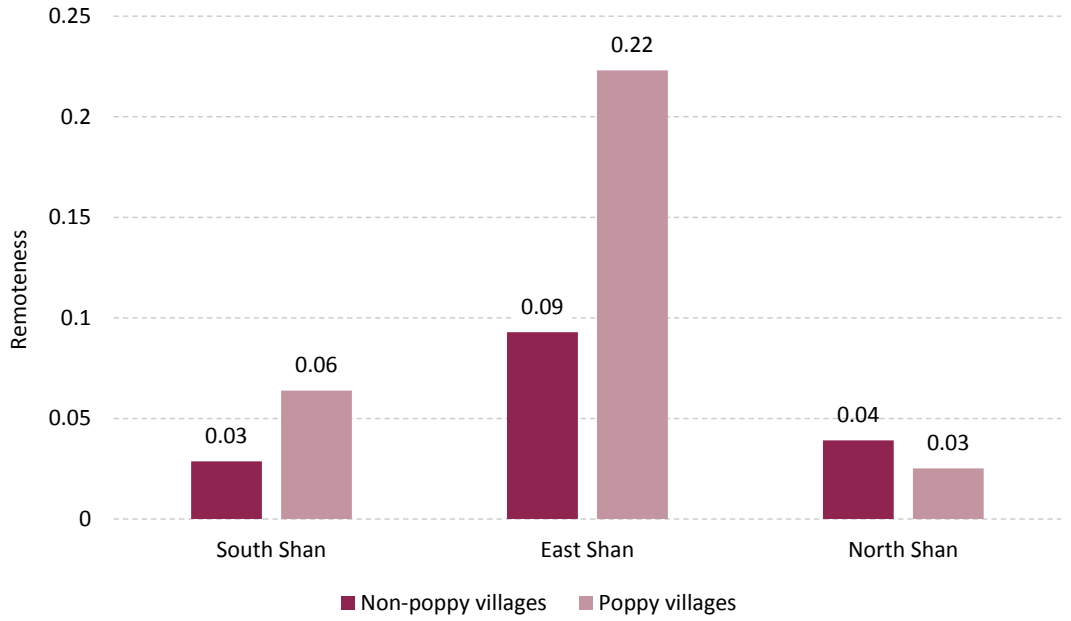
Figure 52: Village Road in South Shan, 2018

Besides the type of road, it is also important to consider other factors that determine "remoteness". Access to roads from each village was used in a geographic analysis that comprised elevation, slope and distance[24]. The analysis was done for remoteness to all roads and to the major roads only. The results showed a

[24] Based on an ASTER 30 meter digital elevation model. ASTER GDEM is a product of METI and NASA. This was done with a path-distance GIS analysis.

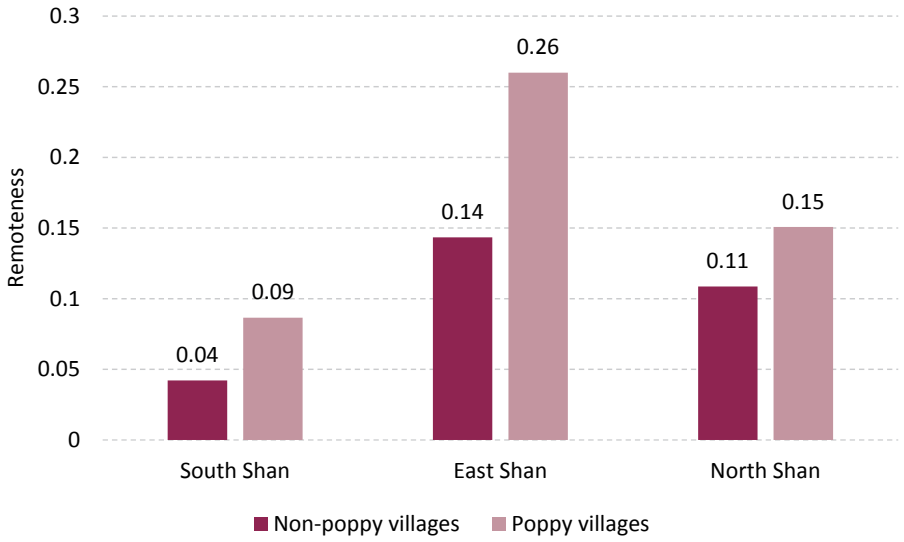
significant difference in remoteness to all mapped roads when comparing poppy and non-poppy villages in East Shan and South Shan, where poppy villages were found to be more remote. Villages in East Shan were generally more remote than in other regions, and a comparison between the two types of village showed that poppy villages here were the most remote in the state. The villages in South Shan were the least remote, but poppy villages were still more than twice as remote as non-poppy villages.

Figure 53: Road access to mapped roads for parts of Shan State, where 0 is the most access and 1 is the least



When considering access to major roads only, the contrast between village types was even more prominent. Here, a significant difference was also found in North Shan, with poppy villages being more remote than non-poppy. Access to major roads is different from access to all mapped roads, as major roads are usually of higher quality and allow for larger vehicles.

Figure 54: Access to major roads for parts of Shan State, where 0 is the most access and 1 is the least



In terms of implications, remoteness might contribute to a lack of access to education, employment opportunities, markets and clinics. Remoteness is linked to chronic poverty, where it is argued that remote

populations have less access to opportunities that can improve their economic situation[25]. While there was already a lack of well-remunerated employment opportunities, improving connectivity is crucial in providing access to the opportunities that do exist. The results show that poppy villages had worse access than non-poppy villages, which contributed to their increased vulnerability. Results showing longer walk times to health clinics, presented earlier, concluded that poppy villages often had worse access than non-poppy. Finally, worse access to education was also reported in poppy villages. These are both consequences of remoteness and can be improved through increased connectivity. Also affected by remoteness is market access, which is critical for increasing incomes and enhancing food security among the rural population in Shan State. Improvements to the road network help to lower transaction costs and minimize crop losses, giving farmers more opportunities for income generation from the increased farm-gate profits and lowered farm costs. As the rural population in Myanmar derives most of its income from agriculture, good access to markets - a place to sell and buy agricultural and other products - is imperative for obtaining sufficient household income. Most of villages in Shan (99%) relied on external markets, and it took significantly longer for villagers from poppy villages to go to markets than villagers from non-poppy villages.

[25] Minot, N., Epprecht, M., Tran, T.T.A. and Le, Q.T., 2003. *Income diversification and poverty in the northern uplands of Vietnam—patterns, trends and policy implications*. Technical Report, International Food Policy Research Institute (IFPRI), Washington, DC.

Map 3: Map showing access to major roads, which contains the data used in figure 55

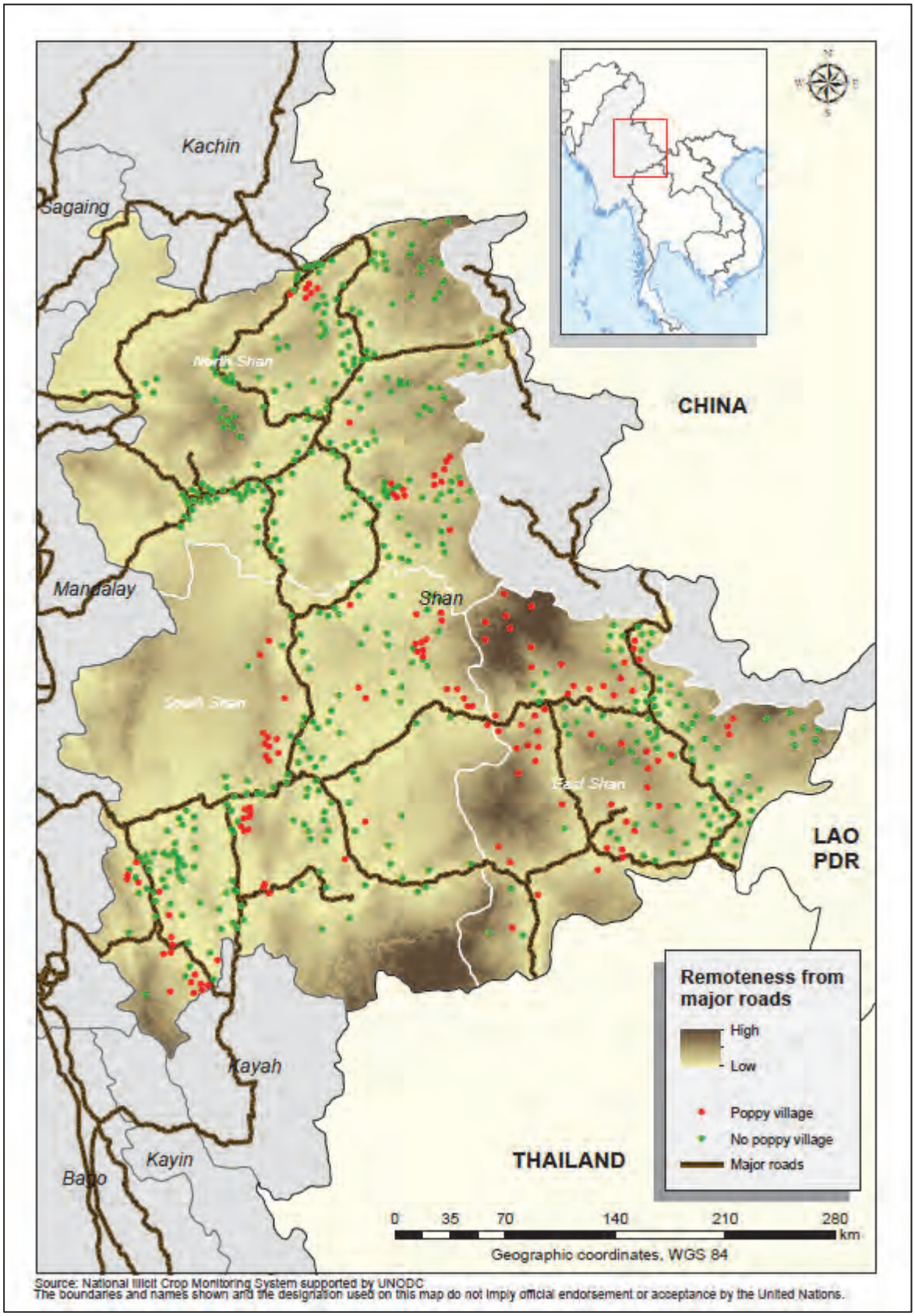
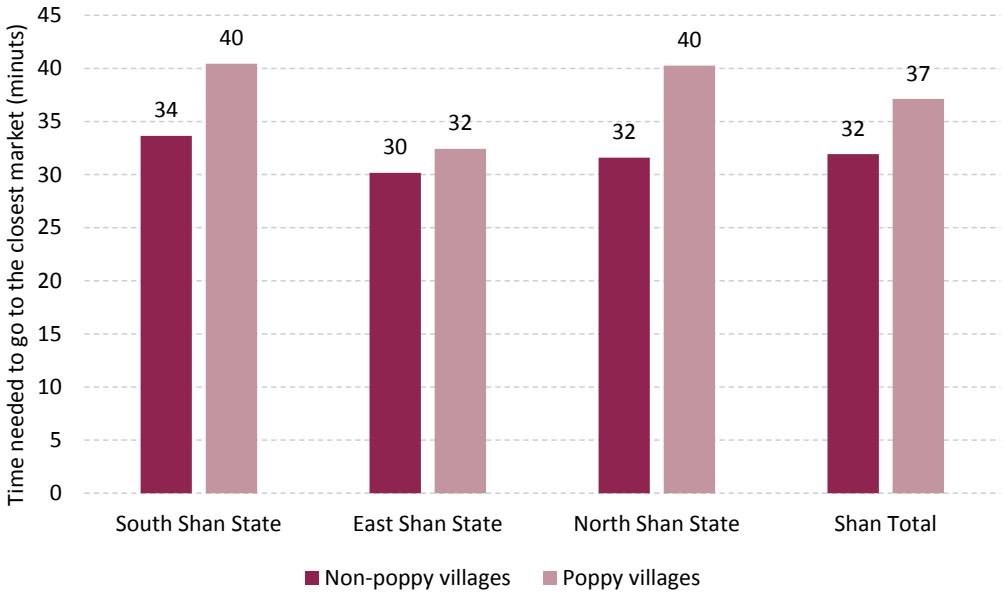
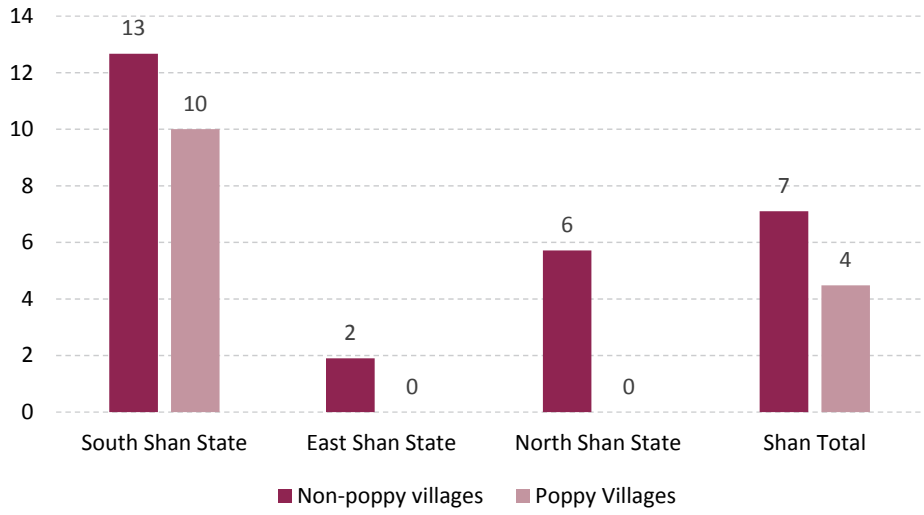


Figure 55: Time needed to go to the closest markets using the most common mode of transportation, as indicated by village headmen, by region and poppy cultivation status, 2018



Access to markets does not only relate to physical access, but also to the risk of being disempowered, because farmers are unable to negotiate fair terms with buyers. Farmer organizations more directly facilitate the integration of farmers into value chains and increase their negotiation power. Their absence exacerbates the disempowerment due to the lack of market access (7%) already present. There was a regional difference, with South Shan having the highest rate of having cooperatives within villages (12%) and East Shan and North Shan having no co-operatives at all.

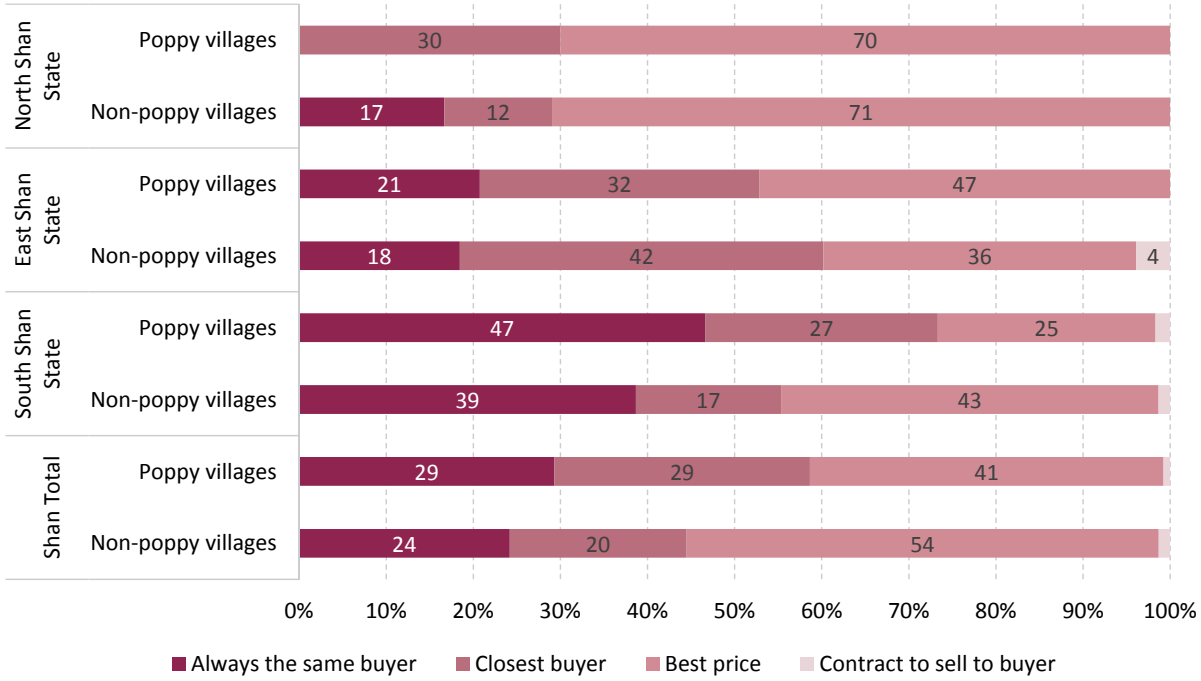
Figure 56: Percentage of villages with availability of cooperatives inside the villages, as indicated by the village headmen, total, by region and village type, 2018



Building long-term relationships and trust between buyers and sellers also minimizes transaction costs (e.g., negotiation costs) and assists farmers in reaching fairer sale prices. On average, more non- poppy villages sold agricultural products to the same buyer (27%) than poppy villages (22%) in 2016, which may denote some degree of trust between buyers and sellers.

Sellers are more likely to sell their products for the best prices in an efficient market. On average, a significantly higher percentage of non-poppy villages were able to sell their products based on the best price available (54%) than poppy villages (41%), suggesting that non-poppy villages not only had better access to markets, but also access to more efficient markets.

Figure 57: Percentage of villages by main criteria for choosing buyer in the market, as indicated by village headmen, total, by region and cultivation status, 2018



Support value addition[26]

SDG target 9b promotes high-value licit crops and lower expenses associated with their cultivation. In the case of rice (paddy), the major cash crop in Myanmar, there was not a significant variation in the costs of cultivating paddies across regions or the two village types. Hardly any costs were related to farming infrastructure such as irrigation, since irrigation systems were essentially non-existent in Shan State. Of all 599 villages, only one village headman reported having an irrigated paddy field in the village. Future research is needed to investigate the effectiveness of irrigation systems in increasing yields and thus incomes.

[26] Target 9.b indicates "Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities".

Figure 58: Percentage of villages by type of cash crops cultivated, as indicated by village headmen, Shan State, 2018

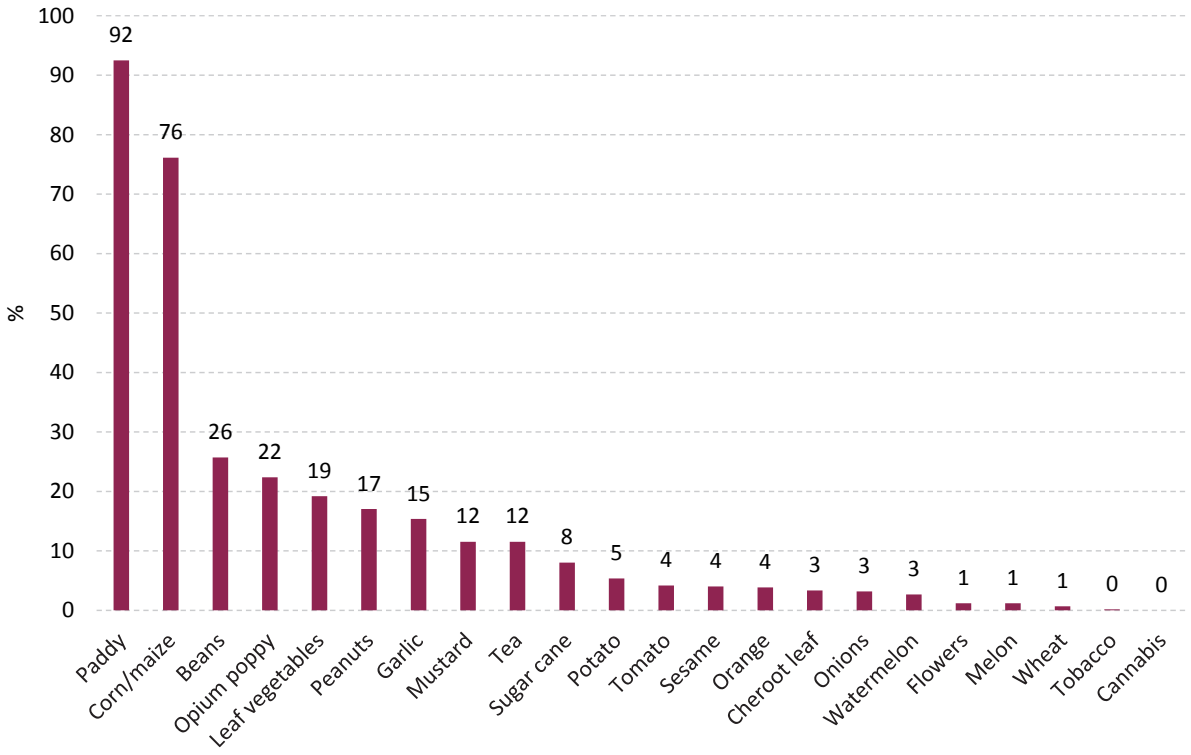
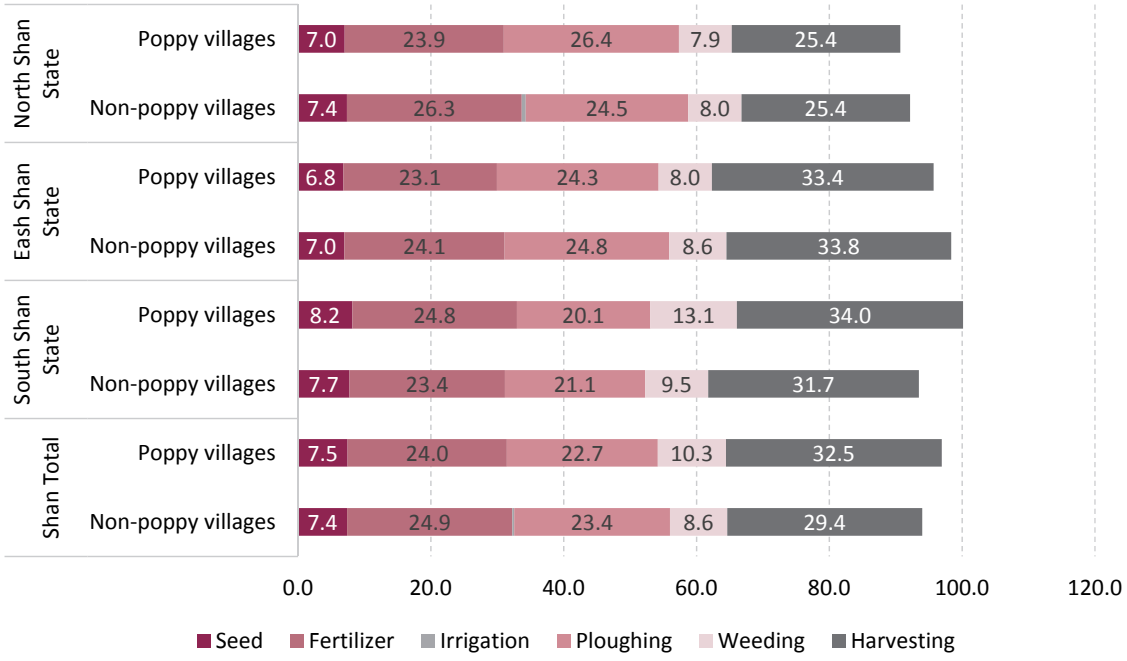


Figure 59: Cost of rice cultivation by activity (USD) per acre, as indicated by village headmen, total, by region and cultivation status, 2018



The household survey showed that farmers who had their plots on a hill were significantly more likely to grow poppy compared to farmers growing on flat land or terraced land. Poppy households also left a significantly higher proportion of their agricultural plots fallow (20% of the land in non-poppy households

and 25% of the land in poppy households), indicating that more of their fields needed to be replenished. Additional analysis using digital elevation data of village locations supported these findings. In both North and South Shan, the elevations of poppy villages were significantly higher than those of non-poppy villages. Interpreting these results with the finding that poppy households were also more likely to report worse soil quality (see section Challenges for achieving Sustainable Development Goal 15), it is likely that poppy households had a more limited choice of crops due to the soil quality and/or topography of their plots. To allow for sustainable production and due to different agroecological circumstances, different types of land use are required. For example, if it was confirmed that plots on hill sides were generally less nutrient rich than required for growing licit crops, helping farmers transition to using their land for other income-generating activities, such as agroforestry, may be a more suitable solution.

Figure 60: Estimated percentage of households having agricultural plots on hills based on the household survey, Shan total, by region and poppy cultivation status, 2018

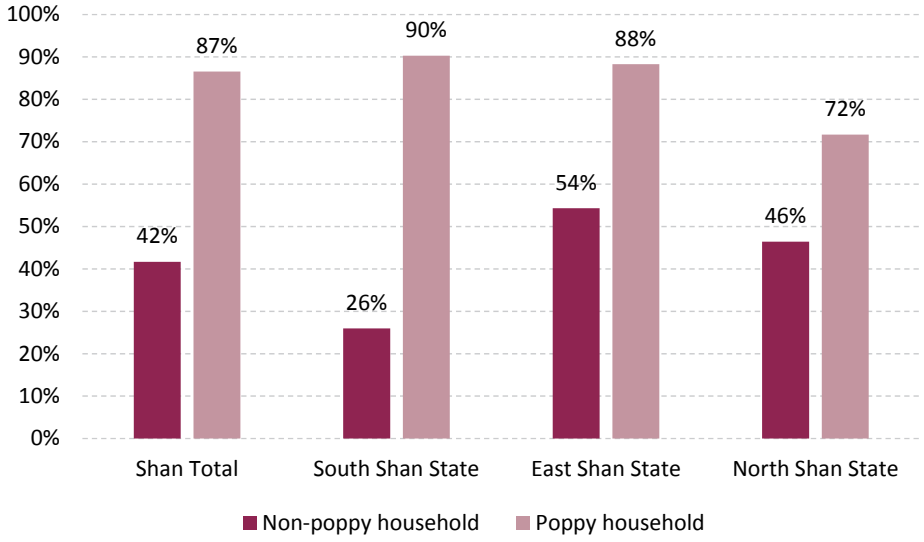
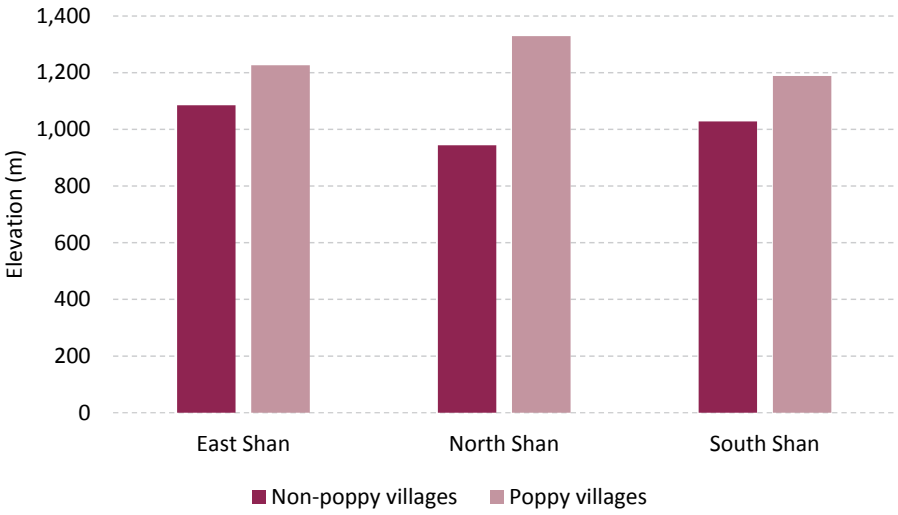


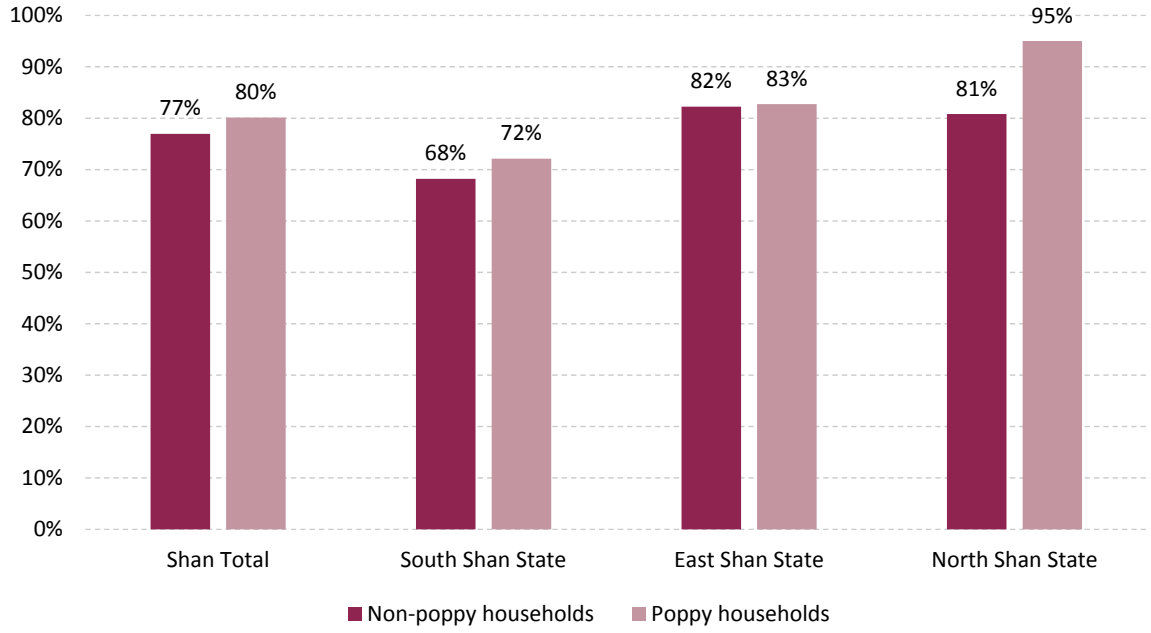
Figure 61: Elevation of the villages by region and poppy cultivation status, 2018



According to the household survey, approximately 80% of the households were small farms (defined as having less than 5 acres of land). However, there were regional variations. In South Shan, 68% and 72% of non-poppy and poppy households respectively were small farms, compared to 82% and 83% of non-poppy and poppy households in East Shan respectively. There was no significant difference between non-poppy

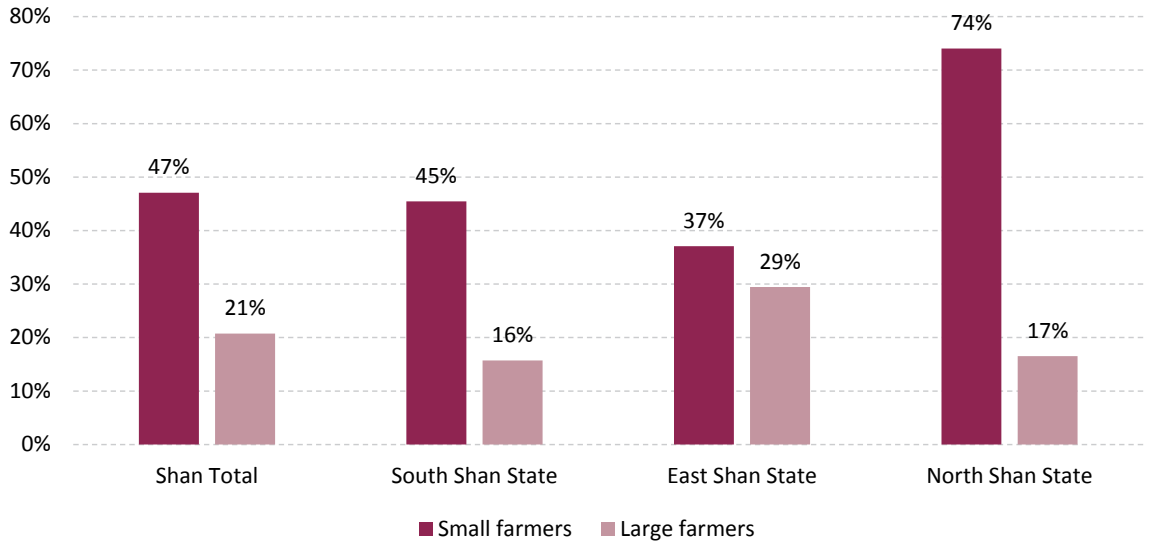
and poppy households in these two regions. However, in North Shan, 95% of poppy households were large farms, compared to 81% of non-poppy households.

Figure 62: Estimated proportion of small farmers based on the household survey, Shan total, by region and poppy cultivation status, 2018



Among poppy growing households, small farms used a significantly higher proportion of land for poppy cultivation. This is because smallholder farmers have fewer opportunities to grow a diverse set of crops in an efficient way. Together with the previous finding that a large proportion of village headmen reported a decrease in income after stopping poppy cultivation (see section Challenges for achieving Sustainable Development Goal 8), any efforts to reduce poppy cultivation may have a greater impact on the livelihood of smallholder farmers. Ensuring that farmers have viable alternatives will be key to reducing poppy cultivation, particularly among smallholder farmers.

Figure 63: Estimated proportion of land used for poppy cultivation among poppy growing households, Shan total, by region and plot size (large vs small farmers; defined as having plot size above and below 5 acres respectively). Estimate for large farmers in North



In addition to farming, a substantial proportion of households kept livestock such as chicken and cattle. As the majority of households relied heavily on paddy farming, and many reported reduced crop yields due to adverse climate conditions (see Section Challenges for achieving Sustainable Development Goal 13), diversification into animal husbandry may reduce the impacts of climate-related shocks.

Figure 64: Percentage of households reporting keeping various type of livestock in Shan State, 2018

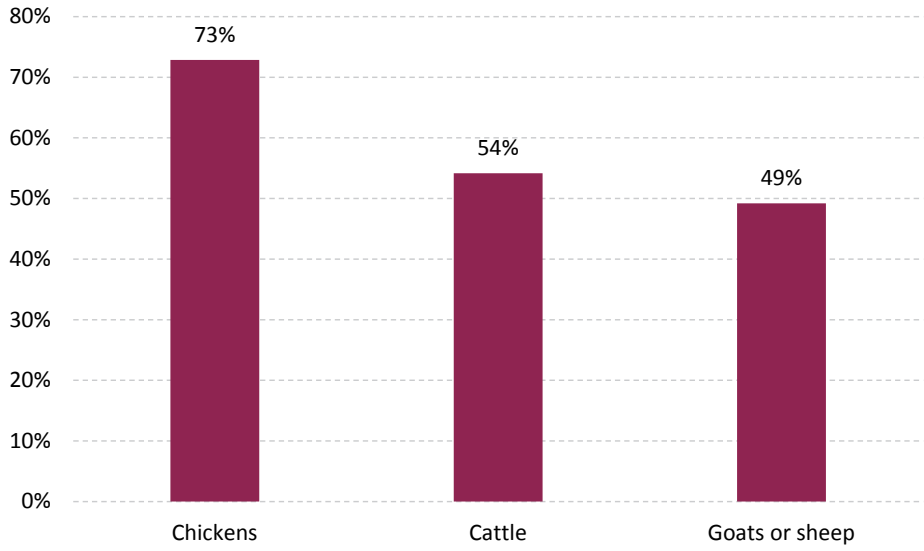


Figure 65: Irrigated garlic cultivation in South Shan, 2018

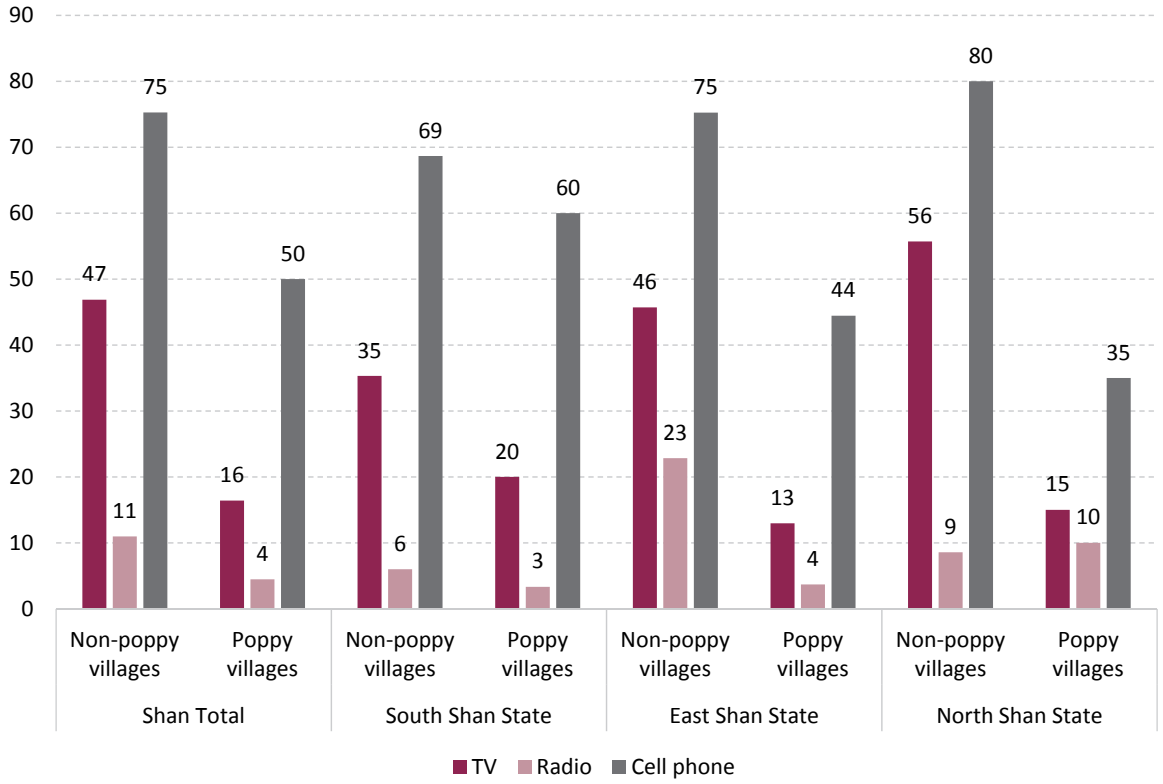
Figure 66: Orange plantation in North Shan, 2018

Figure 67: Upland rice fields in East Shan, 2018

Access to information and communication technology

In Myanmar, the links between farmers and markets are weak. Most farmers are not aware of the crop prices at the nearest market before arriving there to sell their products. Equally, most farmers are not aware of the latest market opportunities concerning consumer preferences and price competitiveness[27]. The ownership of assets such as mobile phones to enable farmers to communicate could facilitate their access to information and potential integration into broader rural economic systems. Overall, non-poppy villages had a significantly higher level of ownership of TVs, radios and cell phones than did poppy villages, with the most pronounced difference in owning TVs (16% of poppy villages and 47% of non-poppy villages).

Figure 68: Percentage of villages with more than half households owning TVs, radios and cell phones, as indicated by village headmen, total, by region and cultivation status, 2018



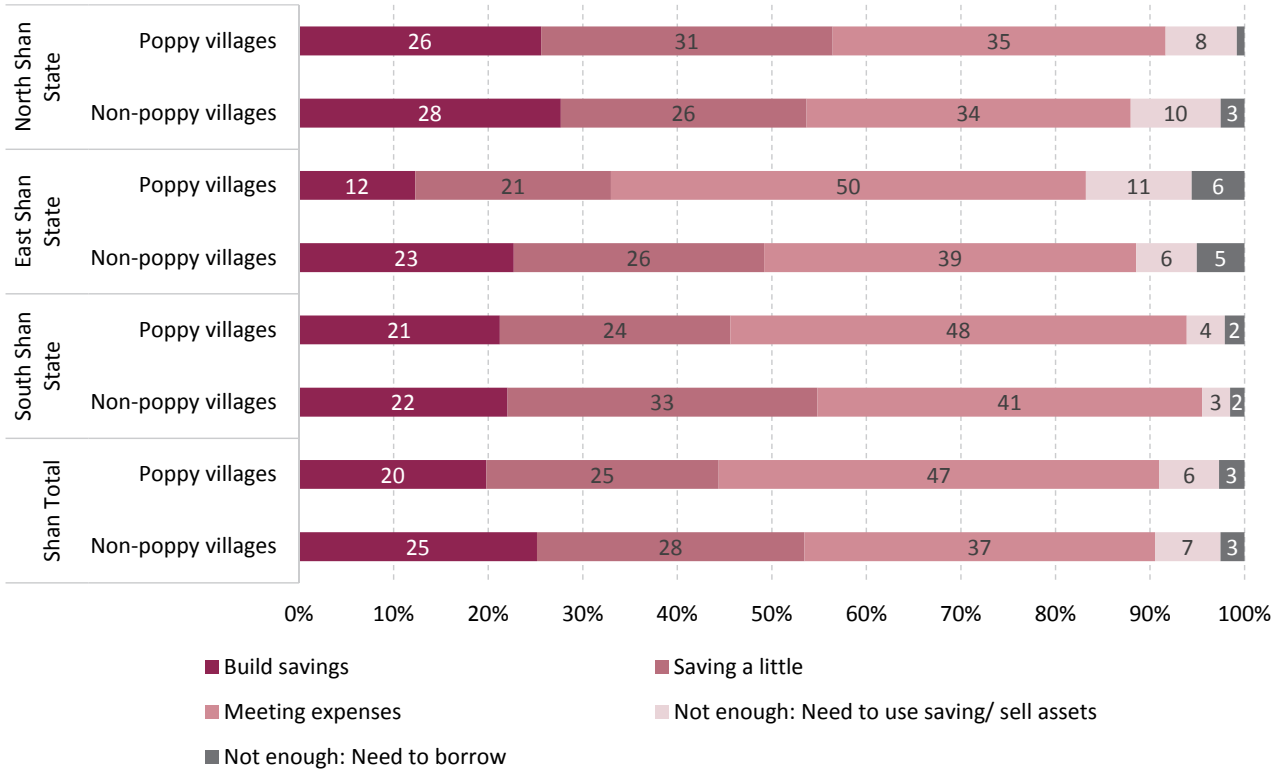
[27] FAO/WFP, 2016. Special report from the crop and food security assessment mission to Myanmar.

Figure 69: A household with television in North Shan, 2018

Challenges for achieving Sustainable Development Goal 10: "Reduced inequalities"

SDG 10 calls for reducing inequalities in general, including income; and to support the economic growth of the poorest. In Myanmar, the rural poverty rate is around 70%. However, Myanmar's inequality is considered low; a common characteristic of traditional or agrarian societies[28]. Overall, a lower percentage of households was able to build up savings in poppy villages (44%) than in non-poppy villages (53%). This could indicate that a higher percentage of the poorest (households who spend all their income on subsistence without any possibility of savings) lived in poppy villages in 2018. There were significant regional differences: In North Shan, the affluence level in poppy and non-poppy villages was similar, with 57% and 54% of households being able to accumulate some savings. There was a relatively large income gap between poppy and non-poppy villages in East Shan, where only 33% households in poppy villages could accumulate savings compared to 49% in non-poppy villages. The income gap in South Shan between poppy and non-poppy villages was in between the levels of North and East Shan, with 55% of households in non-poppy villages being able to build up savings, compared to 45% of households in poppy villages.

Figure 70: Percentage of households by income level, as indicated by village headmen, total, by region and village type, 2018



[28] UNDP. 2013. A regional perspective on poverty in Myanmar.

Challenges for achieving Sustainable Development Goal 12: "Responsible consumption and production"

Sustainable growth and development require minimizing the natural resources used throughout the production and consumption process. Clear linkages exist between poverty reduction and natural resource management, but knowledge and skills relating to the latter are low in rural Myanmar. Opium poppy communities were more dependent on forest resources - for example, wood for cooking - compared to non-opium poppy communities. On average, a significantly higher percentage of village headmen from poppy villages (62%) reported households in their villages always collected wood for cooking than in non-poppy villages (49%).

Figure 71: Percentage of villages by frequency of collection of wood for cooking, as indicated by village headmen, total, by region and village type, 2018

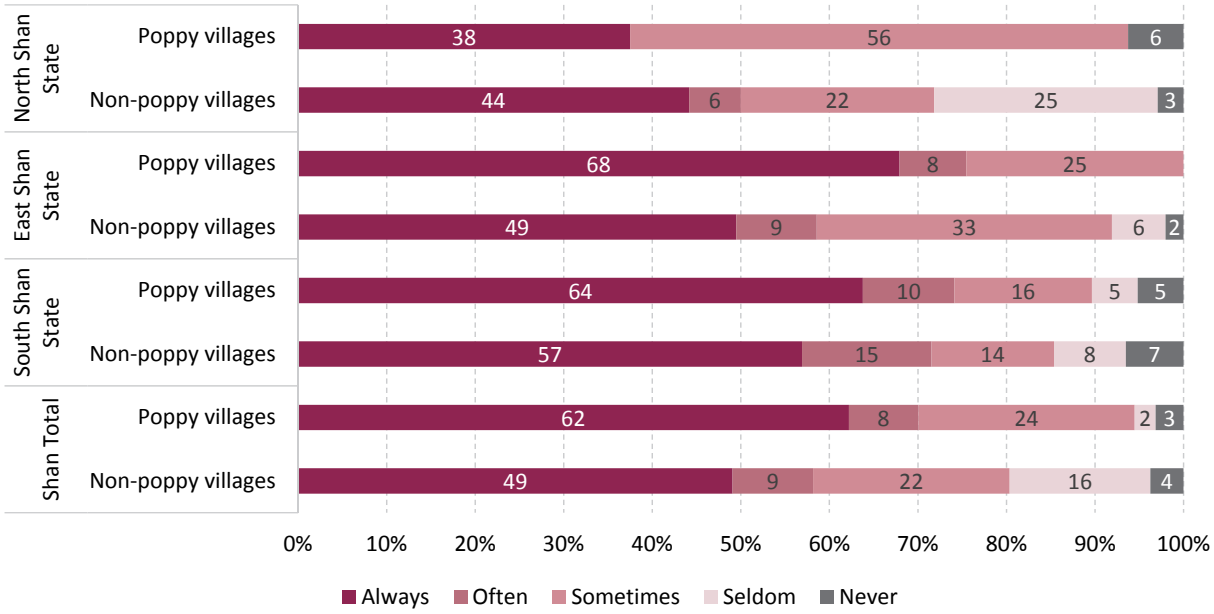


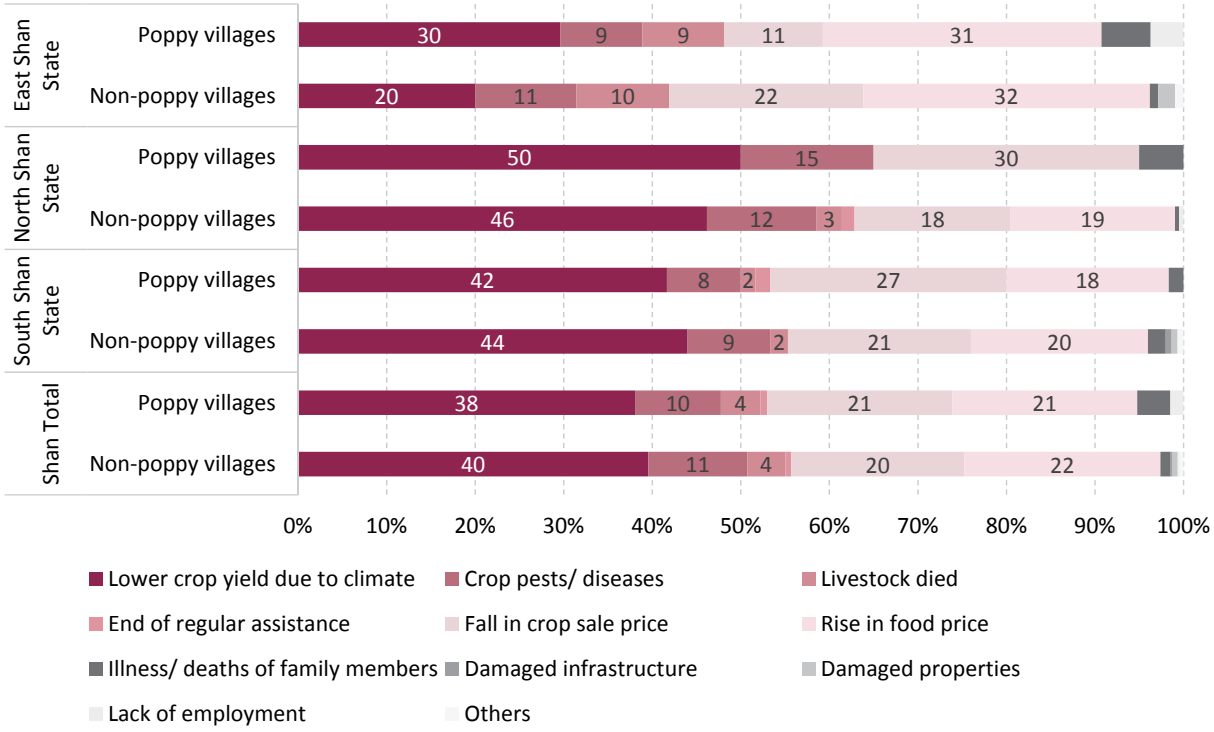
Figure 72: Irrigation channel for agriculture in North Shan, 2018

Challenges for achieving Sustainable Development Goal 13: "Climate Action"

Climate change represents one of the biggest threats to development, and its widespread impacts disproportionately burden the poorest and most vulnerable[29]. Many households are below the poverty line and many are close to it. Most of the environment-related shocks faced by both poppy and non- poppy villages were similar, and mainly related to increases in the price of food and low crop yield, which were strongly associated with adverse weather conditions. Mitigation plans for Shan State could alleviate the impact from shocks caused by adverse climate conditions in the future.

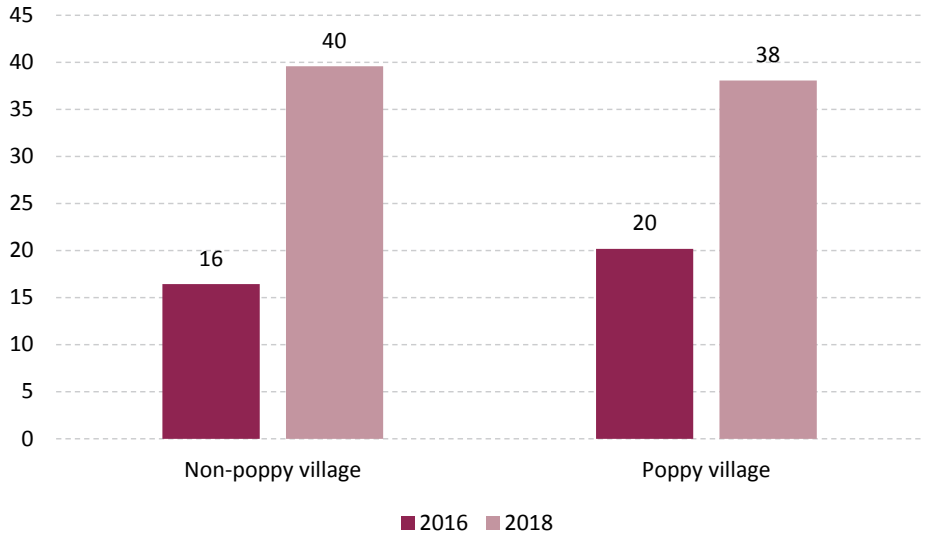
Compared to 2016, a significant higher proportion of village headmen reported "Lower crop yield due to climate" was the more severe shock faced by the villagers.

Figure 73: Percentage of villages by type of shocks faced by villagers, as indicated by village headmen as the more severe shock, total, by region and village type, 2018



[29] United Nations Framework on Convention on Climate Change. 2018. Action on Climate and SDGs.

Figure 74: Proportion of village headmen who reported lower crop yield due to climate being the most severe shock faced by villagers, by year and poppy cultivation status in Shan State 2018



Challenges for achieving Sustainable Development Goal 15: "Life on land"

Goal 15 focuses on managing forests sustainably, reducing the degradation of natural habitats and ending biodiversity loss. Overall, the majority reported deteriorating forest quality, and forest resources deteriorated significantly more rapidly in poppy villages (as reported by 80% of village headmen) than in non-poppy villages (as reported by 67% of village headmen). The disparity between poppy and non-poppy villages in the rate of deterioration was largest in East Shan and smallest in South Shan. Compared to 2016, there was a significantly higher proportion of village headmen reporting forest deterioration in non-poppy villages, whereas there was no significant change in poppy villages. More research is required to understand why forest quality deteriorated more rapidly in non-poppy villages than in poppy villages, and environment protection plans will be needed for sustainable development.

Figure 75: Percentage of villages by changes in forest quality over the last two years as perceived by the village headmen, total, by region and village type, 2018

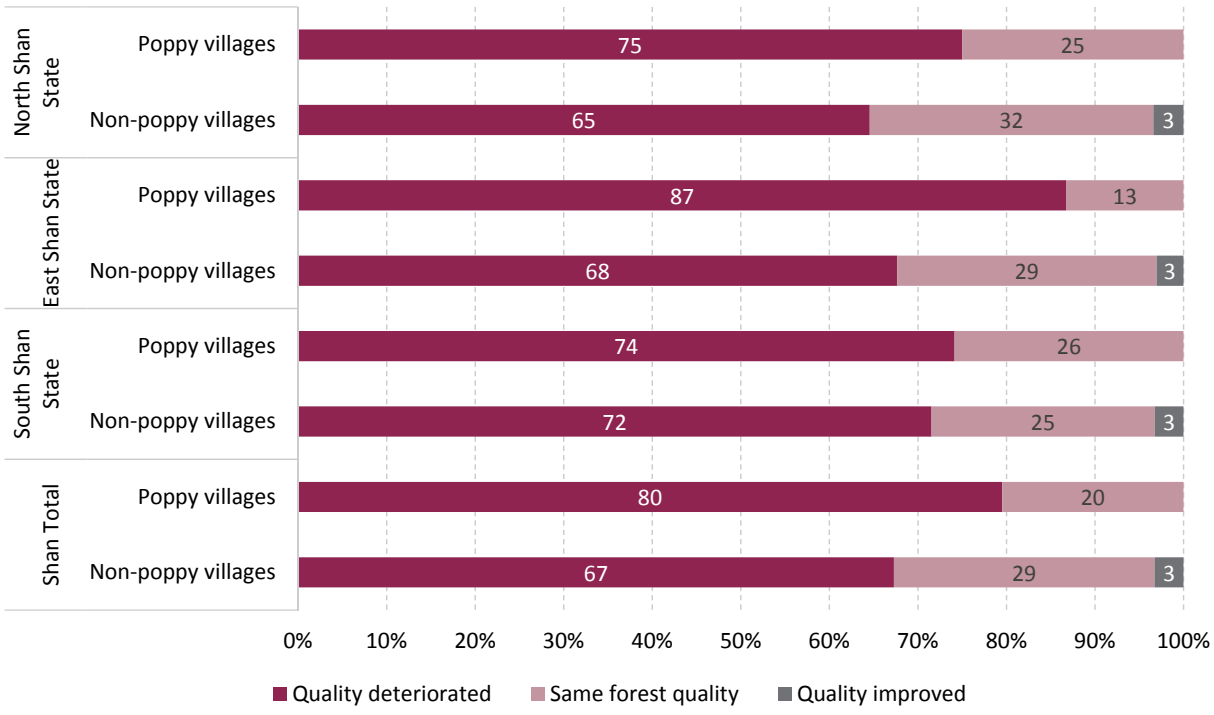
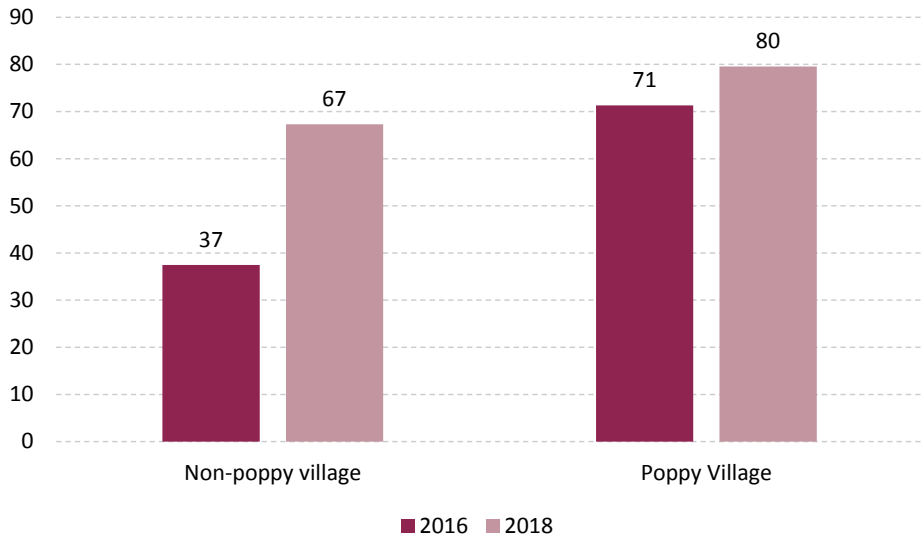


Figure 76: Percentage of villages reported deteriorating forest quality by poppy cultivation status in 2016 and 2018



Although a majority of the households reported that the soil quality of their agricultural land was regular (80% of all surveyed households reported it was neither good nor bad), those who grew poppy reported a significantly worse soil quality in North Shan and South Shan – 22% of non-poppy growing households reported good quality of soil in North Shan, compared to only 2% among poppy growing households. In South Shan, 8% of non-poppy growing households reported good soil quality, compared to 2% among poppy growing households. It is unclear if worse soil quality made poppy cultivation more attractive, or poppy cultivation caused more soil degradation. Further research is needed to further explore the association between soil quality, poppy cultivation and agricultural practices.

Figure 77: Soil quality reported by households, Shan total, by region and poppy cultivation status, 2018

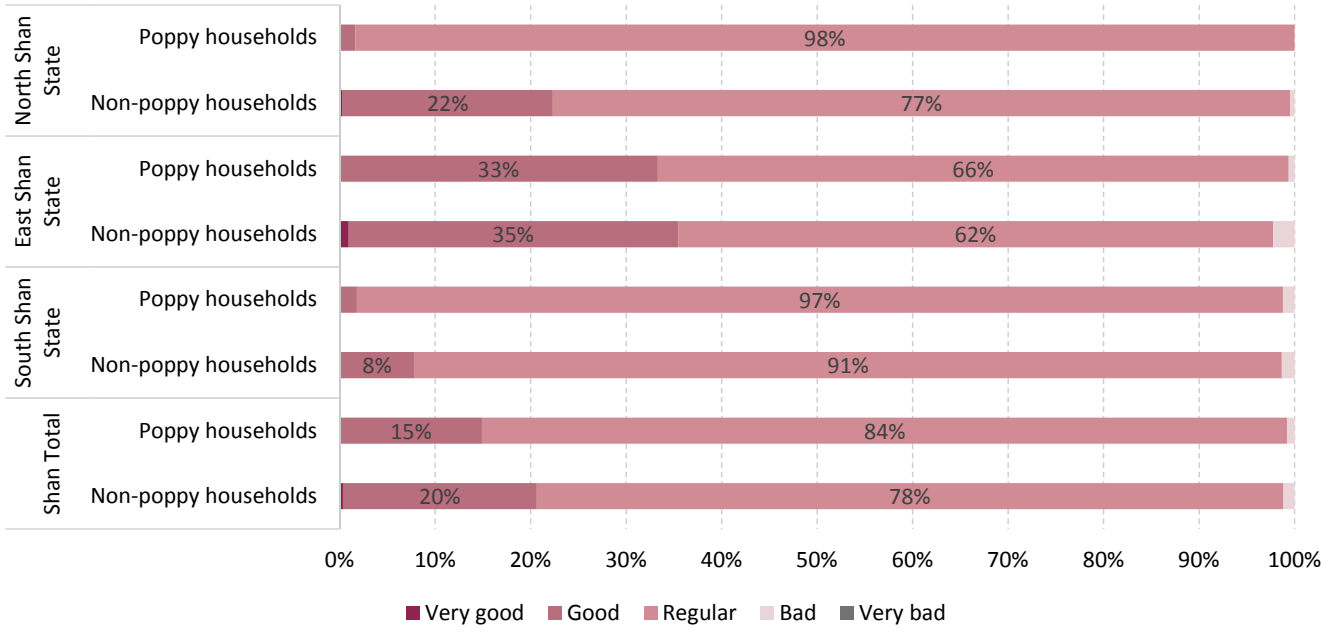


Figure 78: Community bamboo forest in South Shan, 2018

Challenges for achieving Sustainable Development Goal 16: "Peace, Justice, and Strong Institutions"

Peace, justice and effective, accountable and inclusive institutions are at the core of sustainable development. On average, a significantly smaller share of poppy villages was under the control of the government (82%) than non-poppy villages (91%). Overall, less than half of the village headmen reported the perception of feeling "safe" or "very safe", and there was no significant difference in the level of perceived safety between poppy and non-poppy villages. However, there were large regional differences: 66% of village headmen from East Shan reported feeling safe or very safe in their villages, compared to 31% in South Shan and 37% in North Shan.

Figure 79: Percentage of villages by controlling forces, as indicated by village headmen, total Shan State, by region and poppy cultivation status, 2018

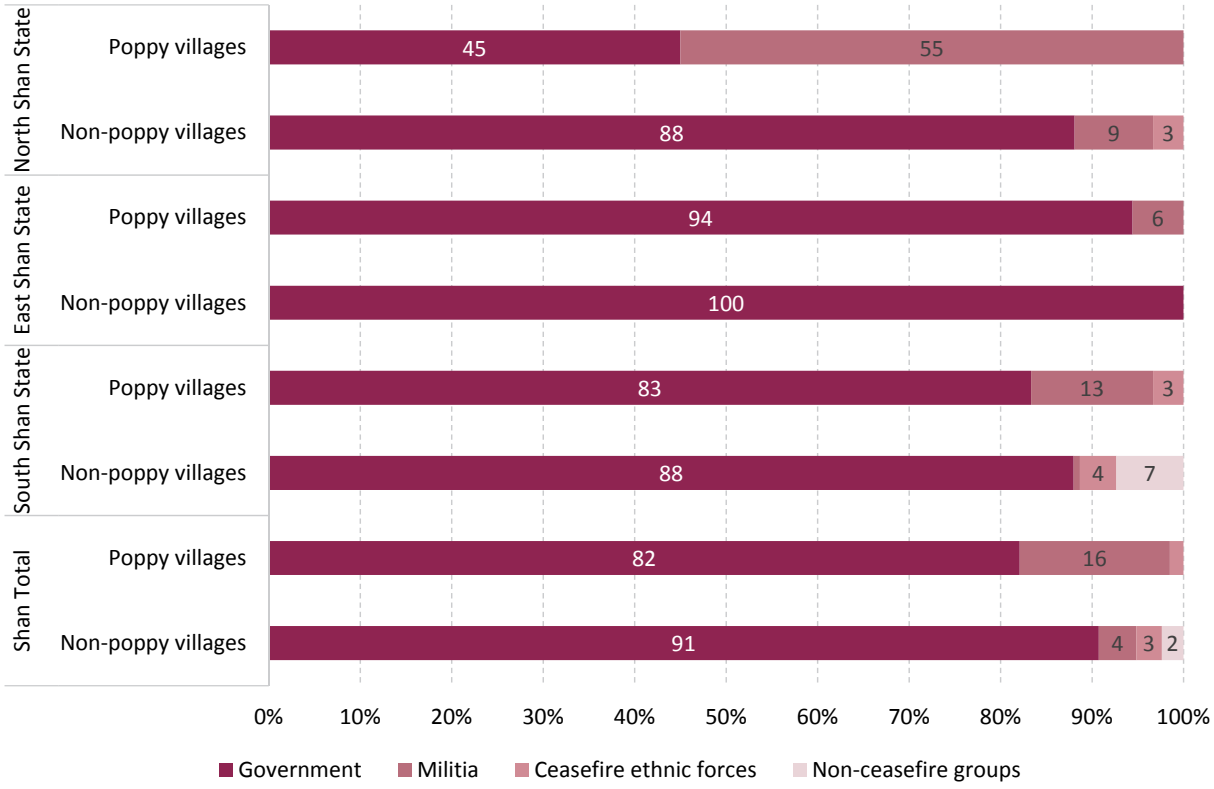
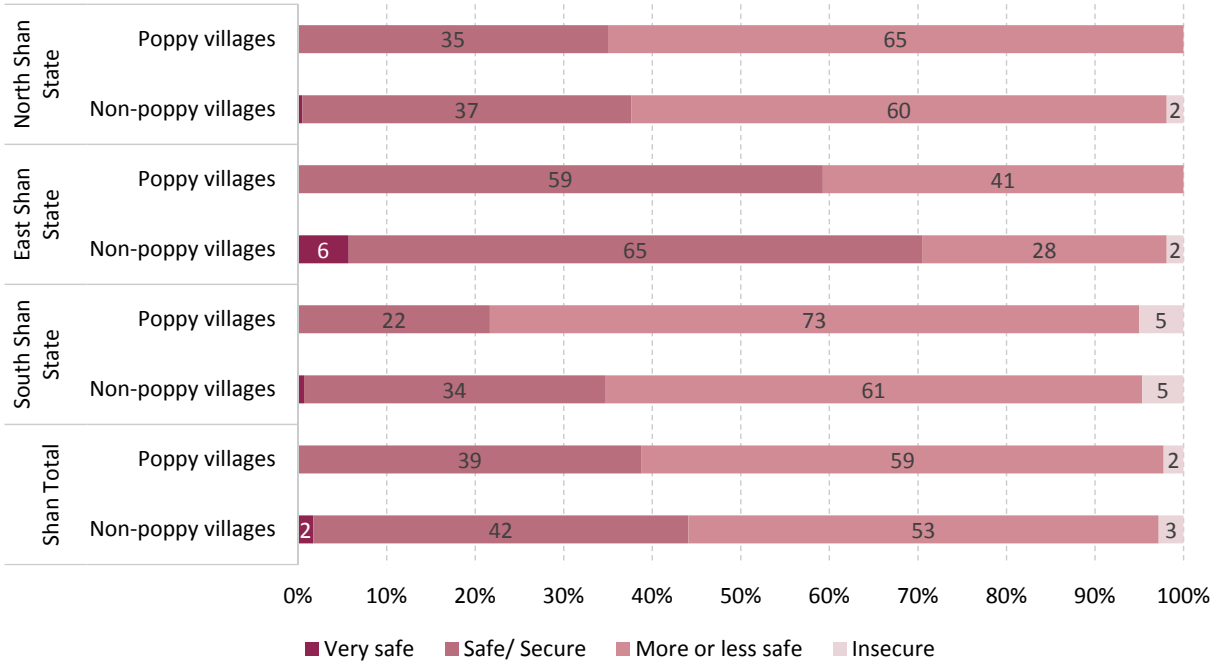


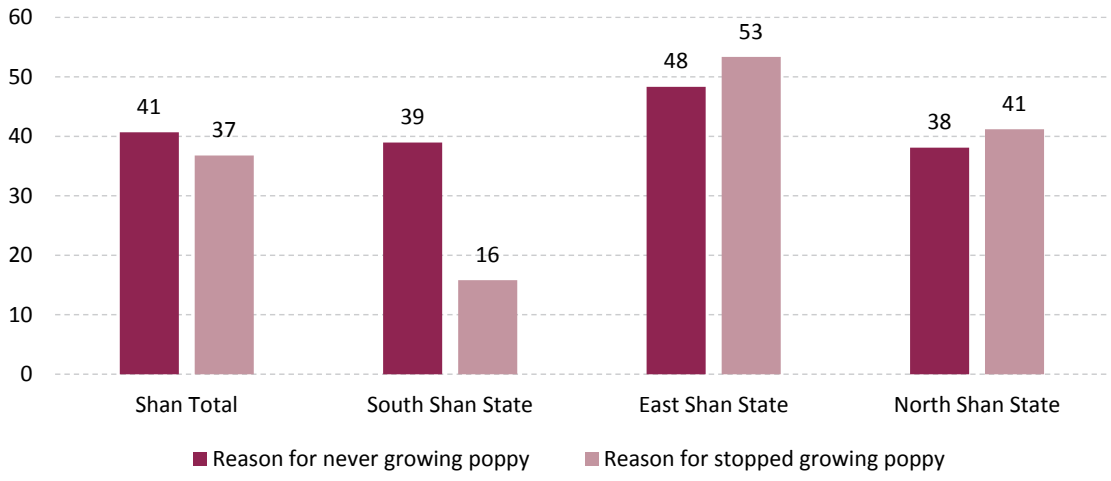
Figure 80: Percentage of villages by reported level of safety inside villages, as perceived by the village headmen, total Shan State, by region and poppy cultivation status, 2018



Promoting the rule of law in comprehensive drug-control strategies: alternative development along with law enforcement

Target 16.3 focuses on "Promoting the rule of law at the national and international levels…" The presence of rule of law is conducive to decreases in opium poppy cultivation. Law enforcement plays an important role in farmer-level decisions related to opium poppy cultivation. Fear of eradication by the government was indicated as one of the top three reasons for stopping opium poppy cultivation in 37% of villages that stopped cultivating opium poppy. Similarly, opium poppy being banned by the government was one of the main reasons for never having grown opium poppy in 41% of non-poppy villages in 2018. It is remarkable that the highest percentage of fear for eradication was reported in East Shan, whereas most of the eradication took place in South Shan[3].

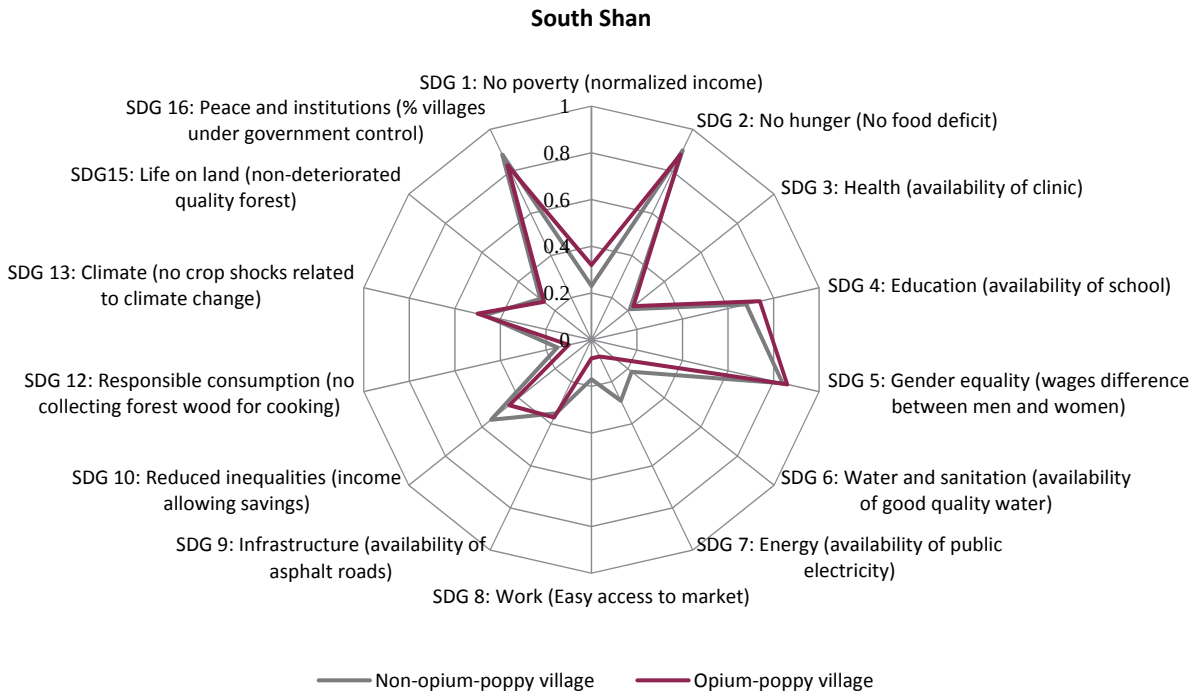
Figure 81: Percentage of village headmen who indicated governmental poppy cultivation ban as one of the three main reasons for never having grown poppy and stopping to grow poppy, total and by region, 2018



Summary of development gaps by region

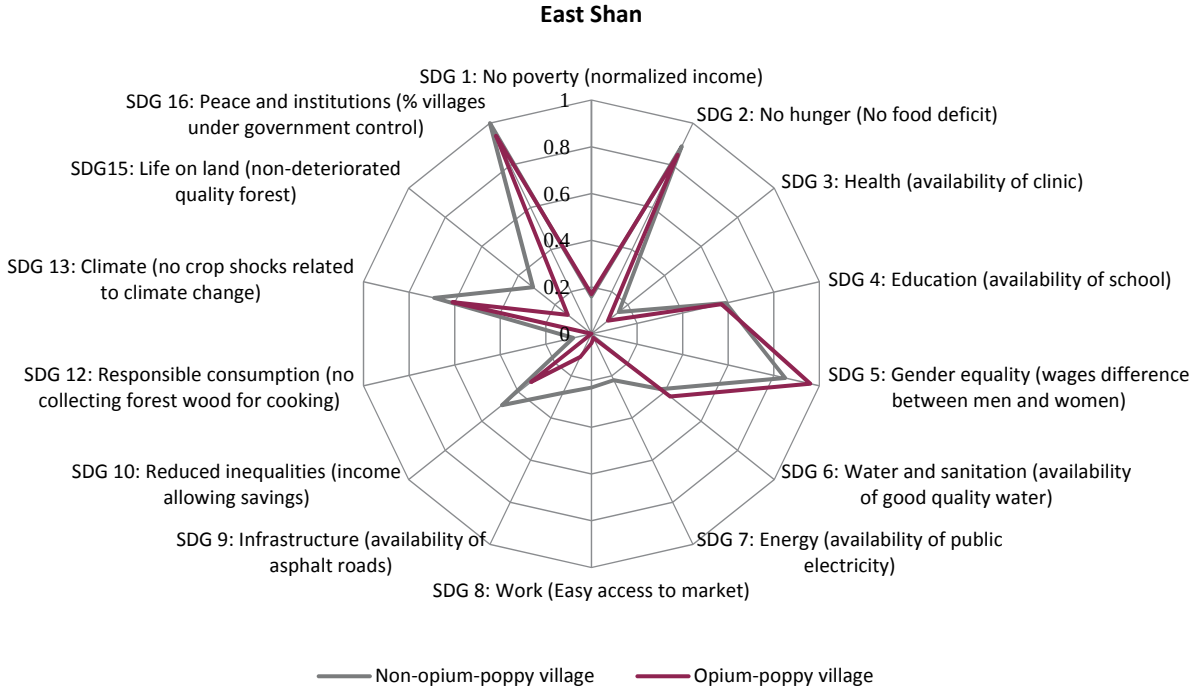
Having looked at the results in the context of the SDGs, the results showed that there are regional differences when comparing poppy and non-poppy villages. East Shan appeared to be the least developed, and the development gap between poppy and non-poppy villages in East Shan was the largest. For example, poppy villages in East Shan had the lowest occurrences of local clinics and schools, the least access to flush toilets, and villagers were least able to build up savings. The frequency of villages reporting forest deterioration was also the highest in poppy villages in East Shan. North Shan saw the greatest gap between poppy and non-poppy villages in the proportion of villages under government control. While poppy farmers often had access to worse land than non-poppy farmers throughout Shan State the farmers cultivating poppy were significantly more likely to be situated on a hill (with worse soil quality) in North and South Shan. Access to the public grid for lighting electricity was the lowest in poppy villages in East Shan and the highest in non-poppy villages in North Shan.

Figure 82: Spider chart showing the development gap between poppy and non-poppy villages in South Shan



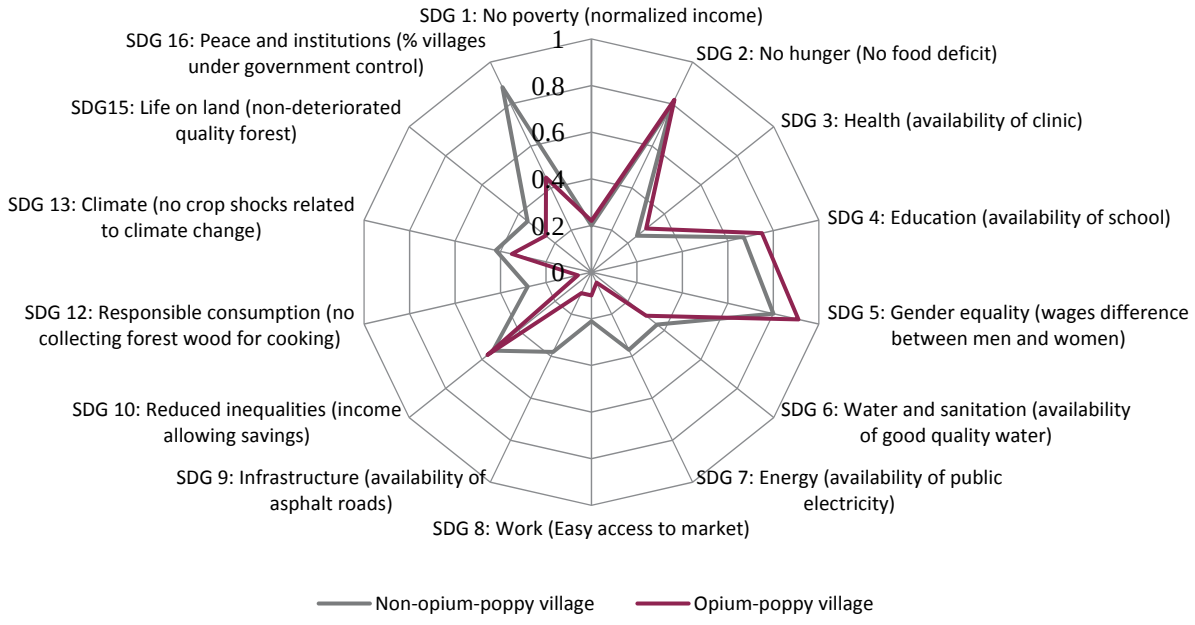
* The indicators for SDG2, SDG 5, SDG 8 and SDG 9 were changed in 2018 and therefore the values for these four indicators are not directly comparable with the 2016 results. In 2018, there were insufficient data to update the estimate for SDG 1 and therefore the 2016 values were used. See Appendix 1 for details.

Figure 83: Spider chart showing the development gap between poppy and non-poppy villages in East Shan



* The indicators for SDG2, SDG 5, SDG 8 and SDG 9 were changed in 2018 and therefore the values for these four indicators are not directly comparable with the 2016 results. In 2018, there were insufficient data to update the estimate for SDG 1 and therefore the 2016 values were used. See Appendix 1 for details.

Figure 84: Spider chart showing the development gap between poppy and non-poppy villages in North Shan



* The indicators for SDG2, SDG 5, SDG 8 and SDG 9 were changed in 2018 and therefore the values for these four indicators are not directly comparable with the 2016 results. In 2018, there were insufficient data to update the estimate for SDG 1 and therefore the 2016 values were used. See Appendix 1 for details.

Conclusions and lessons learned: Addressing diversity for promoting and enhancing resilience to opium poppy cultivation in Shan State

In 2018, poppy villages faced great challenges in terms of income poverty (see SDG1), as daily wages were 15-30% lower than in non-poppy villages. In addition, poppy growers cultivated less poppy area and fresh opium prices declined by nearly 50% between 2016 and 2018. This provides an opportunity to encourage farmers to switch to other, licit crops.

In general, there were large development gaps between poppy and non-poppy villages: poppy villages had a more limited access to health services (SDG 3), sanitation facilities (SDG 6), public grid access (SDG 7) and communication technology (SDG 9). There was a significant improvement in the access to flush toilets and asphalt roads in both poppy and non-poppy villages between 2016 and 2018, but access to health services remained low and unchanged.

East Shan had the highest proportion of poppy villages among the three regions in Shan State and, within its poppy villages, 72% of the households were directly involved in poppy cultivation compared to 31% in South Shan and 37% in North Shan. East Shan also has some of the most adverse conditions among poppy villages in terms of, for example, travel time to clinics and schools (contributing to the highest levels of uneducated village headmen), the proportion of households with debts, conditions for infrastructure demonstrated by the high use of open-air toilets, low availability of public electricity and asphalt roads. Creating non-poppy related jobs (SDG 8) would likely be most impactful in East Shan, as 40% of poppy villages that stopped cultivating poppy here reported the availability of non-poppy related jobs to be one of the main reasons for ending their poppy cultivation.

Besides disparities in living quality, poppy villages were also more remote than non-poppy villages in all regions. This remoteness may deny them the same access to markets that non-poppy villages enjoy (SDG 9). Market access can provide more favourable prices, which might make licit crops more attractive. Connectivity is also important for providing access to non-poppy related job opportunities, which are lacking in poppy villages. Poppy growers may also prefer remoteness, as it is more difficult for law enforcement to access the fields for eradication. On the other hand, farmers in remote areas might be in greater need of cash, driving them into poppy cultivation. Poppy villages also had less asphalt roads than non-poppy villages. A lack of infrastructure affects access to clinics and schools (SDG 3 - 4) for villages that do not have them in the village itself, and it took longer to walk to them for those living in poppy villages. Moving forward, improving connectivity and infrastructure will be necessary for development and poverty reduction in the long term.

Generally, female daily wages were lower than male daily wages for similar work (SDG 5), denoting gender inequalities in both types of villages.

A significantly higher proportion of non-poppy villages were under government control than were poppy villages (SDG 16). Governance and security continue to be found inversely associated with opium poppy growing, as non-opium poppy villages had better governance and enhanced security levels. It seems that these low levels are a cause and a consequence of opium poppy cultivation. Opium poppy starts in villages with relatively low levels of governance and security, and opium poppy cultivation decreases the governance and security of the villages. Sustainable development without opium poppy cultivation requires good governance and security to break the vicious circle of poverty, lack of opportunities and insurgency, which are likely to be key components driving opium production.

The fear of law enforcement influences the decision of farmers to grow poppy and might suppress opium cultivation in Shan State (SDG 16). However, the survey shows the continued need for an income for subsistence. Although food deficits were relatively uncommon, most households in poppy villages relied heavily on poppy income for food. Any abrupt loss of income from poppy without offering alternatives is

likely to cause food insecurity in many poppy villages (SDG 2). Over 80% of poppy villages reported a decrease in income after stopping poppy cultivation. Opportunities that can help farmers maintain their level of income after stopping poppy cultivation are needed to sustain the effort of poppy eradication. In combination with a substantial decrease in the opium prices in Myanmar in recent years, there is an opportunity to promote alternative income sources, such as licit cash crops and non-farm job opportunities.

Poppy villages depend more directly on natural resources than non-poppy villages. For example, they were more inclined to collect firewood for cooking (SDG 12) and reported a greater degradation of the local forest quality (SDG 15). Although, on average, non-poppy villages still reported better forest quality than poppy villages, their forest quality had deteriorated as well. This suggests a need for implementing natural resource awareness activities and management plans that consider the sustainable use of resources.

The analysis showed that East Shan had the lowest levels of development among the regions and the highest levels of engagement in poppy cultivation. Efforts to attain the SDGs need to be accompanied by enhanced resilience to opium poppy cultivation. This report is building an evidence base and sharing lessons learned to further our understanding of the needs of poppy and non-poppy villages across Shan State, and their current SDG status. Further monitoring and evaluations must continue with these efforts and focus on the relationship between poverty and opium poppy cultivation. The analysis should continue to be complemented with disaggregated data at household level for a better understanding at the level of the individual farmer.

While the SDGs are interlinked and interdependent, there are certain SDGs that are more urgent. The evidence suggests that improvements in infrastructure and services can help reduce the costs of living in opium poppy villages, and therefore decrease the dependency of those communities on opium poppy income. This holds particularly true in East and North Shan as the development gaps between poppy and non-poppy villages were relatively large here. These improvements need to be accompanied by the provision of income diversification opportunities, the strengthening of institutions and governance, as well as the promotion of support to the rule of law.

Appendix 1. Description of SDG indicators included in the "spider" graphs of the Executive Summary and Conclusions

Similar to the 2016 report, indicators for SDGs were approximated using measures from the village survey in this report. Indicators for SDG 2 "Zero hunger", SDG 5 "Gender equality", SDG 8 "Decent work and economic growth" and SDG 9 "Industry, Innovation, and Infrastructure" were updated from the 2016 report. Currently, only a single measure from the survey was used to approximate each SDG, and research will be required to refine these measures to better approximate the SDGs.

The indicators used in the graphs are briefly described below:

- SDG 1 "No Poverty": household income per year (normalized or adjusted to the scale 0-1 for comparative purposes).
- SDG 2 "Zero Hunger": average percentage of households reported no food deficit.
- SDG 3 "Good Health and Well-Being": percentage of villages with a clinic inside the village.
- SDG 4 "'Quality of Education": percentage of villages with a school inside the village.
- SDG 5 "Gender Equality": the average women's wages as a percentage of men's wages of farm or non-farm labour; the smaller value was chosen as the indicator
- SDG 6 "Clean Water and Sanitation": percentage of villages with good or very good quality of drinking water.
- SDG 7 "Affordable and Clean Energy": percentage of villages with public grid electricity.
- SDG 8 "Decent Work and Economic Growth": percentage of villages with markets within 15mins of reach.
- SDG 9 "Industry, Innovation, and Infrastructure": percentage of villages with access to an asphalt road.
- SDG 10 "Reduced Inequalities" (including sustainable economic growth for the poorest): percentage of households inside the village earning enough income to allow at least some savings.
- SDG 12 "Responsible Consumption and Production": percentage of villages where the main source of energy for cooking is not forest wood.
- SDG 13 "Climate Action": percentage of villages not reporting climate-related shocks among the three major shocks faced by the inhabitants in the village.
- SDG 15 "Life on Land": percentage of villages indicating no changes or improvements in forest quality in the last two years.
- SDG 16 "Peace, Justice, and Strong Institutions": percentage of villages under the control of the government.

SDG 11: "Sustainable Cities", SDG 14: "Life below Water", and SDG 17: "Partnerships for the goals" were considered not applicable for this report.
SDG 2 was approximated based on "Percentage of villages not reducing number of meals" in the 2016 report; In this report, it was approximated based on the percentage of households reporting no food deficit. SDG 5 was approximated based on "Proportion of villages with equality male and female salary" in the 2016 report. In this report, it was approximated based on the ratio between female and male daily wages. SDG 8 was approximated based on the percentage of villages with internal market to sell crops in the 2016 report; in this report, it was approximated based on the percentage of villages having access to markets within 15mins of reach. SDG 9 was approximated based on "Proportion of villages with asphalt roads among villages that had road" in the 2016 report. In this report, it was approximated based on the "proportion of villages with asphalt roads among all survey villages".

Appendix 2. Survey Methodology

Sampling procedure

The sampling frame is composed of an updated village listing provided by the Central Committee for Drug Abuse Control (CCDAC) in Myanmar; however, it excludes the Western sections of South and North Shan where opium-poppy cultivation is ineligible (see Maps 1). The village listing includes names of villages, village tracts, townships, regions and their codes. The listing also includes the opium poppy growing history and the GPS latitude and longitude for the former surveyed villages. This listing or baseline data is regularly updated with information obtained through previous surveys to reflect changes in village locations or names, village mergers and relocations, and to delete double entries. For many village entries, GPS positions facilitate the unique identification of each village.

The sample size is influenced by a number of requirements and constraints. The main requirement was the level of accuracy considered acceptable for the estimates, whereas the constraints were either economical or logistical. For the 2018 socio-economic survey, a total of 600 villages were randomly selected throughout Shan State, which was approximately 6.3% of the 9,501 villages from the sampling frame. About 230 villages in North Shan, 210 villages in South Shan and 160 villages in East Shan were selected.

Table 4: Sample selection and survey dates of the socio-economic survey, 2018

	South Shan	East Shan	North Shan	Total
Start date	4-May-2018	10-May-2018	6-May-2018	4-May-2018
End date	30-Jun-2018	7-Jul-2018	30-Jun-2018	7-Jul-2018
Number of survey teams	16	10	17	43
Targeted villages	210	160	230	600
Surveyed villages	210	159	230	599
% of Villages achieved	100%	99.4%	100%	99.8%
Targeted households	630	480	690	1,800
Surveyed households	630	477	690	1,797
% of households achieved	100%	99.4%	100%	99.8%
Households covered	17,452	7,133	21,067	45,652
Rural Population covered	88,684	37,384	10,7033	233,101

Survey organization

As in previous surveys, the components of the socio-economic survey were coordinated by the UNODC Myanmar Country Office and operationally implemented in close collaboration with the Myanmar Government counterpart. Field operation of the survey was implemented by the CCDAC, while UNODC provided technical support, coordination and supervision with national and international staff throughout the survey.

Based on the number of survey townships and the number of sample villages per township, UNODC proposed the number of required surveyors for field data collection to CCDAC. This number was estimated

based on experiences in previous surveys. The surveyor team was composed by members of CCDAC in collaboration with the State Committee for Drug Abuse Control (SCDAC) and local authorities. A total of 86 surveyors were selected, organized into 43 teams (17 teams for North Shan, 16 teams for South Shan and 10 teams for East Shan). Each team was composed of two surveyors. Each team leader was from the Myanmar Police Force (MPF) with one team member from the General Administration Department (GAD). All surveyors were from township-level offices based in each township.

All the team leaders were graduated police lieutenant level officers from Myanmar Police Force. They are familiar with local geography and the general situation with regard to ethnic traditions, social characteristics and the security situation within their respective township. The team members from GAD were office clerks and some were township-level deputy section heads. A majority were university graduates and only a few were current college students. The GAD team members are familiar with village tract-level authorities and village headmen. They know key demographic information of their respective township.

UNODC provided survey materials to the survey teams which were necessary in field operations. The items listed in the table below were provided to each survey team at the time of training. The materials were returned to UNODC when the field operations were accomplished.

GPS device	to collect village location latitude/longitude
Digital camera	for collecting field pictures
Digital calculator	to use in data input with numerical calculation

Moreover, UNODC provided a few additional items to each survey team in order to facilitate their field work. Those items were for field use and there was no need to return them to UNODC afterwards.

Survey bag with UN logo	to put material together in field work
Cap with UN logo to each surveyor	for safety purpose in some security risk areas
Field notebook/envelopes	to put questionnaires in when sending back to UNODC
Pencil/eraser/marker pen	to mark village codes in envelopes/form filling
T-shirt with UN logo to each surveyor	for safety purpose in some security risk areas

Socio-economic questionnaire design

The 2018 Myanmar socio-economic survey included two separate questionnaires, village interview and household interview questionnaires. The questionnaire was developed by a research expert from UNODC headquarters, including inputs from the national technical team at the UNODC Myanmar office. The questionnaire contained a total of 91 questions which were categorised by relevant topics and the household questionnaire contained a total of 27 questions. A draft version of the questionnaire was sent to CCDAC for comments, based on which the final questionnaire was elaborated at UNODC headquarters. The questionnaires were translated to a Myanmar version by the technical team at the UNODC Myanmar office. The survey questionnaires in both English and Myanmar version were shared with CCDAC before survey trainings.

Surveyor training

The technical team from the UNODC Myanmar office gave trainings to the respective surveyors in each survey region. Not only 86 surveyors but also 8 area supervisors (3 in South Shan, 2 in East Shan and 3 in North Shan) participated in trainings. An in-charge officer from the CCDAC head office supervised each training. During the training, each survey question was discussed with surveyors based on their field experiences, and this improved some unclear and confusing terms in the questions. Interview questions were practised by asking questions and giving answers between the teams. Training materials such as Powerpoint slides, terms definitions, guidelines, list of targeted samples, baseline villages list per respective township et cetera were provided to surveyors. The training also included practical sessions for handling GPS devices and collecting GPS latitude/longitude. It also included debriefing sessions on experiences encountered in past surveys. About 60% of the surveyors had field data collection experiences in past annual opium surveys.

Table 5: Training village surveyors, 2018

Region	From	To	Trainees	Venue
South Shan	2-May-2018	3-May-2018	32	Taunggyi
East Shan	7-May-2018	8-May-2018	20	Kyaing Tong
North Shan	14-May-2018	15-May-2018	34	Lashio
Total			**86**	

Map 4: Location of the surveyors' training sessions, Shan State, 2018

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

Conducting the survey

Field operations were started within one week after the training in each region. The operation period was set to about six weeks in each survey region. The time frame of field data collection in the whole survey area was set from 4 May 2018 to 7 July 2018. The surveyors of 38 townships out of the targeted 39 townships completed their fieldwork on time, but the surveyors of one township were delayed one week in data collection work because of security and transportation difficulties. The operation achieved field data collection in 599 villages out of the targeted 600. The surveyors could not conduct interviews in one village (in Tachileik township in East Shan) because of security issues.

The number of survey teams was justified according to the number of survey townships. Normally one survey team was assigned to each township and two teams were assigned to each of those townships with either a particularly heavy work load or difficulties related to accessibility (townships with more than 40 selected villages). The townships that were assigned two teams were three townships in North Shan (Tang Yang, Kutkai, and Lashio townships) and one township in East Shan (Kyaing Tong township). The number

of questionnaires filled out by a survey team depended on the number of selected villages in its respective township. The number of questionnaires filled out by a team ranged from minimum 5 villages (Moemit, Namtu townships in North Shan and Linhkay, Mong Pan townships in South Shan) to maximum 25 (Thibaw township in North Shan).

Figure 85: Survey conduction in East Shan, 2018

Figure 86: Survey conduction in North Shan, 2018

Figure 87: Survey conduction in South Shan, 2018

Introducing the surveyors to headmen

The surveyors were trained and instructed to establish a basis of trust before conducting the interview with the village headmen. When the survey team arrived the village, they first met the village headmen to introduce the survey; that it is a collaboration between the government and the UN in order to get

attention by the headmen. The team explained to the headmen the purposes of data collection, how important the field data is for making planning regarding development concerns and the kinds of questions which would be made in the interview. The team leader, a police officer, explained and pledged that the answers would be protected and used only for analytical purpose to reflect the real situation. The surveyors were trained to prepare answers corresponding with any possible questions by the headmen and villagers. In order to ease the interviewing, and base on cultural norms in Myanmar, the surveyor team urged village headmen to form a group of villagers including women who were interested and willing to attend the interview. The size and formation of the group was not specifically defined.

After establishing a basis of trust between surveyors and the group, the interview was started. A majority of the survey interviews took place at the house of village headmen or at the village monastery. One of the survey team members asked questions and another wrote down the answers on the questionnaire form. They recorded the village location - latitude/longitude and field pictures - and also crosschecked villagers' answers with available information. The surveyors were instructed to write down the answers to the questionnaire form in front of the villagers. Similarly, the survey team conducted household interviews with the heads of selected households. Household interviews took place at the house of selected household. Annual opium surveys were conducted for the last 10 years, and most of the village headmen in survey regions had more or less already heard about this survey interview and they knew it did not cause distress to villagers.

Data handling and collection

During the survey field operation time, the area supervisors monitored and checked survey teams' field work in their respective areas. There were three 8 area supervisors – 3 in South Shan, 2 in East Shan and 3 in North Shan. When the field data collection was completed, each team put the questionnaires in one A4 envelope per village tract and sealed it. All sealed A4 envelopes were put together into an A3 envelope and sealed again. Each survey team sent the sealed A3 envelope/envelopes to the respective regional supervisors who are heads of Drug Enforcement Units (former Anti-Narcotic Task Forces) at Taunggyi in South Shan, Lashio in North Shan and Kyaing Tong in East Shan. The survey materials were packaged and sent along with the questionnaire envelopes to the region supervisors. The regional supervisors collected the sealed envelopes and material packages sent by each survey team. Each regional supervisor prepared a large package including the questionnaire envelopes and materials from his region and sent it to the UNODC Myanmar office at Yangon. The surveyed questionnaires from 38 townships were received on time but the questionnaires from one township (East Shan) were received two weeks later than targeted date because of transportation difficulties.

Data entry, data cleaning and quality control

Data entry was conducted by UNODC technical team at the UNODC Myanmar office. Data entry was carried out from 1 July to 14 August 2018. The technical team successively carried out data verification and data cleaning. Whenever any confusing or unclear answer was observed, the technical team contacted the respective survey teams and asked for clarification. After the data cleaning, the technical team prepared a data tabulation as instructed by the research expert from UNODC headquarters. The full dataset of village survey, an MS Excel table, contained 626 columns and 599 rows without blank cells. The full dataset of household survey, another MS Excel table, contained 191 columns and 1,797 rows without blank cells. The full dataset was shared with the CCDAC head office before data analysis. All statistical comparisons in the analysis were done using a significance level of 0.05.

Limitations of the village survey

The main limitations in the data collection and analysis were:

- The socio-economic interviews were conducted in groups that consisted of village headmen and villagers. It is unclear exactly how these groups were formed, and thus, whether the information obtained would be the same if individual households were chosen randomly.
- The data obtained were aggregated at the village level. The data collected cannot be used to draw conclusions about why individual people grow opium poppy or work in the poppy trade.
- This was the first instance of interviewing households for the Myanmar survey. It surveyed three households per village (not random, but convenience selection). Based on these initial results and on the feedback from surveyors (i.e., on how difficult is to collect the data, among others), a more random household sampling can be proposed for the next years.
- The interviewers were trained and instructed to establish a basis of trust before conducting the interview. However, since law enforcement was part of the group, a certain effect on the interview answers cannot be excluded ("social desirability" or reluctance to talk freely about illicit activities).

Appendix 3: Socio-economic questionnaire 2018

UNODC

Myanmar Opium Survey 2018
Socio-economic Survey

Central Committee for Drug Abuse Control

Key Guidelines

Guideline-1: The survey upon arrival to a village will meet with the village headman and/or key informants and explain the purpose of survey.
Guideline-2: After gaining their confidence and/or willingness to collaborate, the survey team will start the interview.
Guideline-3: The surveyor must fill up the forms in the presence of the interviewed.
Guideline-4: The surveyors have to conduct interviews in all sample villages.

VILLAGE IDENTIFICATION

Name of Team Leader:			Survey Team No:	
	Township	Village Tract	Village	Date of Survey
Name:				dd/mm/yy
Code:				
	Latitude (N)	Longitude (E)		Elevation (Meter)
Village GPS position:				
Number of people participating in the survey in the village			Number of women:	
			Number of men:	

I. DEMOGRAPHIC INFORMATION

1 What is the total population (number of inhabitants) in the village? ☐ People
- 1a How many are men above or equal to 15 years old? ☐ People
- 1b How many are women above or equal to 15 years old? ☐ People
- 1c How many are children younger than 15 years old? ☐ People

Check that sum of 1a+1b+1c = total population (Question 1)

2 What is the total number of households in the village? ☐ Households
(group who normally live under the same dwelling and share a common income)

3 How many children have been born inside the village in the last 12 months? ☐ People
4 How many children younger than 1 year old have passed away in the last 12 months? ☐ People
5 How many adults between 15 and 60 years old have passed away in the last 12 month? ☐ People

II. PUBLIC SERVICES AND INFRASTRUCTURE

A. Health service

6 Do the villagers have access to health care or medical clinic? ☐ Yes ☐ No
7 If yes -
- 7a How many health employees work in the health center or clinic? ☐ People
- 7b Are female medical doctors (or similar) working in the health center or clinic? ☐ Yes ☐ No

B. Educational services

8 Does the village have -
- 8a Primary school? ☐ Yes
- 8b Middle school? ☐ Yes
- 8c High school ☐ Yes
- 8d No school but have access to school in other village ☐ Yes — How far is it in walking minutes? ☐
- 8f No school in the village, also not have access to school in other village ☐ Yes

C. Water and sanitation

9 What is the main source of drinking water inside the village? *(cross only one option)*
- 9a ☐ Water piped into dwelling
- 9b ☐ Water piped outside dwelling for personal use
- 9c ☐ Communal standpipe
- 9d ☐ Personal hand-pump
- 9e ☐ Communal hand-pump
- 9f ☐ Water collected in buckets from river/spring/lake
- 9g ☐ Personal open well
- 9h ☐ Communal open well
- 9i ☐ Others. Specify - - - - - - - - - - - - - - -

10 If the source of drinking water is communal or from river/spring/lake -
What is the average distance from the population houses to that source? ☐ Walking time in minute

11 How is the quality of the drinking water (cleanness and taste)?
☐ Very good ☐ Good ☐ Regular ☐ Bad ☐ Very bad

12 What is the type of toilet facilities inside the village? *(cross only one option)*
- ☐ Flush toilet (a sitting or squat toilet that uses water for flushing)
- ☐ Latrine (generally consisting on hole in the ground, floor with a small hole, and a shelter)
- ☐ Composting toilet (specially designed for composting residues for agricultural use)
- ☐ Open air (not toilet facilities)
- ☐ Others. Specify - - - - - - - - - - - - - - -

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D. Energy

13 What type of energy the majority of population use -

13a for cooking? *(cross only one option)*

- ☐ Public electricity
- ☐ Gas
- ☐ Charcoal
- ☐ Firewood
- ☐ Crop residues or animal waste
- ☐ Solar panel
- ☐ Others. Specify - - - - - - - - - - - - - - - -

13b for lighting? *(cross only one option)*

- ☐ Public electricity
- ☐ Candles
- ☐ Lamp from kerosene or paraffin oil
- ☐ Gas
- ☐ Batteries (e.g., dry cell)
- ☐ Solar panel
- ☐ Generators
- ☐ Others. Specify - - - - - - - - - - - - - - - -

E. Transportation and roads

14 Does the village have access to roads that connects the village with other villages? ☐ Yes ☐ No

15 If yes, are they mainly - *(cross only one option)*

- ☐ Asphalt roads?
- ☐ Dirt (sandy/muddy) roads?
- ☐ Gravel-surfaced roads?
- ☐ Others. Specify - - - - - - - - - - - - - - - -

16 What is the quality of the roads?

16a During rainy season -

☐ Very good ☐ Good ☐ Regular ☐ Bad ☐ Very bad

16b During dry season -

☐ Very good ☐ Good ☐ Regular ☐ Bad ☐ Very bad

17 Do the villagers live close to these roads (30 walking minutes or less from their house)?

- ☐ Less than 1/4 of the villagers
- ☐ Between 1/4 and half
- ☐ More than half to 3/4
- ☐ More than 3/4

18 Does some sort of vehicle pass these roads on which you can pay a fare for a ride? ☐ Yes ☐ No
(e.g. bus, motorcycles, and similar)?

18a If yes, how often do these vehicles(e.g. buses) arrive/leave the village?

☐ Once per day ☐ Twice per week ☐ Others. Specify - - - - - - - - - - - - - - - -

18b How far in traveling time (minutes) is the next village where most of the transportation ☐ Minute

18c How much the does the fare cost to the next village? ☐ Kyats

III. CROPS CULTIVATED INSIDE THE VILLAGE

A. Area per agricultural crop

19 What is the total agricultural area of the villagers of the total agricultural area *?* ☐ Acres
(including communal agricultural land, but excluding forest land in acre)

19a What area corresponds to private households' land? ☐ Acres

19b What area corresponds to communal land, including common land cultivated by organized group of people? *Check that sum of 19a + 19b = total agricultural land (Question 19)* ☐ Acres

20 Which crops, including cereals, fruit trees and flowers, have been cultivated or harvested this season, as cash crops or for self-consumption in private households' land? *(Cross the corresponding crops and indicate the irrigated and rain-fed area)*

Irrigated (Acres)	*Rain-fed (Acres)*		*Irrigated (Acres)*	*Rain-fed (Acres)*	
☐	☐	Beans	☐	☐	Opium poppy
☐	☐	Orange	☐	☐	Paddy (rice)
☐	☐	Corn/maize	☐	☐	Peanuts
☐	☐	Flowers	☐	☐	Cheroot leaf
☐	☐	Leaf vegetables	☐	☐	Potato
☐	☐	Melon	☐	☐	Sesame
☐	☐	Mustard	☐	☐	Sugar cane
☐	☐	Garlic	☐	☐	Tea
☐	☐	Onions	☐	☐	Tomato
☐	☐	Tobacco	☐	☐	Watermelon
☐	☐	Others. Specify - - - - - - - -	☐	☐	Wheat
			☐	☐	Others. Specify - - - - - - - -

Check that sum of (Question 20) = total hectares of private farmers' land (Question 19a)

Note: in the case of intercropping provide an estimate of the area per individual crop

21 How many geographically independent agricultural plots have on average each household? ☐ Acres

22 Which crops, including cereals, fruit trees and flowers, have been cultivated or harvested this season, as cash crops or for self-consumption in communal or common land?

Irrigated (Acres)	*Rain-fed (Acres)*	
		Crop name - - - - - - - - - - - - - - - - - - -
		Crop name - - - - - - - - - - - - - - - - - - -
		Crop name - - - - - - - - - - - - - - - - - - -
		Crop name - - - - - - - - - - - - - - - - - - -
		Opium poppy

Check that sum of 22a+...+22e = total hectares of communal land (Question 19b)

B. Current and previous poppy cultivation

23 If there is opium poppy cultivation in the village this season -

(Only for villages with opium poppy cultivation this season)

23a how many households have grown poppy this season? ☐ Households

23b how many grow poppy exclusively in their own agricultural land? ☐ Households

23c how many exclusively rent agricultural land to grow poppy? ☐ Households

23d how many exclusively use a share crop modality to grow poppy? ☐ Households

23e how many use more than one modality (of the indicated above) to grow poppy? ☐ Households

Check that sum of 23b+23c+23d+23e = total number of poppy households (Question 23a)

23f do farmers in the village grow opium poppy twice per year (in the same plot area)? ☐ Yes ☐ No

23g do farmers in the village stagger opium poppy planting? ☐ Yes ☐ No

23h in which month(s) the opium poppy cultivation started? ☐ Month

23i do poppy fields were affected by diseases this year? ☐ Yes ☐ No

23j do poppy fields were affected by drought, frost, heavy rain this year? ☐ Yes ☐ No

23k in comparison to last year, the total opium poppy area under cultivation have

☐ Increased ☐ Decreased ☐ Remained the same ☐ Not applicable (no poppy last year)

23l if poppy areas have increased, what are three most important reasons for this?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

Access to credit and debt

- Advance cash for poppy cultivation has been provided this year ☐
- Need money for a large expense (e.g. wedding), ☐
- difficult to be covered otherwise Higher debt this year than last year and need to repay it ☐

Access to labor and jobs

- Cannot find non-poppy related jobs / high unemployment this year ☐
- There is higher availability of labor for poppy cultivation this year than last year ☐

Access to land, water and land ownership

- Land area is small, or not suitable for other crops, or lack water ☐
- No land owner and I am trying to make money fast ☐

Agronomic and environmental conditions

- Better climate conditions this year (e.g., not drought) for poppy cultivation than last year ☐
- Reduction on or no poppy pests or diseases this year ☐
- Failure with alternative crops, poor yield results in previous years ☐
- Have more experience cultivating poppy ☐

Addiction

- Self-consumption (addicted to opium poppy) ☐

Eradication and forced activities

- Forced to cultivate poppy ☐
- Less afraid of eradication this year than last year ☐

External or internal assistance

- External or government assistance has decreased this year ☐

Income and market conditions

- Higher demand for opium poppy this year than last year ☐
- Higher sale price for opium poppy this year than last year ☐
- There has been a reduction in the sale prices of alternative crops this year ☐
- Higher prices of agricultural (non-poppy related) inputs this year ☐
- The demand for non-poppy crops in the market has decreased this year ☐

Social and religious issues

- It is common. Almost everybody does it. ☐

Transportation

- Difficult to take non-poppy crops to the market due to bad roads or controls ☐

Others

- Others. Specify - ☐

23m if poppy areas have decreased, what are the three most important reasons for this?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

Access to credit and debt

- Advance cash for poppy cultivation has not been provided this year ☐
- No large expense (e.g. wedding) that need to be paid this year ☐
- Lower debt this year than last year ☐

Access to labor and jobs

- Can find non-poppy related jobs / high unemployment this year ☐
- There is low availability of labor for poppy cultivation this year than last year ☐

Access to land, water and land ownership

- Bought or accessed more land, better access to water ☐

Agronomic and environmental conditions

- Worse climate conditions this year (e.g., drought) for poppy cultivation than last year ☐
- Increase on poppy pests or diseases this year ☐
- Good results with alternative crops, good yields last year ☐
- Have limited experience growing poppy (only short time, do not want to risk a lot) ☐

Addiction

- Afraid of family members become addict to opium ☐

Eradication and forced activities

- Not forced to cultivate poppy this year ☐
- Afraid of eradication this year ☐

External or internal assistance

- External or government assistance has increased this year ☐

Income and market conditions

- Good results with alternative crops, enough income from them ☐
- There has been an increase in the sale prices of alternative crops this year ☐
- Lower prices of agricultural (non-poppy related) inputs this year ☐
- Lower sale price for opium poppy this year than last year ☐
- Lower demand for opium poppy this year than last year ☐

Social and religious issues

- Poppy cultivation is not common. Almost anybody does it ☐
- Opium poppy cultivation has been banned by the government ☐
- Community associations have banned poppy cultivation ☐

Transportation

- Easier to take non-poppy crops to the market due to improved roads or no controls ☐

Others

- Others. Specify - ☐

23n Why farmers grow poppy inside the village?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

Access to credit and debt

- Advance cash for poppy cultivation has been provided this year ☐
- Need money for a large expense (e.g. wedding), difficult to be covered otherwise ☐
- Higher debt this year than last year and need to repay it ☐

Access to labor and jobs

- Cannot find non-poppy related jobs / high unemployment this year ☐
- There is higher availability of labor for poppy cultivation this year than last year ☐

Access to land, water and land ownership

- Land area is small, or not suitable for other crops, or lack water ☐
- No land owner and I am trying to make money fast ☐

Agronomic and environmental conditions

- Poppy is easier to cultivate and harvest than other crops ☐
- Driven by yields, and opium poppy has high yield ☐
- Good climate conditions for poppy growing ☐
- Bad results with alternative crops, bad yields ☐
- Have experience cultivating opium poppy

Addiction

- Self-consumption (addicted to opium poppy) ☐

Eradication and forced activities

- Forced to cultivate poppy ☐
- Not afraid of eradication ☐

Income and market conditions

- Poppy is convenient. It provides higher net income than other crops or activities ☐
- I am poor. Need money for buying food and basic shelter ☐
- High costs of inputs for cultivating non-poppy crops ☐
- Poppy is easy to sell, high demand for opium poppy ☐
- Driven by prices, and opium poppy has high sale price

Social and religious issues

- It is common. Almost everybody does it. ☐

Transportation

- Difficult to take non-poppy crops to the market due to bad roads or controls ☐
- Do not need to transport the opium poppy to the market (no transportation costs)

Others

- Others. Specify - ☐

24 Regardless if there are opium poppy cultivation this year, was there opium poppy cultivation inside the village during the previous years -

		Poppy			
24a	In 2017	☐	Yes	☐	No
24b	In 2016	☐	Yes	☐	No
24c	In 2015	☐	Yes	☐	No
24d	In 2014	☐	Yes	☐	No
24e	In 2013	☐	Yes	☐	No
24f	Others - - - -	☐	Yes	☐	No

25 If the villagers have not grown poppy this year but did it in the past - ☐ Year

(e.g. stopped poppy cultivation some years ago),

25a what do these households do instead of poppy cultivation?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option).

- Cultivation of land with other crops. Which ones - - - - - - - - - - ☐
- Livestock raising ☐
- Daily wages ☐
- External or government assistance ☐
- Rental of land, cars or agricultural tools ☐
- Petty trade (Which products do they trade?) ☐
- Rely on remittance ☐
- Others. Specify - ☐

25b If farmers decided to cultivate land with other crops instead of opium poppy, do the total area cultivated with other crops is larger than the previous area where they used to cultivate poppy?

☐ Increased ☐ Equal ☐ Smaller

25c how have their household income changed without poppy income?

☐ Increased ☐ Equal ☐ Smaller

25d why did the villagers stopped poppy cultivation?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

Access to credit and debt

- Advance cash for poppy cultivation has not been provided ☐
- No large expense (e.g. wedding) that need to be paid this year ☐
- Have low or not debt that need to be repaid ☐

Access to labor and jobs

- Can find non-poppy related jobs ☐
- There is low availability of labor for poppy fields ☐

Access to land, water and land ownership

- Bought or accessed more land, better access to water ☐

Agronomic and environmental conditions

- Bad climate conditions for poppy growing (e.g., drought) ☐
- High poppy pests or diseases ☐
- Good results with alternative crops, good yields ☐
- Have not or have limited experience growing poppy ☐

Addiction

- Afraid of family members become addict to opium ☐

Eradication and forced activities

- Not forced to cultivate poppy any longer ☐
- Afraid of eradication ☐

External or internal assistance

- External or government assistance has increased ☐

Income and market conditions

- Good results with alternative crops, enough income from them ☐
- There has been an increase in the sale prices of alternative crops ☐
- Low prices of agricultural (non-poppy related) inputs this year ☐
- Low demand for opium poppy ☐
- Low sale price for opium poppy ☐

Social and religious issues

- Poppy cultivation is not common. Almost anybody does it. ☐
- Opium poppy cultivation has been banned by the government ☐
- Communal associations have banned poppy cultivation ☐

Transportation

- Easier to take non-poppy crops to the market due to improved roads or no controls ☐

Others

- Others. Specify - ☐

26 If the villagers have not grown poppy this year, and have never done it, why do the villagers do not grow poppy?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

Access to credit and debt

- Advance cash for poppy cultivation is not provided ☐
- If I have a large expense (e.g. wedding) I can access to credit (no need poppy) ☐
- Have low or not debt that need to be repaid ☐

Access to labor and jobs

- Can find non-poppy related jobs ☐
- There is low availability of labor for poppy growing ☐

Access to land, water and land ownership

- Have access to land or water to avoid poppy cultivation ☐

Agronomic and environmental conditions

- Bad climate conditions for poppy growing (e.g., drought) ☐
- High poppy pests or diseases ☐
- Have not or have limited experience growing poppy ☐

Addiction

- Afraid of family members become addict to opium ☐

Eradication and forced activities

- Not forced to cultivate poppy any longer ☐
- Afraid of eradication ☐

External or internal assistance

- External or government assistance has been provided ☐

Income and market conditions

- Good results with alternative crops, enough income from them ☐
- Low demand for opium poppy ☐
- Low sale price for opium poppy ☐
- There has been an increase in the sale prices of alternative crops ☐
- Low prices of agricultural (non-poppy related) inputs ☐

Social and religious issues

- Poppy cultivation is not common. Almost anybody does it. ☐
- Opium poppy cultivation has been banned by the government ☐
- Community associations have banned poppy cultivation ☐

Transportation

- In comparison to other villages, it is easier to take non-poppy crops to the market ☐
  (markets are close, there are roads or no controls over the roads)

Others

- Others. Specify - ☐

VI. INCOME-GENERATING ACTIVITIES

A. Average income per household

27 What was the average income, after excluding expenses per household (including all working members of the household) for each of the following sources over the last 12 months?

(Indicate the number of households performing the activity, household income per activity and corresponding currency)

Number of households	***Household income per activity (Kyats)***	
☐	☐	Sales of paddy and rice *(including by-products such as husk)*
☐	☐	Sales of other licit crops, fruits, and flowers *(including by-products such as wheat, straw)*
☐	☐	Opium sales *(including poppy straw and poppy oil from seeds)*
☐	☐	Livestock and by-products *(e.g., eggs, milk, etc)*
☐	☐	Forest product sales.
☐	☐	Daily wages *(agricultural related)*
☐	☐	Daily wages *(non-agricultural related)*
☐	☐	Salaried job or employee
☐	☐	Petty trade. What products do they sell?
☐	☐	Rental of property, vehicles, and tools
☐	☐	Others. Specify -

Check that sum of number of households = total number of households (Question 2)

B. Poppy prices and labour and contribution of poppy to the local economy

(Only if there is opium poppy cultivation this season in the village)

28 What are the current farm-gate price of:

28a fresh opium (just after harvesting)? ☐ Kyat/Viss

28b dried opium? ☐ Kyat/Viss

29 This season, how many households (who live permanently in the village) were -

29a Only growing their own poppy (but no earning labour on poppy fields run by others)? ☐ Households

29b Only earning from labour on poppy fields run by others (but not growing their own poppy)? ☐ Households

29c Growing their own poppy and earning from labour on poppy fields run by others? ☐ Households

30 How many labourers do a poppy household hire on average (1 acre of poppy)?

	Labourers who live in the village	*Temporal labourers (who do not live in the village)*
30a for poppy weeding?	☐	☐
30b for poppy lancing?	☐	☐

31 How many days on average a poppy household spend (1 acre of poppy in Myanmar)?

31a for poppy weeding? ☐ Days

31b for poppy lancing? ☐ Days

32 How much are labourers paid for -

32a Opium poppy weeding (Kyats) ☐ Male ☐ Female

32b Lacing or gum collection for opium poppy (Kyats) ☐ Male ☐ Female

33 Are labourers also paid with opium poppy? ☐ Yes ☐ No

(only labourers do not include tenant and sharecrop modality)?

☐ Less than 1/4 of income ☐ Between 1/4 - 1/2 ☐ More than 1/2 to 3/4 ☐ More than 3/4 ☐ No

34 Is daily food provided by the hiring household? ☐ Yes ☐ No

35 What was the poppy income used for by villagers?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

☐ Food
☐ Medical expenses
☐ Education
☐ Paying debt
☐ Buying land or house property
☐ Buying agricultural tools or vehicles
☐ Village infrastructure
☐ Religious buildings
☐ Others. Specify -

C. Cost of agricultural production

36 What are the average cost in Kyat of cultivating one acre of - ?

Rice	*Opium poppy*	
		Seeds
		Fertilizer
		Irrigation
		Ploughing
		Weeding
		Harvesting/Lacing
		Total cost

D. Agricultural (non-poppy) and off-farm daily wages

37 What is the current daily wage (Kyats) inside the village for the following activities?

- Farm labor (non-poppy) ☐ Male ☐ Female
- Non-farm labor (construction of roads, houses, etc.) ☐ Male ☐ Female

38 Considering the number of available positions, how difficult is to get a paid non-farm labor job inside the village?

☐ Very difficult ☐ Difficult ☐ More or less ☐ Easy ☐ Very easy

39 During which months are there high demand for farm-labor (non-poppy)? ☐ Month

E. Remittances and working abroad

40 For relatives sending remittances or working abroad, how many months during the year are they away from the household?

☐ All year round ☐ 11 to 6 months ☐ 5 to 3 months ☐ Less than 3 months

41 Where do most of the people working abroad are located? *(Cross only one option)*

☐ Other village in the same region ☐ Neighbouring countries
☐ Other village in other region ☐ Other non-neighbouring countries

F. Livestock

42 How many households possess cattle? (e.g. cows, bulls, other oxen) ☐ Households

43 How many cattle are in the village? ☐ Cattles

44 How many households possess the following -

44a Chicken and poultry:	☐ Less than 1/4	☐ Between 1/4 -1/2	☐ More than 1/2 to 3/4	☐ More than 3/4
44b Goats:	☐ Less than 1/4	☐ Between 1/4 -1/2	☐ More than 1/2 to 3/4	☐ More than 3/4
44c Sheep	☐ Less than 1/4	☐ Between 1/4 -1/2	☐ More than 1/2 to 3/4	☐ More than 3/4
44d Pigs	☐ Less than 1/4	☐ Between 1/4 -1/2	☐ More than 1/2 to 3/4	☐ More than 3/4

G. Industrialization and value addition

45 Inside the village, are there availability of -

45a co-operatives or farmer associations? ☐ Yes ☐ No
45b small scale manufacturing industries or similar? ☐ Yes ☐ No

V. LAND OWNERSHIP, IRRIGATION AND SOIL QUALITY

46 How many households have property rights of their agricultural land inside the village? ☐ Households

46a If there is poppy cultivation, how many of them are poppy growers? ☐ Households

47 How do most of the villagers irrigate their agricultural fields? *(Cross only one option)*

☐ Hosepipe ☐ Superficial canal or divert stream / river / lake
☐ Sprinkler ☐ Underground canal or divert stream / river / lake
☐ Flood ☐ Buckets
☐ Others. Specify -

48 What is the main source of irrigation? *(Cross only one option)*

☐ Streams / springs (e.g. from mountain deglaciation) ☐ Lakes
☐ Rivers ☐ Wells
☐ Others. Specify -

49 How do villagers mainly extract irrigation water? *(Cross only one option)*

☐ Hand-pump ☐ Manually with buckets or similar
☐ Treadle pump ☐ Others. Specify -
☐ Motor pump

50 Overall, how is the quality of land for agricultural production?

☐ Very good ☐ Good ☐ Regular ☐ Bad ☐ Very bad

50a If the quality of soil is bad or very bad, what are the main soil quality problems faced by the farmers? *(Cross only one option)*

☐ Soil degradation / low organic matter and nutrients (farmers do not use enough fertilizers)
☐ Soil degradation / low organic matter and nutrients (farmers do not rotate crops)
☐ Soil erosion (e.g. due to deforestation and sharp slopes or heavy rain)

☐ Soil salinization (e.g. bad drainages)
☐ Others. Specify -

VI. NATURAL AND FOREST RESOURCES

51 What is the total forest area in the traditional boundary of the village? ☐ Acres

51a What is the extension of the forest area owned by individual households? ☐ Acres

51b What is the extension of common forest area, owned by groups or the community? ☐ Acres

Check that sum of 36a+36b = total forest area (Question 36)

52 How often do the villagers use resources provided by the forest and surroundings?

52a	Collect wood for fire	☐	Always	☐	Often	☐	Sometimes	☐	Seldom	☐	Never
52b	Collecting plants, seed, mushrooms	☐	Always	☐	Often	☐	Sometimes	☐	Seldom	☐	Never
52c	Hunting and fishing	☐	Always	☐	Often	☐	Sometimes	☐	Seldom	☐	Never
52d	Pastures for animals	☐	Always	☐	Often	☐	Sometimes	☐	Seldom	☐	Never
52e	Others. Specify - - - - - - - - - - - - - -	☐	Always	☐	Often	☐	Sometimes	☐	Seldom	☐	Never

53 If there is communal forest….

53a Who have access to the communal forest resources? *(Cross only one option)*

☐ Open access
☐ Regulated access. Who regulates the access? - - - - - - - - - - - - - Who has access? - - - - - - - - - - - -
☐ Others. Specify - - - - - - - - - - - - - - -

53b Do the status of the communal forest over the last two years have? *(Cross only one option)*

☐ Deteriorated ☐ Remained the same ☐ Improved

VII. FOOD SECURITY AND NUTRITION STATUS

54 During the last 12 months, how many households have not had enough food or money to buy food?

(less than 3 rations/full cups of wheat/rice per adult per day)

☐ For three months or less? ☐ For four to six months? ☐ For seven to nine months? ☐ For nine to 12 months? ☐ No food deficit

Check that sum of 73a+…+73e = total households (Question 2)

55 When the household do not have enough food, what do they usually do?

select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option)

☐ Reduce number of daily meals or eat smaller meals
☐ Do not consume expensive food or eat cheaper but less preferred staples
☐ Reduce non-food expenditures
☐ Spend cash savings
☐ Borrow food from neighbors or relatives
☐ Hunt wild animals or collect plants from the forest
☐ Purchase food on credit
☐ Receive free-aid or help from organizations, government, others
☐ Sell livestock, household assets (e.g. farming tools) or land to buy food
☐ Rent out part or all their farmland
☐ Work longer hours or work more days
☐ Other household members who were not working go to work
☐ Remove children from school to work
☐ Migrate to other regions or areas
☐ Others. Specify - - - - - - - - - - - - - -

VIII. ACCESS TO MARKETS AND SELF-CONSUMPTION

56 In which type of market do most of the farmers sell their crops or agricultural products? *(Cross only one option)*

☐ Local market inside the village
☐ Market outside the village
☐ Others. Specify - - - - - - - - - - - - - -

57 What type of market is it? *(Cross only one option)*

☐ Daily ☐ Weekly ☐ Monthly ☐ Irregular, sporadic ☐ Others. Specify - - - - - - - - - - - - - -

58 What is the most common mean of transportation to get to the market? *(Cross only one option)*

☐ Feet ☐ Horse or donkey ☐ Bus or car ☐ Motorcycle ☐ Others. Specify - - - - - - - - - - - - - -

58a How long (minutes) does it takes to get to the market by this mean of transport? ☐ Minutes

59 How most of the farmers choose the buyer? *(Cross only one option)*

- ☐ Always sell to the same trader / They trust him/her
- ☐ Closest buyer
- ☐ Best price
- ☐ Contract to sell to buyer
- ☐ Others. Specify - - - - - - - - - - - - - -

60 Which cash crops are usually sold?

Crop Name	*Unit*	*Sale price*	
Paddy			Kyats
Maize/Corn			Kyats
- - - - - - - - - - - - - - - - - -			Kyats
- - - - - - - - - - - - - - - - - -			Kyats
- - - - - - - - - - - - - - - - - -			Kyats
- - - - - - - - - - - - - - - - - -			Kyats

61 If some farmers do not sell their products in the market, what is the main reason? *(Cross only one option)*

- ☐ The market is too far
- ☐ There is not demand for them
- ☐ The sales prices are too low and it does not worth to sell products in the market
- ☐ The roads are in bad shape for transporting products to the market
- ☐ The market is difficult to reach because there are controls imposed by government/ insurgents on road transit
- ☐ The market is difficult to reach due to violence and conflict make difficult to travel
- ☐ The sellers in the market only buy from people they know or they trust / Farmers do not know the sellers in the market
- ☐ The quality of the products is too low or good enough for finding buyers in the market
- ☐ Low price / good quality products from neighboring countries are already available in the market
- ☐ It is inconvenient. Traders buy on credit.
- ☐ Lack of information on which agricultural products have demand or good prices
- ☐ Others. Specify - - - - - - - - - - - - - -

62 How many households buy staples in the market for eating at home?

- ☐ Less than 1/4 of households
- ☐ Between 1/4 -1/2
- ☐ More than 1/2 to 3/4
- ☐ More than 3/4

IX. MAIN EXTERNAL AND INTERNAL SHOCKS

63 In the last 12 months, was the village affected by -

(rank the three most important shocks: 1=most severe, 2=second most severe, 3= third most severe)

- ☐ Lower crop yields due to climate conditions (e.g. drought or floods)
- ☐ Crop diseases or crop pests
- ☐ Livestock died due to drought, floods, diseases or stolen
- ☐ End of regular assistance, aid
- ☐ Large fall in sale prices for crops
- ☐ Large rise in price of food
- ☐ Illness, accidents or deaths of household members
- ☐ Infrastructure (e.g., dwelling/houses, medical clinics, school buildings) or roads damaged or destroyed
- ☐ Vehicles, agricultural tools have been damaged or destroyed
- ☐ Lack of employment (large number of unemployed or unpaid people)
- ☐ Others. Specify - - - - - - - - - - - - - -

X. EXTERNAL AGRICULTURAL AND NON-AGRICULTURAL ASSISTANCE

64 What kind of external agricultural assistance have the villagers received during the last 12 months? *(Multiple choice)*

- 64a ☐ Seeds *For which crops?* - - - - - - - - - - - - -
- 64b ☐ Fertilizers
- 64c ☐ Herbicides
- 64d ☐ Pesticides and fungicides
- 64e ☐ Agricultural tools *Which kind?* - - - - - - - - - -
- 64f ☐ Animal vaccinations
- 64g ☐ Others. Specify - - - - - - - - - - - - - -
- 64h ☐ No external agricultural assistance

65 Have the farmers participated in formal or non-formal training in the last 12 months? ☐ Yes ☐ No

66 Have the farmers received in kind or money transfers from social assistance programs in the last 12 months?

☐ Yes ☐ No

XI. DEBT AND RURAL FINANCE

67 How many households are in debt or have outstanding loans? ☐ Households

67a Of them, how many are poppy growers? ☐ Households

68 What was the main reasons for obtaining loans? *(Cross only one option)*

- ☐ Purchase land
- ☐ Purchase agricultural inputs
- ☐ Purchase inputs for opium cultivation
- ☐ Purchase non-farm inputs
- ☐ Others. Specify - - - - - - - - - - - - - -

69 What is the main reason why do some households do not borrow money? *(Cross only one option)*

- ☐ No need
- ☐ Have already failure to pay debt
- ☐ Believed to be refused
- ☐ Too expensive
- ☐ Too much trouble for what it is worth
- ☐ Inadequate collateral
- ☐ Do not like to be in debt
- ☐ Do not know any lender
- ☐ Others. Specify - - - - - - - - - - - - - -

70 If there is poppy growing in the village this season -

70a Did farmers get advance money or advance payments to cultivate opium poppy this season? ☐ Yes ☐ No

XII. INFORMATION, SECURITY ISSUES, SOCIAL CAPITAL, AND RULE OF LAW

71 Do households in the village have their own -

71a Radio:	☐ Less than 1/4	☐ Between 1/4 and 1/2	☐ More than 1/2 to 3/4	☐ More than 3/4
71b Television:	☐ Less than 1/4	☐ Between 1/4 and 1/2	☐ More than 1/2 to 3/4	☐ More than 3/4
71c Cell phone	☐ Less than 1/4	☐ Between 1/4 and 1/2	☐ More than 1/2 to 3/4	☐ More than 3/4

72 How safe is currently the village?

☐ Very safe ☐ Safe/Secure ☐ More or less safe ☐ Insecure ☐ Very insecure

73 In comparison to last year, has safety inside the village - *(Cross only one option)*

☐ Deteriorated ☐ Remain the same ☐ Increased

74 If villagers were in serious financial/economic troubles -

74a do they have relatives or friends they can count on to help them?

☐ Less than 1/4 ☐ Between 1/4 and 1/2 ☐ More than 1/2 to 3/4 ☐ More than 3/4

74b do they access to help through the organized community ?

☐ Always ☐ Usually ☐ About half of the time ☐ Seldom ☐ Never

75 Which is the main method used to solve internal, neighbor-related or domestic disputes from villagers (formal or informal judicial mechanism)? *(Cross only one option)*

- ☐ Government officials
- ☐ Respected member of the community
- ☐ Military or police
- ☐ Anti-government organization
- ☐ Traditional justice through community-based organizations
- ☐ Others. Specify - - - - - - - - - - - - - -

75a In general, how effective is this method in solving disputes?

☐ Very effective ☐ Effective ☐ More or less effective ☐ Ineffective ☐ Very ineffective

76 How many villagers (male adults in working age) participate in organized communal activities?

(e.g. construction of common roads for the community)

- ☐ Less than 1/4 of male adults
- ☐ More than 1/2 to 3/4
- ☐ Between 1/4 and 1/2
- ☐ Between 1/4 and 1/2

77 In the last 12 months, would you say the villagers have become -

☐ More united ☐ Less united ☐ As always ☐ Do not know

78 Who has been mainly controlling of the village? *(final decision on access to territories and resources)*

78a This year *(Cross only one option)*

- ☐ Government
- ☐ Militia
- ☐ Ceasefired ethanic force
- ☐ Insurgence
- ☐ Others. Specify - - - - - - - - - - - - - -

78b Last year *(Cross only one option)*

- ☐ Government
- ☐ Militia
- ☐ Ceasefired ethanic force
- ☐ Insurgence
- ☐ Others. Specify - - - - - - - - - - - - - -

XIII. AWARENESS AND ERADICATION CAMPAIGNS FOR OPIUM POPPY

79 Was there any initiative to convince farmers not to cultivate opium poppy inside the village before planting time?

☐ Yes ☐ No

79a If yes, what was the main source of the awareness information? *(Cross only one option)*

- ☐ Billboard
- ☐ Governador
- ☐ Religious leader
- ☐ Radio
- ☐ TV
- ☐ Community-based association
- ☐ Others. Specify - - - - - - - - - - - - - -

80 If there was poppy growing in the village this season -

80a has there been any poppy eradication in the village this season? ☐ Yes ☐ No

80b If yes, what proportion of the total poppy area in the village was affected?

☐ Less than 1/3 ☐ Between 1/3 - 2/3 ☐ More than 2/3

XIV. MIGRATION AND DISPLACEMENT

81 How many people have permanently left the village in the last 12 months? ☐ People

82 What are the main reasons for leaving the village?

(select the three most important ones, and rank them from 1=the most important, 2=second most important, 3=third most important, write the number next to the corresponding option).

- ☐ Schooling
- ☐ Unemployment / lack of jobs
- ☐ Lack of access to food
- ☐ Security issues
- ☐ Getting married
- ☐ Natural disasters / destroy or damage of crops
- ☐ Others. Specify - - - - - - - - - - - - - -

83 Where did they mainly leave? *(cross only one option)*

- ☐ Other village in the same region
- ☐ Other village in other region
- ☐ Neighbouring countries
- ☐ Other non-neighbouring countries (e.g., as refugees)
- ☐ Others. Specify - - - - - - - - - - - - - -

84 How many people have immigrated to the village in the last 12 months? ☐ People

85 From where did they manly come from? *(cross only one option)*

- ☐ Other village in the same region
- ☐ Other village in other region
- ☐ Neighbouring countries
- ☐ Other non-neighbouring countries (e.g., as refugees)
- ☐ Others. Specify - - - - - - - - - - - - - -

XV. WELL-BEING, ETHNIC COMPOSITION AND FINAL QUESTIONS

A. Assessment of well-being and ethnic composition

86 What different languages do the villagers speak at home? ☐

87 How many households are under the following situations?

(Indicate number of households and the languages these households speak at home)

	Number of households	*Languages they speak at home*
- Current income allows them to build their savings	☐	- -
- Current income allows them to save just a little	☐	- -
- Current income only just meets their expenses	☐	- -
- Current income is not sufficient so they need to use their savings or sell assets to meet expenses	☐	- -
- Current income is really not sufficient, so they need to borrow to meet expenses	☐	- -

Check that sum number of household equal total households (Question 2)

B. Use of drugs and prevention of drug use

88 How many persons above or equal to 15 years old took -

88a Opium in the last 4 weeks? ☐ Persons

88b Heroin in the last 4 weeks? ☐ Persons

88c Synthetic drugs in the last 4 weeks? ☐ Persons

89 During the last 12 months, were there any -

89a awareness campaign in place inside the village to prevent drug use? ☐ Yes ☐ No

89b initiative in place inside the village to treat drug users? ☐ Yes ☐ No

C. Suggestions for government

90 What would be your suggestion for the government to stop poppy cultivation?

- -
- -
- -

D. Final comments

91 Do you have any final comments you would like to add?

- -
- -
- -

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Appendix 4: Household questionnaire 2018

UNODC

Central Committee for Drug Abuse Control

Township	Village Tract	Village	Village Code	Household no.	Date
					/ /2018

Demographic characteristics

1) Please indicate how many people live in your household:
   a) Number of male adults _____
   b) Number of female adults _____
   c) Number of children (younger than 18 years old) _____

Agricultural plot characteristics and labor availability

2) For the previous season, please make a sketch of each of your agricultural plots below

(Referential coordinates of at least one point. Latitude:____ Longitude:_____)

3) For all you agricultural plots in the previous season, indicate the total area of… (in acres)
   a) Permanent crops (eg fruit trees and similar)_____
   b) Opium poppy_____
   c) Other annual or transitory crops (besides opium poppy)_____
   d) Forest or pastures_____
   e) Fallow land_____

4)Overall topography of your agricultural plots
   a) Flat b) Terraced c) Hill

5) How is the overall quality of the soil in your agricultural plots?
   a) Very good b) Good c) Regular d) Bad e) Very bad

6) Which is the ownership status of your agricultural plots? (mark more than one if applicable)
   a) Own agricultural land
   b) Tenant
   c) Sharecrop modality

About the opium poppy cultivation

7) Local name of the opium poppy variety that you cultivate_____

8) In the previous season, did you use in your poppy fields…?
   a) Fertilizer Yes No
   b) Herbicides Yes No
   c) Insecticides/pesticides Yes No

9) In the previous season, did your poppy fields suffer damage due to…?
a) Drought Yes No
b) Heavy rain Yes No
c) Frost Yes No
d) Heat waves Yes No

10) Were your poppy fields irrigated? Yes No

11) Did you or members of your household engage in reciprocity labor for opium poppy last season? Yes No

12) Was difficult to access to paid labor for opium poppy cultivation last season?
a) Very difficult b) Difficult c) More or less d) Easy e) Very easy

Animals, other economic activities, and access to credit

13) Do you or any member of your household own any of the following ...?

a) chickens	Yes	No
b) cattle	Yes	No
c) goats or sheep	Yes	No
d) horses or donkeys	Yes	No
e) beehives for honey	Yes	No

14) Please indicate all the economic activities performed by you and your household members

Activity	**Annual income (in Kyat)**
a) Salaried employee	
b) Daily paid worker for agricultural activities	
c) Daily paid worker for non-agricultural activities	
d) Sale of legal crops	
e) Sale of eggs, dairy products, chickens, meat, or similar	
f) Sale of handicrafts	
g) Sale of homemade meals	
h) Sale of honey	
i) Rental of land, vehicles, or similar	
j) Sale of forest products	
k) Others . Which?_____	

15) During the last 12 months, does you or any member of your household were looking for a remunerated job and could not find one? Yes No

16) How long does it take you to reach the closest operating market? (in minutes, fill only one option)
a)On foot___ b)Horse/donkey____ c)Bus/car____ d) Motorcycle ___ e)Others. Specify_____

17) Are you (or anybody else in your household) member of a cooperative/ association? Yes No

18) Do you or any member of your household have access to credit? Yes No

Perceptions

19) How safe do you feel inside the community?
a) Very safe b) Safe c) More or less d) Unsafe e) Very unsafe

Socio-economic characteristics of the household and migration

20) How old is the head of the household?_____

21) Indicate the gender of the head of the household: a) Male b) Female

22) What is the highest level of education that the head of the household has completed?
a) No education b) Primary school c) Secondary school
d) High school e) Technical or University

23) Please indicate the place of birth of the head of household:
a) In the same township where the survey is conducted
b) In another township, but in the same state
c) In another state, but in the same country
d) In another country

24) If the head of the household was not born in the same township where the survey is being conducted, please indicate the number of years living in the survey place_____

25) Indicate the mother tongue of the head of your household _____

Health and Drug Use

26) Can you please tell us your personal experience of use of drugs?

Type of substance	Q 26.1: Have you ever used...? 1. Yes 2. No→next item	Q 26.2: What was your age at first use?	Q 26.3: Have you use in the last 12 months? 1.Yes 2. No →-next item	Q 26.4: In the past-30 days, how many days did you use it? (Symbols are shown underneath the chart))	Q 26.5: What is the usual method by which you use? (Symbols are shown underneath the chart)	Q 26.6: What is the average amount you spent per day during last 30 days on this substance? (Kyats)
a) Cannabis (herb or resin (hashish))						
b) Prescription opioids or painkillers such as tramadol or codeine						
c) Tranquilizer/sedatives such as valium						
d) Amphetamine such as dexedrine						
e) Methamphetamine						
f) Cocaine						
g) Crack cocaine						

h) Ecstasy						
i) Cough syrups containing codeine such as coldex or benyln						
j) Heroin						
k) Hallucinogens such as LSD or PCP						
l) Solvents/Inhalants (such as glue)						
m) Other (specify)_____						

Code for How Often Used (Q 10.4)*

1. Once a month; **2.** 2 - 3 days a month; **3.** About once a week; **4.** 2 - 3 days a week; **5.** 4 - 6 days a week; **6.** Every day; **7.** Not used in past 30 days

8. Don't know

Code for Usual Method of Use (Q 10.5) **

1. Inject; **2.** Smoke; **3.** Eat / Drink; **4.** Sniff; **5.** Inhale **6.** Tinfoil; **7.** Don't know **8.** Other (specify)_____

27) Can you please tell me if any people you know personally use any of the following substances, either if the bought it themselves or were given by other family members?

Type of substance *(The names in **bold** are commonly used local names)*	Q 27.1: people known personally 1. Yes 2. No (⇨ Next type)	Q 27.2: Approximate number
a) Cannabis (herb or resin (hashish))		
b) Prescription opioids or painkillers such as tramadol or codeine		
c) Tranquilizer/sedatives such as valium		
d) Amphetamine such as dexedrine		
e) Methamphetamine		
f) Cocaine		
g) Kratom		
h) Ecstasy		
i) Cough syrups containing codeine such as coldex or benyln		
j) Heroin		
k) Opium		
l) Hallucinogens such as LSD or PCP		
m) Solvents/Inhalants (such as glue)		
n) Other (specify)_____		

(People known personally include – family members, household members, relatives, friends, colleagues and people with whom you have had a meal together within past year)

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