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Discussion Paper:
Is poverty driving the Afghan opium boom?

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One of the poorest countries in the world, Afghanistan faces many challenges. One of them is the drug industry. Afghanistan now produces upwards of 90% of the world's opium and production has doubled in just the last two years. The Afghan drug problem has been evolving fast and, increasingly, its dimensions appear to be determined more by new events than historical factors. As a result it tends to defy categorization efforts. Yet, understanding the factors that influence the decision to plant opium poppy is of great importance to policy makers who want to affect this decision-making process and reverse the trend. This paper does not attempt to provide a comprehensive answer to such a complex question, but examines, based on the available data, whether one traditional factor, poverty, has played a central role in the recent Afghan opium boom.

The robustness of the analysis depends on the quality of the data available and, in that respect, the Afghan situation imposes clear limitations. With this important caveat in mind, the paper concludes that poverty does not appear to have been the main driving factor in the expansion of opium poppy cultivation in recent years. The vast majority of farmers in Afghanistan, as in other parts of the world, still choose to produce licit crops instead of drugs – opium poppy is grown on just 4% of the arable land in the country – and there is no evidence that opium poppy cultivation is necessarily the choice of the poorest of the poor farmers. Further, it has increased most in areas notable for their exposure to the insurgency, not the depth of their poverty.

1. Was opium poppy produced in the poorest regions of Afghanistan in 2007?

Determining whether poverty has recently motivated a growing number of farmers to cultivate opium poppy is not as straightforward as it might seem. First, poverty is notoriously difficult to measure. On a macro level, countries with low national incomes may nonetheless offer their citizens a higher quality of life than nominally richer ones, for a variety of reasons.[1] On a micro-level, household survey data typically fail to fully capture the material reality of respondents, similarly missing many sources of support as well as hidden burdens. Any exploration of the relationship between poverty and the decision to cultivate opium must acknowledge this central limitation and then move on to evaluate the evidence at all levels.

On a macro-level, Afghanistan is undoubtedly one of the world's poorest countries. Perhaps most telling is the level of infant mortality – over one quarter of Afghan children never see their fifth birthday. But this poverty is not evenly distributed, and there are areas and individuals who are doing significantly better than the national average. Opium poppy cultivation is likewise concentrated in a relatively small area of the country, and so it makes sense to ascertain whether there is a geographic overlap between opium poppy cultivation and poverty in today's Afghanistan.

The analysis of the current relationship between poverty and opium poppy cultivation in Afghanistan is complicated by the fact that surveys designed to measure one of these factors

[1] These include, for example, more equitable income distribution; provision of social services and safety nets,; large informal sectors; large unregistered remittance flows; and the availability of sustainable subsistence livelihoods.

may be less effective at measuring the other. Data on the provincial distribution of opium poppy cultivation in Afghanistan in 2007 is available from UNODC, which has conducted an annual survey of opium production since 1994.[2] The latest data on local social and economic conditions in Afghanistan were gathered in the 2005 National Risk and Vulnerability Assessment (NRVA), conducted by the Afghan government with technical assistance from WFP. [3]

The data from the opium survey show that opium poppy cultivation today is primarily a problem of the insurgent south, and particularly the province of Hilmand. The southern region (encompassing the provinces of Hilmand, Uruzgan, Kandahar, Zabul, and Day Kundi) was responsible for 70% of the opium produced in the country in 2007. The province of Hilmand alone produced over half the opium crop in Afghanistan. Not coincidentally, it is also the province at the centre of the insurgency.

With regard to economic conditions in these provinces, the NRVA avoided the difficulties of household income assessment by focusing instead on the ownership of certain key assets. Comparing these data to the cultivation figures, it appears that the wealthier provinces were actually more likely to cultivate opium poppy than the poorer ones – wealth and opium poppy cultivation were positively correlated for almost all assets. Thus, based on the most comprehensive data available on both opium poppy cultivation and economic conditions, it does not appear that the poorest provinces were responsible for the bulk of the drug production in 2007.

Table 1: Correlations between opium poppy cultivation in 2007 (at the provincial level) and 2005 wealth indicators (at the provincial level)

Wealth indicators ownership of:	Correlation with level of opium poppy cultivation (in ha)	Statistically significant (at $\alpha = 0.05$)	Correlation with opium poppy cultivation in % of arable land	Statistically significant (at $\alpha = 0.05$)
Tractors	+0.89	Yes	+0.64	Yes
Combine thresher	+0.76	Yes	+0.51	Yes
Motorcycle	+0.63	Yes	+0.48	Yes
Cars	+0.59	Yes	+0.37	Yes
Generator	+0.49	Yes	+0.33	No
Truck	+0.30	No	+0.14	No
Bicycle	+0.30	No	+0.31	No
Handcart	+0.30	No	+0.34	Yes
Non-leaking windows, doors, roof	+0.24	No	+0.12	No
Watch	+0.17	No	+0.14	No
Carpets	+0.14	No	-0.01	No
Radio	+0.13	No	+0.10	No
Refrigerator	+0.10	No	+0.03	No
Video recorder	+0.10	No	+0.02	No
TV	-0.03	No	-0.05	No

[2] In cooperation with the Ministry of Counter-Narcotics of Afghanistan since 2002.

[3] Ministry of Rural Rehabilitation and Development and the Central Statistics Office, *The National Risk and Vulnerability Assessment 2005*, Kabul, June 2007, pp. 147 and 151. Although the analysis of the 2007 situation would clearly have benefitted from having NRVA data for that year, the 2005 NRVA data set was considered a suitable proxy for the purposes of the present paper.

Sources: UNODC and Ministry of Counter Narcotics, *2007 Afghanistan Opium Survey,* October 2007 and Ministry of Rural Rehabilitation and Development and the Central Statistics Office, *The National Risk and Vulnerability Assessment 2005*, Kabul, June 2007

This point becomes clearer in the data on the key province of Hilmand. According to the NRVA, some 41% of households in Hilmand reported opium as a source of income in 2005, far more than any other province – ten times the national average of 4%. In 14 out of 15 categories of assets analyzed, households in Hilmand owned more than the national average, the exception again being television sets. This is particularly true for vehicles: Hilmand scored first for the share of households with cars or motorcycles, and second for trucks, combine threshers, and tractors. More than half the households polled owned a motor vehicle, a large share for such a poor country. These capital assets are far more expensive than those detected in other categories, and in more than half of all categories of assets, Hilmand holds either the first, second or third rank among all provinces.

Table 2: 2005 wealth indicators for Hilmand province – asset ownership in % of all households

Wealth indicators ownership of:	Afghanistan	Hilmand	Rank within Afghanistan (1 =best; 34=worst)
Watch	88%	96%	4
Radio	78%	86%	7
Non-leaking windows, doors, roof	43%	81%	3
Bicycle	35%	63%	1
Handcart	26%	58%	4
Motorcycle	13%	45%	1
Carpets	22%	32%	4
Tractors	1%	21%	2
Cars	4%	16%	1
TV	19%	15%	19
Video recorder	10%	10%	6
Generator	1%	7%	2
Refrigerator	6%	7%	4
Truck	1%	4%	2
Combine thresher	<1%	2%	2

Source: Ministry of Rural Rehabilitation and Development and the Central Statistics Office, *The National Risk and Vulnerability Assessment 2005*, Kabul, June 2007

One researcher with access to the original NRVA data set has looked at the issue in terms of even smaller geographic units, at the district level. Based on a regression analysis, he found poverty variables (including average debt levels) could explain little of the district-level variation in opium poppy cultivation between 2002 and 2005. He concluded, "on the basis of the quantitative results, it is difficult to claim that a direct relationship between poverty and the level of opium poppy cultivation exists."[4]

In summary, the province that produces half of Afghanistan's opium is also ranked among the top provinces in terms of assets ownership. Given the value of opium as a cash crop, this is, perhaps, not surprising. But it also suggests that, in 2007, opium poppy was not necessarily

[4] Kreibich, M., 'The impact of poverty and alternative livelihoods programmes on opium poppy cultivation in Afghanistan.' Thesis presented at the University of London, 17 September 2007.

cultivated by the majority of households as a basic survival strategy, and it draws attention to the role of other factors, such as the insurgency, in promoting opium production.

2. Has cultivation increased in the poorest areas?

Another way to test the links between poverty and opium poppy farming is to look at the changes in both across time. Opium poppy cultivation increased by a factor of 2.6 over the last five years, and if poverty were the driving factor, one would expect overall poverty to be growing proportionately, with the poorest provinces experiencing the most rapid expansion in cultivation. This scenario is not borne out by the data.

Afghanistan is extremely poor, but it is becoming less so. Since 2002, massive support from the international community has produced a constant upward trend in GDP per capita, while at the same time opium poppy cultivation has more than doubled.

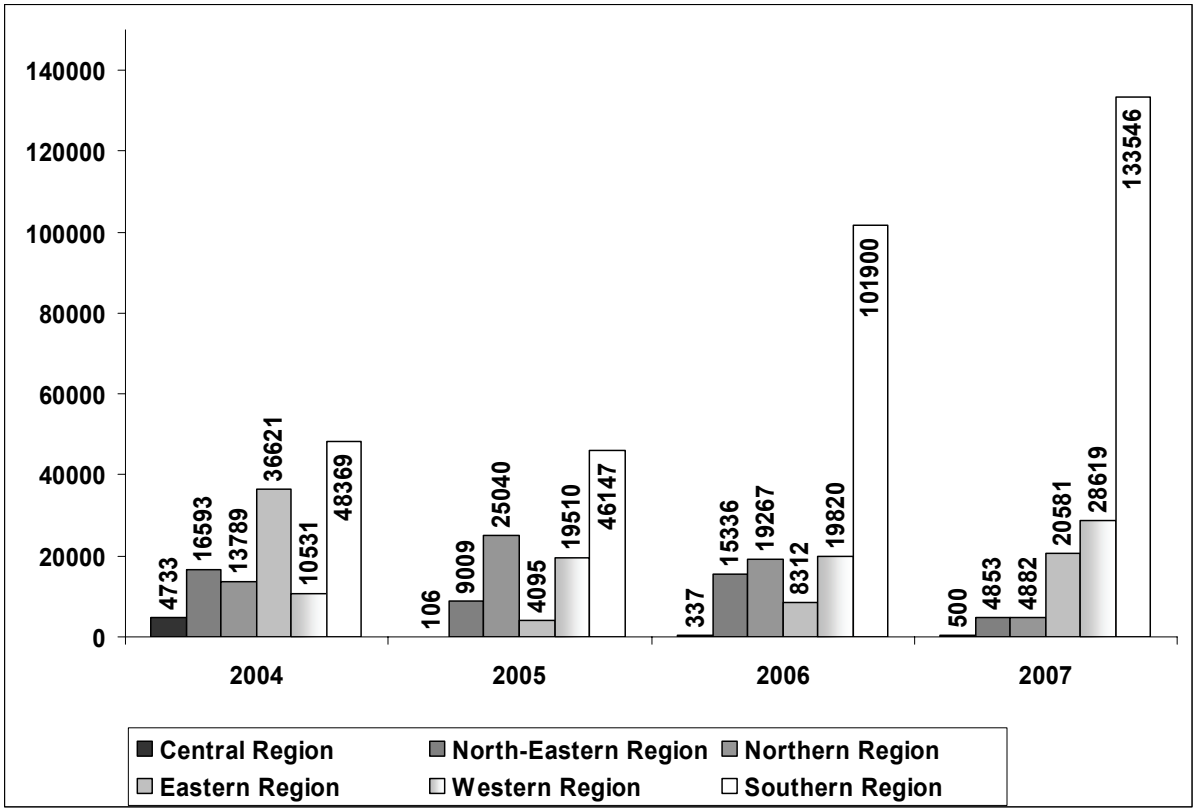
Table 3: Opium poppy cultivation and GDP per capita in Afghanistan, 2002-2007

	2002	2003	2004	2005	2006	2007
Opium poppy cultivation in ha	74,000	80,000	131,000	104,000	165,000	193,000
Annual % change		8.1%	63.8%	-20.6%	58.7%	17%
GDP per capita in current US$	179	193	242	285	309	362
Annual % change		7.6%	25.3%	17.8%	8.7%	17.2%
Sources: MCN/UNODC, 2007 Afghanistan Opium Survey and IMF, World Economic Outlook October 2007.						

Of course, the overall growth in the economy of the country may be made up of both positive and negative developments at the local level. It could be that while the economy of the country as a whole is growing, certain areas are in recession, and these could be the areas where opium production is occurring. Unfortunately, data on income dynamics at a sub-national level are not available, but the data on asset ownership suggests that it is not in the poorest provinces that the bulk of the cultivation increase is found.

The increase in cultivation is clearly linked to particular areas of the country. Looking regionally, opium poppy cultivation almost tripled in the southern and in the western provinces between 2004 and 2007, while it declined over the same period in northern, north-eastern and eastern Afghanistan. These large regions contain both relatively rich and poor provinces, and there is no evidence that economic growth is similarly geographically divided.

Figure 1 Regional dynamics of opium poppy cultivation in Afghanistan (ha), 2004-2007



Source: MCN/UNODC, 2007 Afghanistan Opium Survey, October 2007

A closer focus on the key production province of Hilmand again suggests that poverty is not driving the expansion. In 2005, 6.7% of arable land was under opium poppy cultivation in Hilmand. By 2007, this proportion rose to 25.9%. This represents an increase of 19.2 percentage points between the two periods, by far the largest in the country. As has been shown above, Hilmand is less poor than other provinces in Afghanistan. It is also, according to the NRVA, a province where, as of 2005, economic conditions were improving relative to the rest of the country. Some 44% of households in Hilmand reported their economic situation had improved in the past year, compared to 27% in the national population.

Table 4: Comparison of the perceived overall economic situation of households in 2005 with respect to the situation one year earlier in Hilmand and in Afghanistan

	Comparison of economic situation on a year earlier					
	Much worse	Slightly worse	Stable	Slightly better	Much better	Total
Hilmand	7%	16%	34%	35%	9%	100%
National average	11%	27%	36%	24%	3%	100%

Source: Ministry of Rural Rehabilitation and Development and the Central Statistics Office, *The National Risk and Vulnerability Assessment 2005*, Kabul, June 2007

Applying this reasoning to the other provinces and again making use of the asset data, the correlations between the wealth indicators and the changes in opium poppy cultivation over the 2005-07 period were found again to be positive. In other words, most of the opium poppy

cultivation expansion occurred in the provinces that, by Afghan standards, had a better socioeconomic situation.

Table 5: Correlations between changes in opium poppy cultivation (at the provincial level), 2005-2007 and 2006-2007 and wealth indicators (at the provincial level)

Wealth indicators ownership of:	Correlation with changes in opium poppy cultivation in % of arable land, 2005-07	Statistically significant (at $\alpha = 0.05$)	Correlation with changes in opium poppy cultivation in % of arable land, 2006-07	Statistically significant (at $\alpha = 0.05$)
Tractors	+0.59	Yes	+0.42	Yes
Combine thresher	+0.50	Yes	+0.34	Yes
Motorcycle	+0.44	Yes	+0.50	Yes
Bicycle	+0.43	Yes	+0.45	Yes
Handcart	+0.42	Yes	+0.32	No
Cars	+0.36	Yes	+0.31	No
Generator	+0.32	No	+0.23	No
Truck	+0.16	No	+0.17	No
Watch	+0.15	No	+0.07	No
Radio	+0.11	No	+0.12	No
Refrigerator	+0.08	No	+0.17	No
Non-leaking windows, doors, roof	+0.05	No	-0.12	No
Videorecorder	+0.03	No	+0.15	No
Carpets	+0.02	No	+0.02	No
TV	-0.01	No	+0.17	No

Sources: UNODC and Ministry of Counter Narcotics, *2007 Afghanistan Opium Survey*, October 2007 and Ministry of Rural Rehabilitation and Development and the Central Statistics Office, *The National Risk and Vulnerability Assessment 2005*, Kabul, June 2007

Recent information on opium stockpiles in villages also suggest that the expansion of opium poppy cultivation in the south is not primarily driven by economic desperation, as opium producing villages there can reportedly afford to save more opium than in other regions. In the southern region, 52% of the headmen in opium producing villages surveyed in early 2008 by MCN/UNODC[5] reported that their village held opium stocks, against 11% in the eastern region, 10% in the western region, 3% in the northern region and none in central and north-eastern Afghanistan.

3. Are those who cultivate opium poppy poorer than those who do not?

Turning from the regional/provincial analysis, it is possible to increase the resolution of our picture of opium poppy growers further still, by looking at individual cultivators through the survey data. Like many developing countries, Afghanistan is a country of small scale agriculturalists, many of them very poor. The vast majority struggle to survive without producing opium. What is it that distinguishes those who enter the drug market from those

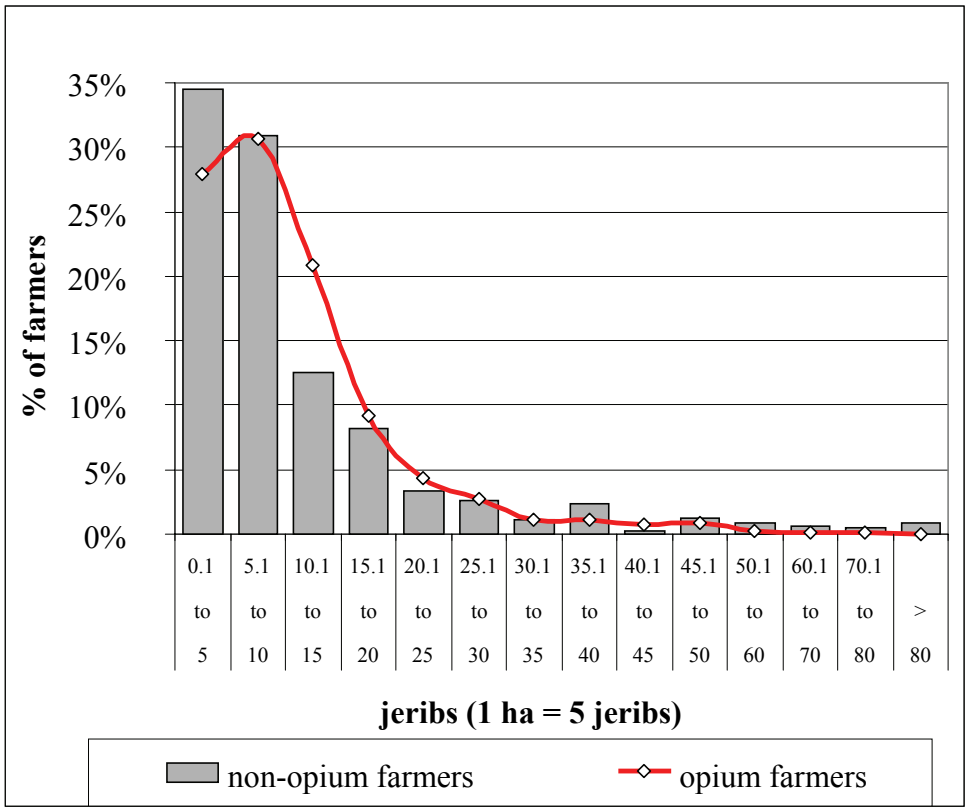
[5] MCN/UNODC, *Afghanistan Opium Winter Rapid Assessment Survey*, February 2008, p. 10. Due to the limited size of the sample used for the Rapid Assessment Survey, caution must be used in extrapolating the findings, pending further results from the next annual opium survey.

who do not? Is it the very poorest who are forced by circumstances to take up opium poppy cultivation?

Since each square meter of cultivation space represents potential income to poor farmers, and there is very little non-farm economic activity in rural Afghanistan, it stands to reason that the poorest farmers would also be those that own, lease or sharecrop the smallest plots of land. If it were these poorest farmers who were leading the recent years' boom in opium poppy cultivation, one would expect a corresponding proliferation of small plot opium poppy cultivation. But this is not the case – the average size of opium poppy plots has actually increased over time, suggesting the relatively better-off farmers have been entering the market.

Most farmers in Afghanistan have only around 10 jeribs (about two hectares) of land available for farming[6], but the land available to opium poppy cultivators has changed over time. According to the MCN/UNODC 2003/4 Farmers Intention Survey, only 29% of opium poppy farmers polled said they had more than two hectares available, while by 2007, 41% so reported. In 2002, based on the MCN/UNODC cultivation survey data,[7] opium poppy growers did indeed have about one third less land at their disposal than those who did not cultivate opium poppy, so relative poverty made sense as an explanation then. But by 2007 there was no longer a statistically significant difference between the average land holdings of those who grow opium poppy and those who do not. (See the methodological annex at the end of this report for further clarification on this issue.)

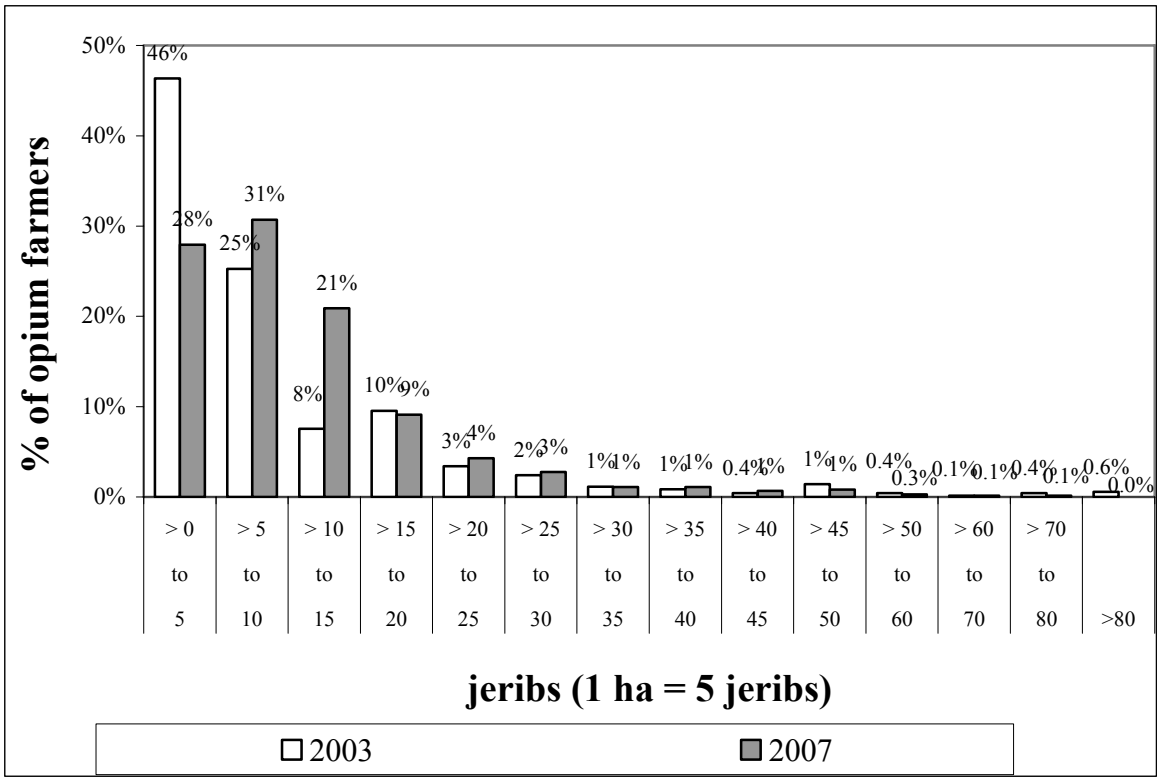
Figure 2: Distribution of cultivated land in Afghanistan



[6] This includes land available from landholding, lease holding, and share cropping.
[7] MCN/UNODC 2003/04 Farmers' Intention Survey.

In 2003, nearly half (46%) of the opium poppy farmers were working small plots of land, of less than one hectare. By 2007, only 28% had plots so small, which indicates that wealthier farmers have entered the market.

Figure 3: Distribution of total cultivation among opium farmers in 2003 and 2007



Source: UNODC, Database for 2007 Afghanistan Opium Survey and UNODC, 2003/04 Farmers Intention Survey Database.

Of course, the most direct way to determine whether opium poppy cultivators are poorer than other farmers is to compare income figures for both groups. As noted above, however, gathering income data at a household level is generally problematic, especially when one of the sources of income is illegal, and the sampling in the opium survey was not designed to produce representative household income data[8]. As a result, this analysis cannot be regarded as dispositive on the question of whether there is a connection between household income and opium production.

With this caveat in mind, the data show that farmers who reported growing opium poppy had an average annual cash-income of US$3933, which was significantly higher than that reported by other farmers (US$2279) despite the fact that the land holdings of the two groups were largely the same. This stands to reason, as opium poppy brings in more cash income.

What is less clear is what the income of opium poppy farmers would be if they were to give up farming opium poppy for other crops. Certainly they would earn less money, but how much less? In the south, where the recent boom is centred, available data show that non-

[8] The survey focuses on the annual cash income of households, which is only one of several income sources of rural households, although a very relevant one in the context of opium poppy cultivation.

opium poppy farmers earn significantly more than opium poppy farmers in all other regions, with the exception of the northern region. This suggests that, on average, southern farmers could give up opium poppy and still earn more than most farmers elsewhere in the country.

4. Conclusion

There is no deterministic relationship between poverty and criminality anywhere in the world – many of the poorest countries and the poorest individuals are among the most law abiding. Aside from opium, coca is the world's most problematic drug crop, and the majority of the world's coca supply also comes from just one country: Colombia. Colombia was ranked by UNDP on the high end of "medium development" countries in 2007 (75th out of 177 countries), above nations like the Ukraine, China, and Turkey. Colombia is very different from Afghanistan in this regard.

What Colombia and Afghanistan do have in common is a problem with insurgency. One key problem of poor countries like Afghanistan is that their governments are also under-resourced. This undermines the quality of the services they can offer to their citizens, and makes more attractive the claims of those who would challenge the state's power – insurgents. Low government capacity also reduces the amount of control central governments can exercise over their territory, leaving the country vulnerable to regional secessions. And it limits the amount of oversight that can be exercised over local authorities and the borders, all of which increase vulnerability to drug cultivation and trafficking.

Poverty aside, it is clear that both local corruption and the insurgency are key elements in the recent opium boom in Afghanistan. Today, the most significant factor affecting the scale of cultivation among opium poppy farmers appears to be the security situation. In areas with good security, the average opium poppy farm consisted of just 10 jeribs. In more dangerous areas, the plots were nearly four times as high, averaging 37 jeribs. The February 2008 MCN/UNODC Rapid Assessment Survey[9] showed that, in a sample of 469 villages, more than two-thirds of the villages located in areas with poor security conditions reported growing opium poppy in 2008, as compared to less than one-third in areas that enjoyed better security. In the southern and western provinces, the link between security conditions and opium poppy cultivation was even stronger, with 100 per cent of the surveyed villages where poor security conditions prevailed having planted opium poppy this year. As stated in a recent report commissioned by the World Bank and DIFID: "Ominously, the links and synergy between opium poppy and insecurity are becoming increasingly apparent. [10]"

The February 2008 MCN/UNODC Rapid Assessment Survey also illustrated how poor security conditions can undermine the expected effect of development assistance on opium poppy cultivation. [11] Of the 469 villages surveyed, 152 had received agricultural assistance

[9] MCN/UNODC, *Afghanistan Opium Winter Rapid Assessment Survey*, February 2008, p.6. Due to the limited size of the sample used for the Rapid Assessment Survey, caution must be used in extrapolating the findings.

[10] The World Bank and DIFID, *Economic incentives and development initiatives to reduce opium production*, February 2008, p. 1.

[11] MCN/UNODC, *Afghanistan Opium Winter Rapid Assessment Survey*, February 2008, pp.5-6. Due to the limited size of the sample used for the Rapid Assessment Survey, caution must be used in extrapolating the findings.

(32%) in the form of seeds, fertilizers and irrigation facilities. Of those 152 villages, 76% did not plant opium poppy this season, which suggests that, overall, villages that have received assistance are more likely to refrain from cultivating opium poppy. However, in the southern region, 69% of villages surveyed that had received such agricultural assistance have nonetheless planted opium poppy. The corresponding figure for the north, north-east and west is approximately 30 %, while in the eastern and central regions none of the surveyed villages that received agricultural assistance have grown opium poppy this season.

All of this suggests that combating opium production cannot be reduced to poverty alleviation alone and that other measures are also necessary. Afghanistan's farmers are in need of assistance, but this assistance cannot be seen as a sufficient answer to the drug trade, nor can this need be used to justify continued and expanding opium poppy cultivation.

The recent expansion in opium poppy farming questions the notion of opium poppy cultivation as a survival strategy, as there is much evidence that there are other factors at play. Addressing the opium surge means addressing these "other factors" in an effective manner, with an appropriate combination of security and law enforcement interventions, good governance and anti-corruption measures, so that the necessary development assistance to rural communities can also have its intended effect on opium production.

Methodological annex – village survey sampling

One component of the Annual Opium Survey implemented by MCN/UNODC in Afghanistan is a village survey. The primary purpose of the village survey is to complement the comprehensive satellite survey of the country to establish opium poppy cultivation and production estimates. The village survey also helps provide yield estimates and a cross-check for the results from MCN/UNODC measurements of individual plots. For estimates at the district-level, information from the village survey is used in combination with data from other sources[12].

For sampling purposes, the country is divided into six large regions, each comprising several provinces, in which some 1500 villages, distributed among the 34 provinces were surveyed in 2007, equivalent to about 5% of all villages in Afghanistan (31,220). In view of an uneven distribution of opium poppy cultivation at different elevation levels, a stratified sampling method was used to select the sample villages (group 1: villages located at an elevation of less than 1,500 m; group 2: villages at elevations between 1,500 and 2,500 m; and group 3: villages located at an elevation of more than 2,500 m.). This approach was used to allow for a slight 'over-sampling' of villages of less than 1500 m of altitude (5.8% of such villages sampled) – which have stronger likelihood of producing opium - and a slight 'under-sampling' of villages above 2,500 m altitude (3.4% of the villages sampled in this stratum) where the likelihood to find opium poppy cultivation is generally lower. Within each stratum (based on elevation), villages were selected randomly. The basis for the selection was the database of villages obtained from the Afghanistan Information System (AIMS), which contains a total of 31,220 villages and their GPS positions, which also allows to establish their respective elevations.

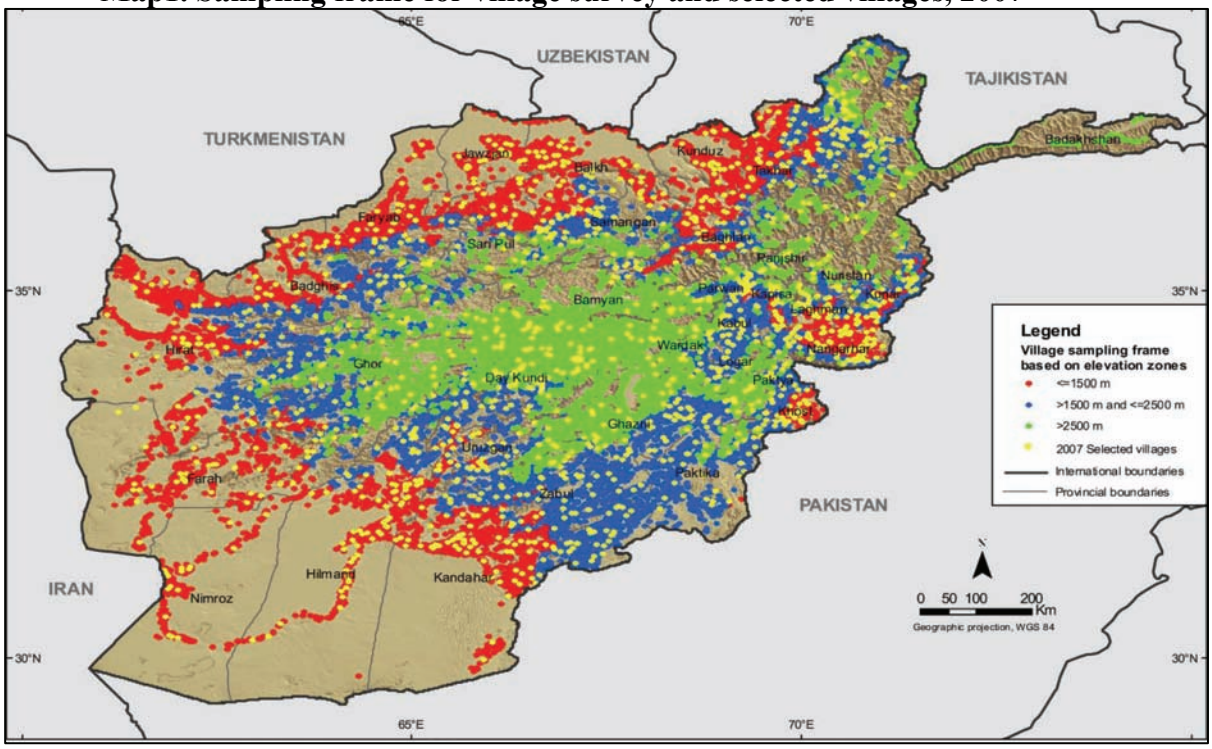
Table 6: Village survey data

Strata	Elevation (metres)	Total no. of villages	No. of villages surveyed	% villages surveyed
Group 1	<1,500	10,551	613	5.81%
Group 2	1,500-2,500	11,810	587	4.97%
Group 3	>2,500	8,859	300	3.39%
		31,220	1,500	4.80%

The slightly 'over-sampled' areas (with an elevation of 1500 meters altitude or less) are shown in red on the map; the slightly 'under-sampled' regions (of more than 2500 meters) altitude are shown in green. As can be seen from the map below, the overall distribution of the sample – even without further corrections, should be a rather good representation of rural villages in both opium-producing and non-producing regions of Afghanistan.

[12] For more information on the organization and methodology of the MCN/UNODC Annual Opium Survey, see survey reports at http://www.unodc.org/unodc/en/crop-monitoring/index.html

Map1. Sampling frame for village survey and selected villages, 2007



The village survey consists of one set of questions directed towards the village headman and another set of questions which are directed towards two farmers in each village. In 2007 interviews were conducted with 2,996 farmers.

The survey was geared toward obtaining information, as far as possible, from both opium poppy and non-opium farmers across Afghanistan, to learn about the motivations for growing and non-growing opium poppy as well as the specific socio-economic conditions under which the farmers operate. In order to have a sufficient number of both opium- and non-opium farmers in the sample, the following survey design was established: If opium- and non-opium farmers were available in a village, the first selected farmer should be an opium farmer and the second a non-opium farmer. In villages where only opium- or only non-opium farmers could be identified, two opium- or two non-opium farmers were selected and interviewed.

In total, the sample contained information from 2,271 non-opium and 724 opium farmers in Afghanistan. Only one farmer provided information but refused to report in the interview whether he was actually growing opium poppy. The proportion of opium farmers in the total number of farmers interviewed amounted to 24.2%. This was – on purpose - an over-representation of opium poppy growing farmers in the total sample of selected farmers. The extent of this over-representation can be established. Based on the estimates provided in the 2007 Afghanistan Opium Survey, the actual proportion of opium farmers and their family members in the total rural population of the country amounted to 14.3% in 2007. The number of opium farmers in the sample is thus about a third larger as one would have expected if a complete random sampling approach would have been applied. The expected sample of opium poppy growers under such a random sampling approach – based on a total of 2996 interviews – could have been expected at around 548 opium poppy farmers (instead of 724 farmers). Having a higher number of opium farmers in the sample enabled to produce statistically more robust information at the regional level.

Interviews conducted in the headman survey shed some light on the question of whether the individual samples of opium poppy and non-opium poppy farmers are representative. According to information provided by the headmen on the number of opium poppy farmers in their respective village, the MCN/UNODC Opium Poppy Survey could establish an estimate of the likely number of opium poppy farmers in each region. The proportions of farmers in the sample for southern, western and central Afghanistan were almost identical with the proportions calculated based on the headman survey. For northern and north-eastern Afghanistan the farmers' survey showed a slight over-representation while for eastern Afghanistan there has been a slight under-representation in the number of opium poppy farmers (based on the assumption that the headmen provided accurate estimates). Nonetheless, the overall geographical distribution of opium poppy farmers across regions, established on the basis of the headman survey, proves to be reasonably similar to the distribution of opium poppy farmers selected for interviews in the farmer's survey. So no significant geographical bias of the sample could be established.

Similar conclusions can be drawn from the analysis of the distribution of the sample of non-opium poppy farmers and the overall distribution of the rural population in Afghanistan. The distribution is almost identical. There is only a small under-representations of farmers from eastern Afghanistan and a small over-representation of farmers in western Afghanistan. For the other regions, the distribution is identical.

Table 7: Estimated number of opium farmers in the sample

	Estimated number of opium farmers (based on headman survey)		Opium farmers in sample of farmers' survey	
	Number	Distribution	Number	Distribution
Central	3,000	1%	18	2%
Eastern	132,000	26%	139	19%
North-eastern	36,000	7%	62	9%
Northern	10,000	2%	46	6%
Southern	245,000	48%	347	48%
Western	83,000	16%	112	15%
Total	509,000	100%	724	100%

Source: UNODC, Database for 2007 Afghanistan Opium Survey

Table 8: Distribution of rural population and non-opium farmers in sample

	Opium farmers in sample		Non-opium farmers in sample		Rural population (2005/2006)	
	Number	Distribution	Number	Distribution	In '000	Distribution
Central	18	2%	561	25%	4329.7	25%
Eastern	139	19%	245	11%	2336.9	13%
North_eastern	62	9%	271	12%	2140.0	12%
Northern	46	6%	500	22%	3541.1	20%
Southern	347	48%	325	14%	2336.0	13%
Western	112	15%	369	16%	2655.0	15%
Grand Total	724	100%	2,271	100%	**17338.7**	**100%**

Source: UNODC, Database for 2007 Afghanistan Opium Survey; CSO estimated population for 1384 (2005/2006)

MCN/UNODC's farmers' survey in 2007 revealed that there are no statistically relevant differences between opium poppy and non-opium poppy growing farmers in terms of land-holding or overall land available for cultivation, but was the sample representative of the actual size and the land holding structure in Afghanistan? There is one result that can be tested and compared with other sources – the 'average area under cultivation' (on land owned, leased or share-cropped). The average area under cultivation amounted to 2.5 hectares according to MCN/UNODC's farmers' survey. The National Risk and Vulnerability Assessment 2005 (NRVA), conducted by the Ministry of Rural Rehabilitation and Development and the Central Statistics Office, found an average size of irrigated land in rural Afghanistan to amount to 7.5 jeribs (1.5 ha) and the average size of non-irrigated land per household to amount to 13 jeribs (2.6 ha). Taking into account the differences in sample between the irrigated and rain-fed estimates, UNODC estimates that the total area under cultivation according to the NRVA figures would amount to some three hectares per farm household.

Applying UNODC figures from the farmers' survey suggests that based on total arable land of 7,226,765 ha and an average cultivation of 2.5 ha per farmer, there should be 2.89 million farmers in Afghanistan (which is similar to the original FAO/WFP estimate for 2001). Based on a number of 6.5 family members,[13] the rural farming population (farmers and their family members) would amount to some 18.8 million people. Based on the average of 6 persons per family, as found in the 2007 village survey, the total rural farming population could be estimated at around 17.3 million (which is again similar to the FAO/WFP estimate for 2001). This compares with an estimate of 19 million people living in rural Afghanistan in 2007, calculated on the basis of 15.83 million persons living in rural Afghanistan in 2002 and an average annual population growth rate of 3.8% as reported by the UN population division of New York for Afghanistan. Based on this estimate, the total non-farming population in rural Afghanistan would amount to 1.7 million or close to 10% of the total. The population estimates by the Central Statistical Office of Afghanistan are generally considered to be conservative, so that the total number of persons not involved in agriculture could be substantially higher. Overall population estimates for Afghanistan as a whole by the Central Statistical Office of Afghanistan (22.1 million in 2005) [14] are, for instance, lower than those provided by the United Nations (25.1 million in 2005) or the International Monetary Fund (25.7 million in 2003).[15] Thus, the cross-checks of the results emerging from MCN/UNODC's sample suggests MCN/UNODC's overall data set is consistent with other national and international estimates of the country's (rural) population, and there is no evidence of a systematic bias in the MCN/UNODC sample.

[13] Food and Agriculture Organization (FAO) activities update in Afghanistan, No. 2, p. 2, January 2003.
[14] Central Statistical Office http://www.cso-af.net/cso/documents/estimated%20population%201384.xls
[15] IMF Country Report No. 07/253, July 2007, http://www.imf.org/external/pubs/ft/scr/2007/cr07253.pdf