



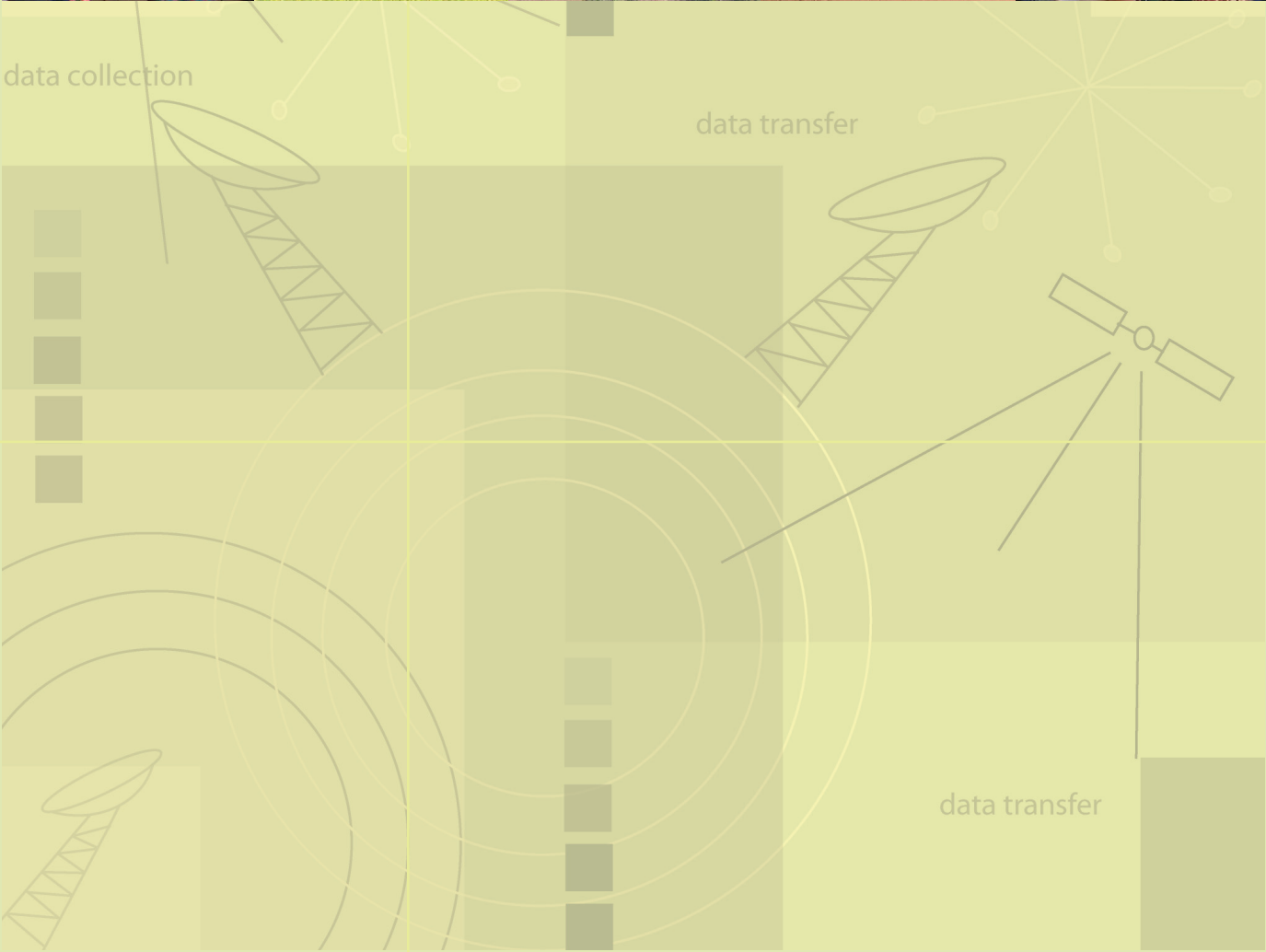
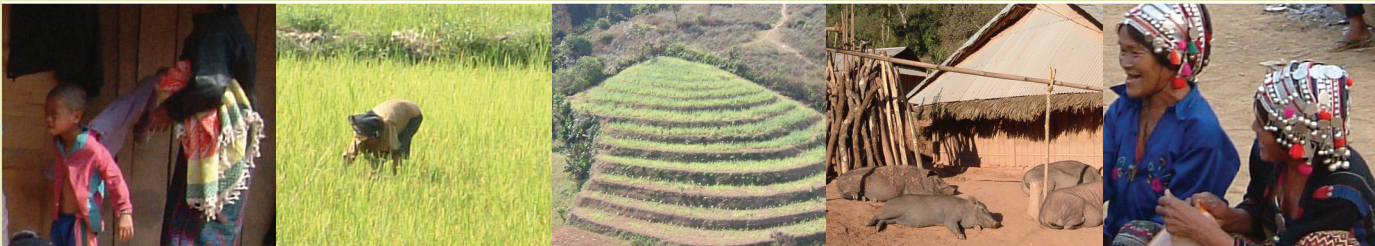
UNITED NATIONS
Office on Drugs and Crime



Lao National Commission for
Drug Control and Supervision

LAOS

Opium Survey 2005



JUNE 2005

Abbreviations

UNODC	United Nations Office on Drugs and Crime
GoL	Government of Laos
ICMP	Illicit Crop Monitoring Programme
LCDC	Lao National Commission for Drug Control and Supervision
NTFP	Non Timber Forest Products
PCDC	Provincial Committee for Drug Control
PFU	Programme Facilitation Unit
NAFRI	National Agriculture and Forest Research Institute
RAS	Research and Analysis Section (UNODC)

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Vongkot Inpradith	Village survey supervision, LCDC-PFU

National Agriculture and Forestry Research Institute

Linkham Duangsavanh	Team Leader, Socio-Economic Study Team
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The implementation of the survey would not have been possible without the support from the local administrations and the dedicated work of 42 field surveyors.

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Klaus Nyholm	Resident Representative (Country Office Lao PDR)
Xavier Bouan	Regional Illicit Crop Monitoring Expert, overall survey supervision and management, ICMP/RAS
Coen Bussink	Remote sensing and GIS-Expert, ICMP/RAS
Sakina Frattina	Research Assistant (Country Office Lao PDR)
Anja Korenblik	Programme Management Officer, ICMP/RAS
Johanna Lindgren	Research Assistant, Socio-Economic Data Analysis Coordinator (Country Office Lao PDR)
Sengdeuane Phomavongsa	Village survey supervision (Country Office Lao PDR)
Ronald D. Renard	Socio-Economic Study Team Leader (Consultant)
Patrick Seramy	Fieldwork organisation and supervision, database management, ICMP/RAS
Javier Teran	Statistician, ICMP/RAS

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Preface

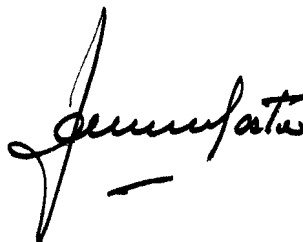
Laos has taken one more step towards freedom from opium. By early 2005, poppy cultivation in the country stood at 1,800 hectares, down from 6,600 hectares a year earlier. When the decline started in 1998, Laos had 26,800 hectares under opium poppy cultivation. It now seems likely that the country will reach the goal its government set itself four years ago: freedom from opium by the end of 2005.

For the first time in many years, we can safely assume that Laos is no longer a supplier of illegal opiates to the world market. What is still produced is consumed by the country's approximately 20,000 opium smokers, many of whom are now undergoing treatment or rehabilitation.

This year's opium survey was supplemented by a study on the coping strategies of former opium growers - how have they managed to survive economically without the income from the sale of opium? It is not surprising that farmers targeted by alternative livelihoods projects did better than others. But even those who did not benefit from externally financed projects somehow coped, by taking off-farm employment, by establishing small-scale irrigation, by developing their livestock or by collecting non-timber forest products. And in each and every village surveyed, at least one half of the population – the women – voiced no doubts about the advantages of opium elimination. Typically, it was the women in farming communities who did most of the backbreaking work in the opium fields, and they and their children who had suffered from their husbands' addiction in terms of malnutrition and domestic violence. Today, women have time for other household and family activities.

There is ample reason to pay tribute to the intelligence and resilience of farming families in the former opium growing mountains of northern Laos. They have coped remarkably well under difficult circumstances. But their communities have still not escaped the poverty associated with drug production. In response, the Government of Laos recently formulated a strategy that relies on alternative livelihood programmes that offer farmers much-needed income during the transition from illicit to legal crops.

On many occasions, in the UN General Assembly and elsewhere, the international community has solemnly declared that the problem of illicit drugs is an international problem that cannot be solved by the producer countries alone. I therefore urge donor countries and development agencies to extend a hand to farmers struggling to break free of drug cultivation. It is a proven method of sustaining opium elimination in Laos.



Antonio Maria Costa
Executive Director
UNODC

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FACT SHEET, LAOS OPIUM SURVEY 2005

	2005	Variation on 2004
Opium poppy cultivation	1,800 ha¹	-73%
Average opium yield	8 kg	n.a.
Potential production of opium	14 metric tons	-67%
Number of villages growing opium poppy	270	-68 %
Number of households cultivating opium poppy	6,200	-73 %
Average farm gate price of opium	5,461,000 kip/kg (US\$521/kg)²	139%
Total potential value of opium production	US\$7,378,000	-21 %
Average annual cash income of opium poppy growing households	1,457,000 kip (US\$139)³	n.a.
Opium growing households with rice deficit	57%	-
Average annual cash income of households not cultivating opium poppy	2,418,000 kip (US\$231)	n.a.
Non-opium growing households with rice deficit	28%	-
Number of opium addicts ⁴	20,160	-30%
Average drug addiction prevalence rate (in 8 northern provinces)	1%	-

¹The estimate does not account for eradication of standing crops after the survey

² Based on an average exchange rate of 10,370 kip/US\$ from December 2004 to March 2005

³ Based on an average exchange rate of 10,480 kip/US\$ from January 2004 to December 2004

⁴ Source: LCDRC, May 2005. Figure refers to number of addicts left in all 11 northern provinces

EXECUTIVE SUMMARY

The 2005 opium poppy survey in the Lao PDR was conducted jointly by the Lao Government and UNODC, across 8 provinces of northern Laos with three, parallel and independent data collection exercises. The first, aimed at verifying to what degree opium was still cultivated in the northern provinces, consisted of an aerial survey by helicopter to sample sites in 7 provinces. The second was at village level, carried out through interviews of village headmen to collect socio-economic and yield data in 189 villages in 8 provinces. The third, an in-depth socio-economic study, made qualitative and quantitative assessments on the impact of ending opium poppy cultivation among a sample of 181 households in 24 villages of 6 provinces.

Opium poppy cultivation

Opium poppy cultivation was found in 7 provinces. The total area under opium poppy cultivation in the Lao PDR for the 2005 season was estimated at **between 900 and 2,900 ha with a mean value of 1,800 ha⁵**, which is a decrease of 73% compared to the 2004 estimate of 6,600 ha. This translates into an impressive cumulative decline of 26,600 ha since 1998. It was estimated that a minimum of 6,200 households still engage in opium cultivation, representing 2% of a total of 297,000 households in the 8 surveyed northern provinces of Laos.

Opium yield and production

The average national opium yield potential for 2005 was estimated at **8 kg/ha**. The estimate was based on reports from the field, assessments of crop vigour of standing opium poppy fields and the review of weather and yield data over the last 5 years. The average estimated production of opium for the year 2005 is around 14 mt. This is a 67% reduction with respect to 2004.

Opium prices and trade

The average farm gate price of opium at harvest time was estimated at **5,461,000 kip/kg**, corresponding to \$US521/kg. This represents an increase of 139% compared to the price during the same time in the previous season. The increase reflects the scarcity of opium produced during this season due to the reduction of opium poppy cultivation. High prices could present an incentive for farmers to cultivate opium next year.

Household income from opium cultivation

Average annual cash income of an opium-producing household was estimated at 1,457,000 kip (US\$139) while the average annual income of non-opium producing households was estimated at 2,421,000 kip (US\$231). These figures reveal that opium is linked to more marginal economic conditions, which are probably exacerbated by reduced productivity of households with addicts most of whom are male (1.5% among the total male population, versus 0.6% among females). Analysis shows that opium production contributes 10% of the annual cash income of an average opium-growing household. Of the opium that is not consumed, about 40% is sold; the rest is bartered or used to pay for labour.

⁵ Exclusive of eradication after the survey.

Addiction

The 2005 survey found 63 out of 189 villages surveyed where there is at least one daily opium addict. In these villages, the average prevalence rate of addiction was 1% of the population aged 15 and above. Official reports from the Government of Laos indicate that there are 18,500 opium addicts this year in the 8 provinces covered by the opium survey, a decrease of 32% since 2003. Data show that 52% of the addicts grow opium either for their own use, including as medicine, compared to 48% to obtain cash or to buy food.

The impact of opium poppy elimination

The main strategies adopted by farmers to make a living immediately after ending opium cultivation were: growing more rice or other field crops, selling their livestock, collecting and both using and selling non-timber forest products (NTFPs), and taking various jobs as labourers. Other alternatives, such as migrating out the area, were less common.

While government services in the former poppy growing areas have expanded in road construction, health, education, and agricultural inputs, more help is needed to overcome problems in over-expansion of shifting cultivation, a lack of forage crops for big livestock, and shortfalls in expertise both among the government officials and villagers.

Evidence from this survey and other reports show that the cash income from poppy cultivation was not high and that many grew opium poppy for their own use. Although households have lost income when they stopped growing opium, positive effects have also been reported. Substantial reductions in addiction, resulted in improved health of villagers, as well as enhanced productivity. The in-depth study found that women, who used to do the major part of the time-consuming opium poppy cultivation work, now have more time for other activities.

The level of opium production in 2005 (14mt) is low and addiction is declining. It is likely that almost no Lao opium is exported. Price increases, the scarcity of the drug and persistent pressure of the Government for further reduction may well lead to new types of drug abuse in Laos.

1 Introduction

The objectives of the UNODC's Illicit Crop Monitoring Programme are to establish methodologies for data collection and analysis, to increase the government's capacity to monitor illicit crops and to assist the international community in monitoring the extent and evolution of illicit crops in the context of the elimination strategy adopted by the Member States at the General Assembly Special Session on Drugs in June 1998.

The Government of the Lao PDR (GoL) has decided to take action to eliminate opium poppy cultivation by 2005. The root of this rapid elimination began several years ago. In 1999 the GoL and UNODC developed the programme strategy "Balanced Approach to Opium Elimination in the Lao PDR". This was backed up in November 2000 by the Prime Minister's order fourteen, stipulating measures against cultivation and abuse. In 2001 the 7th National Party Congress called for opium production and use, which was linked with poverty reduction, to be eliminated by 2005. A National Campaign against Drugs was also launched in October 2001 to mobilize and convince the communities to give up opium production. The government has increased the momentum of this campaign during the last two years. This has led several districts and provinces to declare their territory opium poppy free in 2004 and 2005.

The first national-level Government-UN survey to produce comprehensive national estimates took place in 1992. It was based on an inventory of all known opium-producing villages and a survey of a sample of opium producing villages. Similar surveys were conducted in 1996, 1998 and then annually since 2000. This year for the first time, the 2005 Lao opium poppy survey consisted of the following three components: a helicopter survey, a village survey and an in-depth socio-economic study aimed at assessing coping strategies of farmers who stopped cultivating opium poppy. The information provided by the survey is used for planning and monitoring the impact of interventions under the programme "Balanced Approach to Opium Elimination in the Lao PDR".

2 Findings

The helicopter survey implemented by UNODC, in coordination with the Ministry of Defence of Lao PDR was conducted in seven provinces of northern Laos to verify whether opium was still cultivated in these provinces. The survey covered a distance of approximately 1,745 km over the provinces of Phongsaly, Luang Namtha, Oudomxay, Xayabouri, Luang Prabang, Xieng Khouang and Huaphanh during more than 23 hours of monitoring flight. The flight covered 30 segments of 3x3 km. In addition, the corridor between those segments was monitored, but these observations were not included in the statistical analysis. The total area covered during this monitoring flight was approximately 7,000 km², which corresponds to 7% of the total area (102,664 km²) of the 7 provinces surveyed.

Since opium poppy cultivation was found and recorded, an estimate of the total cultivation area was made. Given the few available data and the little existing scientific research of the effectiveness of helicopter surveys for area estimation, this estimate has to be taken with caution, since there are different sources of bias leading to random errors, which could not be adjusted by a standard correction factor.

The second element of the 2005 Lao opium survey was the village survey. A group of village headmen and farmers were interviewed for the purpose of collecting socio-

economic data and ancillary information on opium cultivation, trade and addiction.

A third component, the in-depth socio-economic study was conducted in 24 sample villages and 181 households to assess the socio economic impact of the planned eradication of opium poppy cultivation in the Lao PDR in 2005. Both the village survey as well as the household survey provided information on coping strategies. Map 1 shows the location of the sample villages covered by the village survey and the in-depth socio-economic study.

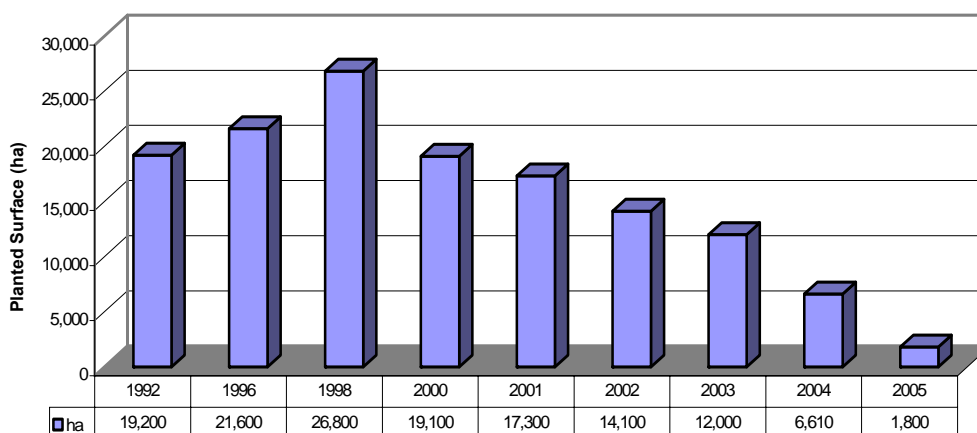
The pressure to overcome the cultivation of illicit crops in Laos has been strong during the 2004-2005 season, raising the risk of receiving unreliable answers from the villagers. Therefore, this year, the data for the estimation of the planted area were exclusively based on the results of the aerial survey and did not rely on information provided by the local population who might have feared forced eradication if they provided specific information on opium poppy cultivation. Consequently, surveyors could not measure any fields in villages reporting opium poppy cultivation

2.1 Opium Poppy Planted Area

The helicopter survey found several opium poppy fields in the randomly selected segments, as well as in the buffer corridor between segments. Many fields were found hidden in small valleys, possibly to avoid eradication by the local government authorities. Most of the opium poppy fields observed during the helicopter flight were found in Phongsaly and Oudomxay; the rest was observed in Luang Prabang, Luang Namtha, Oudomxay, Huaphanh and Xieng Khouang. There was no direct evidence of poppy cultivation from the helicopter survey and village survey in Bokeo and Xayabury province.

Statistical analysis of the findings of the helicopter survey revealed that there is a 90% probability that the area under opium poppy cultivation is between 900 ha and 2,900 ha, with a mean estimate of 1,800 ha. It should be noted that the upper and lower estimates do not lie symmetrically around the mean estimate obtained from these seven provinces because of the different statistical tools used to arrive at the most accurate estimates. The 1,800 ha would correspond to a reduction of 73%, from the 6,600 ha in 2004 and would indicate further acceleration of the downward trend from 1998, when the opium poppy production stood at 26,800 ha.

Figure 1: Estimated Area under Opium Poppy Cultivation, 1992-2005



Based on the number of villages reporting opium poppy cultivation during the village survey, the estimated number of opium poppy growing villages was calculated at 270. This is a significant decrease compared to 2003 and 2004 figures when the number of opium producing villages was respectively 1,537 and 846. These figures should be taken with care due to the reluctance of villagers to report opium cultivation this year.

The number of households engaged in growing poppy was calculated from the estimated area under opium poppy cultivation, which itself was based on the findings of the helicopter survey. Assuming an average opium poppy field size per household of 0.29 ha⁶, the total number of opium cultivating households would be 6,200 (ranging between 3000 and 10,000).

Table 1: Estimated Opium Producing Villages and Households 2002-2005

Year	Villages	Households
2002	1,610 ⁷	38,000
2003	1,537	40,000
2004	846 ⁸	22,800
2005	270 ⁷	6,200

Due to resource constraints, which directly affected the sample size, it was not possible to provide estimates by province. Map 2 shows the sample segments used for estimating the area under cultivation, as well as the helicopter flight path.

Photo: Opium Poppy Fields Observed during Helicopter Survey



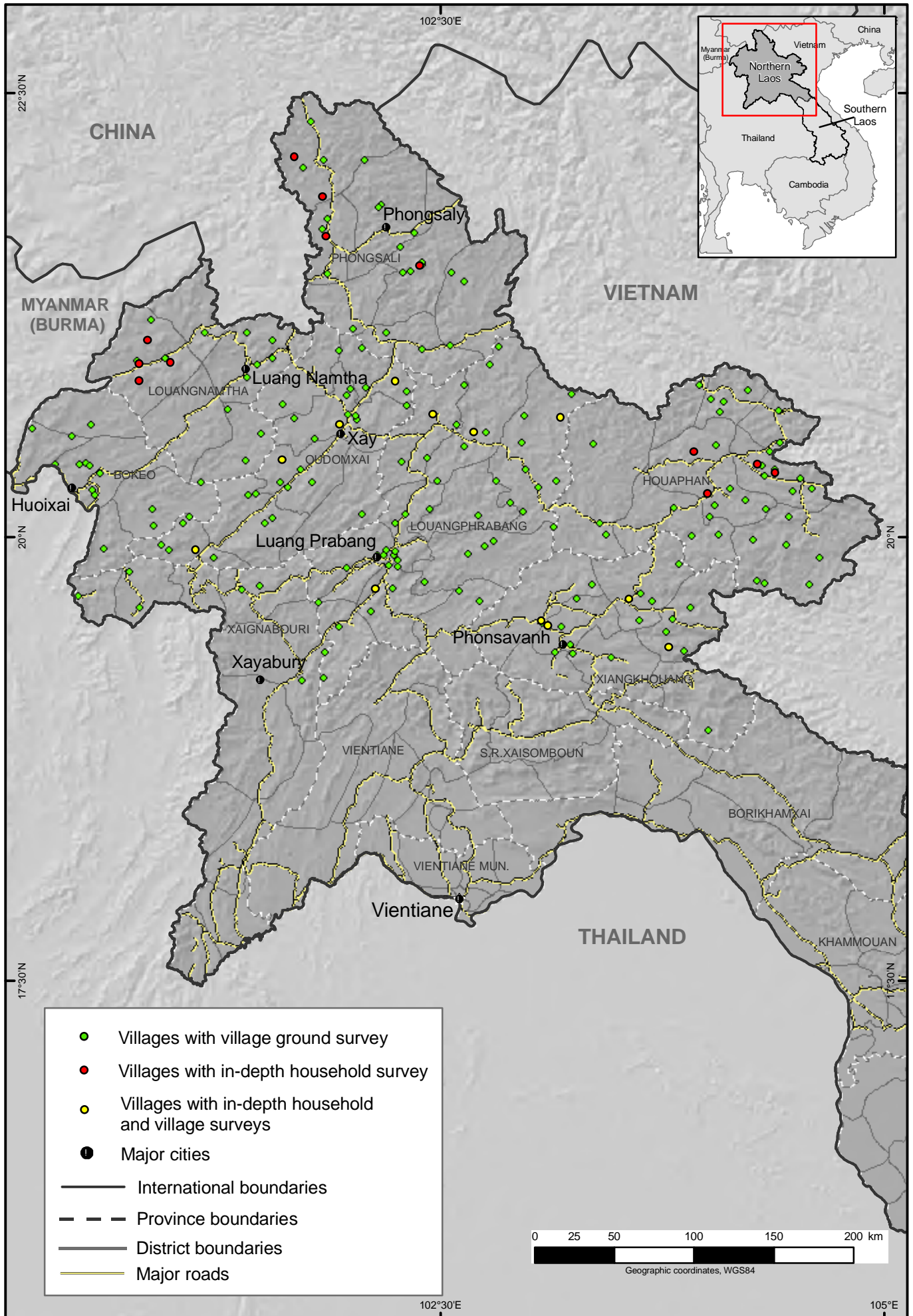
⁶ As was reported in 2003 Opium Poppy Survey

⁷ Estimate from 2004 Village and Household survey.

⁸ Official data reported from Lao district authorities.

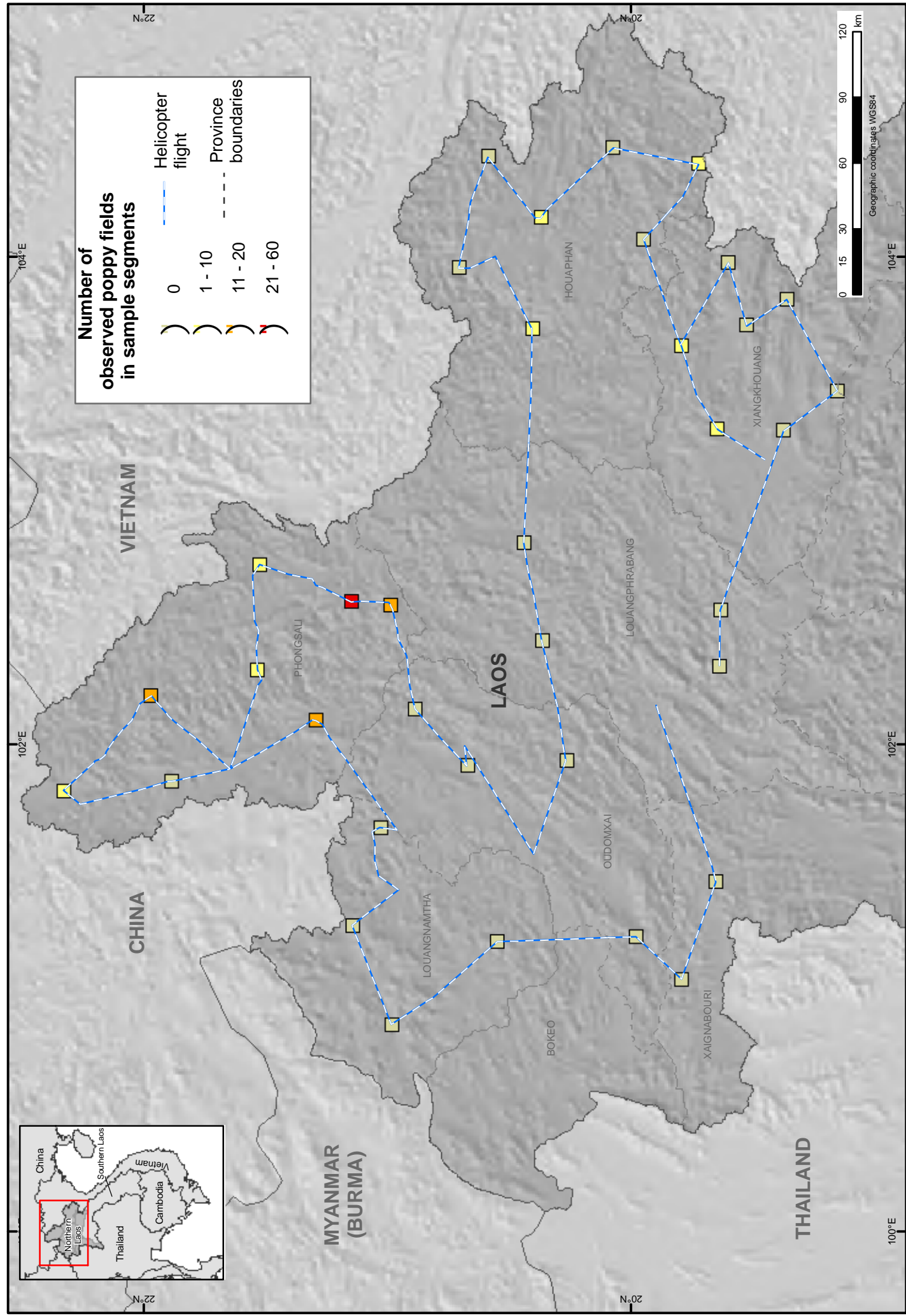
⁷ There are an estimated 5,117 villages in the 8 provinces surveyed in 2005.

Surveyed villages, Laos 2005



Source: Government of Laos - 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

Helicopter survey flight and visited segments with the number of poppy fields found, Northern Laos 2005



Source: Government of Laos and UNODC. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

2.2 Yield and Production

Opium poppy cultivation is becoming rare. In 2005, it was not possible to measure any poppy fields during the village survey due to the villagers' fear of eradication. Therefore no estimations of yield could be derived from the village survey.

Table 2: Opium Yield 1992-2005

	1992	1996	1998	2000	2001	2002	2003	2004	2005
Potential Opium Yield in kg/ha	6.6	6.4	4.6	8.7	7.2	8	10	6.5	8

The 2005 yield estimate was based on surveyor reports from the field, assessments of crop vigour of standing opium poppy fields and a review of weather and yield data over the last 5 years. In 2004-2005 the weather during opium poppy season was favourable compared to the 2003-2004 season. Meteorological data show that rainfall has been sufficient and regular during the planting and growing stages, ensuring not only good germination, but also good growth of the plant at an early stage. Analysis of several hundred digital pictures taken during the helicopter survey showed that the crop vigour of most of the opium poppy fields was good. Based on a comparison with previous yield data and reports from field surveyors, this year's opium yield was estimated at 8 kg/ha.

Figure 2: Potential Opium Production Since 1992 (in metric tons)

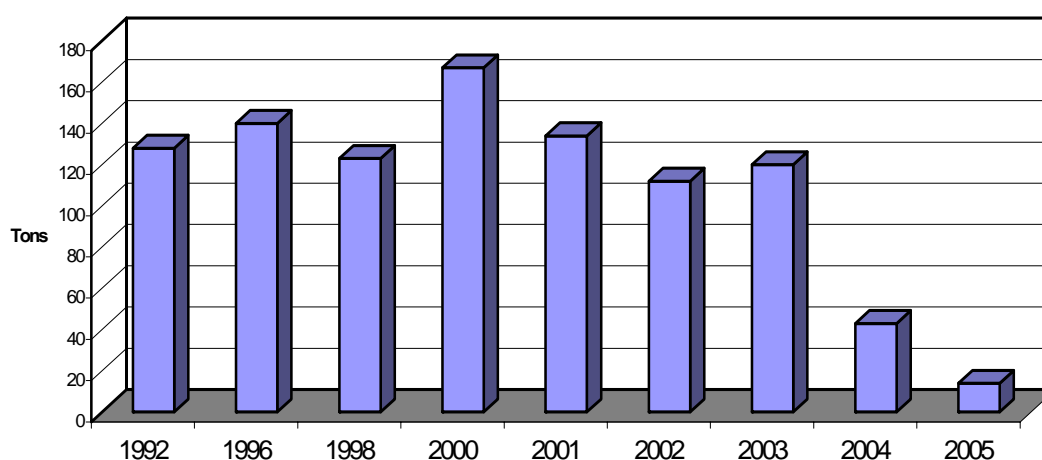


Table 3: Opium Production 1992-2005 (in metric tons)

	1992	1996	1998	2000	2001	2002	2003	2004	2005
Potential Opium Production	128	140	123	167	134	112	120	43	14

The potential opium production for the year 2005 amounts to 14 mt, 67% less than in 2004 and is based on an estimated area under cultivation of 1,800 ha.

Crop Calendar

Observations done during the helicopter survey showed no major changes in crop calendar with previous years. Harvesting of opium started at the end of January and was completed by mid-March at the latest.

Table 4: Crop Calendar

	Field Preparation		Sowing		Harvest	
	Start	End	Start	End	Start	End
Average	II/Sep/04	III/Oct/04	I/Oct/03	Nov/04	Feb/05	II/Mar/05

I = first 10 days of the month, II = second 10 days, III = third 10 days

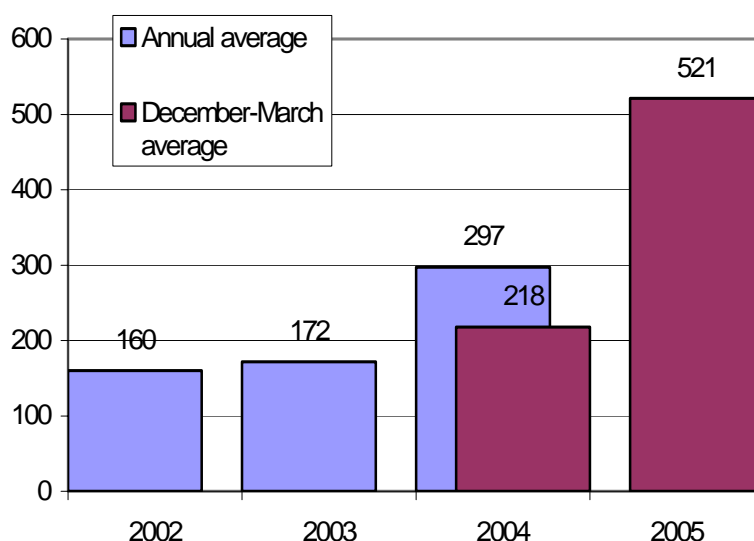
Photo: Vigour of Standing Opium Poppy Fields



2.3 Opium prices

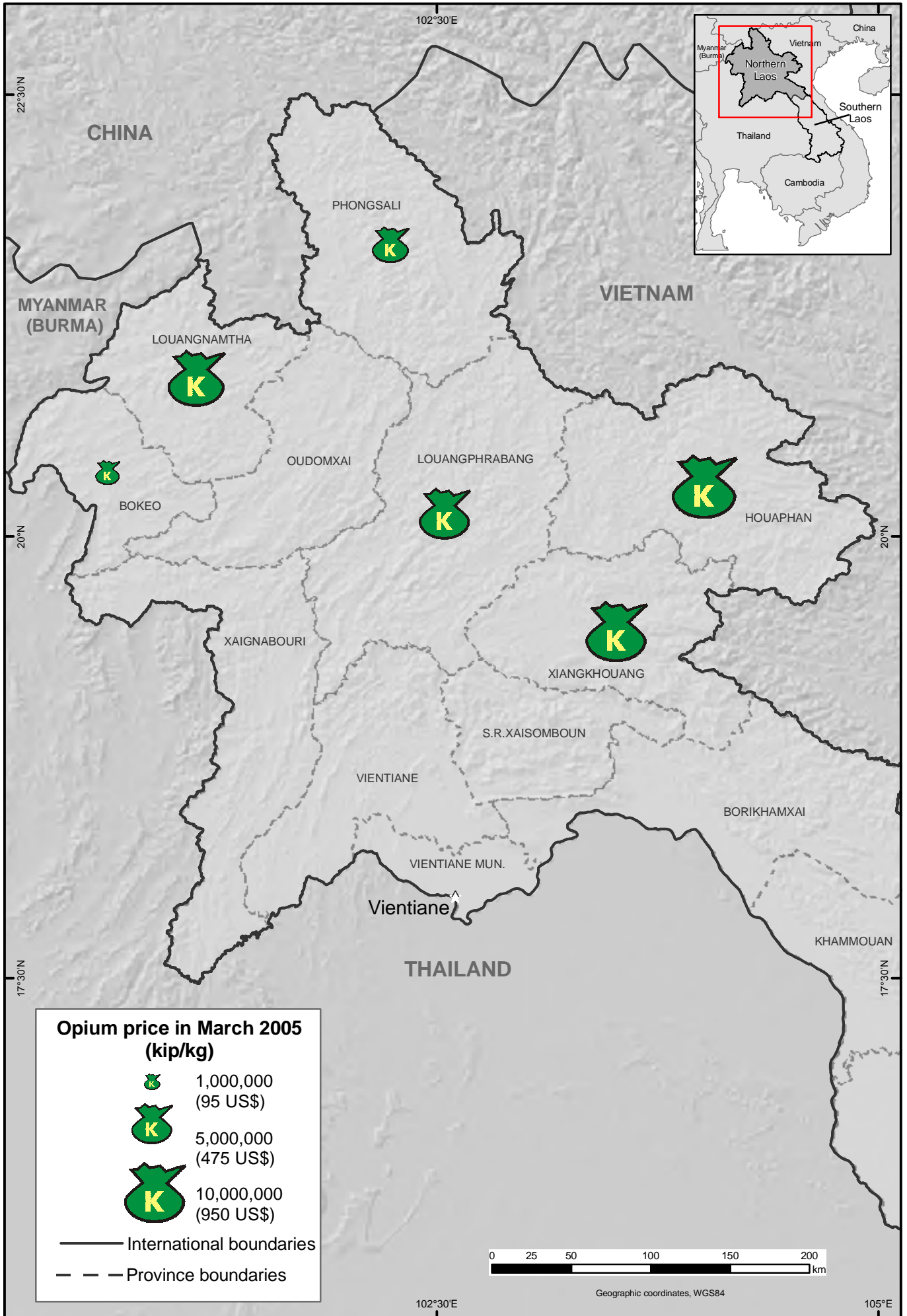
Price data were collected during interviews with village headmen, as well as during the qualitative and quantitative assessments of the impact of ending opium poppy cultivation (189 households). Although opium is sold throughout the year, the collection of information on opium farm gate prices was done during and after the harvest cycle. At the time of survey, in March 2005, farmers were expecting to be able to sell their product in March 2005 for 5,461,000 kip per kilogramme (US\$521). This represents an increase of 139% compared with the farm gate price of US\$218 reported by farmers in 2004. This price increase at harvest time confirms that opium has become scarce in Laos. Internal demand for opium has not decreased as fast as production.

Figure 3: Opium Farm Gate Price 2002-2005 (US\$/kg)



Prices for the 2005 opium poppy season show large variations between provinces. The lowest average price was observed in Bokeo while prices were five times higher in Huaphanh and Xieng Khouang. Phongsaly, Luang Prabang, Luang Namtha had relatively low prices. Price fluctuations between provinces are likely to be influenced by internal demand and production, as well as external demand and production. High prices in Xieng Khouang and Huaphanh may be caused by the demand for opium from across the Vietnamese border, since there is hardly any opium poppy cultivation in Vietnam. While Bokeo province has less addicts, its proximity to Myanmar and thus greater availability of opium, may be the reason for lower prices. In Luang Namtha, where opium poppy was eradicated last year, the demand for opium by the many addicts remaining in the province has pushed the price up.

Opium prices in Laos by province, March 2005



Source: LCDC - UNODC
 The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Farm gate prices vary not only by location, but also over time. Typically, prices are lower just after the harvest, but gradually increase as the opium gets drier and the stock available declines. The 2005 village survey collected data on 2004 opium prices, which showed that average prices varied from \$74 to \$395 during the year. Farmers do not sell all their opium immediately after harvest, nor is all of it sold to traders.

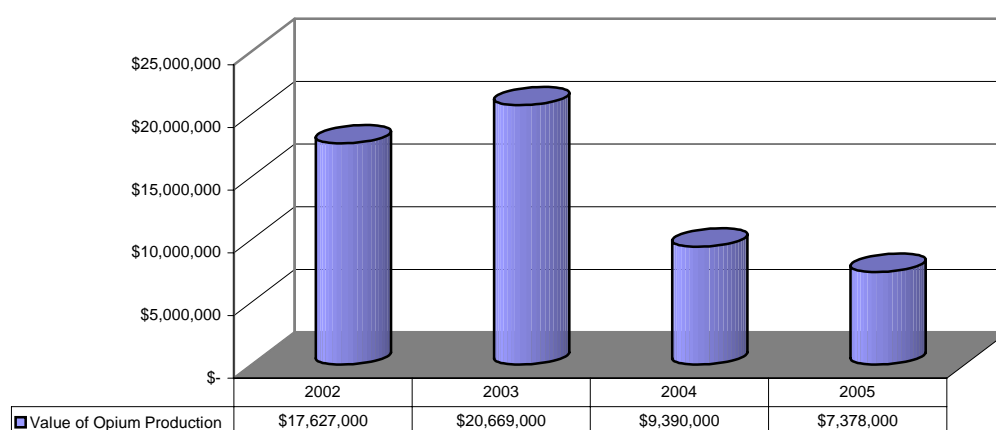
Most farmers who grow opium use are addicts or use the substance as medicine. They also sell some to people in the same village or to nearby villages for local consumption while some is bartered or used to pay for labour. Of those who are addicts, 52% grow opium poppy for their own use or for medicine while 48%, apparently those who either restricted their own usage or those who had a sufficient supply, sold some to obtain cash or buy food. Approximately 8% was bartered or used to pay for labour. The remaining 40% was sold to obtain cash or buy food. Reduced supply and rising costs of opium affect consumption since opium addiction is becoming very expensive.

Table 5: Value of Opium Production (2002-2005)

Year	2002	2003	2004	2005
Price per kg of opium (kip)	1,600,000	1,824,000	2,280,000	5,461,000
kip/\$ exchange rate	10,166	10,590	10,441	10,370
Price per kg of opium (\$)	\$160	\$172	\$218	\$521
Value of Production (\$)	\$18 million	\$21 million	\$9,4 million	\$7.4 million
Variation on previous year	-	+17%	-55%	-21%

It should be noted that the value of opium production is calculated based on the assumption that the entire potential opium production is sold. As explained above, this scenario is not likely in Laos.

Figure 4: Value of Opium Production (2002-2005)



The village survey and household study give a picture of the overall rural economy and its links to opium production and trade. The estimates and results of the village survey are largely confirmed by the more detailed information of the in-depth socio-economic study.

2.4 Addiction

The 2005 opium survey showed a lower opium addiction than previously. The data collected (See Table 6) shows daily opium addiction in 33% of the villages surveyed (63 out of a total of 189 villages). In these villages, the average prevalence rate of addiction amounted to only 1% of the population aged 15 and above. Addicts in the non-growing villages reported that they sometimes used opium from previous harvests for personal use. As supplies dwindled and the cost of opium increased, some addicts reduced their intake, according to Lao-UNODC national projects.

Table 6: Distribution of Addiction in Village Survey (n=189)

	n	%
Number of sample villages with opium addicts	63	33%
Number of people and % of adult population taking opium in surveyed villages	475	1%
Female opium addicts (>15 years old)	124	0.6%
Male opium addicts (>15 years old)	351	1.5%

Opium smoking addiction is mainly a male phenomenon (1.5% among the total male population in the sample, versus 0.6% among females).

Table 7: Percent of Addicts in Socio-Economic Study Population (n=181)

Province	% households with addicts	% population with addicts
Phongsaly	8.0%	1.3%
Luang Namtha	13.3%	2.3%
Houaphanh	5.8%	0.8%
Oudomxay	15.0%	2.3%
Luang Prabang	0.0%	0.0%
Xieng Kouang	2.5%	0.4%
Total	7.6%	1.2%

These results should be interpreted with caution, as there might be a reluctance of respondents to report opium addiction in the context of the Government's efforts to curb it. For the geographical distribution of addiction, the official Lao Government statistics data is more complete and shows a higher opium prevalence rate in the Phongsaly Province at 2.7% (see Table 8). The same GoL survey shows the relative variation in addiction, with respect to 2003, 2004 and 2005. GoL figures on addiction are comparable to survey results. All provinces are showing a decline in addiction compared to 2003 and 2004.

According to the latest Government data in table 8, there were 18,500 addicts in the eight provinces covered by the survey, or 1.0% of the total population. If only the six provinces covered by the socio-economic survey are considered, the number of addicts is 16,586, or 1.2% of the population. This is consistent with the figures collected in the socio-economic survey (table 7), except for Luang Prabang Province. The low addiction rate found here

resulted from the fact that many addicts are reportedly moving out of the hills to other areas where they believe opium may be easier to find. Also, the low sample size in the socio-economic study, done randomly in Luang Prabang may have accidentally selected villages with a less than representative number of users. According to statements made by the heads of the PCDC from a number of provinces, at the 4th annual PCDC workshop (17-20 May, 2005) there is a high degree of mobility among the remaining households with addicts, which makes it difficult to monitor consumption and treatment.

Table 8: Addiction, by Province

Province	Total population	Addicts 2003	Addicts 2004	Addicts 2005	Prevalence %	Variation 2003/2005
Huaphanh	270,100	5,368	4,881	3,948	1.5	-26%
Luang Namtha	138,000	2,896	2,042	1,400	1.0	-52%
Luang Prabang	384,300	5,513	5,368	3,000	0.8	-46%
Oudomxay	250,800	3,012	3,088	2,085	0.8	-31%
Phongsaly	150,000	5,362	5,872	3,997	2.7	-25%
Xieng Khouang	222,000	3,158	2,898	2,157	1.0	-32%
Total for 6 provinces	1,415,200	25,309	24,149	16,587	1.2%	-34%
Bokeo	145,000	793	1,119	700	0.5	-12%
Xayabouli	365,400	1,301	1,301	1,213	0.3	-7%
Total for 8 provinces	1,925,600	27,403	26,569	18,500	1.0	-32%
Borikhamxay	212,800	686	657	423	0.2	-38%
Vientiane Province	365,000	1,356	1,342	1,113	0.3	-18%
Xaisomboun SR	34,800	516	378	124	0.4	-76%
Total for 11 provinces	2,538,200	29,961	28,946	20,160	0.8	-33%

Source: LCDC, May 2005

From 1998 to 2004, the Opium Surveys all reported that over half the sample households had addicts, something confirmed by other studies. However, due to recent treatment programs, addiction has declined. The number of households in the present socio-economic study that reported that they have or recently had at least one addict was 73%. Households with at least one addict now total about 8%. These figures are consistent with the findings from other surveys. In 1999, the evaluators of the GTZ project in the area of Moung Sing, in Luang Namtha Province, surveyed the ten project villages, predominately Akha, with the highest number of users. They found that 15-22 per cent of the total population was using

opium.⁹ With the rapid decline in opium supply and the increasing cost of opium, there is much demand for treatment with one result being reduced relapse rates.

Although there was ample evidence in the past that many opium smokers could continue to function in society, this is not always so, and depends on usage levels as well as various cultural factors. According to reports from development projects and researchers, these generally male users spent large amounts of time idle. Villagers from the Hmong village of Na Phian in Huaphanh told the socio-economic study team that users there had formerly consumed an average of 2 kilogrammes annually but sometimes up to 3. Although the amount of opium one can use and at the same time continue to function in society varies considerably according to local cultural conditions, most users in any society who consumed an average of 5.5 grams daily (or 8 grams if the addict used 3 kilogrammes in a year) could hardly be very active.

Evidence supporting the assessment that men in poppy-growing villages were unable to contribute significantly to the household livelihoods comes from women focus group discussions in the socio-economic survey. The women in these groups (all provinces, all ethnic groups studied) overwhelmingly said that when their menfolk were smoking (sometimes 2-3 times per day), most family farming work was left to the women, which they had to do in addition to their customary chores. However, when the men stopped smoking opium, they became more active resulting in greater household productivity.

This supports the finding from the village survey, that there is a positive correlation between growing opium poppy and poverty. A major reason reported by a range of people in cultivating communities was that more than half the growers did so to use opium themselves. Even a major poppy cultivating Hmong village in the Palavek area of Xaisomboun S.R., reported in about 1990 that 38% of the addicts grow the crop for their own consumption.¹⁰ An extreme but not a unique case was Huai Khong in Huaphanh where the people said that they consumed all they cultivated more for addiction than to use opium as medicine. Data from the village survey show that 52% grow opium either for their own use compared to 48% to obtain cash or to buy food.

If each addict consumes 1 kg per year, 22 tons of opium would be required. Since the production in Laos in 2005 was 14 mt, Laos is no longer a significant opium exporter and opium is almost purely a domestic concern. No heroin consumption was reported during the survey. There was no seizure of opium imported into Laos in 2004-2005.

Price increases, the scarcity of the drug and persistent GoL pressure for further reduction may well lead to new types of drug use in Laos.

Detoxification Camp in Luang Namtha



⁹ Ministry of Public Health/GTZ/DED Integrated Food Security Programme. 1999. *Analysis of Activities—Assessment of Impact (1997-1999)*, p. 109. The report says usage was higher in Moung Long.

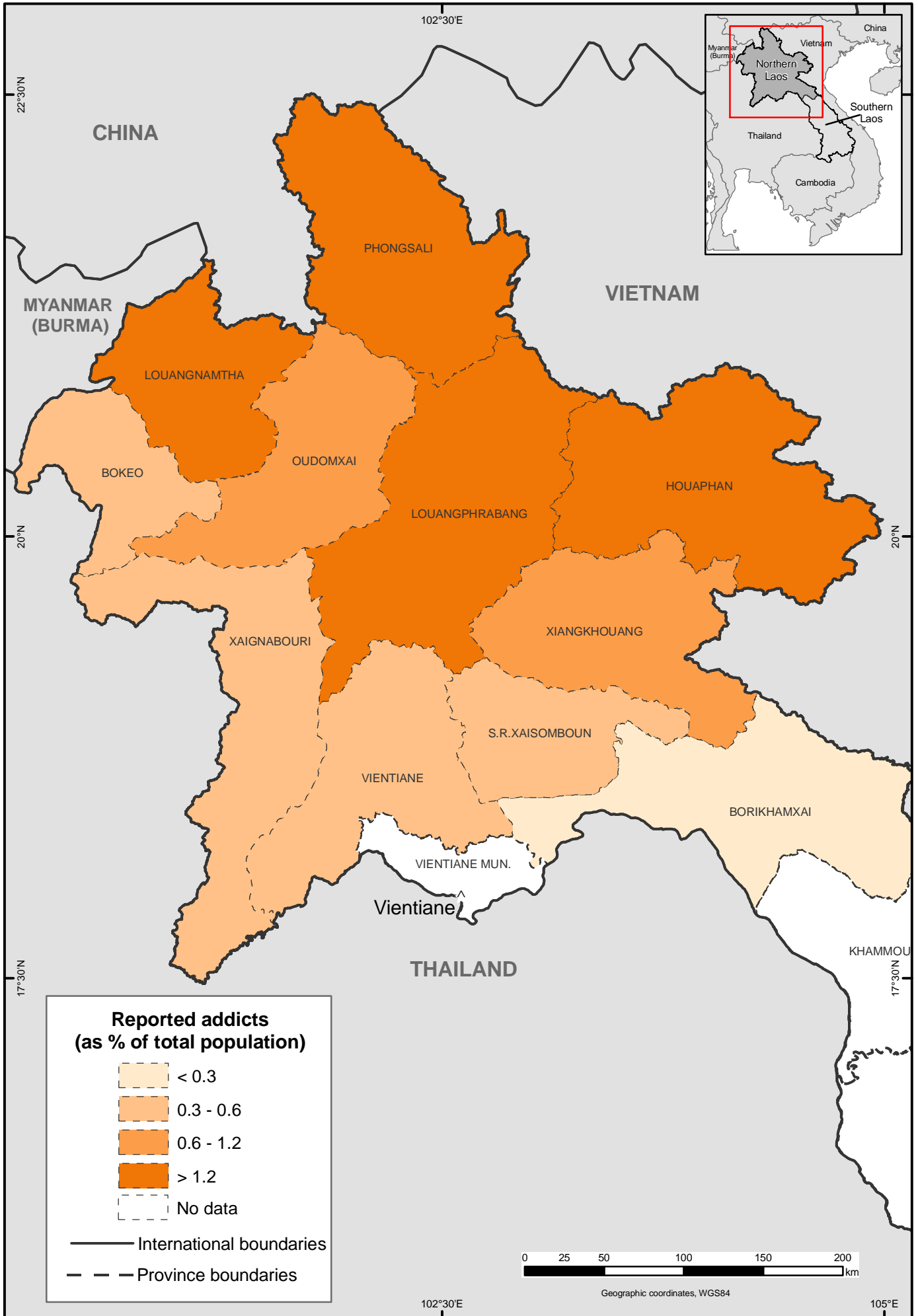
¹⁰ P.R. Jones. *Consultant Report on Upland Agricultural Extension*. For the UNODC Highland Integrated Rural Development Pilot Project Lao/89/550.

Table 9: Addiction, by Substance in Village Survey (n=189)

	N	%
Sample village with ATS addicts	16/189	8.4
Addicts taking ATS and % of adults population surveyed	131/45023	0.2
Sample village with heroin addicts	0/189	0
Sample households with heroin addicts	0/45023	0

Abuse of ATS was reported in 8.4% of the villages surveyed. This might be due to increased availability but also a result of addicts wanting another substance to compensate for the lack of opium. ATS abuse was reported in the northwestern Lao provinces of Bokeo, Luang Prabang, Oudomxay and Xayabouly provinces with Bokeo having the highest amount.

Distribution of addicts as reported by Lao PDR, 2005



Source: LCDC - UNODC
 The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

2.5 Qualitative and Quantitative Assessments on the Impact of Ending Opium Poppy Cultivation.

2.5.1 Rationale for the Socio-Economic Study

The GoL & UNODC Opium Surveys show that poppy cultivation in the Lao PDR is declining rapidly, from a peak of 26,837 hectares in 1998 to 6,610 hectares in 2004, and to less than a third of that in 2005. The number of villages involved in poppy production fell from 2,056 in 1998 to 846 in 2004 and this will decline further in 2005.¹¹ Government statistics show also that addiction is declining.

With the significant reductions of opium cultivation the percentage of cash derived from opium has also declined as households diversify their production or consume more than they produce, thus resorting to buying from others with a surplus.

While this reduction in opium cultivation is welcome from a narrow drug control point of view, UNODC recognized that the impact of this reduction of income to the farmer, particularly in areas with no development support from outside, could well challenge the sustainability of poppy eradication as well as the prevention of other illegal or dangerous activities that might emerge in its place. This year's ground survey found that 65% of villages surveyed had received some external support, but not necessarily to stop opium cultivation. More development assistance is needed, especially to reach former growing communities that have not yet received sufficient aid.

A study was therefore launched on the socio-economic conditions in the opium growing areas of upper Laos to assess the impact of opium elimination on local livelihoods. Objectives include studying the coping strategies and livelihood options (such as expanded paddy and shifting cultivation, also known as swiddening) available to and adopted by farmers, identifying household incomes and expenditures and examining whether alternative development initiatives are alleviating the vulnerability of farmers, particularly women. The study also gives some indication of what support the local, district and provincial service providers, as well as other agencies, need to help farmers. The scope included impacts of eradication on migration, education and health, on the attitudes of local authorities and farmers, and on the role of women. No suggestions are made on possible courses of action, but the data indicate several avenues for intervention.

The report combines findings from this in-depth socio-economic study at the household level with the general socio-economic information collected from the village survey. The findings from the household study from 24 villages are validated by reference to the broader survey which was also conducted in all the 8 northern Lao provinces where opium is produced. Together they provide both a comprehensive and a close-up understanding of the situation of ex-opium growers. References are also made to other reports on opium use in Laos in order to present a comprehensive picture of opium elimination and its impact on different aspects of highland life.

The study findings provide an input to planners to determine the needs of the farmers. It will also support efforts to establish ways to help the farmers live with respect and dignity without becoming vulnerable to such threats as human trafficking or other types of drug abuse. Finally, although this study could only be conducted on a limited scale, it did identify areas that need further investigation.

¹¹ LCDC *Annual Opium Poppy Survey 1999/2000*, p. 10; UNODC/LCDC *Laos Opium Survey 2004*, pp. 2.

2.5.2 Reduction of Poppy Cultivation

The poppy is a cash crop bringing the growers high prices for its sale. It also is a potent and addictive medicine. These factors constrain farmers from stopping cultivation and use on their own. In almost all cases where illicit crops have been eliminated, such as by the Chinese in the early-1950s, in Thailand in the 1980s, and with the Taliban in Afghanistan, strong political will was required. So it is in Laos at present.

Figure 5: Reasons for Not Cultivating Opium¹²

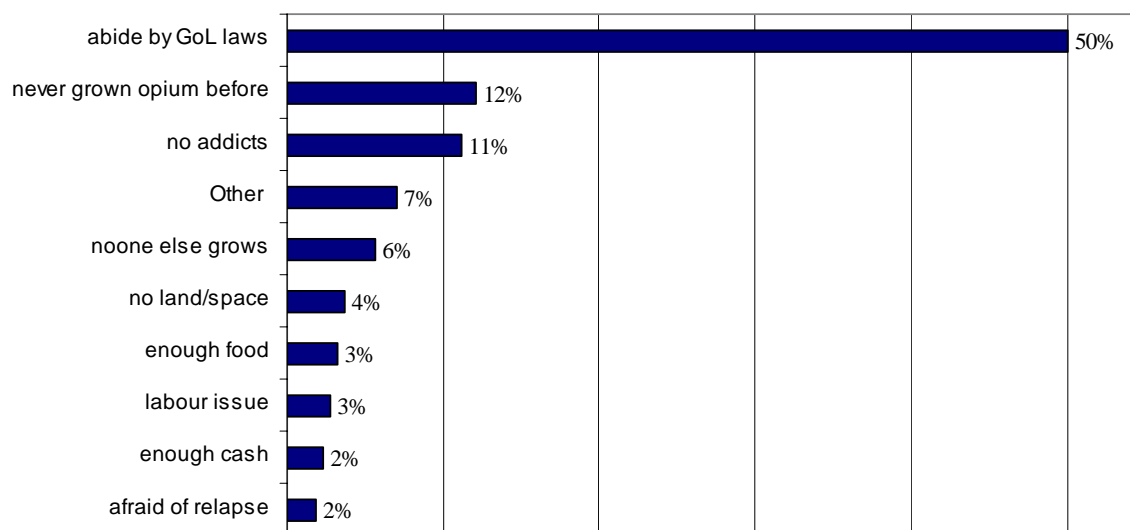


Figure 5, based on responses from the socio-economic data, shows a clear connection between law enforcement and not cultivating opium. For those who once grew opium poppy, the reasons for not cultivating at present were also related to practical matters such as insufficient land. Others said that since they enjoyed food security, they did not need to grow opium for cash sales.

Most of those villages who reported receiving assistance stopped growing more than 2 years ago or had never grown poppy. At the same time, some villages receiving assistance are still growing opium.

For most villages, opium cultivation ended recently. Of the 24 villages surveyed in the socio-economic study, 42% of the villages stopped cultivating opium within the last 2 years. As can be seen from Table 10 this is supported by the village survey. Out of 80 villages that had cultivated opium poppy, 36 stopped in the last two years. Elsewhere, government statistics showed similar rapid declines in the last few years.

¹² Due to the relative frequency of the responses, the answers 'afraid of relapse', 'no space or land', 'no one else grows' were extracted from the 'Others' category and illustrated as independent answers.

Table 10: Opium Growing Status of Villages in Northern Laos

	Still cultivating	Stopped <1 year	Stopped 1-2 years ago	Stopped 3-5 years ago	Stopped >5 years ago	Never grew
Proportion of villages in socio-economic study	0%	4%	38%	17%	21%	21%
Proportion of villages in village survey ¹³	5.8%	4.2%	24.9%	28.6%		23.8%
Projected no. of villages in northern Laos ¹⁴	270	200	1160	1460		1330

Alternative development projects facilitate the application of this political will by providing means for the villagers to end their connections with opium. This includes treatment for addiction, building roads and market places to allow for new sources of income, and providing agricultural development assistance so that the people can produce enough food for their needs. Health and educational assistance enables villagers to improve their standard of life at the same time. All this makes it possible for people to gain the self-reliance they had lost by becoming involved with opium.

2.5.3 Demographic Situation

Table 11 provides information on the 24 villages in 17 districts of the six northern provinces of Laos where the most opium poppy has been grown in the last five years. The northern highlands where the opium poppy is grown is one of the poorest parts of Laos. One factor contributing to this poverty is decades of fighting that displaced hundreds of thousands of people, left tons of unexploded ordnance, and disrupted livelihoods. Opium production was one way to survive but it did not contribute to long-term development. Government statistics showed that in the 1990s, the north was the country's poorest region with half the people living in poverty.¹⁵ According to the National Growth and Poverty Eradication Strategy of 47 districts identified as the poorest of the country, 32 are or recently were opium producing.

Many peoples of many linguistic groups live in the Lao opium poppy zone. These include Mon-Khmer (Austroasiatic) groups, such as Khmu, who came here some two millennia ago, and are the largest non-Lao ethnic group in the north and the largest in the sample (35%). Lao and Tai groups took over the valley lands about 1,000 years ago. About 500 years ago, groups speaking Tibeto-Burman languages such as Akha, Lahu, and Phunoi, entered from the west, many ending up in the north and northwest. Also there are Hmong and Mien (Yao) who started moving here about 1810 from China via Vietnam, perhaps the earliest such settlement being Phavaen in Nonghet, Xieng Khouang.

Persons from all these groups grew opium poppy, including Lao or Tai, who are not normally associated with poppy cultivation because they live in valleys at altitudes generally below what is optimal for poppy cultivation. However, some such groups in upland valleys in places like Xamneua District of Huaphanh Province did grow opium poppy, sometimes in large quantities.

¹³ The total sum of this proportion does not equal 100 because 12.7% of villages in the village survey did not respond to this question. Therefore also the projected total does not include these villages.

¹⁴ The total sum of villages in northern Laos is to be estimated at 5,246 (see methodology section). The sum of villages in the table accounts up to 4,420. The remaining 826 are the projected villages, which did not respond to this question.

¹⁵ "Interim Poverty Reduction Strategy Paper." 2001. A government paper prepared for the World Bank and the International Monetary Fund.

Table 11: Demographics of socio-economic survey villages

Province	District	Village	Ethnic group	No. HH	No. families	Total Pop.	Men	Women	People of working age
Phongsaly	Gnot Ou	Panhok Ao	Akha	51	64	340	195	145	90
Phongsaly	Gnot Ou	Ngong	Lu	54	69	292	141	151	106
Phongsaly	Boun Neua	Seng Dao Tai	Yao	29	38	174	90	84	75
Phongsaly	Samphan	Nam Thouang	Khmu	28	n/a	198	99	99	n/a
Luang Namtha	Long	Hua Nam Long	Lahu	29	n/a	155	78	77	n/a
Luang Namtha	Long	Aisaeng	Lahu	20	25	137	75	62	35
Luang Namtha	Long	Sompanmai	Akha	34	36	160	70	90	58
Luang namtha	Long	Huanambakmai	Akha	34	45	189	93	96	n/a
Houaphan	Xamneua	Na Phien	Hmong	26	n/a	196	96	100	n/a
Houaphan	Xamneua	Huai Khong	Khmu	53	n/a	426	210	216	n/a
Houaphan	Xamneua	Houysone, 01	Hmong	44	89	325	160	165	n/a
Houaphan	Xamneua	Lak 20	Khmu	42	51	419	205	214	n/a
Oudomxay	La	Kop May Nyai	Akha	83	113	542	272	270	322
Oudomxay	Beng	Xienglae	Khmu	55	72	271	133	138	116
Oudomxay	Pakbeng	Longseuy	Khmu	36	37	255	143	112	86
Oudomxay	Xai	Huay Dou	Khmu	43	45	253	130	123	71
Luang Prabang	Ngoi	Huaykhong Tai	Lao, Khmu	47	53	288	211	77	80
Luang Prabang	Viengkham	Ombring	Hmong, Khmu	82	82	497	232	265	273
Luang Prabang	Xieng Ngeun	Pounsavan	Lao, Khmu	76	79	440	220	220	145
Luang Prabang	Nambak	Nam Mai (Luk)	Khmu, Lu	185	195	899	456	443	325
Xieng Kouang	Kham	Thon	Lao Phuan, Khmu	122	138	786	413	373	318
Xieng Kouang	Nonghet	Xamnyong	Hmong	31	31	219	113	106	59
Xieng Kouang	Poukout	Piengluang	Lao Phuan, Hmong	49	56	263	130	133	96
Xieng Kouang	Pek	Hokgaeng	Hmong	21	21	148	67	81	40
TOTAL				1274	1339	7872	4032	3840	2295

The study covered villages of all major poppy cultivating ethnic groups and various sub-groups, giving the study a diverse mix. This is important because there is much variety among the groups that grow opium poppy, e.g. in their methods for treating users, and livelihoods.

Table 12: Ethnicity in Village Survey and Socio-Economic Study, combined

Language Family	Ethnic Group	Bokeo	Huaphanh	Luang Prabang	Luang Namtha	Phongsaly	Oudomxay	Xayabouli	Xieng Khouang	Total	%
Lao-Tai	Lao (incl. Phuan)	143	1066	1118		34	524	250	746	3881	31%
	Lu	138			298	141		244		821	7%
	Red Thai		18			50				68	1%
	Phouthai		75		1		48			124	1%
	Yuan	5			6			178		189	2%
	Black Thai	2			5	17				24	0%
	Other Thai				47					47	0%
Mon-Khmer	Khmu	353	563	1346	195	461	1032	139	214	4303	35%
	Phong		134							134	1%
	Samtao	112								112	1%
	Other	58		20		1				79	1%
Hmong-Mien	Hmong	103	219	306	42		102	132	375	1279	10%
	Yao	39	63		95	27				224	2%
Tibeto-Burman	Akha				256	345	56			657	5%
	Lahu	68			90					158	1%
	Phounoy	1			1	183	8			193	2%
Sinitic	Chinese	44				13	15			72	1%
Other	Other				39					39	0%
Total		1066	2138	2837	1028	1272	1785	943	1335	12404	

Poppy is cultivated in hills or upland valleys where the climate and humidity favour the crop's growth. This topography, besides contributing to ethnic diversity, makes it more difficult to provide infrastructure and development inputs, and also slows the flow of information.

According to the 2000 Lao national reproductive health report, the annual population growth rate in Laos is 2.8%. The rate in the hills is higher, although it is not clear whether or to what degree the end of opium cultivation was a causative factor. A UNFPA study of mortality differentials found that characteristics common in the hills, generally associated with poverty, such as bamboo housing, a lack of electricity, and being more than 1 hour from a hospital all contributed to a higher natural population increase.¹⁶ The under 5-mortality rate (per 1000 births) was 100 in 2002 compared to 218 twenty years earlier.¹⁷ Village survey data showing 1,760 births compared to only 467 deaths indicates rapid growth.

Population increases partly result from better health care provided by government authorities in the previously poorly accessible hills that has reduced mortality. New government and

¹⁶ UNFPA. 2004. *In-Depth Analysis on Mortality Differentials in Lao PDR*. Vientiane, p. 9.

¹⁷ UNDP, Human Development Report 2004.

project roads have facilitated health care reaching people once almost completely out of contact with cities and their services. According to the socio-economic study, 17 (71%) of the villages had a medical kit.¹⁸

According to the women's focus group discussions, the villagers are healthier. Out of 181 household interviews, 44% said that their health had improved while 44% said there had been no change. However, for households that had formerly grown opium, 61% reported that health in the household had improved. Many wives of ex-opium users said that once their husbands had been treated for drug use, their energy had increased energy, which also seems to have contributed to the increased fertility. Population increases also have resulted from improved education that has enabled the people to know better how to care for themselves. Nevertheless, the growing population challenges the ability of the government to meet the needs of the people living in a vulnerable physical environment.

2.5.4 Economic Situation

As a "Least Developed Country" (LDC), the Lao PDR is one of the poorest countries in the world. From ranking 140th in the Human Development Index, in 2001 the country rose to 135th by 2004. From 2000 to 2004 Laos improved its ranking on the UNDP Gender-related Development Index, from 119th to 109th. Nevertheless, the country faces many obstacles. Laos is landlocked with 83.4% of the population in subsistence agriculture. Lao PDR has a GDP per capita of US\$304.¹⁹

The country has established the goal of emerging from LDC status by 2020 by eradicating mass poverty. To meet this goal, the country has defined priority programmes, including increasing food and commercial production, infrastructure and rural development, as well as bettering socio-economic management, foreign economic relations, and stabilizing and reducing shifting cultivation.

Already in 1976, the government established a policy to reduce the amount of shifting cultivation, which it identified as causing low agricultural production and replace it with sedentary agriculture. Village elders in study villages told of village resettlement, sometimes to their present site, as early as 1975, long before opium poppy control measures started.

These resettlements were one of the bases for the 'Focal Site' approach, initiated in 1994, which has since served as a primary base for Lao rural development. The GoL encourages people in scattered areas to move to focal sites where such facilities as schools, marketplaces, and health centres can serve a wide population base. Many small settlements, sometimes numbering 3-5 households, have been relocated in centralized areas to facilitate the provision of government services outside of these focal sites.

As the Lao government formulated poverty eradication goals, many observers came to identify opium use—and indirectly, opium production—as a major cause of poverty. This led to the government announcing the balanced approach to opium control. The goal was to eliminate opium production, drug abuse, and drug trafficking by 2006 by an approach combining alternative development, community-based drug demand reduction, and law enforcement.

At about this time, government efforts to address problems it saw regarding shifting cultivation were renewed. The government wants to increase permanent cultivation so that it

¹⁸ As defined by the Government of Laos, such a kit includes 27 basic medicines. The kit has a value of about 900,000 kip and is managed as a revolving fund. Before a medicine bag is given to the village, at least one village health volunteer is trained on how to administer the medicines as well as other general health care skills.

¹⁹ *United Nations Development Programme Human Development Index 2004.*

will be available to everyone by 2020. Since the opium poppy is cultivated by shifting cultivation some observers made a connection between the two policies, seeing efforts to control shifting cultivation as drug control in disguise even though the opium policies started about two decades later, and are not intrinsically linked.

Opium Cash Cropping

Cash cropping of the opium poppy in Laos is recent. Old records and interviews with villagers show that the poverty associated with opium in Laos did not exist until the mid-1900s. Most opium used in Laos in the early colonial period came from Persia and Turkey. When, during World War II, these imports were cut off, new sources developed in northern Laos during which time production grew from approximately 7 to 60 tons per year in Indochina. This occurred as Lao growers, who once planted the poppy only as a garden crop for medical needs, took advantage of the new market. With this rapid growth, some opium was sold legally, but more was sold illegally such as when they sold the substance privately to dens instead of the government. As this criminalized the trade it never regained whatever transparency it had before this, nor could authorities suppress opium sales. Opium production grew through the 1970s until after the establishment of the Lao PDR in 1975.

As villagers, especially the earliest cash croppers, profited, they became accustomed to earning cash from poppy. Many then began to buy rice and various goods they had previously produced themselves. As a result, they lost their self-sufficiency and traditional skills faster than their neighbours who did not grow opium and who tended to remain more productive with a more diversified economy.

This led to a rapid increase of addiction. A Norwegian Church Aid (NCA) report noted that when opium production increased fivefold between 1974 and 1992, the sudden availability “resulted in a sharp increase in opium addiction.”²⁰ Although reports state that growers raised the poppy mainly for sale and did not become addicted, this was not always so. An American physician, Westermeyer, who worked with opiate users in Laos from the late-1960s until 1975, reported addiction rates in northern villages of 1-10%, varying according to locality and ethnicity.²¹ Figures from this survey show that in the 1990s, over half the households in opium growing villages had at least one addict. Some groups, such as the Hmong, hired members of other ethnic groups by paying one day’s dose of opium. No statistics are needed to show that those workers were poor.

More often than not, it was the men who became addicts, probably from using it to socialize after work—the village survey found 351 out of the 475 addicts were men. Although there is evidence that opium smokers can continue to function in society,²² their ability to do so decreases, especially, as often occurs, dosage grows. Many who take opium are not able to work in the fields as a result of which this is added to the workload of the family’s women. Addict households grew less productive, more prone to illness, and poorer. This led to their selling opium to buy the food they no longer produced. Survey findings indicate that the many villages, especially those of such ethnic groups as Akha and Khmu, that used all the opium they grew, were the poorest in the highlands.

The income derived from opium sales sometimes varied according to ethnicity. The Hmong, among the earliest commercial growers of opium poppy in Laos, are often popularly

²⁰ Claire Escoffier-Fauveau. 1994. *Opium Addiction in Luang Namtha and Bokeo Provinces*. Vientiane: NCA.

²¹ Joseph Westermeyer 1982. *Poppies, Pipes, and People: Opium and Its Use in Laos*. Berkeley: University of California p. 112.

²² Westermeyer. 1982. Pp. 73-75.

portrayed as having fewer addicts. Although studies to confirm this could not be carried out prior to the 1990s, such research that has since been carried out shows that Khmu, Akha, and others began to grow the poppy more for consumption than for sale. In Muong Sing, a 1995 survey found that 9.3% of the Akha compared to 2.8% of the Hmong were addicts.²³ By comparison, the 1997/98 LCDDC UNODC opium survey found that 14.8% of the Black Lahu used opium. Yet sometimes Hmong villages also had large numbers of addicts. A study in Nonghet found that although normal addiction among Hmong is 2-3%, "in a few villages [where] social control systems have failed...more than 50% of the people...are addicted."²⁴ As addiction grew and users grew more desperate for opium, their poverty increased and they became willing to work for less. In Moun Long, for example, the amount casual labourers received declined from 11 grams of opium per day in 1990 to 2.75 by 1994.²⁵ Such differentials should be considered as development inputs are planned.

2.5.5 Cash Income

The main findings show that average annual household cash income of non-opium growing villages was 2,421,000 kip (US\$231), with livestock and poultry contributing 35% to this value, followed, in order of importance, by salaries (~19%), remittances (~17%), other agricultural products (~15%) and rice (~12%). Although household income data cannot be compared to previous year estimates due to use of a different methodology, it seems that annual household cash income has decreased compared to 2004. Such decrease could be explained by the fact that this year's estimate includes villages and households, which have stopped opium cultivation recently and are poorer than those who have never grown or stopped some years ago.

Table 13: Average Household Cash Income

Main source of income	Non growing villages			Growing villages		
	In kip	in US\$	%	In kip	in US\$	%
Salaries	448,700	42	18	103,800	10	7
Rice	279,600	27	12	165,600	16	12
Remittances	404,100	39	17	54,500	5	4
NTFPs	44,800	4	2	56,700	5	4
Other agricultural products	366,500	35	15	107,800	10	7
Livestock and poultry	835,400	80	35	913,600	88	63
Handicraft and trading	38,700	4	2	32,100	3	2
Opium				23,900	2	1
Average total income per household	2,417,800	231	100	1,458,000	139	100

²³ Geusau, Leo G.M. Altling von 1988. "The Interiorizations of a Perennial Minority Group." *Sociology of Developing Societies in Southeast Asia*. Edited by J.G. Taylor & A. Turton. Basingstoke: Macmillan, pp. 215-219.

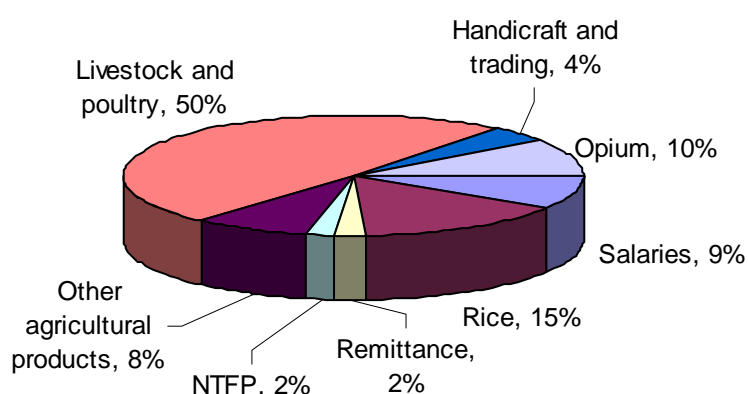
²⁴ IFAD. 1990. *Xieng Khouang Agricultural Development Project Appraisal Report*. Vol. 1, p. 19.

²⁵ Escoffier-Fauveau, C. 1994, p. 19.

In the few villages still producing opium annual household cash income was only 1,458,000 kip (US\$139), with livestock constituting 63%, followed in order of importance by rice and other agricultural product (19%), salaries and wages (7%), handicraft and remittances (6%) and opium about 1%. It should be noted that opium-growing villages include opium-growing households as well as non-growing households.

In opium producing villages livestock sales play an important role in the cash income of a household, while salaries and remittances are much more important in non-growing villages. At the village level opium sales do not play an important role in producing villages, suggesting that there may be few opium-growing households or that opium is mainly used for consumption. The presence of addicts is also a determining factor in lowering the level of household cash income.

Figure 6: Distribution of Cash Income of Opium Growing Households



If the income of an opium-growing household is analyzed separately (i.e. not at village level as above), opium production and trade contributes 10% of the household cash income. This estimate is in line with last year's figure of 12%.

2.5.6 Food Security

Many villages where opium poppy has recently been grown in the hills enjoyed food security in the past. The hill people in the days before cash cropping of opium were not poor and although paying tribute to the king, were independent and self-sufficient. This is seen, for example, in the Khmu village of Nam Thouang (and nearby communities) in Phongsaly that used to send tribute in foodstuffs and silver items through a local leader, Pinnya Kham. This continued until the French took political control of Laos in 1893.

Opium cultivation led to fewer farmers producing enough rice and other foodstuffs for their own needs. Nevertheless, the amount of farmers with both rice and food security remains over 50%. Several factors were examined in this regard, such as whether the households practiced shifting or paddy cultivation or did both. Shifting cultivation if done properly can be sustainable and actually encourage biodiversity. If practiced in a rotational manner with sufficient resources, a village can survive on it and stay in the same place for centuries, such as the abovementioned Khmu in Phongsaly.

According to village survey data, 84% of the villages reported practicing shifting cultivation. At the household level, socio-economic study and village survey findings are consistent. However, as shown in Table 14, the number of years in the rotational system has been

declining from a viable rotation of about 7 years to 5, 4, or even 3 years which is not sustainable. This is mainly due to population increases.

Table 14: Households Reporting Shifting Cultivation in Socio-Economic Study

Province	No	Yes	Total HH	% of HH with shifting cultivation	Fallow			
					Province	Average year let fallow	Min	Max
Phongsaly	16	10	26	38%	Phongsaly	4.2	1	7
Luang Namtha	2	18	20	90%	Luang Namtha	5.1	3	7
Huaphanh	10	16	26	62%	Huaphanh	5.3	1	10
Oudomxay	7	20	27	74%	Oudomxay	3.1	2	4
Luang Prabang	11	37	48	77%	Luang Prabang	3.4	1	7
Xieng Khouang	25	9	34	26%	Xieng Khouang	5.6	2	9
Total	71	110	181	61%	Total	4	2	7

Many farmers reported that they wanted to do paddy cultivation. However, the topography in northern Laos has little area suitable for paddy so that most individual holdings are very small. Thus there is no clear connection between paddy or shifting cultivation and food security, which is confirmed by the village survey data. Of the households practicing shifting cultivation, 71% produced enough food while 29% do not. For households doing paddy cultivation, 28% had no food deficit while 72% did.

Table 15: Rice Production and Food Deficit

	No food deficit	%	Food deficit	%	Total	%
Household holding paddy fields	1,529	28	3,261	47	4,790	39
Household not holding paddy fields	3,906	72	3,629	53	7,535	61
Total number of households	5,435	100	6,890	100	12,325	100
Household practicing shifting cultivation	3,881	71	3,083	45	6,964	57
Household not practicing shifting cultivation	1,554	29	3,807	55	5,361	43
Total number of households	5,435	100	6,890	100	12,325	100

Despite the growing population and other constraints, a total of 54% of the villages surveyed reported having food security. At the household level, 65% reported having enough food for consumption.

The staple food of all the opium growers is rice. Most everyone in the region measures food security in terms of rice although this is not necessarily indicative of a balanced diet. Followed by rice there are other items such as poultry, maize and pigs. NTFPs, such as bamboo shoots, are used seasonally as available. Project and government support has encouraged the digging of fish ponds, vegetable and fruit tree cultivation although they are not widely used yet.

Maize is less favoured as a source of food and is, when sufficient food exists, used as fodder. The survey teams found little difference between poor, medium and better off households in terms of their preferred sources of food, with the exception for NTFPs. NTFPs as a source of food is relatively high in importance for poor households whereas medium and better off households usually rank NTFPs among the last as sources of food.

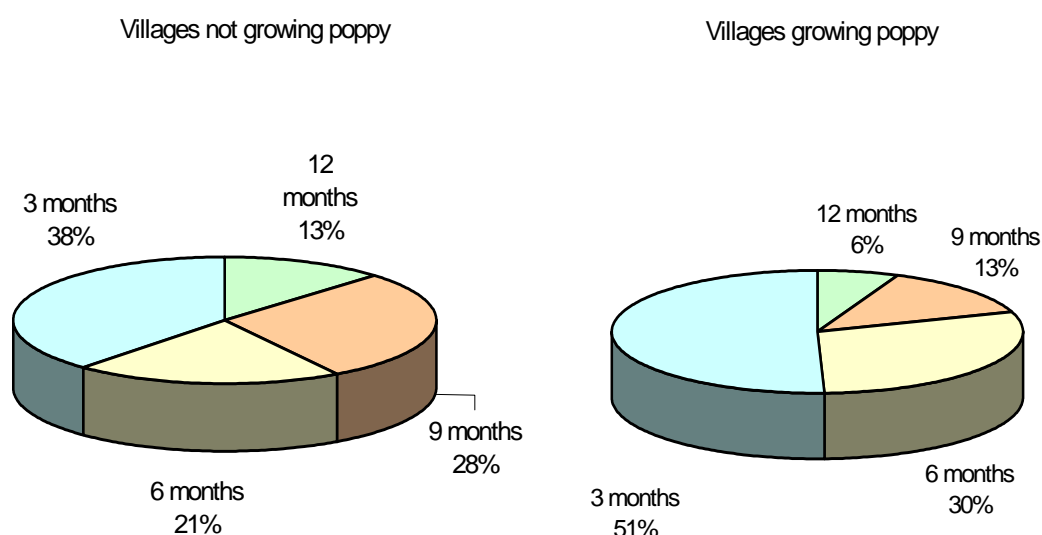
Rice sufficiency in the non-growing villages (socio-economic and village survey combined) is on average 70%. Approximately 30% have reported rice deficit. Rice deficit in opium growing villages is significantly higher at more than 57%. There is a link between opium cultivation and rice deficit and the cash the opium generates is used to buy the rice they are no longer producing.

Table 16: Poppy Cultivation and Rice Deficit

	Rice deficiency	No rice deficiency
Villages not growing poppy	28.2%	71.8%
Villages growing poppy	57.4%	42.6%

Of those that reported not producing enough rice for 12 months, the figure below shows the numbers of months for which their rice production is sufficient. Again, as can be seen from the charts, villages that grow opium poppy have a more severe rice insufficiency situation compared to those who do not grow opium.

Figure 7: Rice Sufficiency (Months) for the 30% of Villages Reporting Rice Deficit



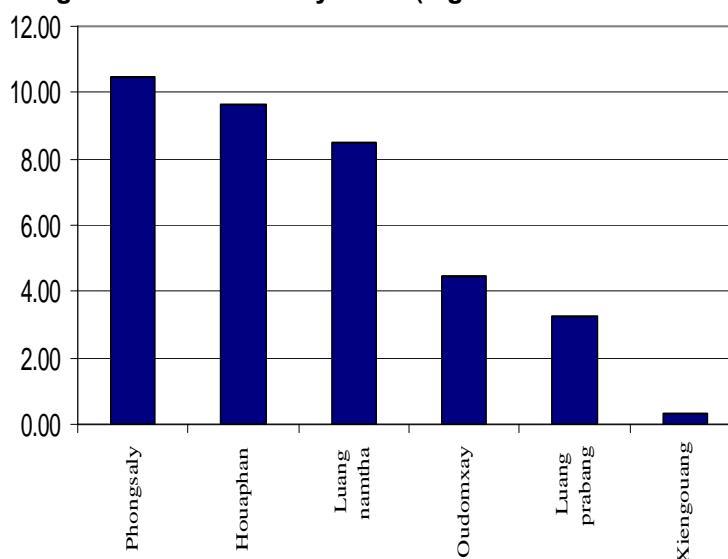
Of the households that reported rice insufficiency, 44% (36/82) reported that they had experienced a situation where they did not have enough food or money to buy food in the past 30 days. These respondents were asked to estimate the frequency with which they resorted to the following alternative strategies for collecting food:

- a) Rely on less preferred food (1)
- b) Borrow or rely on less expensive food (3)
- c) Purchase food on credit (6)
- d) Gather wild food, hunt or harvest immature crops (4)

The answers were weighted by their frequency and severity (see numbers in parentheses for severity weights) and their coping strategy index was calculated.²⁶

CSI food insecurity index shows Phongsaly, Houaphanh and Luang Namtha as having the worst food security situation.

Figure 8: Food Security Index (high values → less secure)



2.5.7 Coping Strategies

Immediate

The main strategies adopted by farmers to make a living immediately after ending opium cultivation were growing more rice or other field crops, selling their livestock, collecting and both using and selling non-timber forest products (NTFPs), and taking various off-farm jobs.

Other alternatives, such as migrating out the area, were less common.

Table 17: Livelihood Changes after Opium Elimination

positive livelihood change	35%
negative livelihood change	10%
no significant change ²⁷	25%

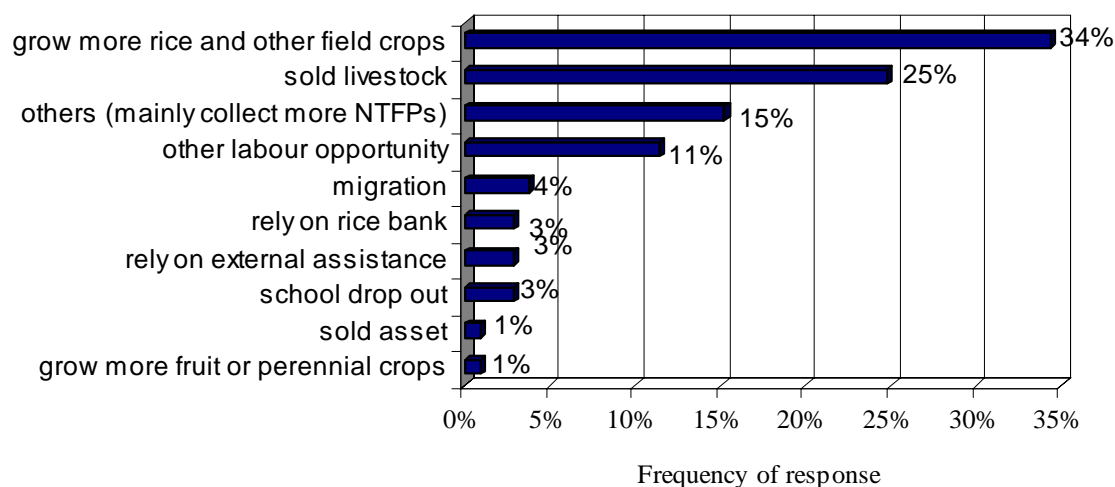
For those households who have cultivated opium in the past, over one third reported a positive change in their livelihood. Among these respondents the most common answer was that they have more time to work in their rice

fields and look for food, partly because of the better health and improved productivity they reported. Of the 10% who reported negative effects from opium elimination the most common explanation for this was that they now lacked cash to buy clothes, medicine and rice. These households often still have an addict in the household and/or have a labour shortage in the household, which limits their capacity for rice production and food collection.

²⁶ The Coping Strategy Index (CSI) is a measure on food security and vulnerability on a household level developed by the World Food Programme (WFP). The CSI was initially developed to food security conditions in East Africa. At the time of writing this report the WFP is adapting the measurement to the Lao context. The adaptations to the measurement used by the socio-economic survey teams may therefore not be entirely compatible to those of the WFP.

²⁷ 30% of respondents did not respond to this question

Figure 9: Immediate Coping Strategies of Farmers Following Opium Elimination in Socio-Economic Study Area



Consistent with the fact that the major use of income from opium sales was to buy food, growing more field crops was the major coping strategy. In areas where there is ample open space, such as Phongsaly and Huaphanh, the expansion of shifting cultivation has been greater. However, in all provinces and districts, whenever possible, farmers terraced hillsides or dug paddy fields in valley bottoms in order to have an annual source of rice. Paddy construction was encouraged by the government, international and bilateral projects, as well as NGOs. However, there is not so much land for paddy cultivation and most of the new fields are too small to result in self-sufficiency by themselves

This has led to much expansion of swiddening. The survey team observed many areas where shifting cultivation has been expanded to cover hilltops and steep slopes, practices not traditionally done by the long-term residents of the area. While the policy of the government is to stabilize shifting cultivation, local officials often realize that at present shifting cultivation is essential to the people making a living.

According to the household interviews, perhaps from a time before the cash-cropping of opium poppy, many hill people raised livestock, especially cattle and buffalo, to use as savings for use in emergencies. During the transition from opium to other sources of income, about 20% of those surveyed reported that they had sold off livestock to generate income. It is difficult to assess whether this is mostly existing stock or new stock since there has been a simultaneous efforts by the Government and projects to promote livestock raising. These inputs are in the form of vaccination programmes and livestock banks. Such initiatives can increase livestock numbers quite rapidly. However, this does not apply to villages that have not received any assistance. These villages have often experienced rapid reduction of their large livestock, which are sold for cash. Much of their small livestock is used for food.


One Akha man, aged about 45 in Huai Nam Bak Mai village in Luang Namtha, told the survey team that his habit and the rising cost of opium led to him selling two buffaloes in the last year. He only owned a few more buffalo and did not expect he could continue to do this in the future.

Many villagers in all the provinces studied told the surveyors that they had ample space to grow more livestock and would like to do so. However, they said that they lacked either the technical knowledge or the capital to do so. Many also mentioned that there seemed to be an insufficient amount of foraging vegetation in the forests. Villagers stated that they raised

pigs and chickens, most of which was for home consumption but also for sale, generating relatively small amounts of money.

Cultivating New Alternatives

For centuries Lao and others in the region have used the soft inner bark of the paper mulberry tree to make paper. Almost neutral in pH, mulberry paper manuscripts are both durable and have many archival applications. For almost all this time, the amount of bark harvested was too small to threaten its supply in the forest. However, this has been changing recently because of forest encroachment and the increasing interest buyers have had in paper mulberry. In response, villagers in Laos, such as the Khmu from Luang Prabang Province pictured here, to cultivate paper mulberry in their fields to ensure a continued supply and sustainable income. Although not a result of alternative development, such an initiative shows that villagers are able to innovatively respond to challenges.



Mother and daughter stripping mulberry bark

NTFPs represent a combination of both items used in the home and for sale, such as rattan, paper mulberry, and a fragrant bark often called sappanwood (*nang niao* in Lao *Boehmeria sp.*), as well as cardamom (*mak neng* in Lao, *Amomum villosum*) and benzoin (*nyan* in Lao, *Styrax tonkinensis*). Home use items include foodstuffs such as bamboo shoots, mushrooms, and greens and items for utilitarian use as brooms, rope, and tools. Depending on local availability, such as palm nuts in Long District of Luang Namtha or sappanwood in Phongsaly, NTFPs are growing in importance. Resources that are both renewable, such as palm nuts, and those that are not, are gathered. Although the forests of Laos are still relatively rich, there are also cases, such as in Luang Prabang, where NTFPs, in particular paper mulberry, are cultivated in household agricultural plots at least partly to preserve endangered resources.

Table 18: Reasons for Migration

	Population emigrated (answers from ground survey)	Estimated number of out-migrants in Northern Laos	Percent
To become farmer in another village	1,610	33,208	89%
To work in a factory	72	2,536	7%
To work as servant to other people	15	672	2%
To work in a restaurant	4	358	1%
To work as paid labour to grow poppy	8	265	1%
To work in a mine	5	159	
Grand Total	1,714	37,198	100%

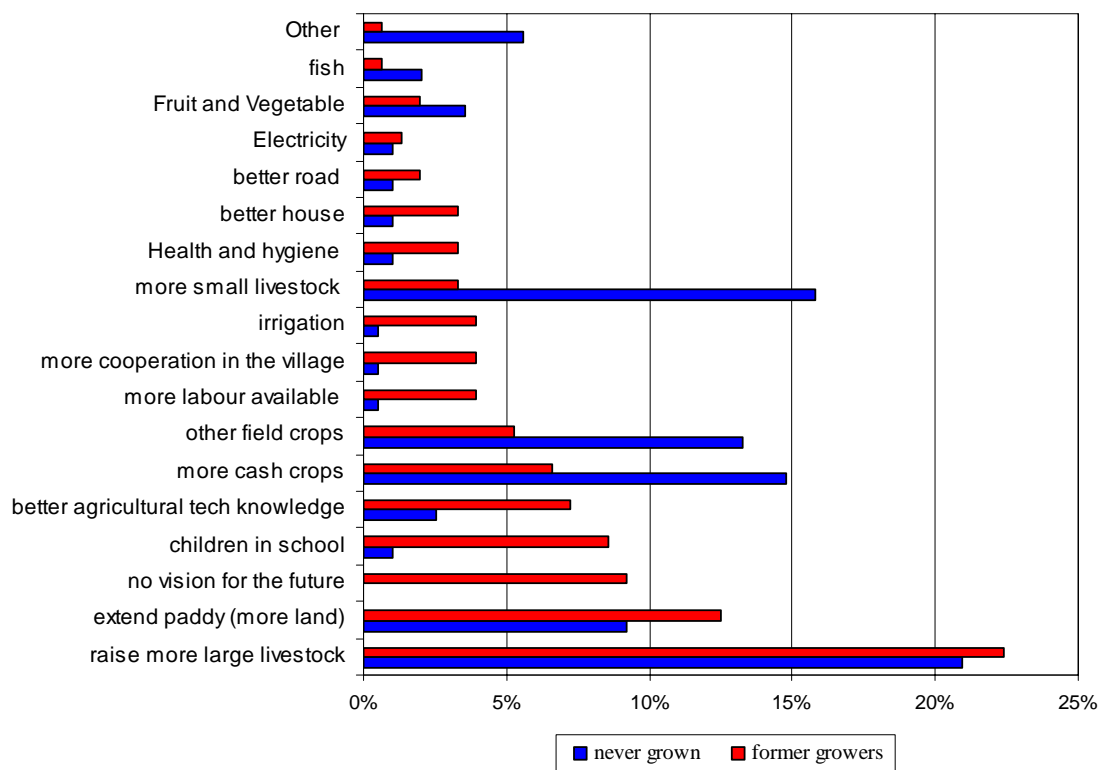
Village survey data indicates that only about 2% of the total population surveyed was reported to have left the village. A total of 89% were reported to have left the home village to become a farmer in another village. Although some of this movement arose out of opium control or similar policies, the link between law enforcement and migration is not strong because of the overall small numbers of people who migrated. If this total were extrapolated to cover the total population of northern Laos, there might well be somewhat more than 37,000 persons in northern Laos who made such moves.

Most of the moves taken seem to have been motivated more by reasons related to poverty, such as having no money or moving to be with other relatives. Some may have moved because of opium eradication but since very few people made significant sums of money from selling opium, the connection between these factors is weak.

Long-term Strategies

The socio-economic survey included a question to the individual households, that was repeated in the focus group discussions on how the people wanted their village to be five years in the future. As shown below in Figure 11, the answers emphasized a desire to have enough farm production, in increased crops and livestock (both poultry and larger animals) to guarantee a better income. Although this implied a need for more information and skills, this was mentioned less often. Similarly a better education for the children in the village was rarely mentioned, sometimes because farmers said they did not see the connection between school learning and improving village livelihoods.

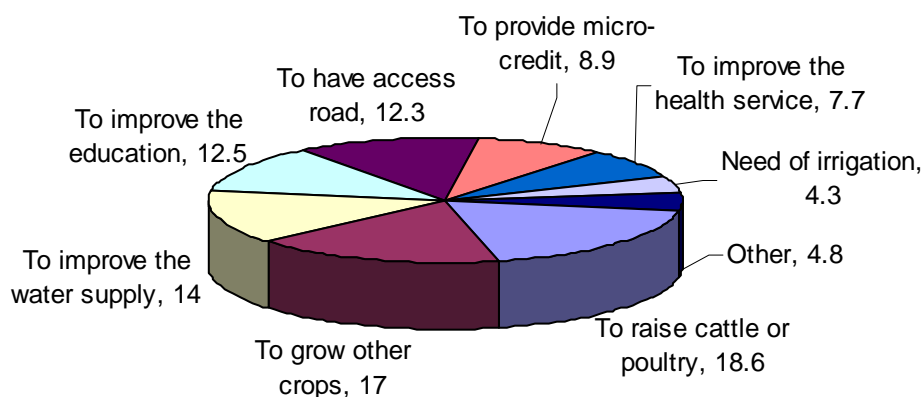
Figure 10: Long Term Coping Strategies of Farmers



Noteworthy is that the long term vision of the households that have grown opium reflect a more vulnerable condition. Food security is the main priority. These households want to

restock on livestock, produce more rice and send their children to school. The third most common response among these farmers is that they have no vision for the future. For households who have never grown opium their strategies more often include improving income generation.

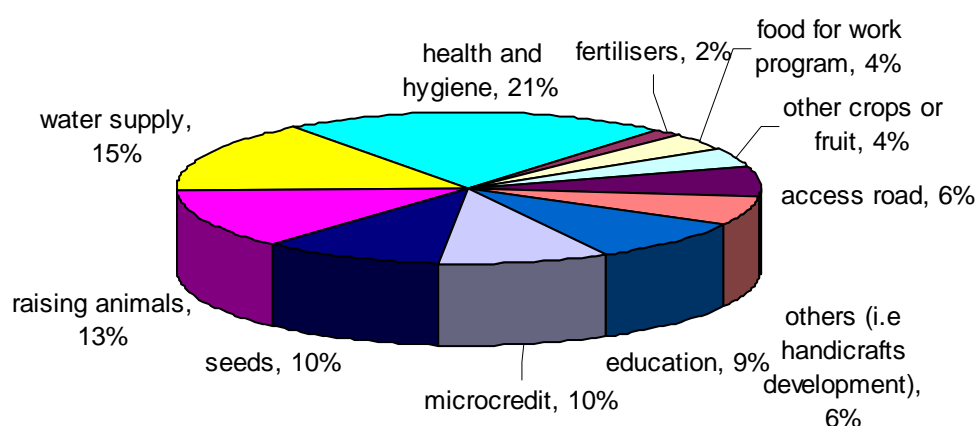
Figure 11: Preferred Kind of Assistance (village survey sample data, in %)



2.5.8 The Role of External Assistance in Coping with Opium Elimination

External assistance, as noted above in this report, although not constituting a significant factor leading to villagers stopping opium cultivation, can play a significant role in helping the farmers cope with sometimes difficult situations. Figures 9 and 12, based on socio-economic survey results, show two sides of this issue, how farmers are coping and what the projects are providing.

Figure 12: Main Forms of External Assistance for Opium Cultivating Farmers



The main forms of assistance by both projects and the government were health related. Much of this was in the form of treatment for drug dependency. Treatment methods used are community based and are conducted in treatment camps set up by the villagers for the villagers. The detoxification method was piloted by UNODC starting in 1993 in the Palaveck project in Xaisomboun Special Region.

Other major inputs have been related to water, including both clean water supplies for household use and irrigation schemes to promote agriculture, especially paddy cultivation

(although more is needed). Clean water is generally inexpensive to provide while yielding highly visible and rapid results ranging from reduced women's work and reduced disease due to greater cleanliness.

Other major inputs by projects coincided directly with the coping strategies. One of the most important was support for livestock. Since selling livestock was the second most often cited coping strategy, and since survey teams determined, based on focus group discussions with villagers, this mainly was the selling of existing stock, promoting livestock raising both helped maintain stock size but encouraged the villagers expand their herds.

Many villagers said they wanted assistance in livestock development. They mentioned a need for improved breeds as well as help in identifying foraging crops for their cattle and buffaloes. Such inputs will help them deal with the poverty that many ex-opium growers still face.

More help may well be needed to help in cultivating field crops to avoid the negative situations, such as rapid increases in shifting cultivation that were sometimes observed. Identifying sites for rice paddies and helping farmers dig them, is another priority.

2.5.9 Impact of Opium Elimination on Women

Out of 24 focus group discussions with women in the villages for the socio-economic study, all women reported that the most positive outcome of opium elimination is time. They have more time to do their work. The survey teams estimate that women have shortened their daily working hours by 1-2 hours. The opium fields were often far from the village and the women spent most of their time away from home, leaving the children in the care of themselves or their husbands. Following opium elimination the women express that they are happy they can work closer to home. This enables them to better look after the house, ensuring that it is clean and improving health standards. Being close to home also allows for more time and energy to be focused on livestock raising (especially pigs and poultry) and other productive activities that can generate income for the household, such as handicraft development.

Productivity in former opium households has improved. Women are not spending so much time on this consuming crop, the output of which is uncertain. More importantly when the husbands stop their opium consumption the productivity of the household increases dramatically as they gain an additional productive labourer.

Focus group discussion in Ngong Village, Phongsaly province



The reduction or elimination of opium consumption is vital to improving the social, economic and emotional welfare of the community, and women in particular. For the most part, when villagers cultivated opium, women were the primary providers for the family and would also be responsible for procuring the opium for the husbands and preparing it for them to smoke. Women throughout the survey areas reported that the husbands often beat them when they returned home late or with insufficient quantities of opium, food or cash. In a study of opium addiction conducted in 1994 commissioned by Norwegian Church Aid in Luang Namtha and Bokeo provinces (see C. Escoffier-Fauveau, 1994, pp. 21-22), the women reported that “their spouse will become angry...even ready to kill if they do not have their daily dose”. The women interviewed in the focus groups frequently reported that domestic abuse has decreased dramatically since detoxification.

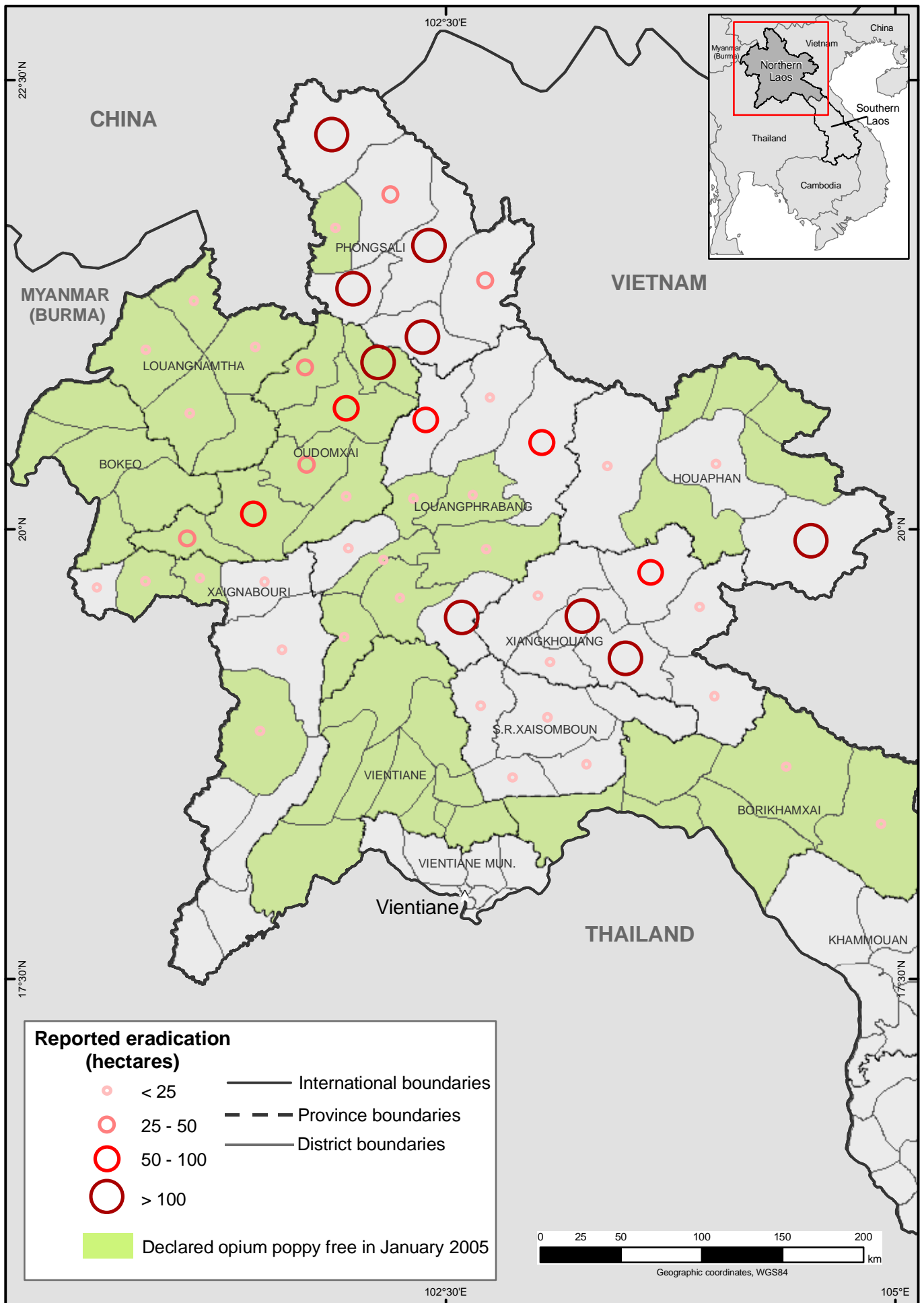
In Huay Nambak Mai village, Luang Namtha, villagers are still waiting for detoxification. The women in the one group discussion told the survey team about living in proximity to opium addiction:

“We are very poor and work very hard largely because many of our husbands still smoke opium. All the money we earn goes to our husbands for opium. The households with an addict also have many family conflicts. We have seen the positive health effects that stopping opium consumption has from those that have already self detoxed and that the men in these households can help more, improving the lives for the whole family.”

2.6 Eradication

At the national level, eradication reportedly covered a total of 2575.11 ha during the 2004-2005 season. The opium survey however was not designed to monitor or validate the results of the eradication campaigns carried out by the Lao Government at the same time but independently of the survey.

Opium poppy eradication and poppy free declared areas as reported by the Lao PDR, 2005



Source: LCDC - UNODC
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

3 Methodology

The 2005 opium poppy survey was conducted over an area of 102,664 km², across seven of the eleven provinces in northern Laos. The size and limited accessibility of this area, coupled with the relative rareness of the target crop suggested a new approach, a helicopter survey, as the only feasible and economical way to verify the extent of the opium poppy eradication campaign conducted by the GoL.

The second component was a village ground survey carried out through interviews with village headmen to collect socio-economic and yield data in a sample of 189 villages in 8 provinces.

The third component was an in-depth socio-economic study aimed at making qualitative and quantitative assessments of the coping strategies of farmers following the elimination of opium poppy cultivation. The socio-economic study covered 181 households in 24 villages in 6 provinces.

Interviews at village and household level were directed at collecting socio-economic information, ancillary data on opium farm gate prices, addiction, other agricultural practices, as well as studying the impact of opium poppy eradication on farmers. Out of a total of 195 villages on the original random sample list, the survey teams visited 189²⁸ villages in 8 provinces, covering a total of 12,325 households and a population of over 72,600 people.

The area planted and corresponding production of opium poppy could not be cross-checked with village data this year due to the scarcity of the crop. The helicopter survey and village survey were initiated, supervised and implemented by the Lao National Commission for Drug Control and Supervision (LCDC) through the Programme Facilitation Unit (PFU) and UNODC (Illicit Crop Monitoring Programme). The socio-economic study was initiated, supervised and implemented by UNODC and NAFRI.

3.1 Organisation, Staff and Procedures

Helicopter Survey

A private 5-seat squirrel helicopter was rented for five full days (17-18 January and 6-8 February) to survey six provinces of northern Laos.

During the first trip, three UNODC international staff, one UNODC national staff and a representative of the Lao Ministry of Defence participated. During the second trip two UNODC international staff, one UNODC national staff, one representative of the Lao Ministry of Defence participated. A representative of the US embassy joined for one day as an observer.

Participants were equipped with GPS and a digital camera to record the location and area under poppy cultivation. During this survey, 30 segments were surveyed. Each of the segments was flown over at a radius of about 3 km. In between the segments a corridor of 1.5 km on each side of the helicopter could be observed and surveyed.

Geographical coordinates of all villages in the segments to be surveyed, as well as in the corridor between the segments, were pre-entered into GPS before the flight started enabling an optimization of flight between segments. The flight started each day as soon as morning

²⁸ The original sampling list was 195 villages but 6 were withdrawn at the start of the field work by GOL authorities.

fog disappeared and lasted for 5 to 6 hours a day. The survey team flew for a total of 25 hours over six Northern Provinces, covering an approximate area of 7,000 km². The helicopter pilot was instructed to fly over a radius of 3 kms around the village in the segment at an altitude at which crops could be clearly distinguished and density assessed. This also allowed to pictures of each field with a digital camera. The number and average size of fields were recorded for each segment.

Village Survey

The survey was initiated, organized, supervised and implemented by the Lao Commission for Drug Control and Supervision (LCDC) through the Programme Facilitation Unit (PFU) and UNODC (Illicit Crop Monitoring Programme).

The survey was implemented by 21 teams: each consisting of 2 members (one surveyor and one district assistant). In addition, supervision teams were established, including the head of each PCDC, as well as staff from PFU, UNODC, representatives of GTZ and NCA and one external consultant. The supervision teams were allocated to different provinces based on their knowledge of the province.

Training of survey teams was conducted in Oudomxay Province from 12 to 14 January 2005. The training covered interview techniques, description of the survey process, and the use of GPS, field measurement techniques and poppy capsule measurement techniques. A half-day training session allowed the teams to practice in a nearby village.

The survey teams conducted the survey between mid-January and the end of February 2005. No field measurement or capsule measurement could be done this year due to reluctance of farmers to report details of opium cultivation. Therefore, the village survey covered only structured interviews of village headmen.

The ICMP provided technical support and international supervision of the fieldwork throughout the survey and accompanied the field supervisors and field survey teams in Luang Prabang, Oudomxay and Xieng Khouang provinces.

Table 19: Number of observations

Province	Total villages
Bokeo	15
Huaphanh	38
Luang Prabang	38
Luang Namtha	18
Phongsaly	25
Udomxay	26
Xayabouli	11
Xieng Khouang	18
Total	189

The survey teams identified each village to be surveyed from the sample list. If the village did not exist anymore or could not be found from the primary list of 189 villages, the surveyors selected the alternative village from the secondary list. The team interviewed village headmen, if possible, in the presence of other key informants. The data were filled in the survey questionnaire. Originally it was planned that if poppy cultivation was reported, the team should make field measurements and fill in the second part of the survey questionnaire. However, as indicated above, this was not possible due to reluctance of farmers to report details of opium poppy cultivation. Completed forms were checked by the supervisor teams. Six villages were deleted from the sampling list by Lao government at the beginning of the field survey. Since these six villages could not be replaced, the village sample was downsized to 189.

Socio-Economic Study

Data were collected from six provinces in Northern Laos, namely Luang Namtha, Phongsaly, Houaphanh, Luang Prabang, Oudomxay Xieng Khouang. UNODC worked in the first of the above three provinces while sub-contracting the data collection work to NAFRI in the latter three. The data collection fieldwork commenced with pre-testing in Oudomxay and Luang Prabang in late-January and February 2005. Data collection was carried out in February through March.

The questionnaire was constructed and translated into Lao in early January following a survey planning workshop held December 14th in Vientiane. The questionnaire and other tools were pre-tested in two villages in Oudomxay Province in January 2005. Training was provided to the NAFRI team in Vientiane and also during the pre-testing in Luang Prabang in February 2005.

Prior to entering a village, the survey team met with district officials to be briefed on the overall situation in the area and to see if any special arrangements would be required. For each village, several tools were used, including semi-structured interviews of village leaders, a questionnaire, separate focus group discussions with women and men. Data collection in a village took 2-4 days, depending on the size of the village.

In the meeting with the village leaders, the team collected information on general conditions in the village, including demographics, livelihoods, opium cultivation and use, health, education, and other major aspects of village life. Based mainly on this information, 2-3 page village profiles were compiled for each of the 24 villages. During this meeting, the leaders were asked to classify households into three economic groups, those better off, medium and poor households. This was done in 23 villages; the leaders of one village claimed there were only middle and poor villagers. Based on this classification, a 15 percent sample of the households was chosen for administering the questionnaires.

Table 20: Number of observations

Province	Total households
Huaphanh	26
Luang Prabang	48
Luang Namtha	20
Phongsaly	26
Oudomxay	27
Xieng Khouang	34
Total	181

Table 21: Wealth Categories of Households

Poor households	60	33%
Medium households	89	49%
Better Off households	32	18%
Total	181	

The questionnaire comprised 74 questions. The team asked the questions to the head of the household in their homes, sometimes in the presence of other family members. Non-family members were not present except in a very few cases where help with translation was required to communicate with the individual. Main sections of the questionnaire included general information, livelihoods and income, migration, opium prices and income, health and addiction, food security, external aid, and groups and networks.

The focus group discussions were held with the village women and, depending on the availability of female translators, by women from the team. Main subjects discussed were women's work before and after opium cultivation, perceived risks in village development and future plans, as well as health and related issues. The village elder focus group, covered

how the villagers assessed the community's strong points, village plans for future food security and access to information. Village maps were drawn using PRA techniques.

In addition, all the teams used direct observation to assess village conditions. This allowed for follow-up discussions and other types of review on items not covered or made clear by the above techniques.

Village reports comprised the village profiles, focus group discussion summaries, and the village maps. Other information came from the questionnaires, district profiles, and other reports such as from the government, development agencies, and NGOs.

3.2 Sampling Procedure

Helicopter Survey

As in previous years, the sampling procedure and the survey methodologies were adapted to the challenging conditions prevailing in Northern Laos. The expected scarcity of opium poppy cultivation combined with the lack of available funds to perform a vast village verification survey, led UNODC to modify previously used methods.

To verify the extent of the opium poppy eradication campaign, a representative sampling frame was built. The construction of the sampling frame is often the most challenging problem. The sampling procedure started with the definition of a stratification map, which defined the sampling frame for the area covered by the 7 provinces simply by gridding the area into segments of three km by three km.

The provinces where the survey took place cover an area of approximately 103,000 km².

Table 22: Provinces Area (sq. km)

Province	Area km ²
Phongsaly	15,466
Luang Namtha	9,569
UdomXay	11,771
Luang Prabang	19,985
Huaphanh	17,618
Xayabouli	15,490
Xieng Khuang	12,765
Total 7 provinces	102,664

The agricultural census 1998-1999, conducted by the Lao PDR Ministry of Agriculture and Forestry, shows that the provinces under examination (Phongsaly, Luang Namtha, Oudomxay, Xayabouli, Luang Prabang, Xieng Khouang and Huaphanh) cover a total

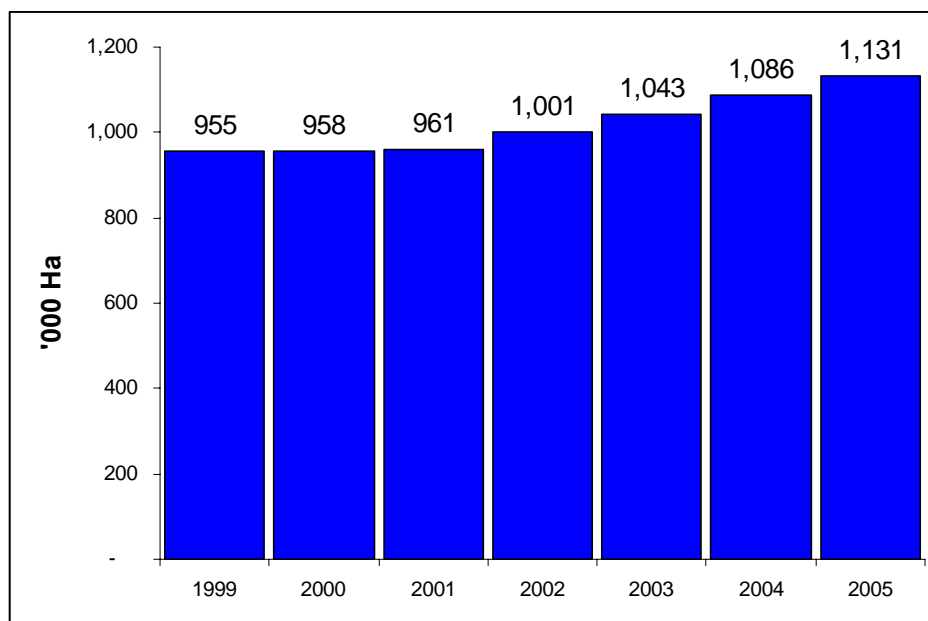
agricultural area of 342,900 ha. However, more recent figures published by the FAO and other sources²⁹ suggest a significant increase in the arable land for 2005. In line with this data, the potential agricultural area for opium poppy cultivation in the provinces mentioned above was calculated at around 4% of the total area, or 4,120 km².

Table 23: Sampling Frame for Agricultural Area of Northern Provinces

Indicator	Unit	1999	2000	2001	2002	2003	2004	2005
Total Land	1000 ha	23,080	23,080	23,080	23,080	23,080	23,080	23,080
Arable Land + Permanent crops	1000 ha	955	958	961	1,001	1,043*	1,086*	1,131*
Arable Land	1000 ha	875	877	880	920			
Irrigated Land	1000 ha	172	175	175	175			

* UNODC estimates

Figure 13: Arable Land + Permanent Crops ('000 ha) 1999-2005



²⁹ Food and Agriculture Indicators, Laos, Estimates prepared by ESSA, July 2004 with information from FAOSTAT, Asian Development Bank- Key indicators, 2003; and the World Bank, World Development Indicators 2003

The required number of selected segments was calculated as a function of flight time and budgetary constraints. Each segment had an assigned code and the selection of the sample was systematic at random within the list of codes, ordered sequentially. The selection interval was determined by dividing the total number of segments by the target sample size. Some controls, such as no adjacency between samples, were applied in order to avoid clumping of samples.

In order to facilitate the location of the selected segments, a list of villages' names and their coordinates within each selected segment were included at the time of the helicopter flight. At the same time, helicopter survey team was requested to follow a predetermined path in order to observe the extent of the eradication campaign along two km buffer zone between each pair of selected segments.

Table 24: Land Use in Lao PDR

Province	Area of holdings	Agricultural land				Grazing land	Forest land	Other land
		Arable land			Permanent Crops			
		Temporary crops	Fallow land	Total Arable land				
Vientiane Municipality	83.3	60.7	9.5	70.2	4.0	2.1	4.0	3.0
Phongsaly	21.1	20.1	0.1	20.2	0.8	-	0.1	-
Luangnamtha	21.8	19.9	0.5	20.4	0.2	-	0.7	0.5
Oudomxay	62.0	39.6	17.2	56.8	0.9	0.4	3.5	0.5
Bokeo	20.0	16.6	1.2	17.8	1.2	-	0.8	0.2
Luangprabang	98.1	59.2	28.4	87.5	4.0	0.4	5.1	1.1
Huaphanh	40.2	37.6	0.4	38.0	1.5	-	0.1	0.5
Xayaboury	61.0	52.9	2.7	55.7	3.2	0.1	1.7	0.4
Xiengkhuang	38.7	33.5	1.3	34.9	1.3	0.3	1.2	1.1
Vientiane Province	73.1	50.7	5.5	56.2	3.8	9.7	1.9	1.6
Borikhamxay	45.2	36.5	4.4	40.9	1.4	0.2	1.6	1.0
Khammuane	54.9	44.3	7.9	52.2	0.9	0.3	1.0	0.6
Savannakhet	150.0	109.2	9.8	119.1	3.1	2.1	23.4	2.4
Saravane	84.5	57.0	10.6	67.6	10.7	0.6	3.8	1.8
Sekong	18.2	11.0	0.7	11.8	4.8	0.1	1.1	0.3
Champasack	146.7	92.0	10.1	102.1	38.2	0.8	3.6	2.0
Attapeu	18.8	16.3	1.0	17.2	0.9	-	0.5	0.1
Xaysomboon SR	9.9	7.7	1.0	8.6	0.4	0.3	0.2	0.3
Total	1047.7	765.0	112.3	877.3	81.3	17.6	54.1	17.5

Source: Division of Statistics, Department of Planning, Ministry of Agriculture and Forestry
<http://www.agrostat-moa.gov.la>

Village Survey

Table 25: Number of Villages by Province

Province	Villages
Bokeo	387
Huaphanh	859
Luang Namtha	451
Luang Prabang	1,185
Phongsaly	613
Oudomxay	794
Xaisomboun	129
Xayabouli	317
Xieng Khouang	511
Total	5,246

The 2005 village socio-economic survey presents the estimates of the impact of the GoL's opium poppy eradication campaign on the following: drug addiction patterns, opium prices, income generated by opium poppy, migrations related to opium poppy eradication, and external assistance received by the population affected by the eradication.

The sampling frame is based on the 2003 GoL listing for the north. It does not include the following provinces: Bolikhamsay, Vientiane, and the southern part of Xayabouri (Phiang, Thongmyxay, Parklai, Kenethao, and Botene). The total number of villages in the sampling frame is 5,246.

Stratification may increase the precision in the estimates of the characteristics of the population. This theory uses a stratified sample in order to obtain the maximum possible precision, while taking the advantage of reducing the variability within strata.

The sampling frame is stratified on the basis of the following conditions:

Stratum A

Villages that have been growing poppy consistently during the last four years (2000-2003)

N=669

Stratum B

Villages that have not been growing poppy during the last four years (2000-2003)

N= 1,741

Stratum C

Villages that started growing poppy in 2000, but have stopped growing poppy some time during 2001-2003

N=443

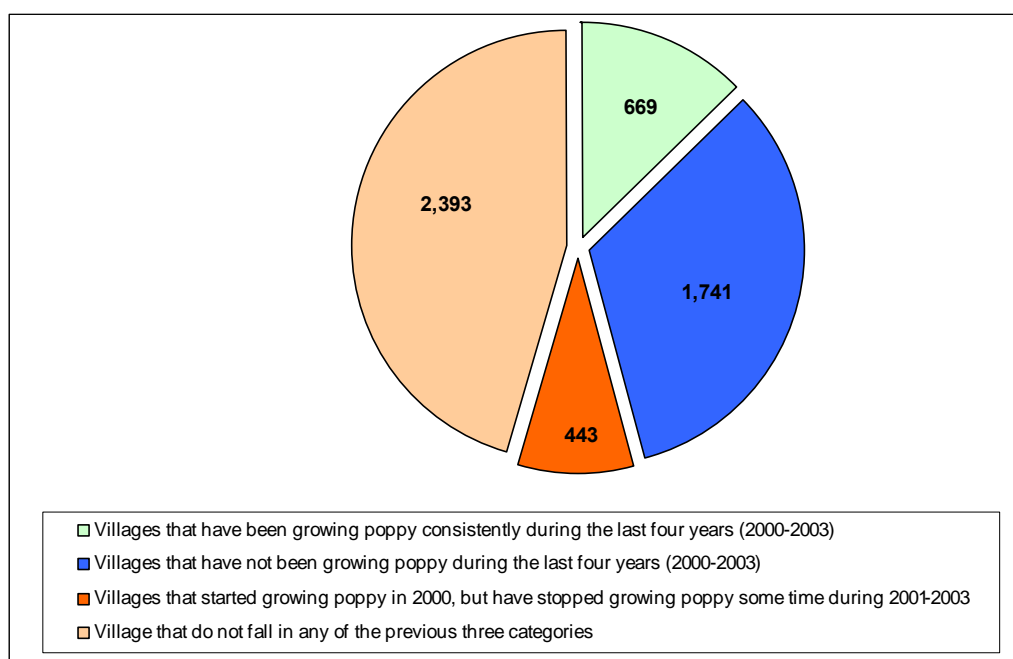
Stratum D

Village that do not fall in any of the previous three categories

N=2,393

Due to time and budgetary constraints, it was agreed that the analysis would be based on a sample size of 3% of the total number of villages. The sample allocation is proportional to the size of the stratum and the sample is geographically distributed in all the regions. Systematic random selection was used within each stratum. The total number of sampled villages was 195.

Figure 14: Village Stratification



The sample size per stratum is defined as follows:

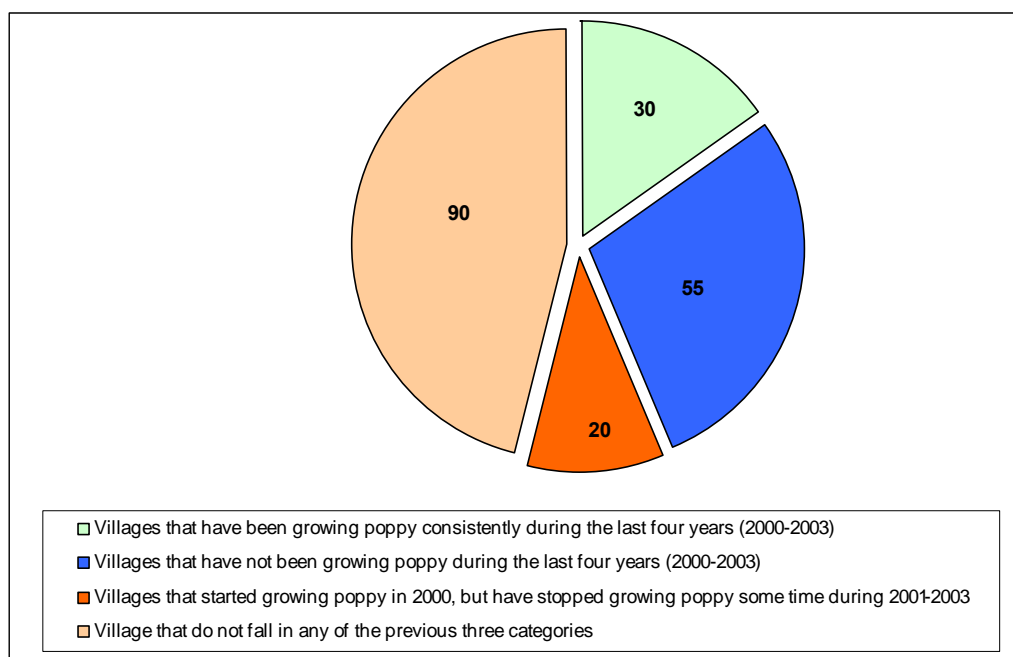
Stratum A n= 30 villages

Stratum B n= 55 villages

Stratum C n= 20 villages

Stratum D n= 90 villages

Figure 15: Sample Distribution



Socio-Economic Study

The socio-economic study was conducted in six provinces: Phongsaly, Oudomxay, Luang Namtha, Luang Prabang, Xieng Khouang, and Huaphanh. Four villages in each province, 24 in all, were studied in depth. To overcome shortcomings caused by such a small sample, 12 were selected from the 189 in the village survey while the rest were picked by the study team to meet certain criteria. This enabled the team to cover a comprehensive range of highland situations including some that otherwise might have been missed in a purely random sample. These criteria, which were identified during the PFU Alternative Development Workshop held in Vientiane on 14 December 2004, included ethnicity, on or off the road, large and small size, length of time since growing poppy, whether the village has migrated recently and in or out of development projects.

3.3 Data Capturing and Storing

Following the survey, all the compiled questionnaires were collected and brought back to the UNODC field office in Vientiane. Once there, all the forms were reviewed for possible inconsistencies and then entered into a consolidated Access database. Data entry took place from April 5 to April 9, 2005. The database was designed to process data reports concerning socio-economic, population data, opium cultivation and addiction. It was structured for easy data recovery and consultation.

The same process was followed for the socio-economic questionnaires except that they were entered into a consolidated Excel database. Data was also obtained from the village profiles on general village conditions. Data entry for the questionnaires took place from 4-10 April and data entry from the village profiles took place from 20-24 April.

3.4 Estimation Procedure

The estimation of the cultivated opium poppy area was based on the information collected during the helicopter survey. The expansion area for the segment survey was limited to the sampling frame and does not consider possible opium poppy fields present outside the seven provinces.

Ratio estimation approach was used to estimate the total area under opium poppy cultivation in Northern Laos.

Estimation of opium poppy cultivation for each segment:

$$\bar{p} = \sum_1^{30} \frac{x_{Poppy}}{X_{Agricultural}}$$

\bar{p} = Proportion of poppy cultivation in segment

x_{poppy} = Total poppy area in each segment

$X_{agricultural}$ = Total agricultural area in segment

In order to estimate the total opium poppy in Northern Laos, the following equation was used:

$$\hat{x} = \bar{p} * N$$

\hat{x} = Total area under opium poppy cultivation in Northern Laos

N = Total agricultural area (7 provinces)

The results for the seven provinces were refined by the bootstrap method with 100,000 iterations. Bootstrapping is recommended for cases when the sample observations have different sizes, which was the case of the Northern provinces of Laos, where the total agricultural land was different for each selected segment.

Bootstrapping consist of sampling with replacement form the original sample thousands of iterations of the initial sample, made in this case of the total poppy areas of the selected cell of a province. After performing each iteration, a mean value is estimated and scored. At the end, a distribution of means can be observed, producing a mean estimate and a confidence interval for the mean.

One of the main advantages of the bootstrap method is that it calculates the standard error of the estimator. Especially when, the sample items have different, the standard error cannot be calculated using the standard simple random formulae.

The bootstrap method with 100,000 iterations revealed that there was a 90% probability that opium poppy cultivation area estimated in the helicopter survey was between 904 ha and 2,890 ha, with a mean estimate of 1,816 ha. It should be noted that the upper and lower estimates do not lie symmetrically around the mean estimate obtained from these seven provinces because of the different statistical tools used to arrive at the most accurate estimates