



UNITED NATIONS
Office on Drugs and Crime

LAOS

Opium Survey 2003



June 2003

Abbreviations

GOL	Government of Lao PDR
ICMP	UNODC Illicit Crop Monitoring Programme
LCDC	Lao National Commission for Drug Control and Supervision
NSC	Lao National Statistics Centre
PFU	Programme Facilitation Unit
UNODC	United Nations Office on Drugs and Crime

Acknowledgements

The following organisation and individuals contributed to the implementation of the 2003 opium survey in Lao PDR (Laos) and the preparation of the present report:

Government of Lao PDR:

Lao National Commission for Drug Control and Supervision
National Statistics Centre
National Geographic Department
Ministry of Agriculture and Forestry

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

UNODC:

Shariq Bin Raza, Officer-in-charge, UNODC (Field Office - Laos)
Leik Boonwaat, Programme Facilitation Unit UNODC (Field Office - Laos)
Hakan Demirbuken, Survey data and systems Analyst (ICMP- Research Section)
Denis Destrebecq, Survey technical supervision (ICMP-Research Section)
Giovanni Narciso, Regional Illicit Crop Monitoring Expert (ICMP-Field Office Myanmar)
Thibault le Pichon, Illicit Crop Monitoring Programme Manager (ICMP- Research Section)

The implementation of UNODC's Illicit Crop Monitoring Programme in Southeast Asia and the 2003 Laos Opium survey were made possible thanks to financial support from the Governments of the USA, Japan and Italy.

NOTE: This publication has not been formally edited.

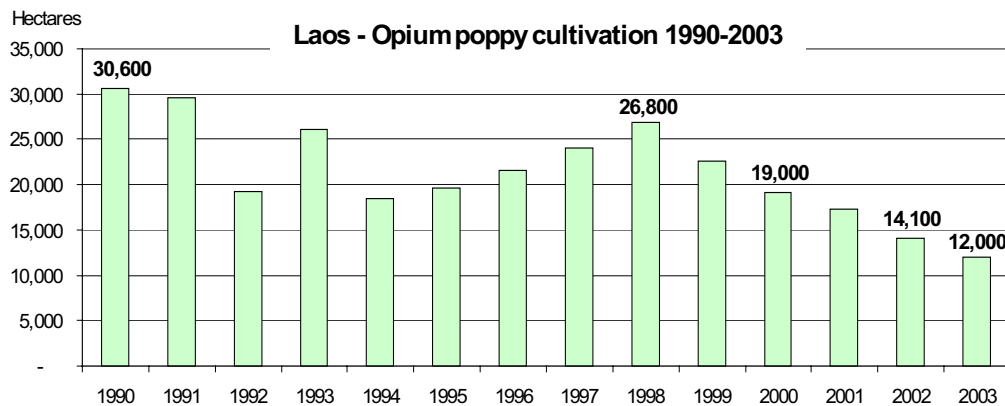
LAOS OPIUM SURVEY 2003

Executive Summary

Although far behind Afghanistan and Myanmar, the remote and mountainous areas of Northern Laos, which border Thailand, Myanmar, China and Vietnam, have consistently come in third place as a source of the world's illicit opium and heroin during the last ten years.

Since 1998, however, opium poppy cultivation has recorded a steady decline in that country. The trend continued in 2003, as shown by the results of the latest UNODC-supported opium survey presented in this report.

Mostly concentrated in the six provinces targeted by the Opium Elimination Programme launched by the Lao Government as a response to the 10-year elimination objective adopted by the UN General Assembly in 1998, opium poppy cultivation is now down to 12,000 hectares (against 14,100 in 2002). Over a one year-period, the decline amounts to 15% and, since 1998, to 55%.



Although their number is declining, an estimated 40,000 households will continue to derive the largest share of their income from the 120 metric tons of opium harvested in 2003. Last year, this only brought them US\$ 88 per family, but it represented 42% of their annual cash income.

Table of Content

1	INTRODUCTION.....	4
2	FINDINGS.....	4
2.1	Opium Poppy Cultivation	4
2.2	Yield and Production.....	7
2.3	Opium Prices and Cash Income	7
2.4	Addiction.....	10
2.5	Field Damage	13
2.6	Voluntary eradication	14
3	METHODOLOGY.....	17
3.1	Organisation and Staff	17
	The Baseline.....	18
	Baseline checking.....	18
	The random sample.....	18
	Data processing.....	20
	Use of satellite images in four districts.....	20
3.2	Opium Poppy Cultivation Estimates	29
3.3	Opium Yield Estimates	30
4	ANNEXES.....	32
 MAPS		
MAP 1	2003 DISTRICT OPIUM POPPY CULTIVATION.....	2
MAP 2	2003 REPORTED OPIUM ADDICTS.....	11
MAP 3	2003 REPORTED VOLUNTARY ERADICATION.....	15
MAP 4	2003 LOCATION OF VILLAGES SAMPLED.....	19

1 Introduction

The objectives of the UNODC's Illicit Crop Monitoring Programme are to establish methodologies for data collection and analysis, to increase governments' 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 eliminate opium poppy cultivation in the Lao PDR by the year 2005. 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, abuse, production and illicit drug trafficking. In March 2001, the Seventh National Party Congress emphasized the national priority to achieve opium elimination by 2005. This was followed by the endorsement in April of the amendment of article 135 of the criminal code that provided for a considerable increase in penalties for drug related offenses. A National Campaign against Drugs was also launched in October 2001 to mobilize and convince the communities to give up opium production

The first government-UN survey to produce comprehensive national estimates took place in 1992. It was based on a inventory of all known opium-producing villages and a ground survey of a sample of opium producing villages. Similar surveys were conducted in 1996, 1998 and then annually since 2000.

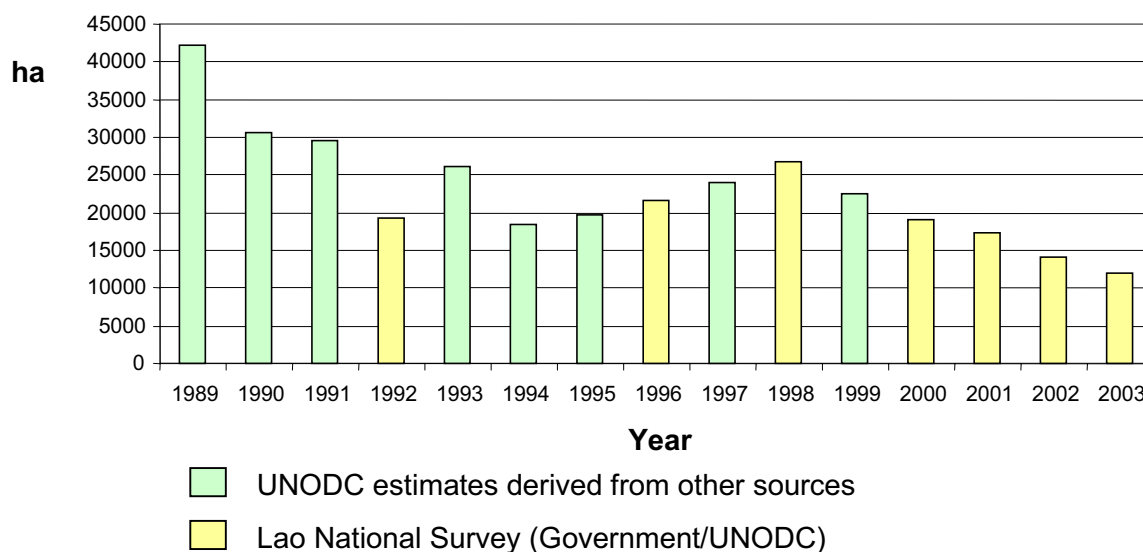
In Laos, the information provided by the surveys is used for planning and monitoring the impact of interventions under the programme "Balanced Approach to Opium Elimination in the Lao PDR".

2 Findings

2.1 *Opium Poppy Cultivation*

At the country level, the survey estimated that there were 12,000 hectares of opium poppy under cultivation in 2003. It was the lowest national estimate since 1989 and represented a reduction of 2,100 hectares (or 15%) compared with the 2001-2002 season (14,100 ha). It confirmed the downward trend of opium poppy cultivation in Laos since 1998 when the cultivation of opium poppy reached 26,800 hectares.

Figure 1: Estimated National Area Under Opium Poppy Cultivation, 1989-2002



This year's decrease in the area under poppy cultivation is due to the significant reduction in the average number of households and villages reported growing opium poppy. On average, 18 households were reported growing opium poppy in the sampled villages, compared to 23 last year, and the district authorities reported 1,537 villages growing opium poppy, that is 73 villages (or 5%) less than the 1,610 villages in 2002.

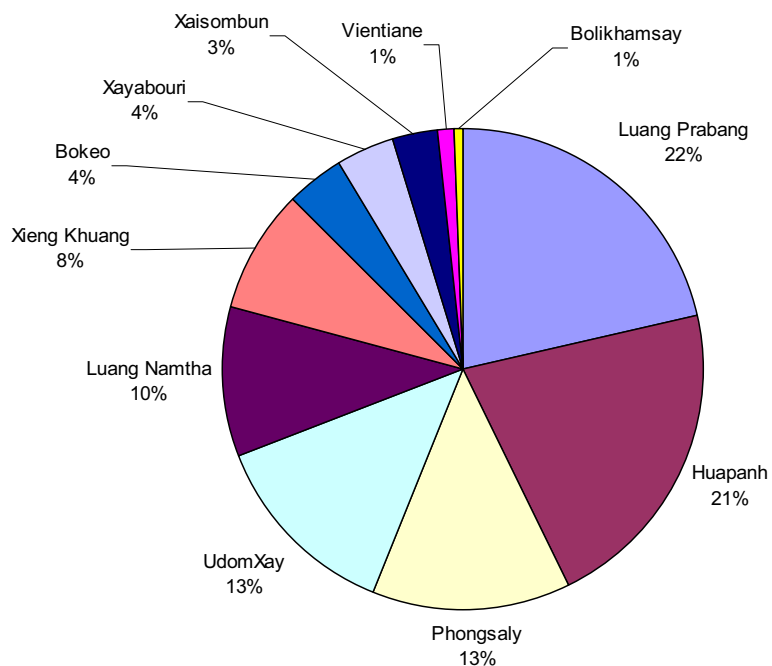
Table 1: Evolution of the area under opium poppy cultivation by province

	1992	1996	1998	2000	2001	2002	2003
Luang Prabang	3,510	3,550	2,786	3,036	2,950	3,400	2,576
Huapanh	3,770	3,817	3,450	3,921	2,903	2,934	2,530
Phongsaly	2,840	3,558	5,778	3,872	3,278	1,703	1,602
UdomXay	1,860	2,416	5,597	4,061	3,112	1,901	1,579
Luang Namtha	1,730	2,197	3,593	1,514	1,687	1,355	1,197
Xieng Khuang	2,880	2,916	2,902	1,376	1,426	1,078	979
Bokeo	620	785	428	448	427	332	480
Xayabouri	400	754	1,014	508	729	857	472
Xaisombun	N/a	n/a	n/a	224	521**	240	354
Vientiane	880*	900*	672*	19	117**	210	130
Bolikhamstay	700	708	617	73	105	42	74
Total	19,190	21,601	26,837	19,052	17,255	14,052	11,973
Rounded Total	19,200	21,600	26,800	19,100	17,300	14,100	12,000

* Includes Xaisombun

** Previously within Xaisombun, the districts of Hom and Longxan are part of Vientiane Province since 2001.

Figure 2: 2003 Opium Poppy Cultivation in Laos: Distribution by Province



The largest decreases in areas under opium poppy cultivation occurred within the six provinces targeted by the Opium Elimination Programme, down 15.4% as compared with last year, whereas in the other provinces, the area decreased by 10.1%. The survey confirmed that cultivation still mainly took place in the six target provinces that accounted for 87% of the total area under cultivation.

The first opium producing province, Luang Prabang, recorded the most significant decrease in opium poppy cultivation within the six provinces targeted by the Opium Elimination Programme, down 24%, from 3,400 ha in 2002 to 2,600 ha in 2003. Cultivation increased in three provinces accounting for 8% of the 2003 total opium poppy cultivation: Bokeo (+45%), Xaisombun (+114%) and Bolikhamsay (+32%). The national opium poppy cultivation estimate broken down by district, is in annex. The map illustrating the estimated district area is presented on page 2.

The Lao government declared six districts opium poppy free in 2003, namely:

- In Luang Namtha province, Nalae district;
- In Udomxay province, Nga, Beng and Pakbeng districts;
- In Luang Prabang province, Chomphet district;
- In Bolikhamsay province, Viengthong district.

The ground survey was not designed to verify if these districts were totally free of opium poppy cultivation in 2003, but in the absence of contradicting evidence, these districts were considered as free of opium poppy in the establishment of the national estimates.

2.2 Yield and Production

The average national opium yield (potential) was estimated to range between 6 and 14 kg/ha, with a mean value of 10 kg/ha. This potential yield may differ from the actual harvest, and does not include possible post-harvest losses, like, for example, opium gum washed away by the rain before being harvested.

The data collected this year revealed a larger capsule volume per square meter (193 cm³/m²) than usual, but a somewhat lower average number of capsules per square meter (18 capsules) than in previous years.

Table 2: Number of capsules and capsule volume since 2001

Year	n	Avg. number of capsules per m ²	Avg. volume cm ³ /m ²	Avg. sample yield kg/ha
2001	591	19	139	8
2002	692	20	143	8
2003	473	18	193	10

Data was not systematically collected on this year's weather conditions, but there were reports of increased rainfalls during the 2003 opium poppy season that could account for the large capsule volume and higher yield recorded this year.

Table 3: Comparison of opium yields in Afghanistan, Myanmar and Laos

	2000	2001	2002	2003
Afghanistan	40	24	46	*
Myanmar	10	10	10	*
Laos	9	8	8	10

* not yet available at the time of reporting

Based on the estimated 12,000 ha of opium poppy cultivation and an average yield of 6 to 14 kg/ha, the potential production of opium in Laos would range between 72 and 168 metric tons, with a mean value of 120 metric tons. In terms of potential opium production, this represented an increase of 7% compared to last year.

Table 4: Potential Opium Production since 1992 (in metric tons)

	1992	1996	1998	2000	2001	2002	2003
Opium production	128	140	123	167	134	112	120

2.3 Opium Prices and Cash Income

As the opium surveys take place during or just before the opium harvest, the opium prices collected in 2003 referred to the 2002 opium season.

The weighted average farmgate price for one kilogram of opium in 2002 was about 1,600,000 KIP or US\$160 (at the average 2002 exchange rate of 10,166 KIP/US\$). This represented an increase of 26 % compared to the price in Kip of April 2001 (1,267,000 KIP, or 149 US\$/kg at the exchange rate of 8,484 KIP/US\$) collected during the 2002 opium survey and representing the 2001 opium price estimate. The price increase in 2002 is in line with the decline of 16% decrease in potential opium production recorded between 2001 and 2002.

Farmgate price comparisons between 2002 and 2003 were not yet possible at the time of reporting. However, recent retail opium prices collected by UNODC Drug Demand Reduction activities suggested that opium prices were further increasing in 2003. In Nonghet district (Xieng Khouang province), the retail price of opium in April 2003 was reported to have reached 2,600,000 KIP/kg (or 242 US\$/kg). It represented an increase of 176 % compared to last year's retail price in the same district of 900,000 KIP/kg (or 88 US\$/kg at the 2002 average exchange rate of 10,166 KIP/kg). As of 2003, opium was also reported to be more often than in previous years mixed with other ingredients. The lower opium quality had a price of 1,300,000 KIP/kg (or 121 US\$/kg), or 38% higher than in 2002, in Nonghet district¹. The opium price increase reflected the scarcity of opium in that district.

During the 2003 opium survey, opium prices were collected for four periods of 2002, with the highest price corresponding to the beginning of the year, when opium from the 2001 season was still traded.

Table 5: 2002 opium prices

Period	Equivalent months range	Answers	Average weight of opium sold (kg)	KIP/kg	US\$/kg
During harvest	Jan-Mar 2002	46	0.64	1,781,855	186
Just after harvest	Apr-May 2002	310	0.98	1,568,448	163
Rainy Season	Jun-Sep 2002	97	1.50	1,660,996	160
Dry Season	Oct-Dec 2002	85	1.22	1,583,858	146
For 2002		538		1,600,000*	160

* Average weighted by number of answers and average weight of opium sold for each period.

The data also revealed that 52% of the opium for sale was sold just after the harvest, roughly between April and May 2002. Most of the opium (52%) was sold to village outsiders within the village, whereas only 5% of the opium was reported to be sold on the market place. However, it should be noted that 32% of the answers did not specify the place of sale ("Other"). This pattern did not change throughout the year.

Table 6: Opium customers and opium selling places

Place of sale	In number of answers		In percent of total	
	Customers		Customers	
	Villagers	Outsiders	Villagers	Outsiders
Village	72	309	12%	52%
Market	0	30	0%	5%
Other	0	189	0%	32%
Total answers	600		12%	88%

Through interviews and recollection of the distribution of opium from the 2002 season, the farmers indicated that, on average, they harvested 1.15 kg of opium in 2002. Half of this quantity was sold for cash, corresponding to an annual farmer's cash income from opium of 931,000 KIP (equivalent to 92 US\$ at the average exchange rate for 2002 of 10,166

¹ For 2002 prices: Kham Noan Hsam, Community based treatment and rehabilitation as part of drug demand reduction in on-going UNODC projects in the Northern provinces of Lao PDR, part one, April 2002.

For 2003 prices: Kham Noan Hsam, informal communication and mission report.

KIP/US\$). The farmers reported to keep 37% of the harvested opium for their own use, and to barter 7%.

Table 7: Use of opium

Use of Opium	Average weight (kg)	% of Total Weight	Number of Answers
Sold during harvest	0.03	3%	50
Sold just after harvest	0.30	26%	312
Sold during rainy season	0.14	12%	99
Sold during dry season	0.10	9%	85
Sold before the harvest	0.01	1%	11
Barter	0.08	7%	312
For own use	0.43	37%	616
Left	0.06	5%	124
Total	1.15		1,609

Sample size: 1,015 interviews of opium farmers

It is worth noting that, unlike in Afghanistan where the phenomenon is widespread, only 1% of the farmers received cash advances for their opium before the harvest, as a mean of credit.

In a separate set of questions, the opium farmers also provided information on their various sources of cash income. The average cash income from opium of 88 US\$/year calculated on the basis of their answers, is very close to the derived estimation of 92 US\$/year mentioned above. The analysis also revealed that opium was the first source of cash income for opium farmers and accounted for 42% of their total cash income. The sale of animals, representing 34% of the cash income, only came second. All the other sources of income combined amounted to 23% of the total annual cash income.

Table 8: Annual source of cash income for opium farmers

Source of Cash Income	Annual cash income (in Kip)	% of total income	Number of answers	Annual income (in US\$)
Paddy	36,130	1.7%	37	4
Upland	121,721	5.8%	180	12
Animal	716,480	34.2%	633	70
Vegetable	74,614	3.6%	374	7
Opium	889,885	42.4%	535	88
Labor	75,300	3.6%	209	7
Trade	22,111	1.1%	39	2
Wood	101,284	4.8%	292	10
Non Timber Forest Products	32,546	1.6%	99	3
Other	26,477	1.3%	75	3
Total	2,096,548	100%		206

Sample size: 1,142 interviews of opium farmers

Based on an average of 0.29 ha of opium poppy cultivation by household (results of the sample ground survey), there would be between 35,000 and 45,000 households cultivating opium poppy in Laos in 2003 (mean of 40,000).

2.4 Addiction

The total number of addicts reported by the provincial and district authorities was estimated at about 30,000 persons, of which 5,600 women (or 19 %) and 9,700 over 60 year old (or 32%).

This year's estimate represented a 43% decrease in the total number of addict in the 11 northern provinces (from 53,000 opium addicts in 2002). It should be noted however that the survey methodologies were different (on a sample basis in 2002, on a village census basis organised by the provincial and district authorities in 2003) and that six districts were not included in the estimates in 2003 (in Xayabouri province, Parklai, Kenethao, Botene and Thongmyxay districts; in Bolikhamsay province, Pakxanh and Thaphabath districts). Unlike previous year's estimate, the data reported by the provincial and district authorities was not checked by international staff. The breakdown by districts of the reported numbers of opium addicts is presented in annex.

Table 9: Number of opium addicts since 2000-2003

2000	2001	2002	2003
63,000	58,000	53,000	30,000

In terms of number of addicts, the six provinces accounting for 87% of opium poppy cultivation also accounted for 85% of the total number of addicts. The ranking is however different as can be seen in the table below:

Table 10: Number of addicts by province

Province	Number of addicts
Luang Prabang	5,513
Huapanh	5,368
Phongsaly	5,362
Xieng Khuang	3,158
UdomXay	3,012
Luang Namtha	2,859
Vientiane	1,356
Xayabouri	1,301
Bokeo	793
Bolikhamsay	552
Xaisombun	516
	29,790

Data on addiction was also collected during the sample ground survey. In 2003, the size of the sample of addicts interviewed was significantly smaller than in previous year. In 2003, data were collected from 678 opium addicts, against 4,464 addicts in 2002. The reason was that, in 2003, the sample survey endeavoured to collect data on opium quantity used and frequency of use by gender and age, rather than recording the number of addicts in the sampled villages as in previous years' surveys.

The 2003 data showed that the distribution by gender remained similar to the distribution observed in previous years: 78% of the opium addicts were male (81% in 2002) and 22% were female (10% in 2002). This ratio was also in line with the results obtained through the LCDC 2003 census survey on addiction that also showed a female opium addicts ratio of 19%.

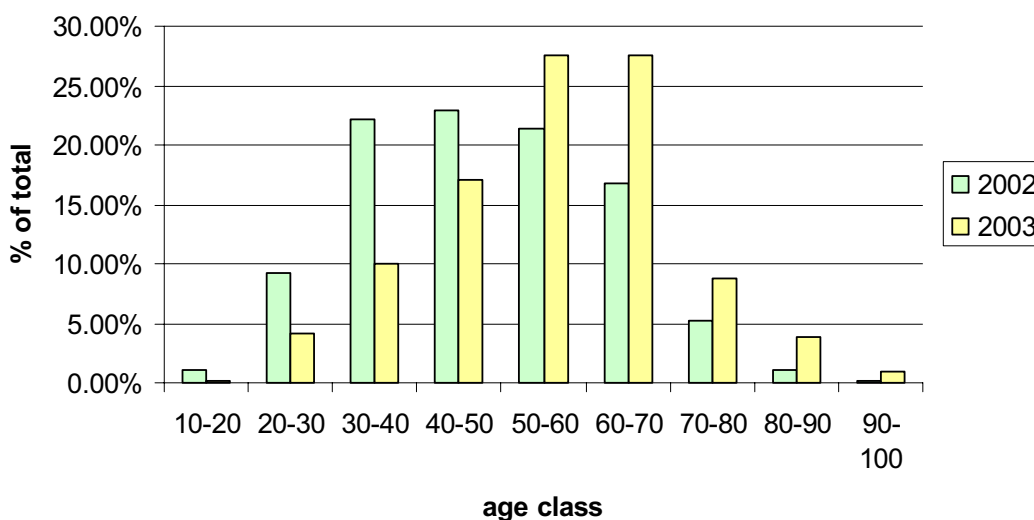
The frequency distribution by age classes showed that the highest number of addicts was found among people between 50-60 (27%) and 60-70 (27%). Together, these two age classes accounted for 54% of the opium addicts. By contrast, in 2001 and 2002 opium surveys, most addicts were found in the 40-50 age class (22%). This would indicate that the reduction in the total number of addicts was mainly in the 40-50 age class. The frequency of opium addicts in the age class 30-40 also decreased significantly.

The mean age for a male addict was 57 years old (compared to 49 years old in 2002) while the mean age for a female addict was 60 years old (compared to 53 years old in 2002). The table and figure below show the demographic distribution of addict by age and gender.

Table 14. Demographic Distribution of Opium Addicts by 10-Year Age Class and Gender

Age	2003				2002	2001
	Male	Female	Total	% of Total	% of Total	% of Total
10-20	1	0	1	0.1%	1.14%	1.20%
20-30	22	6	28	4.1%	9.23%	10.85%
30-40	56	12	68	10.0%	22.13%	21.90%
40-50	93	23	116	17.1%	22.85%	23.27%
50-60	146	41	187	27.6%	21.46%	22.53%
60-70	149	38	187	27.6%	16.71%	14.52%
70-80	44	15	59	8.7%	5.17%	4.57%
80-90	13	13	26	3.9%	1.05%	0.90%
90-100	4	2	6	0.9%	0.22%	0.27%
Total	528	150	678			
%	78%	22%	100%	100%	100%	100%

Figure 3: Demographic Distribution of Opium Addiction by Age



According to data collected in 2003 on the opium quantity used by daily opium users, the average annual opium consumption per opium addict would range between 1.3 and 1.5 kg/year, with a mean value of 1.4 kg/year. The data was collected from 620 male and female daily opium users.

A small gender difference was found: 138 female daily opium users reported consuming on average 1.2 kg/year, while 482 male addicts reported an average of 1.4 kg/year.

With an estimated 30,000 opium addicts in the country, the annual domestic consumption would therefore range between 39 to 45 tons, with a mean estimate of 42 tons of opium (about one-third of the national production).

For both males and females, the overwhelming frequency of opium use (93%) was on a daily basis.

Table 11: Frequency of opium use by gender (in number of addicts within the sample)

Frequency	Female	Male	Total	% of total
Less than once a month	6	16	22	3%
Once a month	3	8	11	2%
Once a week	5	7	12	2%
Every day	138	482	620	93%
Total	152	513	665	100%

2.5 Field Damage

Of the 1,317 fields that were measured, farmers reported some form of damage for 630 of them (or 47%). The cause of damage most often reported by farmers in 2003 was "agreed or voluntary eradication", placing the weather only in second position. Poor weather conditions had been reported as the main cause of damage in previous opium surveys

(for example, 71% in the 2002 opium survey). The main reasons for damage as stated by the farmers can be grouped as follows:

Table 12: Damage to opium poppy crop grouped by cause

	Animal	Voluntary eradication	Weather	Other	Total
Answers	80	332	144	74	630
% of total	13%	53%	23%	12%	

A closer analysis of the weather conditions revealed that 63% of the farmers complained about the heavy rains. Although abundant rainfalls will normally trigger a higher potential yield (as illustrated by this year's results), excessive rainfalls can flood the fields and rot the plants. Excessive rains at harvest time will tend to wash the gum away from the capsule and prevent its harvest.

Table 13: Weather damage to opium poppy crop

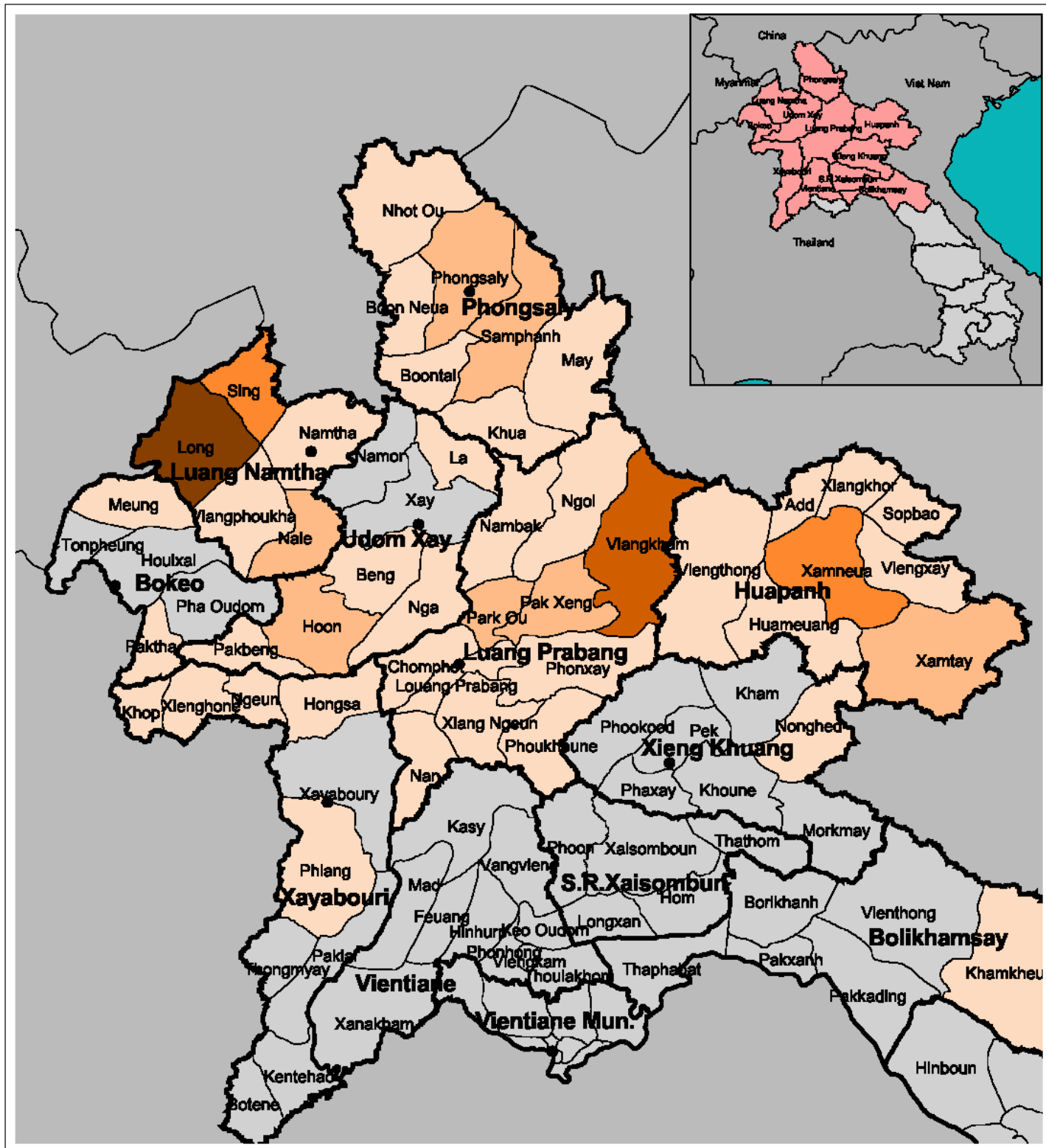
	Too much rain	Rain at harvest	Lack of rain	Other	Total
Answers	90	7	38	9	144
% of total	63%	5%	26%	6%	

2.6 Voluntary eradication

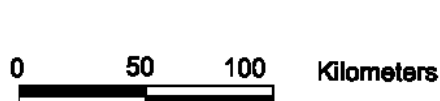
For the first time this year, the Lao Government launched a large-scale campaign of voluntary or agreed eradication. The opium survey was not designed to monitor or validate the results of this campaign. However, the data on eradication, as reported by LCDC are presented on the following map and the breakdown by district can be found in annex.

Prior to the opium planting time, the provincial and district drug control committees made agreements with a number of opium farmers to stop growing opium poppy in 2003. The validity of the agreement was checked during the opium growing season. When opium poppy cultivation was found within the village boundaries and considered a breach of the agreement, the farmers were asked by the authorities to eradicate their opium poppy fields (voluntary eradication), or the farmers to give permission for the opium fields to be eradicated (agreed eradication).

Map Northern Laos 2003 Reported Voluntary Eradication (by district)

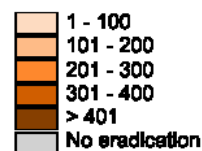


Note: administrative borders are approximate and only used for opium survey purposes



Province
District

2003 reported eradication (ha)



Sources: LCDC

The eradication teams were made of students and staff from the district mass organisations like the Youth Union, the Women Union or other district departments. The military and the police were not involved in these operations.



Voluntary and agreed eradication of opium poppy cultivation, Nonghet district, Xieng Khouang province, January 2003.

If the farmers refused the eradication, the assistance of the village headman was requested to convince the farmers to respect the agreement and to not plant opium poppy in the future. The data on eradication, as reported by the Lao Government, is presented in annex.

3 Methodology

The main objective of the survey was to provide information on the extent and location of opium poppy cultivation, on the potential opium yield - from which the potential production can be estimated -, as well as on opium farm gate prices and addiction rate.

The main component of the 2003 opium survey was a ground-based survey carried out in a sample of villages in the 10 northern provinces of Lao PDR and the Xaysombun Special Region. As there is no evidence of poppy cultivation in the southern provinces of the country, they are not covered by the opium surveys.

A random sample of 460 villages was surveyed. The sample was selected based on previous year's district information regarding opium poppy cultivation in each of the villages in the survey area. The sample represented 14% of the total opium-poppy growing villages (1,537) and 5% of the non-opium-growing villages (4,525). From district to district, the sample size varied somewhat depending upon the availability of human resources during the narrow opium poppy harvesting season (from mid-January till mid-March).

In addition to the sample ground survey, a pilot exercise was launched to identify opium poppy cultivation from satellite images and to crosscheck the results of the ground survey. The exercise covered a sample of four districts (Khua and Samphanh districts in Phongsaly province, Nambak district in Luang Prabang province and Xay district in Udomxay province).

3.1 Organisation and Staff

The survey was initiated and supervised by the Lao National Commission for Drug Control and Supervision (LCDSC), through the Programme Facilitation Unit. The National Statistics Centre implemented it, in close collaboration with the provincial and district authorities. UNODC's Illicit Crop Monitoring Programme provided technical support throughout the survey.

48 teams, composed of 3 staff each, were recruited from the provincial administration and the National Statistics Centre and participated in a one-week training organised in January 2003 in Vientiane and in Oudomxay. The training covered the survey process, interview techniques, content and use of questionnaires, field and capsule measurement techniques, as well as the method to randomly select opium farmers. The training also incorporated a one-day field practice. In the field, the surveyors could also rely on an instruction manual that described all steps of the survey in Lao language, including the interviews, the field measurements and the random sampling methods.

After the training, the surveyors were assigned the districts to survey and were provided with baseline forms, as well as survey forms and equipment. After introducing the purpose of the survey to the district authorities, the surveyors were instructed to fill-in the district baseline forms where each village was classified as "Opium Growing" or "Non Opium Growing".

The surveyors were accompanied in their fieldwork by 2 district technicians to facilitate the location of the villages and to introduce the survey to the village headmen.

At the village level, the village headman was interviewed to fill-in the first part of the survey form. This included data on the village population and ethnicity, and establishing a list of households cultivating opium. The list of households cultivating opium poppy was then used to draw a random sample of opium farmers to be interviewed. After the survey, this list of households was left with the village headman. The field measurements took place after the opium farmers' interviews. All the fields of the interviewed farmers were measured.

Table 14: 2003 Survey Meta-Data

2003 National Opium Survey	
Provinces	11
Districts	82
Villages	6,062
Villages surveyed	460
Opium farmers interviewed	1,252
Opium fields for area measurement	1,316
Opium fields for yield measurement	473
Capsules measured	15,676
Survey teams	48
Total persons (4 persons/team)	192
Field activities started	15/01/03
Field activities ended	15/03/03

The Baseline

The baseline questionnaires were referenced with the official codes and village names provided by the National Statistics Centre. The surveyors, upon arrival in the district, presented the baseline questionnaires to the district authorities.

The questionnaires were filled with basic information for every village on: village demography, opium growing status and estimated number of households growing opium poppy.

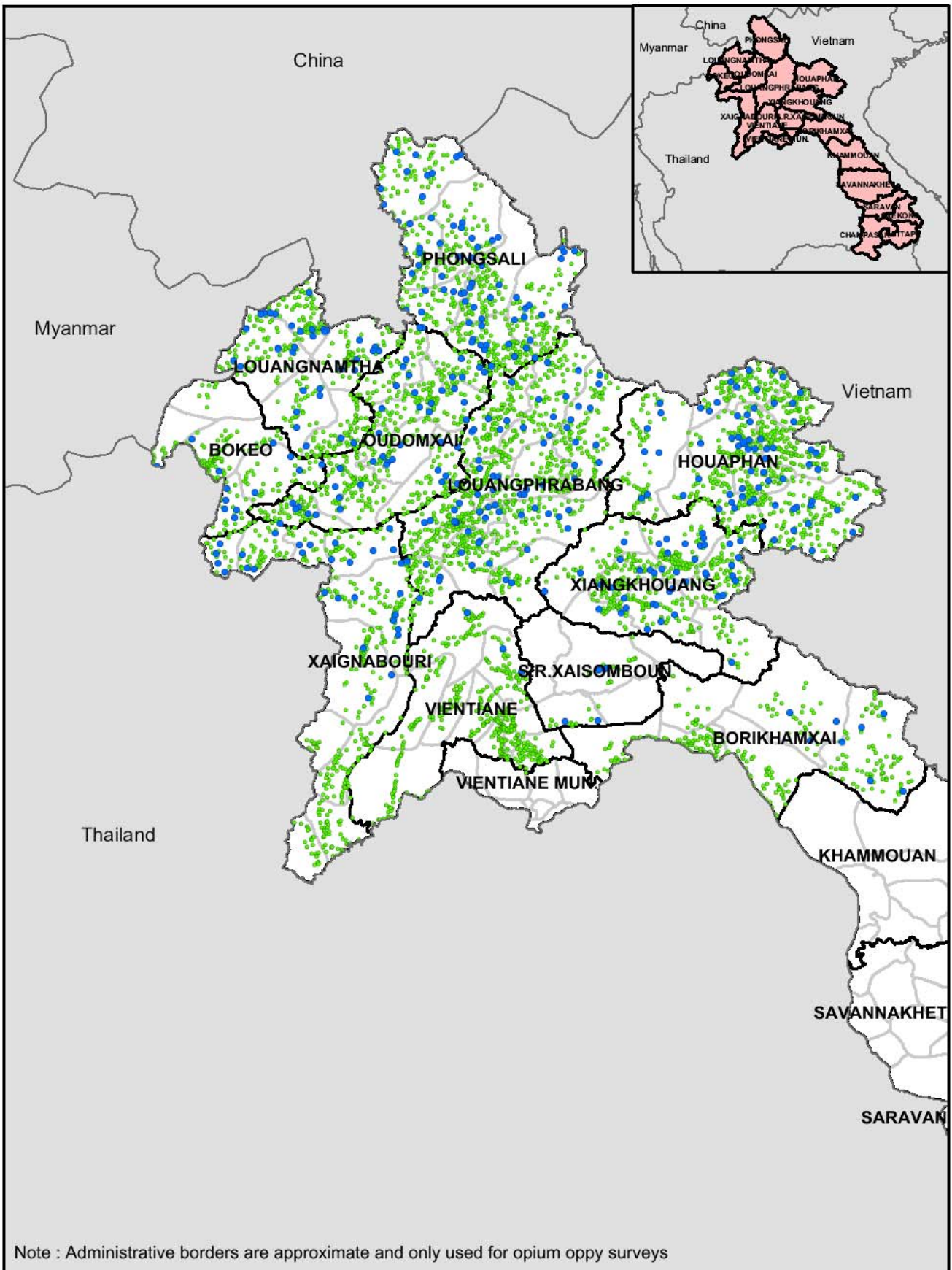
Baseline checking

For the provinces of Phongsaly, Huaphanh and the district of Nonghet (Xieng Khouang province), the baseline data provided by the districts authorities were analysed in February 2003, before the end of the opium poppy growing season. UNODC project staff were then sent to a random sample of 25 villages in those two provinces and district to verify the accuracy of the districts' reporting.

The random sample

A total of 460 villages were surveyed, out of the 6,062 villages considered for the survey, i.e. about 8% of the villages in northern Laos. A distinction was made between opium growing and non-opium growing villages. The number of villages growing and non-growing to survey by district was based on last year's survey results. The sample broke down as follows: 214 villages growing opium poppy (out of 1,534 reported villages growing by the district authorities, or 13%); 246 villages not growing opium poppy (out of 4,527 reported not growing by the district authorities, or 5%). The location of the villages sampled is presented on the map on the next page.

Map
Northern Laos
2003 Opium Survey, Location of villages sampled



- Sampled Villages
- 2003 Base Line Survey



Sources : LCDC-UNODC/ICMP

UNODC
 ILLICIT CROP MONITORING PROGRAM

Interviews and Field Measurements

The data was collected through interviews with key informants and physical measurement of the opium fields. The interviews were structured according to the questionnaire and consisted of the following 3 parts: village headman's interview; opium growing farmers' interview and fields' measurement. The questionnaires are presented in annex.

The Village headman Interview

The main purpose of the village headman interview was to obtain direct information on the current village demography and the number of households growing opium poppy. This information was then used to crosscheck or to complement the data provided by the district authorities. The village geographical co-ordinates were recorded with GPS² instruments.

The Opium Growing Farmers Interview

From the village headman's list of households, a table of random numbers was used to draw a random sample of farmers growing opium poppy. 6 to 10 farmers were interviewed in each village, depending on the total number of farmers growing opium poppy in the village considered. The main purpose of this interview was to collect data on the number of opium poppy fields cultivated by each farmer and on opium farmgate prices.

The Field Measurement

Once the farmer's interview was completed, the opium farmer led the surveyors to the opium fields. A number of data were gathered directly from the surveyor's inspection of the field, as well as through additional questions to the farmer regarding the field being surveyed. The surveyors measured the opium fields, using the same equipment³ and method as for the Lao Agricultural Census (98/99). All the fields cultivated by the farmers were measured. When the opium fields were mature, i.e. when the plants were ready for harvest or being harvested, the surveyors also measured the capsule diameter and height. The data was used for estimated the yield.

Data processing

The database and the data entry programme were designed in MS Access by UNODC and installed on the computers of the National Statistic Centre. 5 technicians from the National Statistic Centre entered the data. The data entry lasted one month (total of 6 men-months) and was supervised and checked by the UNODC's International Survey Supervisor. The analysis of the data took place at the National Statistics Centre in collaboration with UNODC staff.

Use of satellite images in four districts

The remote sensing exercise to estimate opium poppy cultivation in four districts was initially planned to be based on the exclusive use of multispectral four-meter resolution images from the Space Imaging's sensor IKONOS™. Images of two different dates covering the same area (multi-temporal approach) were to be acquired to provide the means to identify poppy fields. However, due to a persistent cloud cover over the area of

² Global Positioning System

³ Calculators, compasses and measuring tapes obtained from the National Statistics Center

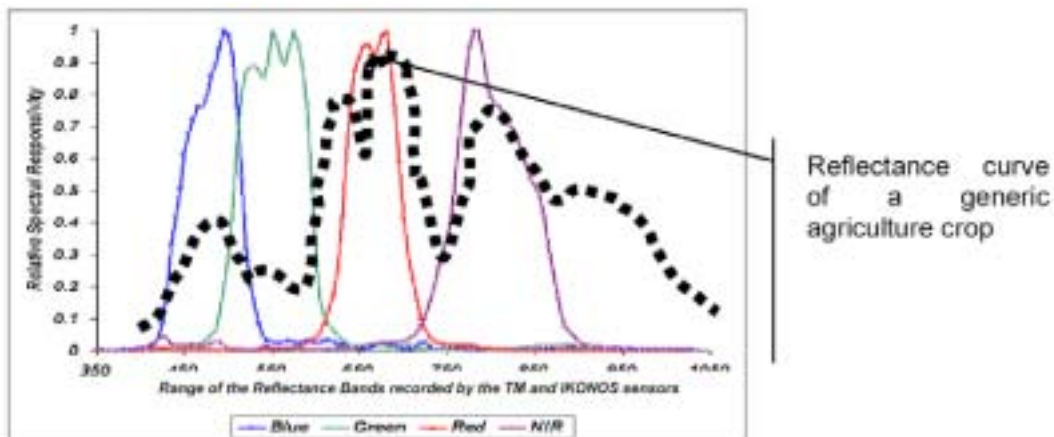
interest during the period of interest, IKONOS images could only be acquired on one date (25 February 2003).

Given the difficulty of effectively identifying poppy fields with single dated images, it was decided to pursue the multi-temporal approach by resorting to the use of images from the Landsat7 Enhanced Thematic Mapper™ (TM7) sensor, acquired in December 2002. The IKONOS and the Landsat7 TM sensors, differ from each other in terms of technical characteristics. The data provided by Landsat7 TM has 3 ground spatial resolutions⁴. The highest is the panchromatic band (band 8) at 15 meters. The visible and near-infrared bands (1-5 and 7) all have 30*30 meter pixel⁵ sizes. The satellite flies a polar, sun-synchronous, orbit and covers the same geographic area, on average, every 16 days. The IKONOS collects black and white (panchromatic) images with 1-meter resolution and multi-spectral imagery with 4-meter resolution, covering the same geography every 3 days.

Table 15: Spectral characteristics of the satellite sensors used in the survey

Sensor	Bands	Spectral Range (mm)	Ground Resolution (pixel size, m*m)	Area Covered (Km*Km)
Space Imaging IKONOS	Panchromatic (Band 5)	0.45 - 0.90	1*1	10*10
	Multi-spectral (Bands 1-4)	0.45 - 0.52 (Blue) 0.51 - 0.60 (Green) 0.63 - 0.70 (Red) 0.76 - 0.85 (Near-Infrared)	4*4	
Landsat 7 TM7	Panchromatic (Band 8)	0.5 - 0.90	15*15	185*185
	Multi-spectral (Bands 1-4)	0.45 - 0.52 (Blue) 0.52 - 0.60 (Green) 0.63 - 0.69 (Red) 0.76 - 0.90 (Near-Infrared)	29 * 29	
	Near infrared (Bands 5-7)	1.55 - 1.75 2.08 - 2.35		

Figure 4: Spectral characteristics of the satellite sensors⁶



⁴ Spatial resolution is the resolving power of an instrument needed for the discrimination of features and is based on detector size, focal length, and sensor altitude

⁵ Pixel: Minimum resolution unit of a satellite image

⁶ Source: www.spaceimaging.com/products/ikonos/spectral.htm

As can be deduced from the above figure, agricultural crops and vegetation in general, reflect or absorb light within specific spectral bands. The use of separate bands gives the possibility to identify land cover types and even discriminate crops by playing on the differences in the specific reflectance curve shape. The capability of these sensors to discriminate ground features gives the possibility to “classify” or associate a specific combination of band reflectance⁷ values to specific land cover classes. In our case, opium poppy fields and any other type of land cover that can be associated or surround these (e.g. forest, fallow, bare soil, ploughed land, etc.).

The criterion that has been adopted for the selection of the images is to have a multi-temporal coverage of the interest area so as to investigate at least two distinct moments in the agricultural cycle of poppy cultivation. Fields are usually ploughed and prepared for seeding between November and December while “lancing”⁸ and harvest takes place between late February and March. At the end of March the crop is generally dry and the fields are cleaned up and prepared for summer crops.

The sequence of images that was used in the 2002-2003 remote sensing survey was Landsat-TM7 for the November–December period and IKONOS for the February-March period.

Table 16: Satellite images used for the poppy cultivation estimate in Laos

Sensor	Bands	Images acquired	Frames	Date of Acquisition
<i>Landsat 7</i> TM7	8	2	129-45 129-46	10/10/02
<i>Space Imaging</i> IKONOS	4 MS	2	<i>Samphan, Khoa</i>	25/02/03
	4+1 (MS + Panchromatic)	2	<i>Xai, Nambak</i>	25/02/03

The classification process of an image relies on what is defined as “spectral signature of the crop”. The use of these “spectral signatures” however, is in most cases, not conclusive, especially given the size of poppy fields (0.1 Ha) and in the particular environmental conditions in Northern Laos. The use of images in two distinct periods of the cycle of opium poppy improves the identification of the crop by introducing “time” and the logical sequence of cultivation events as a further variable for evaluation.

⁷ Reflectance is the ratio of incident light upon a surface which is “reflected” in the visual spectrum.

⁸ Lancing: The process of extracting the opium latex from the incised poppy capsule.

Figure 5: Location of the selected images IKONOS and Landsat TM7 in Northern Laos

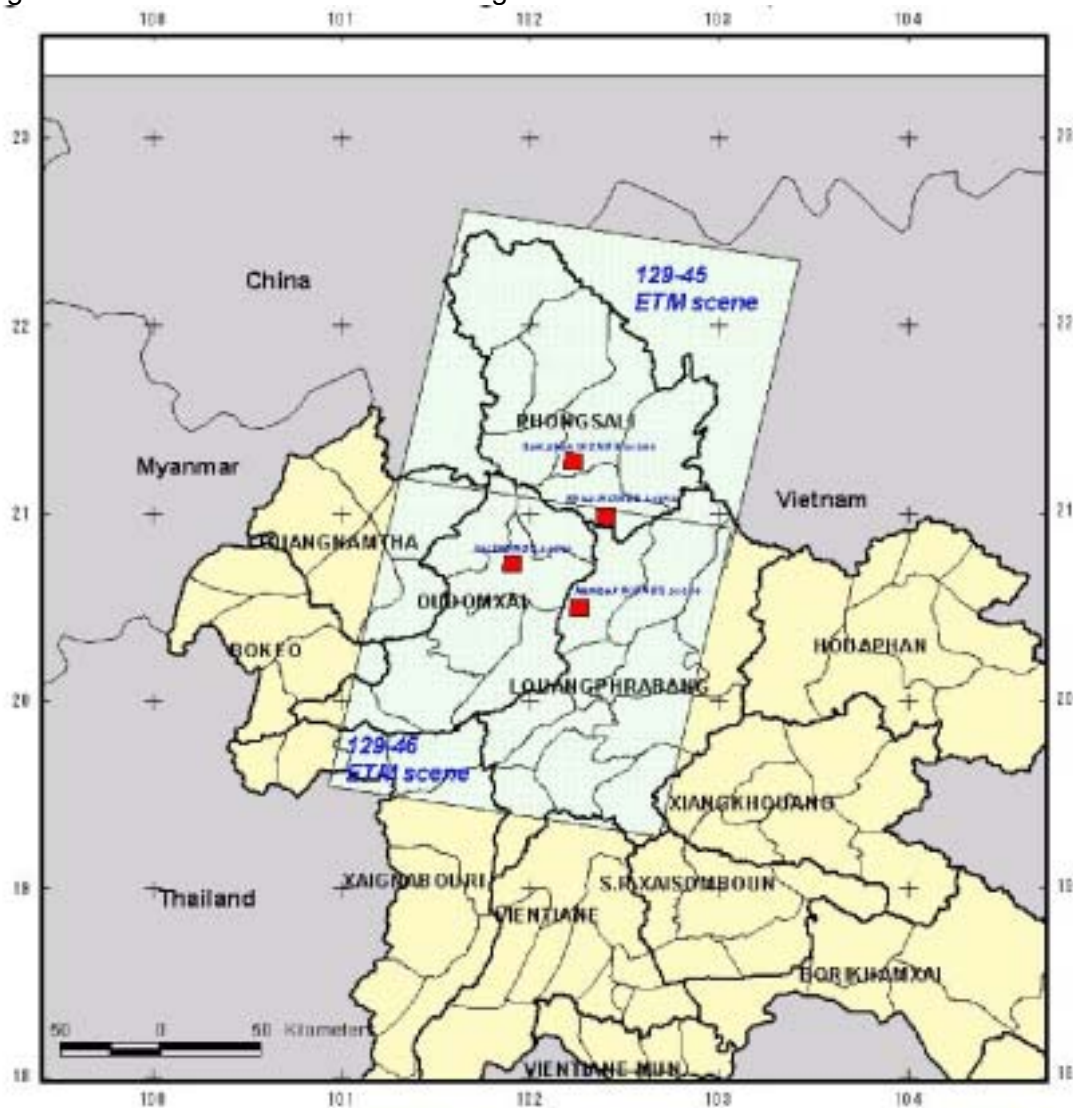
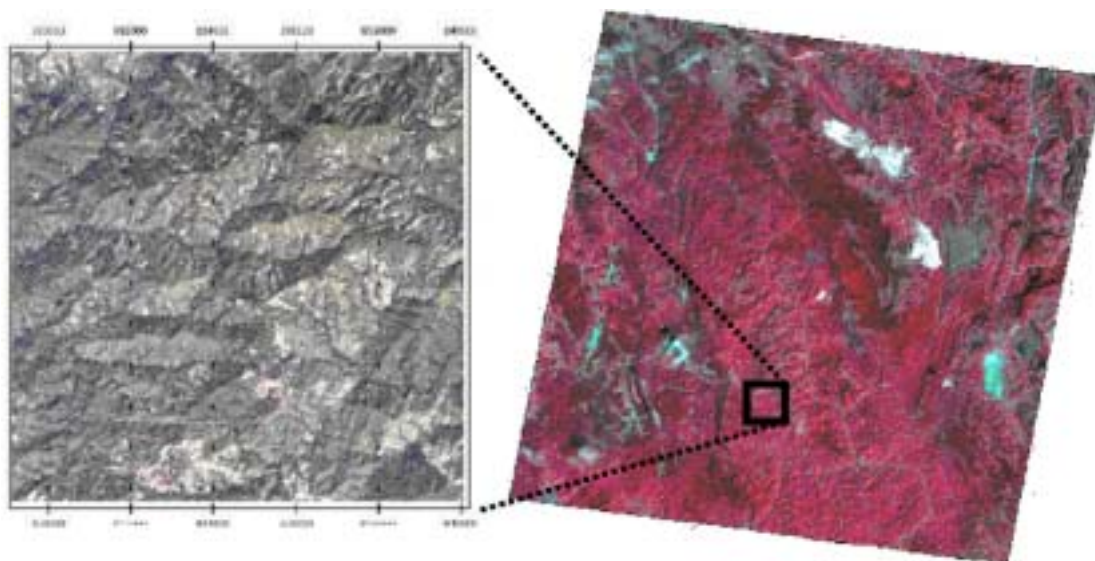


Figure 6: Example of IKONOS Scene - Samphan District- 25/02/2003 (left) and of the Landsat TM7 Scene 129-45, 10/10/2002 (right)



Processing and analysis of the images:

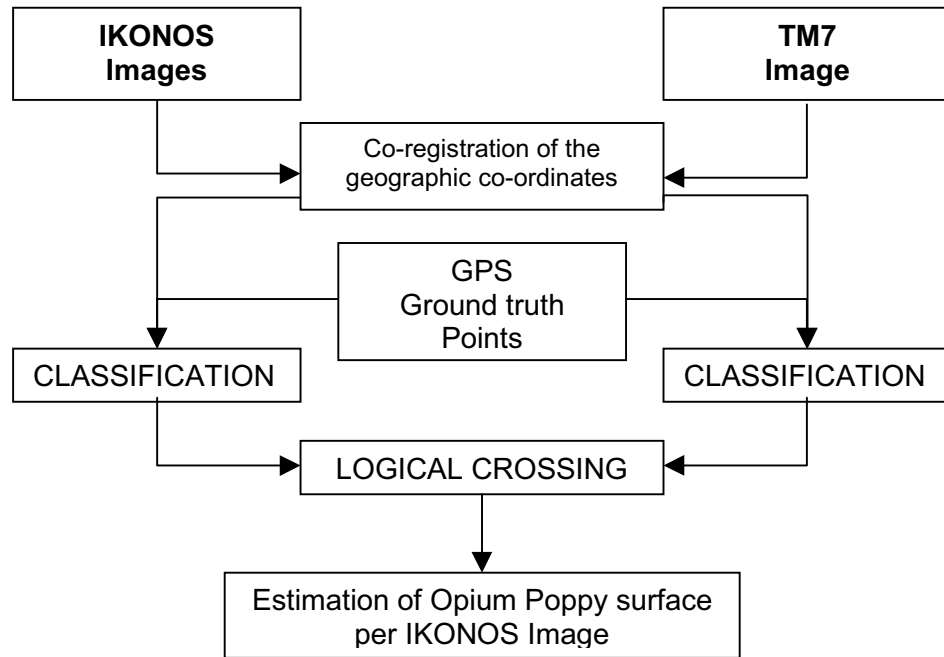
The processing of the remote sensing data followed a specific procedure, as illustrated in the figure below and briefly described here:

- Co-registration of the two dates: As a first step, the IKONOS and Landsat7 TM images were co-registered to the same geographic reference grid, in order to have a full and undistorted overlay of the images.
- Creation of "sub-sets" of the Landsat7 TM scene: The portions of the 2 Landsat7 TM scenes (path 129- row 45 and path 129- row 46) corresponding to the areas covered by the IKONOS scenes were cut out (sub-setting) in order to create multi-temporal pairs of the same areas where to perform the supervised classifications.
- Independent supervised classification of the two dates: The four pairs of Landsat7 TM and IKONOS images, acquired at different dates were independently classified.

The interpretation was guided by the presence of "ground truth" points collected by surveyors in the course of their ground campaign and associated with GPS measurements (supervised classification). This ground truthing was carried out by a team of 4 people and took place from February 10 to March 4 in the Provinces of Luangphabang, Oudomxai and Phongsaly. A total of 28 ground-truth points were spotted and geo-located by GPS.

The land use classes for which there were no ground truth points were interpreted on the basis of the experience of the image analyst performing the classification.

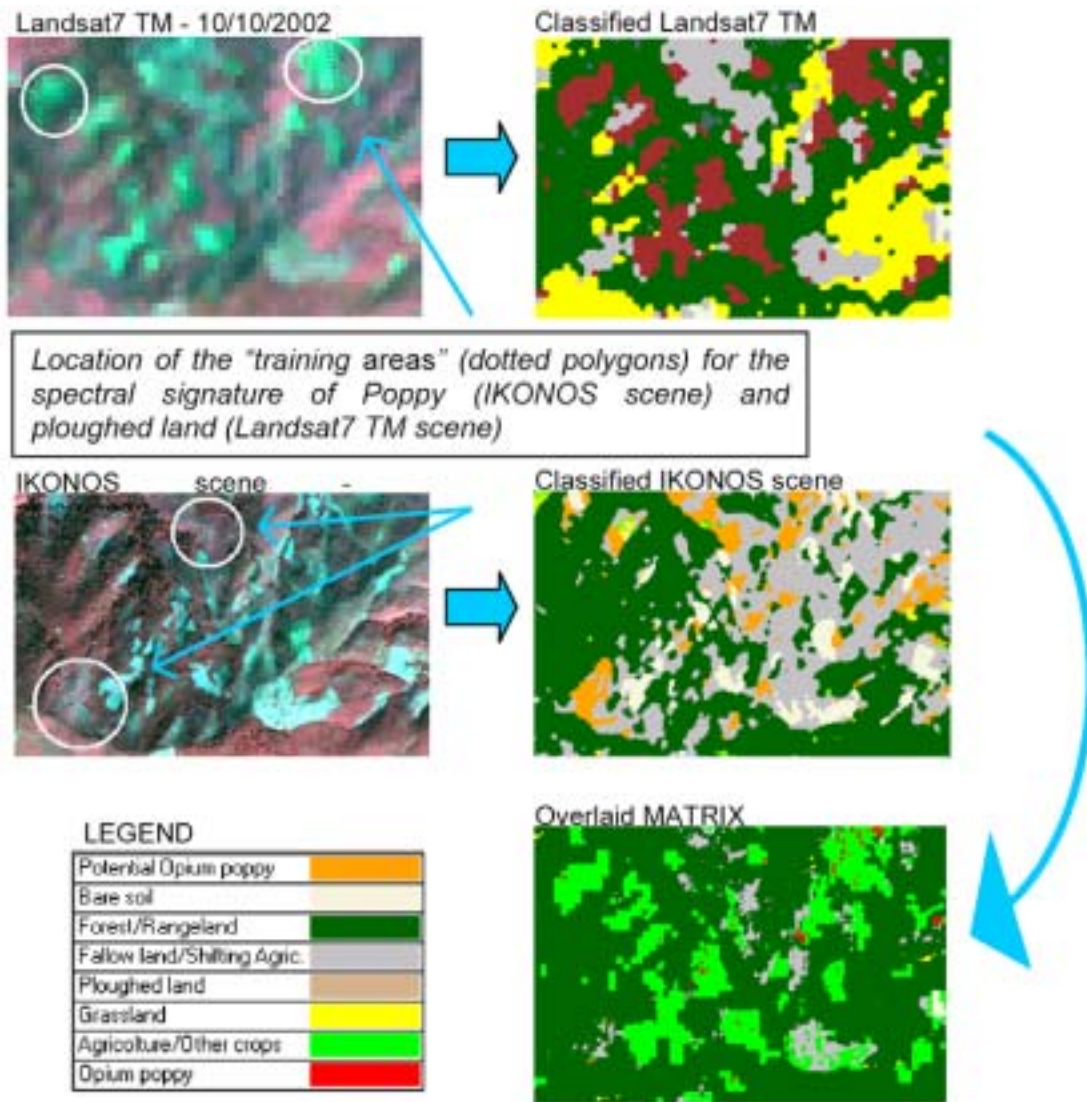
Figure 7: Procedure Flow Chart



- Multi-temporal analysis: This step consisted in a series of processing of the classified images in a GIS environment. The classified Landsat7 TM scene from October 2002 was overlaid to the classified IKONOS scenes from February so as to maintain the information of the originals. In the resulting new image, defined as “Matrix”, the specific combination of classes of the two original images was analysed, pair by pair, in a matrix (hence the definition) to define the re-coding criteria for the new image.

The guiding criteria in interpreting these pairs was that the most probable identification for a poppy field was the association of a surface classified as ploughed in the October and then as poppy in February. Any ‘forest’ or ‘fallow’ or ‘grassland’ surface changing to poppy is most probably a classification mistake due to spectral confusion and is consequently recoded to either ‘generic agriculture’ or ‘rangeland’. Similarly any “changing situation” of ‘bare soil’ to ‘fallow’, ‘forest’ or ‘grassland’, clearly defines human activity and consequently is recoded to ‘agriculture’.

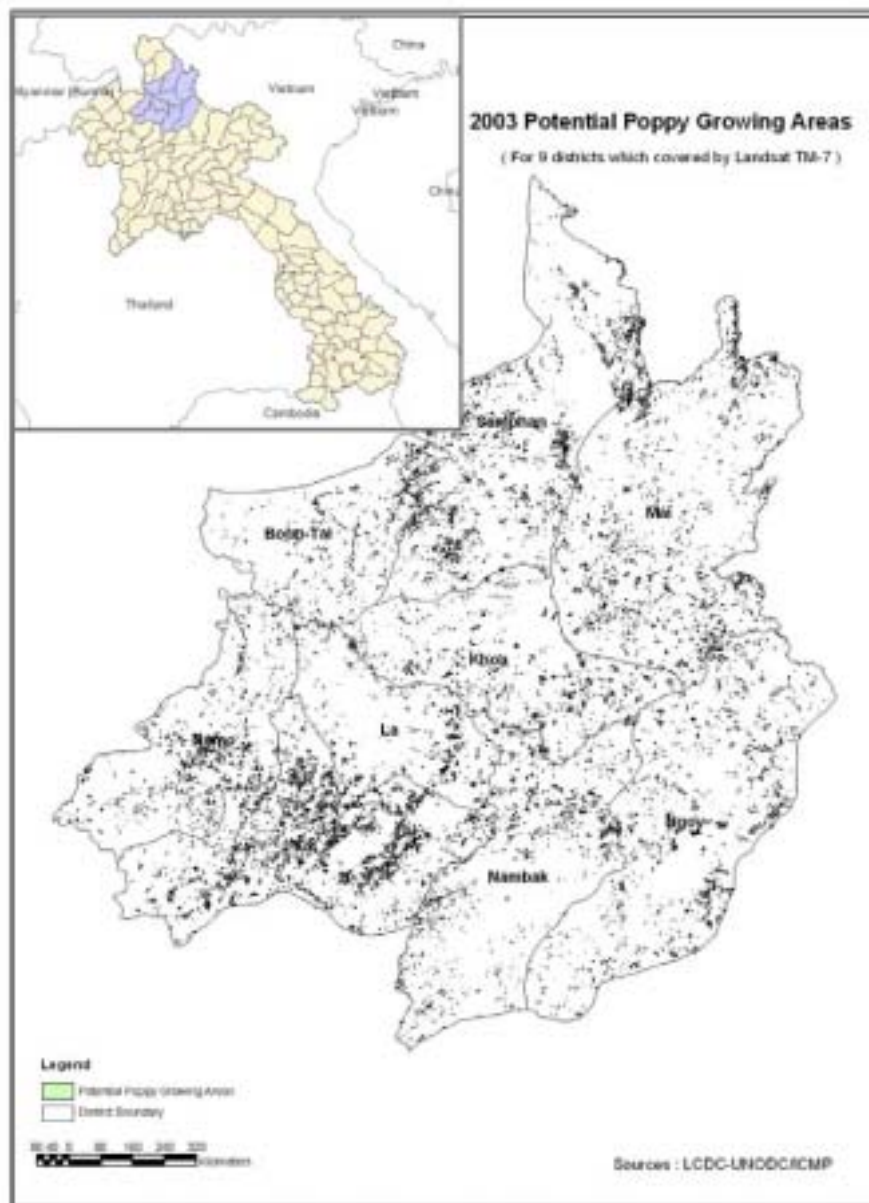
Figure 8: Classification process of the same area on Landsat TM7 (above) and IKONOS (below) and generation o the Matrix image



Estimation Procedure

Besides the subsets used in the multi-temporal analysis, the complete Landsat7 TM scenes were classified in order to identify 2 classes: 'Bare soil' and 'Ploughed land'. The surface of these two classes, detected in the mountainous areas of Northern Laos, in October, before the winter season, can be considered as potential opium poppy growing area (PPA), with the second class (Ploughed land) being the one with the highest potential. 'Bare soil' and 'Ploughed land' can therefore be considered as making up a stratum, within which poppy cultivation can be estimated. This stratification from the two Landsat7 TM scenes was cut on the district administrative boundaries and referred to 9 districts.

Figure 9: Stratification map of Potential Poppy Growing Areas (PPA) of 9 administrative districts of Northern Laos derived from Landsat TM7



Note : Administrative Boundaries are approximate and only used for opium survey purposes.

The IKONOS scenes obtained fell however within just 4 districts: Khoa, Samphan, Nambak, and Xai and only for these it was possible to carry out a statistical estimation. The area covered by the IKONOS scene can be considered as a surface sample of the district in which it falls with a specific sampling ratio.

Table 17: Sampling ratio for the 4 Districts estimated by means of satellite remote Sensing

District	Potential Poppy Area in the district (Ha) (N)	Potential Poppy Area in the IKONOS Scene (Ha) (Nh)	Sampling ratio
Khoa	2,920	174	6.0%
Samphan	6,322	550	8.7%
Nambak	2,859	75	2.6%
Xai	10,497	478	4.6%

The poppy area resulting from the classification of each IKONOS image, was referred as poppy area over “Potential Poppy Area” per scene according to the following formulas:

$$\bar{p}_{st} = \frac{n_p}{N_h}$$

Where:

N_h = Potential poppy area in the IKONOS scene

n_p = Poppy area (derived from the classification) in the IKONOS scene

The poppy area over potential poppy area of the IKONOS scene was then extrapolated to the potential poppy area of the entire district (derived from the Landsat7 classification) as follow:

$$\hat{X} = N * \bar{p}_{st}$$

\hat{X} = Area estimated in the district

Where:

N = Potential poppy area in the District

The standard error was obtained as follow:

$$S_{\bar{p}_{st}} = \sqrt{\left(\frac{N - Nh}{N}\right) * \left(\frac{\bar{p}(1 - \bar{p})}{n - 1}\right)}$$

Where:

$S_{\bar{p}_{st}}$ = Standard Error of the estimate

Nh = Potential poppy area in the IKONOS scene

$\bar{p} = 1 - \bar{p}_{st}$;

The 95% confidence interval is given by the formula $\bar{p}_{st} \mp 2s_{\bar{p}_{st}}$

The results are presented below.

Table 18: Opium poppy planted area estimates for the 4 Districts estimated by means of satellite remote sensing

Province	District	Classified poppy area ⁹ (Ha) (np)	Ratio of poppy area over PPA (Ha)	Poppy area (Ha) (X)	LC ¹⁰	UCI ¹¹
Phongsaly	Khoa	14	8%	238	210	267
Phongsaly	Samphan	21	4%	241	211	270
Laungprabang	Nambak	5	7%	194	168	221
Oudomxai	Xai	23	5%	496	454	538

3.2 Opium Poppy Cultivation Estimates

As in previous surveys, the main approach for estimating the 2003 poppy cultivation was the extrapolation of the sample ground survey results to the district baseline data. However, the Lao Government has increased its efforts against opium poppy cultivation and the pace of change in the cultivation pattern has accelerated in the past few years. As a result, the accuracy of the information reported by the district authorities to establish the baseline has clearly started to show a problematic level of inaccuracy that will call for significant adjustments in the survey methodology in future years. At this stage, an attempt was made to mitigate the effects of these reporting inaccuracies by introducing two cross-checking mechanisms.

1) Analysis of satellite imagery

In four districts, the results of the satellite survey were compared with the results of the ground survey. It showed that the estimate from the satellite survey was 68 % higher than the estimate from the ground survey. The use of satellite imagery presents the advantage of an objective approach, as opposed to the more subjective quality of the information reported by district authorities and villagers.

Table 19: Comparison of results for ground survey and satellite survey

Province	District	Ground survey results	Satellite survey results
Phongsaly	Khua	125	238
Phongsaly	Samphanh	175	241
Udom Xay	Xay	290	496
Luang Prabang	Nambak	104	194
Total		694	1,196

The corresponding correction factor applied to the ground survey results provided an estimate of 13,600 ha of opium poppy cultivation for the country.

2) Verification of the district baseline

Accuracy of the baseline data was checked in the sample of 460 villages visited by the surveyors. Out of the 206 villages reported growing opium by the district authorities, 43 villages were found not growing by the surveyors, and out of the 229 villages reported not

⁹ Within the IKONOS scene

¹⁰ Lower limit of estimation within the confidence interval

¹¹ Upper limit of estimation within the confidence interval

growing opium poppy by the district authorities, 40 villages were found growing it. In addition, UNODC project staff visited another 25 randomly selected villages. Out of 9 villages reported growing, 4 villages were found not growing and out of 16 villages reported not growing, 14 were found growing opium poppy.

The two district baseline checks combined showed that 22% of the villages reported by the district authorities as not growing opium poppy were actually growing it, while 22% of the villages reported as growing opium poppy by the districts were found to be not growing it. The correction factors were then applied to the entire district baseline. 22% (or 818 villages) of the 3,716 villages located in opium-growing districts and initially reported as not growing opium were reclassified as growing opium, and 22% (or 338 villages) of the 1,534 villages initially reported as growing opium as not growing it.

Based on this year's average of 5.3 ha of opium poppy cultivation per village, 4,300 ha (848 villages x 5.3 ha) were therefore added and 1,800 ha (338 villages x 5.3 ha) subtracted from the ground survey results. The correction produced an estimate of 10,600 ha of opium poppy cultivation at the country level.

Country estimates

An average of the two results mentioned above gave an approximate value of 12,000 ha of opium poppy cultivation in Laos in 2003. Although the national estimate established in this manner cannot be considered to be as reliable as in previous years, it was used as the best available estimate for opium poppy cultivation in Laos in 2003. The national estimate was then broken down by district at a pro rata of the ground survey findings.

Voluntary eradication

For the first time this year, the Lao Government launched a voluntary eradication campaign. The opium survey was not designed to monitor the eradication, which took place prior, during and after the survey work, depending on the area considered. It was therefore decided not to take into account the eradication results in the establishment of the 2003 estimates. The methodology of future national opium surveys will be redesigned to integrate this factor.

3.3 Opium Yield Estimates

Field procedures used to collect data (number, height and diameter of poppy capsules) to estimate opium gum yield are based on the "Guidelines for Yield Assessment of Opium Gum and Coca Leaf from Brief Field Visits"¹² prepared by UNODC. These guidelines were the outcome of a Consultative Meeting on Methodologies for Yield Assessment of Illicit Narcotic Crops, held in Vienna from 30 October to 3 November 2000, to which Laos was represented. The guidelines provide for practical field procedures and for options to calculate yield from capsule volume using different formulae.

Opium gum yield for Laos in 2003 was calculated using a linear correlation between capsule volume per square metre (cm³/m²) and oven dry gum yield (kg/ha):

$$Y = 1.89 + 0.0412 \cdot VC$$

where Y = dry gum weight (kg/ha)

VC = projected mature capsule volume per square metre (cm³/m²)

¹² ST/NAR/33, United Nations, New York, 2001.

In 2003, 473 fields were randomly selected and surveyed. Yield estimates were calculated at the square metre-plot level, based on the above formula, and extrapolated at the field level, and then at the national level. Yields at field level are simple averages of the figures for individual square-metre plots (five per field). From the average field's yield, the field production was calculated. The sum of the sample fields' production divided by the sum of the sample fields' area gave the sample national yield.

While it may be convenient to use an existing formula, it should be understood that any correlation formula should preferably be tested to establish whether it is fully applicable to the local conditions. This has yet to be done in Laos.

4 Annexes

Annex 1 2003 Opium poppy cultivation

Annex 2 2003 Reported number of opium addicts

Annex 3 2003 Reported eradication

Annex 2
2003 Opium poppy cultivation by district

P	Province	D	District	Total villages	Villages Surveyed	Villages growing	Opium poppy area 2003 (ha)	Opium poppy area 2002 (ha)	Opium poppy area 2001 (ha)
02	Phongsaly	01	Phongsaly	93	13	29	257	318	378
02	Phongsaly	02	May	96	12	36	319	213	429
02	Phongsaly	03	Khua	119	12	25	184	207	487
02	Phongsaly	04	Samphanh	89	10	35	258	387	706
02	Phongsaly	05	Boon Neua	68	9	9	80	120	361
02	Phongsaly	06	Nhot Ou	92	12	39	345	327	614
02	Phongsaly	07	Boontai	57	8	18	159	131	303
				614	76	191	1,602	1,703	3,278
03	Luang Namtha	01	Namtha	79	7	17	201	207	450
03	Luang Namtha	02	Sing	104	10	48	283	289	490
03	Luang Namtha	03	Long	93	11	43	571	661	594
03	Luang Namtha	04	Viengphoukha	47	5	12	142	149	113
03	Luang Namtha	05	Nalae	95	4	6	-	50	40
				418	37	126	1,197	1,355	1,687
04	UdomXay	01	Xay	149	9	29	428	369	454
04	UdomXay	02	La	63	8	9	133	279	481
04	UdomXay	03	Namor	100	12	37	546	369	801
04	UdomXay	04	Nga	97	8	15	-	189	254
04	UdomXay	05	Beng	76	8	12	-	153	254
04	UdomXay	06	Hoon	168	12	32	472	306	508
04	UdomXay	07	Pakbeng	78	6	14	-	234	361
				731	63	148	1,579	1,901	3,112
05	Bokeo	01	Huoixai	133	4	4	65	38	76
05	Bokeo	02	Tonpheung	60	4	4	65	38	38
05	Bokeo	03	Meung	26	0	3	49	38	38
05	Bokeo	04	Pha Oudom	98	7	6	97	57	76
05	Bokeo	05	Paktha	48	9	15	155	142	180
05	Bokeo	06	Special Region	14	2	3	49	19	19
				379	26	35	480	332	427
06	Luang Prabang	01	Luang Prabang	122	7	8	118	173	182
06	Luang Prabang	02	Xieng Ngeun	86	6	17	251	275	243
06	Luang Prabang	03	Nan	64	4	7	103	100	76
06	Luang Prabang	04	Park Ou	68	6	14	207	268	228
06	Luang Prabang	05	Nambak	107	6	26	153	329	304
06	Luang Prabang	06	Ngoi	118	8	43	578	520	456
06	Luang Prabang	07	Pak Xeng	89	6	13	192	179	122
06	Luang Prabang	08	Phonxay	72	4	16	236	403	380
06	Luang Prabang	09	Chomphet	70	6	16	-	299	259
06	Luang Prabang	10	Viengkham	118	9	36	531	457	259
06	Luang Prabang	11	Phoukhoun	49	4	14	207	397	441
				963	66	210	2,576	3,400	2,950
07	Huapanh	01	Xamneua	153	17	87	513	816	292
07	Huapanh	02	Xiengkhor	66	4	17	100	162	153
07	Huapanh	03	Viengthong	84	8	64	378	291	425
07	Huapanh	04	Viengxay	133	9	32	189	307	258
07	Huapanh	05	Huameuang	89	10	23	170	412	585
07	Huapanh	06	Xamtay	184	13	155	915	622	870
07	Huapanh	07	Sopbao	75	4	27	159	162	139
07	Huapanh	08	Add	79	8	18	106	162	181
				863	73	423	2,530	2,934	2,903

Annex 2
2003 Opium poppy cultivation by district

P	Province	D	District	Total villages	Villages Surveyed	Villages growing	Opium poppy area 2003 (ha)	Opium poppy area 2002 (ha)	Opium poppy area 2001 (ha)
08	Xayabouri	01	Xayabury	117	8	24	142	257	187
08	Xayabouri	02	Khop	36	5	14	83	103	107
08	Xayabouri	03	Hongsa	59	5	7	41	197	133
08	Xayabouri	04	Ngeun	29	3	12	71	103	98
08	Xayabouri	05	Xienghone	63	7	13	77	120	133
08	Xayabouri	06	Phiang	60	4	10	59	77	71
08	Xayabouri	07	Parklai	77	0	0	-	-	-
08	Xayabouri	08	Kenethao	58	0	0	-	-	-
08	Xayabouri	09	Botene	32	0	0	-	-	-
08	Xayabouri	10	Thongmyxay	16	0	0	-	-	-
				547	32	80	472	857	729
09	Xieng Khuang	01	Pek	112	7	21	124	164	303
09	Xieng Khuang	02	Kham	115	11	37	218	223	225
09	Xieng Khuang	03	Nonghed	112	13	92	47	138	300
09	Xieng Khuang	04	Khoun	90	11	55	325	256	311
09	Xieng Khuang	05	Morkmay	29	3	23	136	151	179
09	Xieng Khuang	06	Phookood	42	5	12	71	79	62
09	Xieng Khuang	07	Phaxay	37	3	10	59	66	47
				537	53	250	979	1,078	1,426
10	Vientiane	01	Phonhong	80	0	0	-	-	-
10	Vientiane	02	Thoulakhom	74	0	0	-	-	-
10	Vientiane	03	Keo Oudom	31	0	0	-	-	-
10	Vientiane	04	Kasy	57	3	0	-	-	-
10	Vientiane	05	Vangvieng	75	2	0	-	-	-
10	Vientiane	06	Feuang	62	0	0	-	-	-
10	Vientiane	07	Xanakharm	51	0	0	-	-	-
10	Vientiane	08	Mad	41	0	0	-	-	-
10	Vientiane	09	Viengkam	18	0	0	-	-	-
10	Vientiane	10	Hinhurp	48	0	0	-	-	-
10	Vientiane	11	Hom	13	3	10	59	100	72
10	Vientiane	12	Longxan	37	5	12	71	110	45
				587	13	22	130	210	117
11	Bolikhamsay	01	Pakxanh	59	0	0	-	-	-
11	Bolikhamsay	02	Thaphabath	33	0	0	-	-	-
11	Bolikhamsay	03	Pakkading	51	0	0	-	-	-
11	Bolikhamsay	04	Bolikhanh	42	1	0	-	-	-
11	Bolikhamsay	05	Khamkheuth	110	7	10	74	-	80
11	Bolikhamsay	06	Viengthong	38	2	13	-	42	25
				333	10	23	74	42	105
18	Xaisombun	01	Saysomboun	33	5	22	59	40	270
18	Xaisombun	02	Thathom	30	3	0	-	-	135
18	Xaisombun	03	Phoon	27	3	4	295	200	116
				90	11	26	354	240	521
			Country Level	6,062	460	1,534	12,000	14,100	17,300

Annex 3
2003 reported number of opium addicts

P	Province	D	District	Total	Female	elder
02	Phongsaly	01	Phongsaly	662	158	317
02	Phongsaly	02	May	1,055	211	423
02	Phongsaly	03	Khua	337	58	113
02	Phongsaly	04	Samphanh	1,296	318	651
02	Phongsaly	05	Boon Neua	268	39	174
02	Phongsaly	06	Nhot Ou	1,338	407	649
02	Phongsaly	07	Boontai	406	69	237
				5,362	1,260	2,564
03	Luang Namtha	01	Namtha	766	157	182
03	Luang Namtha	02	Sing	592	35	23
03	Luang Namtha	03	Long	1,206	156	462
03	Luang Namtha	04	Viengphoukha	323	63	29
03	Luang Namtha	05	Nalae	9	1	2
				2,896	412	698
04	UdomXay	01	Xay	466	95	187
04	UdomXay	02	La	480	64	123
04	UdomXay	03	Namor	535	123	138
04	UdomXay	04	Nga	443	82	99
04	UdomXay	05	Beng	341	67	130
04	UdomXay	06	Hoon	434	76	78
04	UdomXay	07	Pakbeng	313	20	55
				3,012	527	810
05	Bokeo	01	Huoxai	9	-	5
05	Bokeo	02	Tonpheung	53	16	28
05	Bokeo	03	Meung	194	46	30
05	Bokeo	04	Pha Oudom	295	40	61
05	Bokeo	05	Paktha	195	33	62
05	Bokeo	06	Special Region	47	8	15
				793	143	201
06	Luang Prabang	01	Luang Prabang	105	18	21
06	Luang Prabang	02	Xieng Ngeun	400	68	62
06	Luang Prabang	03	Nan	292	38	65
06	Luang Prabang	04	Park Ou	266	32	53
06	Luang Prabang	05	Nambak	710	99	122
06	Luang Prabang	06	Ngoi	683	81	157
06	Luang Prabang	07	Pak Xeng	472	72	78
06	Luang Prabang	08	Phonxay	965	72	144
06	Luang Prabang	09	Chomphet	260	47	61
06	Luang Prabang	10	Viengkham	920	64	128
06	Luang Prabang	11	Phoukhoun	440	43	141
				5,513	634	1,032
07	Huapanh	01	Xamneua	1,041	218	364
07	Huapanh	02	Xiengkhor	251	71	107
07	Huapanh	03	Viengthong	518	83	119
07	Huapanh	04	Viengxay	400	63	100
07	Huapanh	05	Huameuang	830	213	355
07	Huapanh	06	Xamtay	1,609	273	498
07	Huapanh	07	Sopbao	527	129	85
07	Huapanh	08	Add	192	33	27
				5,368	1,083	1,655

Annex 3
2003 reported number of opium addicts

P	Province	D	District	Total	Female	elder
08	Xayabouri	01	Xayabury	96	16	22
08	Xayabouri	02	Khop	238	53	97
08	Xayabouri	03	Hongsa	153	26	58
08	Xayabouri	04	Ngeun	275	68	93
08	Xayabouri	05	Xienghone	352	88	70
08	Xayabouri	06	Phiang	187	41	23
08	Xayabouri	07	Parklai			
08	Xayabouri	08	Kenethao			
08	Xayabouri	09	Botene			
08	Xayabouri	10	Thongmyxay			
				1,301	292	363
09	Xieng Khuang	01	Pek	396	72	197
09	Xieng Khuang	02	Kham	534	154	310
09	Xieng Khuang	03	Nonghed	1,162	336	623
09	Xieng Khuang	04	Khoune	598	144	238
09	Xieng Khuang	05	Morkmay	228	40	131
09	Xieng Khuang	06	Phookood	135	34	26
09	Xieng Khuang	07	Phaxay	105	20	71
				3,158	800	1,596
10	Vientiane	01	Phonhong	220	74	51
10	Vientiane	02	Thoulakhom	91	21	20
10	Vientiane	03	Keo Oudom	20	5	19
10	Vientiane	04	Kasy	66	8	20
10	Vientiane	05	Vangvieng	113	22	34
10	Vientiane	06	Feuang	267	48	52
10	Vientiane	07	Xanakharm	29	3	14
10	Vientiane	08	Mad	40	2	13
10	Vientiane	09	Viengkam	3	-	3
10	Vientiane	10	Hinhurp	49	13	20
10	Vientiane	11	Hom	112	24	44
10	Vientiane	12	Longxan	346	88	104
				1,356	308	394
11	Bolikhamsay	01	Pakxanh			
11	Bolikhamsay	02	Thaphabath			
11	Bolikhamsay	03	Pakkading	35	6	8
11	Bolikhamsay	04	Bolikhanh	131	15	29
11	Bolikhamsay	05	Khamkheuth	405	69	120
11	Bolikhamsay	06	Viengthong	115	9	26
				686	99	183
18	Xaisombun	01	Saysomboun	426	94	183
18	Xaisombun	02	Thathom	6	1	6
18	Xaisombun	03	Phoon	84	18	26
				516	113	215
			Country Level	29,961	5,671	9,711

Annex 4
2003 reported eradication

P	Province	D	District	Date eradication	Eradication (ha)
02	Phongsaly	01	Phongsaly	2-12 March 03	101
02	Phongsaly	02	May	2-12 March 03	20
02	Phongsaly	03	Khua	2-12 March 03	9
02	Phongsaly	04	Samphanh	24-28 Feb and 2-12 March 03	174
02	Phongsaly	05	Boon Neua	2-12 March 03	19
02	Phongsaly	06	Nhot Ou	2-12 March 03	55
02	Phongsaly	07	Boontai	2-12 March 03	37
					416
03	Luang Namtha	01	Namtha	24-31 Jan 03	38
03	Luang Namtha	02	Sing	27 Dec 02 and 30 Jan 03	275
03	Luang Namtha	03	Long	28 Dec 02 and 30 Jan 03	519
03	Luang Namtha	04	Viengphoukha	3-10 Jan 03	5
03	Luang Namtha	05	Nalae	8-16 Jan 03	168
					1,005
04	UdomXay	01	Xay		
04	UdomXay	02	La	5-19 Feb 03	2
04	UdomXay	03	Namor		
04	UdomXay	04	Nga	22 Jan - 15 Feb 03	79
04	UdomXay	05	Beng	27 Jan - 25 Feb 03	58
04	UdomXay	06	Hoon	28 Jan - 11 Feb 03	199
04	UdomXay	07	Pakbeng	6 -22 Feb 03	91
					428
05	Bokeo	01	Huoixai		
05	Bokeo	02	Tonpheung		
05	Bokeo	03	Meung		4
05	Bokeo	04	Pha Oudom		
05	Bokeo	05	Paktha		54
05	Bokeo	06	Special Region		
					58
06	Luang Prabang	01	Luang Prabang	1 Nov 02 and 12 Feb 03	76
06	Luang Prabang	02	Xieng Ngeun	10 Jan 03 and 1 Feb 03	51
06	Luang Prabang	03	Nan	27 Dec 02 and 08 Jan 03	54
06	Luang Prabang	04	Park Ou	8 Dec 02 and 10 Jan 03	126
06	Luang Prabang	05	Nambak	7 Dec 02 and 6 Feb 03	80
06	Luang Prabang	06	Ngoi	20 Dec 02 and 09 Jan 03	197
06	Luang Prabang	07	Pak Xeng	30 Oct-26 Nov 02 and 10 Jan 03	73
06	Luang Prabang	08	Phonxay	20 Dec 02 and 09 Jan 03	187
06	Luang Prabang	09	Chomphet	14-16 Jan 03 and 18-31 Jan 03	61
06	Luang Prabang	10	Viengkham	25 Jan 03 and 12 Jan 03	320
06	Luang Prabang	11	Phoukhoune	5 Dec 02 and 10 Jan 03	90
					1,315
07	Huapanh	01	Xamneua	1 Jan 03 and 27 Feb 03	278
07	Huapanh	02	Xiengkhor	17 Dec 02 - 13 Feb 03	9
07	Huapanh	03	Viengthong	24 Jan - 5 March 03	47
07	Huapanh	04	Viengxay	5 Jan - 6 March 03	18
07	Huapanh	05	Huameuang	12 Jan - 6 March 03	8
07	Huapanh	06	Xamtay	17 Jan - 3 March 03	170
07	Huapanh	07	Sopbao	18 Jan - 14 March 03	13
07	Huapanh	08	Add	26 Dec 02 - 21 Feb 03	6
					549

Annex 4
2003 reported eradication

P	Province	D	District	Date eradication	Eradication (ha)
08	Xayabouri	01	Xayabury	4-23 Dec 02	104
08	Xayabouri	02	Khop	6-21 Dec 02	78
08	Xayabouri	03	Hongsa	6-15 Dec 02	40
08	Xayabouri	04	Ngeun	6-15 Dec 02 and 20-25 Dec 02	24
08	Xayabouri	05	Xienghone	6-20 Dec 02	52
08	Xayabouri	06	Phiang	6-15 Dec 02	7
08	Xayabouri	07	Parklai		
08	Xayabouri	08	Kenethao		
08	Xayabouri	09	Botene		
08	Xayabouri	10	Thongmyxay		
					305
09	Xieng Khuang	01	Pek		
09	Xieng Khuang	02	Kham		
09	Xieng Khuang	03	Nonghed	December/January - March 03	18
09	Xieng Khuang	04	Khoun		
09	Xieng Khuang	05	Morkmay		
09	Xieng Khuang	06	Phookood		
09	Xieng Khuang	07	Phaxay		
					18
10	Vientiane	01	Phonhong		
10	Vientiane	02	Thoulakhom		
10	Vientiane	03	Keo Oudom		
10	Vientiane	04	Kasy		
10	Vientiane	05	Vangvieng		
10	Vientiane	06	Feuang		
10	Vientiane	07	Xanakharm		
10	Vientiane	08	Mad		
10	Vientiane	09	Viengkam		
10	Vientiane	10	Hinhurp		
10	Vientiane	11	Hom		
10	Vientiane	12	Longxan		
11	Bolikhamsay	01	Pakxanh		
11	Bolikhamsay	02	Thaphabath		
11	Bolikhamsay	03	Pakkading		
11	Bolikhamsay	04	Bolikhanh		
11	Bolikhamsay	05	Khamkheuth	February 2003	9
11	Bolikhamsay	06	Viengthong	February-March 2003	31
					40
18	Xaisombun	01	Saysomboun		
18	Xaisombun	02	Thathom		
18	Xaisombun	03	Phoon		
			Rounded Total		4,134

