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Monitoring
System
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Annual Opium Poppy Survey 2000





UNDCP

Opium Poppy Growing Districts in Afghanistan, 2000

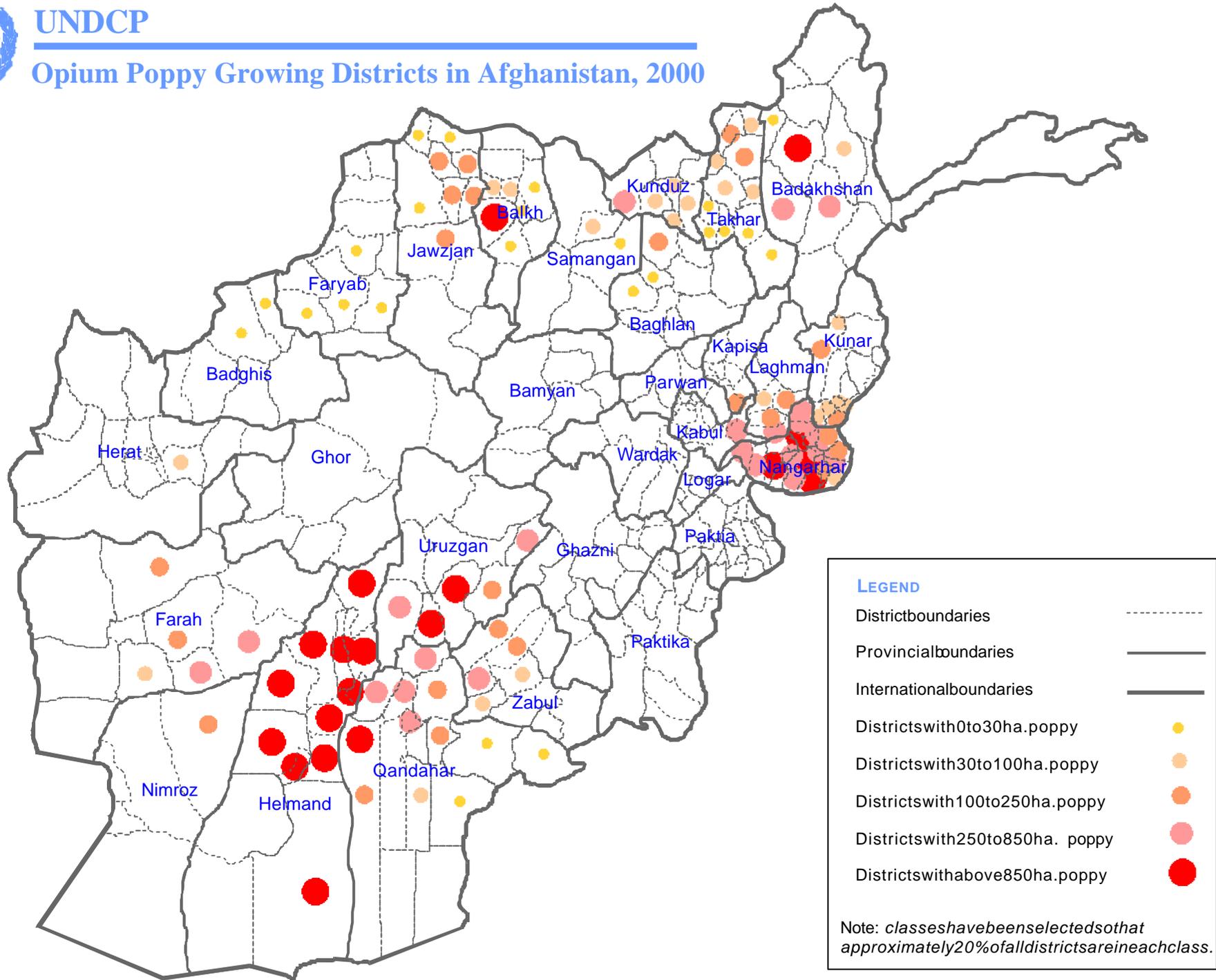


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Executive Summary

The United Nations Drug Control Programme (UNDCP) has, since 1994, conducted the Afghanistan Annual Opium Poppy Survey in response to the alarming increase in poppy cultivation in Afghanistan in the past decade. The survey is primarily a monitoring tool; it aims to provide information on the extent of cultivation of poppy, and the production of its main derivative - opium gum. The survey provides a resource that contributes to planning and resource allocation within UNDCP, other multilateral and bilateral agencies, NGOs, and the Afghan national authorities.

The survey utilises a ground based census methodology. Surveyors visit all known poppy cultivating areas in the country, estimate the area of poppy cultivation, and conduct interviews with poppy growers. In 2000, 7541 villages were surveyed in 125 districts. Of those villages that were surveyed, 6645 were found to cultivate opium poppy.

Main Findings of the Survey

Cultivation

Nationally, the survey estimates that there were 82,172 hectares of opium poppy under cultivation in the 2000 season. This represents a reduction in total poppy area of just under 10% compared with the 1999 estimate of 90,983 hectares.

The top two provinces in terms of poppy area are Helmand and Nangarhar. Helmand accounts for 42,853 hectares or 52% of the national total. Nangarhar accounts for 19,747 hectares or 24% of the national total. The top six provinces jointly account for 92% of the total national poppy area.

Of the 125 districts that were surveyed (out of 344 in the country), 123 were found to be cultivating poppy. However, the survey shows that only ten districts account for 54% of total national area, while twenty districts account for 73% of the total area. One district, Nad-e-Ali in Helmand, accounts for over 10% of total national poppy area.

Significant reductions in poppy area have occurred this year in the provinces of Baghlan (80% reduction), Balkh (34%), Jawzjan (71%), and Qandahar (43%). Significant increases have been recorded in Kabul (157% increase), Kunar (173%), Kunduz (1187%), Laghman (138%), and Takhar (221%). Significant decreases have occurred within some districts of Helmand and Nangarhar. However, these have been offset by increases in other districts.

Three UNDCP target districts, Ghorak, Khakrez, and Maiwand, in Qandahar have all recorded substantive decreases, in line with expected targets. Shinwar district, in Nangarhar province, another UNDCP target district, also recorded a decrease in poppy area.

Analysis of village level data reveals that the top 100 poppy growing villages, when ranked in order of poppy area, account for almost 20% or just over 16,000 ha of the total national poppy area. Only 540

villages account for 50% of the total national poppy area.

Yield and Production¹

The protracted drought that has effected many parts of Afghanistan since early in the year has had a significant impact on the yield reported by farmers for the 2000 harvest.

The national average yield for irrigated poppy in the 2000 season is estimated to be 35.7 kg/ha, while for rainfed poppy it is 18.5 kg/ha.

The estimate for national production of fresh opium is 3,275.9 metric tons. Helmand and Nangarhar account for 57% and 22% respectively of the national production total. The production total represents a 28% reduction in production of opium from the 4,581 metric tons reported in the 1999 survey.

Opium Pricing and Income from Production

In the 2000 season, the farmgate price for fresh opium ranged from a high of \$52/kg in Shahr-E-Bozorg (Badakshan) to just over \$10 in Bar Kunar (Kunar). The average price for fresh opium was \$30/kg. These figures compare with a significantly higher range of prices in 1999 from \$72/kg down to \$27/kg as reported by the 1999 survey. The estimated value at farmgate prices of the entire 2000 crop of fresh opium is US \$91,055,877. Experience shows that up to 60% of the fresh opium stock may be retained by farmers and sold at a later time as dry opium.

Territorial Control

Of the 7,541 villages surveyed in 2000, 6,889 or just over 91% are thought to be in areas under the control of the Taliban. This means that approximately 96% of the total poppy area is in Taliban controlled areas while the remaining 4% is within Northern Alliance areas.

Eradication and Local Bans

The survey shows widespread awareness of the ruling authorities' decree requiring all poppy farmers in Taliban controlled areas to reduce their cultivation area by one third. However, the survey also shows that compliance with this decree has occurred only in parts of the country.

The survey notes that, in nine of the twenty-two provinces surveyed, *all* of the respondents reported that there had been no eradication efforts. In a further five provinces, more than 70% of respondents reported that there had been *no* eradication efforts in their village.

On the other hand, the 50% reduction registered in the three UNDCP target districts in Qandahar shows that alternative development programmes coupled with a political commitment can be successful.

¹ All data in this report related to yield and production refer to *fresh* opium unless otherwise stated.

The Way Forward

The Integrated Inter-Agency Development Programme for Helmand Province is a major sustainable development initiative that has included drug control objectives in conventional development projects in Afghanistan. Data from the 2000 survey can assist in targeting this programme to areas of high poppy cultivation.

Research by UNDCP has shown that multiple factors lead to poppy cultivation at the micro level. These include the price of opium, access to credit, access to water, access to labour, the cost of labour, on-farm and off-farm opportunities, and the risk of exposure to punitive measures.

Well targeted interventions need to address all these factors in the most cost effective manner. *Truly sustainable* outcomes need long term engagement by the international community, the promotion of economic security, and the development of legal frameworks that also eliminate the demand side of illicit crop cultivation.

Introduction

The cultivation of opium poppy in Afghanistan is thought to date back to the time of Alexander the Great when it was introduced into parts of country to be used for medicinal purposes. This pattern continued until the late 1970's when war, coupled with international demand for narcotics, led to a dramatic increase in poppy cultivation. In Afghanistan today, poppy cultivation exists largely in response to two decades of war, limited markets and credit opportunities, and a lack of alternate sources of income for farmers.

Agricultural production of wheat and fruit crops has now, in many areas of the country, been replaced by poppy cultivation. This has reduced food production and led to dependence on rapidly diminishing aid handouts. Afghanistan has now attained notoriety as the world's leading producer of opium.

The United Nations Drug Control Programme (UNDCP) has, since 1994, conducted the Annual Poppy Survey in response to the alarming increase in poppy cultivation in Afghanistan. The survey is primarily a monitoring tool; it aims to provide information on the extent of cultivation of poppy, and the production of its main derivative - opium gum. The survey is ground-based, using a combination of rapid field measurement techniques and key informant interviews throughout all known poppy growing areas of the country. The information gathered by the survey leads to an understanding of the outcome of the past season, and the identification of trends in poppy cultivation.

This report presents the main quantitative and qualitative findings of the 2000 survey. The report consists of two Chapters and four Annexes. Chapter One presents the survey methodology and implementation. Chapter Two presents the main findings of the survey. The Annexes contain, respectively: data summaries; additional data analysis; summaries of surveyor reports; and the survey form.

Chapter 1 - The Annual Opium Poppy Survey

Objectives

The primary objective of the Annual Opium Poppy Survey is to provide information concerning the extent and location of poppy cultivation in Afghanistan. This information contributes to planning and resource allocation within UNDCP, and other multilateral, bilateral, and non-government agencies. National authorities are also increasingly using the survey to monitor domestic cultivation and production. The secondary objectives of the survey are to provide information regarding the production and pricing of opium in the country.

Accurate and up to date information regarding poppy cultivation can assist UNDCP, the donor community, and national and international authorities to:

- C *target* new development assistance strategies in poppy cultivating areas;
- C *monitor* the effectiveness of existing alternative development programmes against specific crop replacement targets;
- C *monitor compliance* with regional cultivation bans or reductions imposed by authorities, and;
- C *monitor opium production* and correlate this with other sources of information on the flow of illicit drugs out of the south west Asia region to consumer countries.

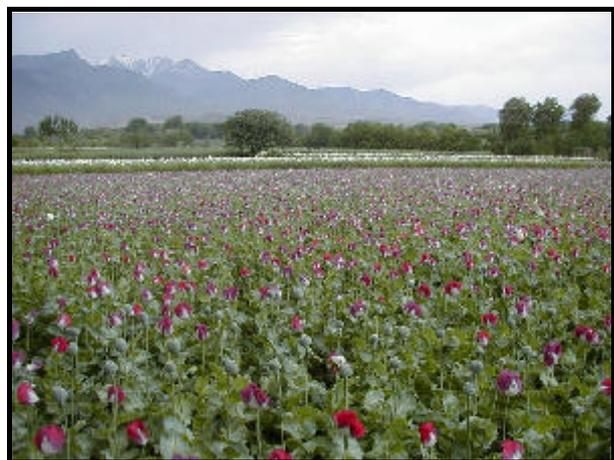


Figure 1: Poppy fields in Khogiani

The survey also contributes to UNDCP's Global Illicit Crops Monitoring Programme. The objectives of this programme are to define international core indicators on illicit crop cultivation, to establish uniform methodologies for data collection and analysis, and to increase host governments' capacity to monitor and develop replacements to these illicit crops.

Methodology

The survey is a ground based census that covers all known poppy cultivating villages of the entire country. The selection of districts included in the survey is based on the results of the previous year's survey. If a district was surveyed and found to have poppy, then it is again included. If the previous year's survey found there was no poppy being cultivated in the district, then it is excluded from the new survey. When, in the intervening period between surveys, a district was found to have commenced poppy cultivation, it is also included in the survey.

Intelligence regarding the emergence of new cultivating districts is gathered using an open network that includes UNDCP staff, other UN agencies, NGOs, surveyors, and the Afghan authorities. Whilst there is still a risk of omission of some districts, this is considered to be minimal given that cultivation in newly developed areas generally begins on a small scale.

Within the selected districts, the survey team visits every poppy cultivating village. Again, the selection of villages is based on past surveys and intelligence received in the intervening period between surveys. Importantly, once in the field, surveyors are required to actively question villagers in poppy growing areas about any new areas of cultivation.

A census approach enables the determination of reliable estimates of a number of key indicators at district, provincial and national levels without the need to use statistical estimation methods. However, this kind of survey requires a large, highly mobile team that needs to work in difficult terrain, sometimes in areas of conflict, and at times with villagers who resist questioning by outsiders.

In the 2000 survey, 139 surveyors and coordinators carried out the data collection in 125 districts of 22 provinces. The survey metadata, with comparative data for 1999, is shown in Table 1 below.

Number of...	1999 Survey	2000 Survey
provinces	18	22
districts	105	125
villages	6842	7541
surveyors	111	126
coordinators	11	13
monitors	4	4

Table 1: Survey metadata

Surveyors identify villages from a master list that they carry in the field. However, a village can change name according to who is the headman or what families are living in the village at the time. Sometimes new villages are formed when larger settlements are split into smaller units. This can cause difficulty for surveyors when they must select the village name. If the name does not appear on the list, the surveyor records the new name.

Several new districts have been created this year by Afghan authorities by splitting existing districts into several smaller districts. To retain compatibility with previous surveys, the original district names have been retained and are used as the reporting units. The new names are also stored within the database.

The primary task of each surveyor is the completion of a two-page questionnaire. This consists of three parts. The first part records village population, and the area of cultivated and poppy land. The second part records the estimates of three village interviewees in respect of poppy area, and the expected yield and prices of their coming harvest. These estimates relate to the village output as a whole, not to the individual farmer. Interviewees are chosen according to their knowledge of village activities and their

involvement in village poppy cultivation. The third part of the survey form is a measurement cross-check that is completed by coordinators during a supervision visit. Approximately five villages per district are checked in this way.

In the 2000 survey, the surveyors spent considerable time in explaining their role to village leaders, seeking out interviewees and estimating areas. Surveyors were required to keep a notebook for recording of observations and notes. Area estimation was carried out using a process of accurate measurement of individually shaped fields, followed by addition of areas of all fields of similar dimensions. This approach yields quite accurate results when plots are regular. In areas in which this is not the case, the area is approximated into basic triangular and rectangular units before aggregation. Surveyors made sketches of the layout of plots within a village to help in this process.

The survey provides two important quality control measurements against which the estimates of the surveyor can be compared. The first is the poppy area estimate given by each of the three village respondents. The second is the accurate poppy area measurement carried out by the coordinator during each supervision visit. The results from these checks indicate the accuracy of the surveyors' estimates. Annex 2 discusses survey accuracy in the light of these checks.

On average, surveyors spend between two and four hours in each village. In the case where poppy is not evident, only those parts of the form unrelated to poppy cultivation are completed.

Recruitment

For the purposes of managing the survey, the country is split into four zones: the provinces of the south and south west are grouped into the Qandahar zone, those of the east make up the Nangarhar zone, whilst the northern provinces are grouped into a north west and a north east zone. The survey teams for the Qandahar and Nangarhar zones were recruited in the first week of March. Surveyors were selected based on their previous experience, education and motivation. Of those selected, 70% had participated in the survey in past years. To become a coordinator, a surveyor is required to have several years of past involvement in the survey, in addition to an appropriate educational background. For the northern zones, as has been the procedure in the past, an NGO (the Pamir Reconstruction Bureau) was again recruited to carry out the work. The PRB has carried out the survey since 1996 and is notable for its ability to work within areas of conflict and in opposition controlled areas.

Training

Formal training for surveyors was conducted at UNDCP offices in Jalalabad and Qandahar during March. Training for the PRB surveyors was conducted in Mazar-E Sarif in the beginning of May. Training programmes emphasised practical skill development, as well as establishing a sound understanding of the principals of surveys and the objectives of the Annual Poppy Survey.



Figure 2. Classroom training in progress

During the three-day training programme, surveyors attended classroom sessions covering data collection, survey methodology, respondent motivation, and area estimation. Role playing sessions were conducted in the second day. Surveyors acted out various roles as farmer, surveyor, DCCU¹ representative, and local guide. Field work was conducted on the second and third days involving pace length calculations, village interviews, and area estimation. Trainees worked in groups to complete the entire survey for one village.



Figure 3. Role playing session

In the 2000 survey training programme, considerable time was spent in group discussion and learning from experienced surveyors. The team worked on the development of a common methodology for rapid area estimation. Presentations were made by team members at the end of the training programme to re-enforce their understanding of the survey.

Preparation of Work Plans and Deployment to the Field

Survey coordinators are responsible for deployment of their survey teams to the field. At the end of the training session, each coordinator was required to prepare a work plan showing, in chart form, the allocation and timing of resources to the field. This plan was then discussed with the survey team leader, modified if required, and then finalised. Each coordinator's work plan was aggregated into a project work plan covering all districts to be surveyed.

¹The DCCU (Drug Control and Coordination Unit) is a national agency that assists in survey implementation and that also undertakes enforcement activities related to use of illegal substances.

Formal letters from DCCU were issued before mobilization of survey teams. These letters give surveyors the authority to conduct the survey in the districts assigned to them and are presented to the village leader on arrival in each village.

The survey teams in Nangarhar and Qandahar zones were mobilised in the third week of March. The PRB teams for the northern districts were mobilised by the second week of May.



Figure 4: Surveyors ready for deployment

Monitoring

Survey monitoring is undertaken to ensure accurate and timely completion of survey forms, prompt attention to any problems or constraints that are hindering the progress of the survey, and early qualitative feedback on the cultivation trends for the current poppy crop. Monitoring in 2000 was carried out by a team of four national and international UNDCP staff.



Figure 5: Monitoring by international staff

Monitors were issued with terms of reference and briefed on their role before deployment. Each monitor submitted a report at the end of their assignment.

UNDCP's Global Illicit Crops Monitoring Programme also provides valuable monitoring support throughout the survey period. This involves the use of satellite imagery at UNDCP headquarters to assist in identification of areas of poppy cultivation and to verify field measurements made during the course of the survey.

Survey Constraints

The main constraints faced by surveyors this year have been access, transport, and security.

Access is generally given by local authorities via the DCCU. Formal letters are required to be given to surveyors before admission to survey areas. Access is facilitated by the presence of a representative from DCCU and a local guide. The ongoing conflict in parts of the country has at times made access difficult.

Surveyors are provided with an allowance to cover local transport in their allocated districts. Poor road conditions and the need to travel large distances mean that much of the surveyors' time is spent travelling. Often there is a need for surveyors to seek lodging in villages to avoid having to return the

next day. This was difficult this year as many villagers were unable to provide food for surveyors due to the severe drought in many parts of the country.

Security is an obvious concern in parts of the country, especially the northern provinces. The DCCUs in each zone take steps to ensure that surveyors are not exposed to undue risk, and ban access to areas where there is fighting. Many surveyors have also expressed their concern of the risk of exposure to mines.

Data Processing

Completed forms were collected in UNDCP offices, bundled by district, sealed and sent by UN pouch to Islamabad for processing. Data entry was carried out by two operators over a period of three months.

With few exceptions, the forms were completed professionally by the surveyors and according to the guidelines given in the training. However, considerable checks are required to ensure accuracy and consistency of the data. Where possible, checks are made at the time of data entry - these largely relate to the naming of villages and districts. Detailed checking of the raw data was carried out after data entry by using computer programmes that scan the entire data set. The main checks carried out by this process are summarised in Table 2.

Check	Strategy
Duplicate village codes	The form is corrected.
Duplicate administration names	The form is corrected.
Date range	The form is corrected.
Inconsistencies between surveyor estimates and farmer estimates	If a surveyor reports poppy but the farmers report none, the farmer response is considered invalid. The converse case did not arise.
Inconsistencies within the farmer interview - for example, farmer reports a positive opium yield when there is no poppy in the village.	The corresponding farmer response field was set to invalid.
Presence of outliers.	These were detected by examination of the distributions of main variables: poppy area, cultivated area, population, yield, prices, and exchange rates.

Table 2: Data processing checks

In all, twenty-eight independent checks are made for each survey form. When a farmer response was invalid, the value is not considered part of the data set for the purposes of analysis. This had the effect of marginally reducing the sample size used to determine district means for each respondent variable.

Chapter 2 - Survey Findings

Introduction

This Chapter presents the main findings of the survey. Data summaries and analysis in support of these findings are contained within Annexes 1 and 2.

Poppy Cultivation

Nationally, the survey estimates that there were 82,172 hectares of poppy under cultivation in the 2000 season. This represents a reduction in total poppy area of just under 10% compared with last year.

Poppy Growing Provinces

Poppy is grown in 22 Provinces out of a total of 32. The survey again confirms the Province of Helmand as having the highest cultivated area of poppy with 42,853 ha under cultivation. This is followed by Nangarhar with 19,747 ha, Oruzgan with 4,331 ha and Qandahar with 3,427 ha. In the northern part of the country, Balkh and Badakshan, are significant cultivating provinces with 2,669 ha and 2,458 ha respectively.

As shown in Figure 6, these six provinces account for 92% of the total national poppy area. A vast majority of 97% of this total poppy area is irrigated land, with the rest being rainfed land. However, in Badakshan, 50% of poppy cultivation is on rainfed land, while for Takhar the figure is 45%. In Balkh and Kunar, 16% of poppy land is rainfed.

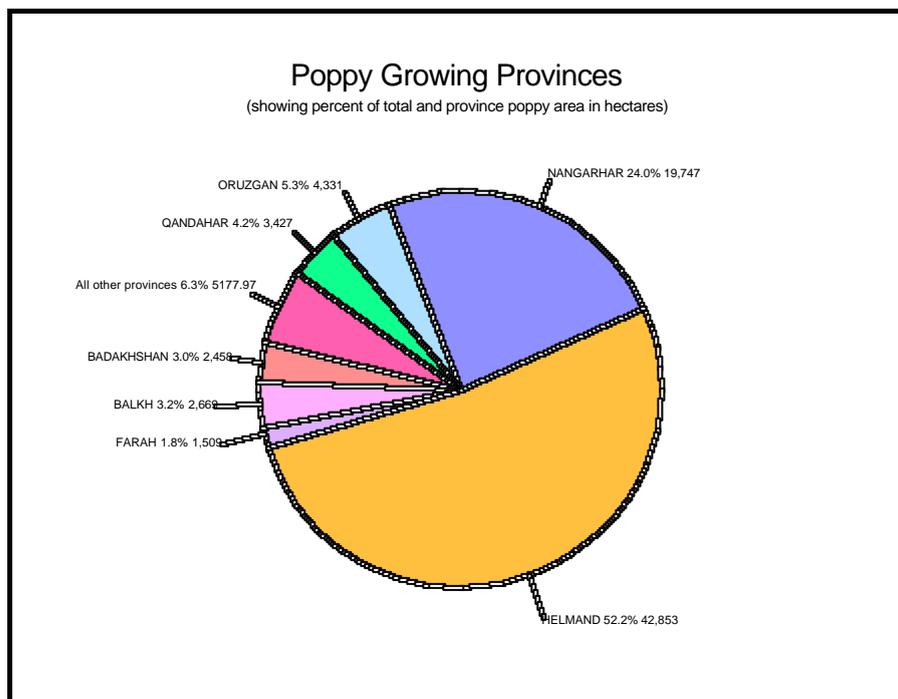


Figure 6. Poppy growing provinces

Significant reductions in poppy area have occurred this year in Baghlan (80% reduction), Balkh (34%), Jawzjan (71%), and Qandahar (43%).

Significant increases have been recorded in Kabul (157%), Kunar (173%), Kunduz (1187%) Laghman (138%) and Takhar (221%).

Table 3 shows the area of poppy cultivation for each province since 1994, the year of the first UNDCP Opium Poppy Survey. Blank cells show the provinces that were not surveyed in that year because they were known to be poppy free.

Opium Poppy Cultivation in Afghanistan, 1994-2000							
(hectares)							
Blank=province not surveyed							
Province	1994	1995	1996	1997	1998	1999	2000
Badakhshan	1,714	2,970	3,230	2,902	2,817	2,684	2,458
Badghis							41
Baghlan				328	929	1,005	199
Balkh			1,065	710	1,044	4,057	2,669
Farah		9	630	568	171	787	1,509
Faryab							36
Helmand	29,579	29,753	24,909	29,400	30,673	44,552	42,853
Herat							38
Jawzjan						2,593	746
Kabul						132	340
Kapisa						5	104
Kunar	115	152	19	0	75	288	786
Kunduz						38	489
Laghman	0	0	0	0	77	297	707
Logar	0	0	0	0	4	29	46
Nangarhar	29,081	15,722	15,643	14,567	17,822	22,990	19,747
Nimroz	682	119	136	642	11	203	219
Oruzgan	6,211	2,573	7,777	4,587	4,288	4,479	4,331
Qandahar	4,034	2,461	3,160	4,521	5,602	6,032	3,427
Samangan							54
Takhar						201	647
Zabul	54		255	154	161	611	725
Total	71,470	53,759	56,824	58,416	63,674	90,983	82,172

Table 3. *Opium Poppy Cultivation from 1994-2000*

Poppy Growing Districts

The 2000 survey visited 125 districts (out of 344 in the country) and found 123 of them to be cultivating poppy. As shown in Figure 7, cultivation of poppy is highly concentrated within a relatively few districts of the country. The top ten districts account for 54% of total national area while the top twenty districts account for 73% of the total area. The district with the highest poppy area, Nad-e-Ali in Helmand, accounts for over 10% of total national poppy area.

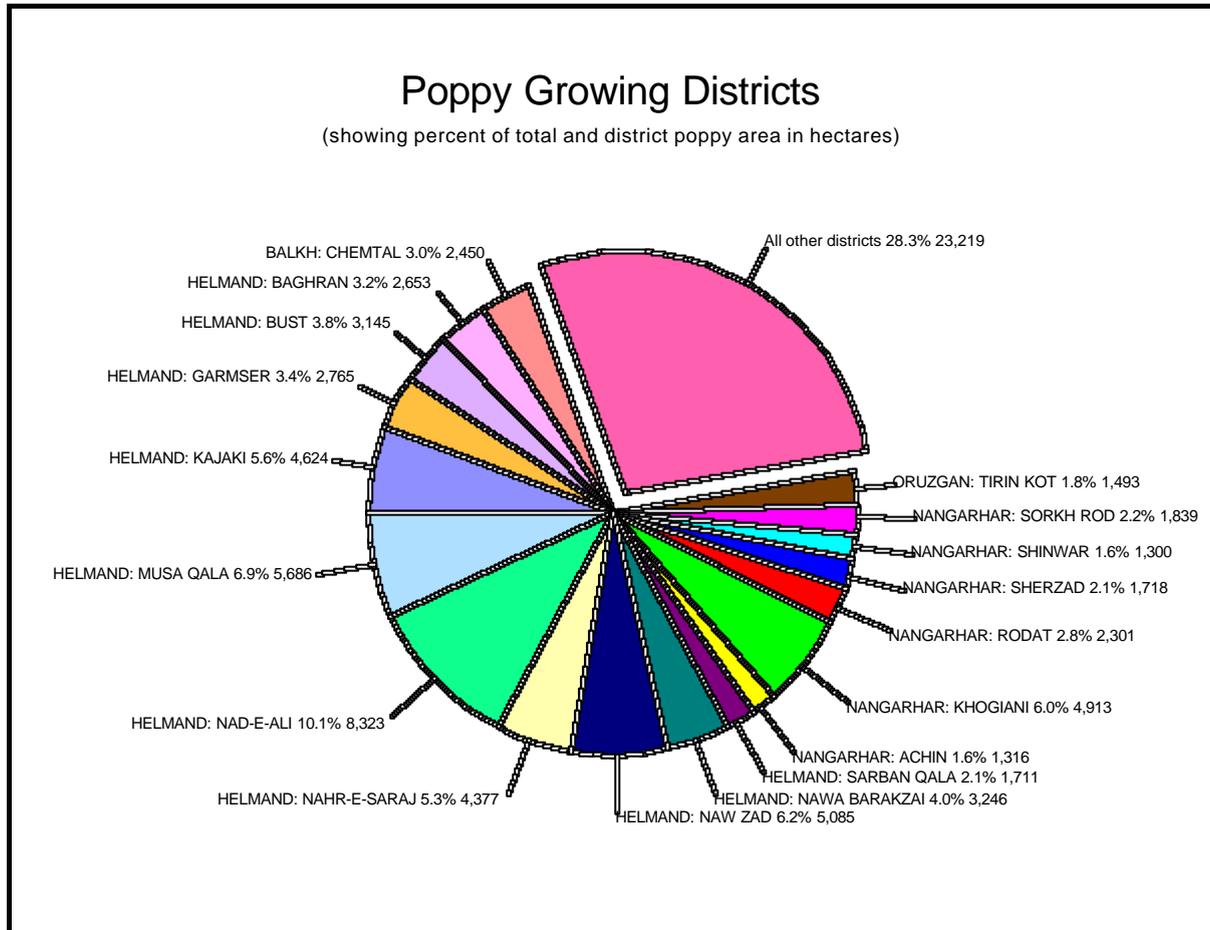


Figure 7: Poppy growing districts

Figure 8 shows the twenty-two districts recording more than 1,000 ha in the year 2000 with their 1999 poppy area as comparison. Of these, it can be noted that exactly one half of these districts recorded decreases in poppy area from last year, while the rest have recorded an increase in cultivation.

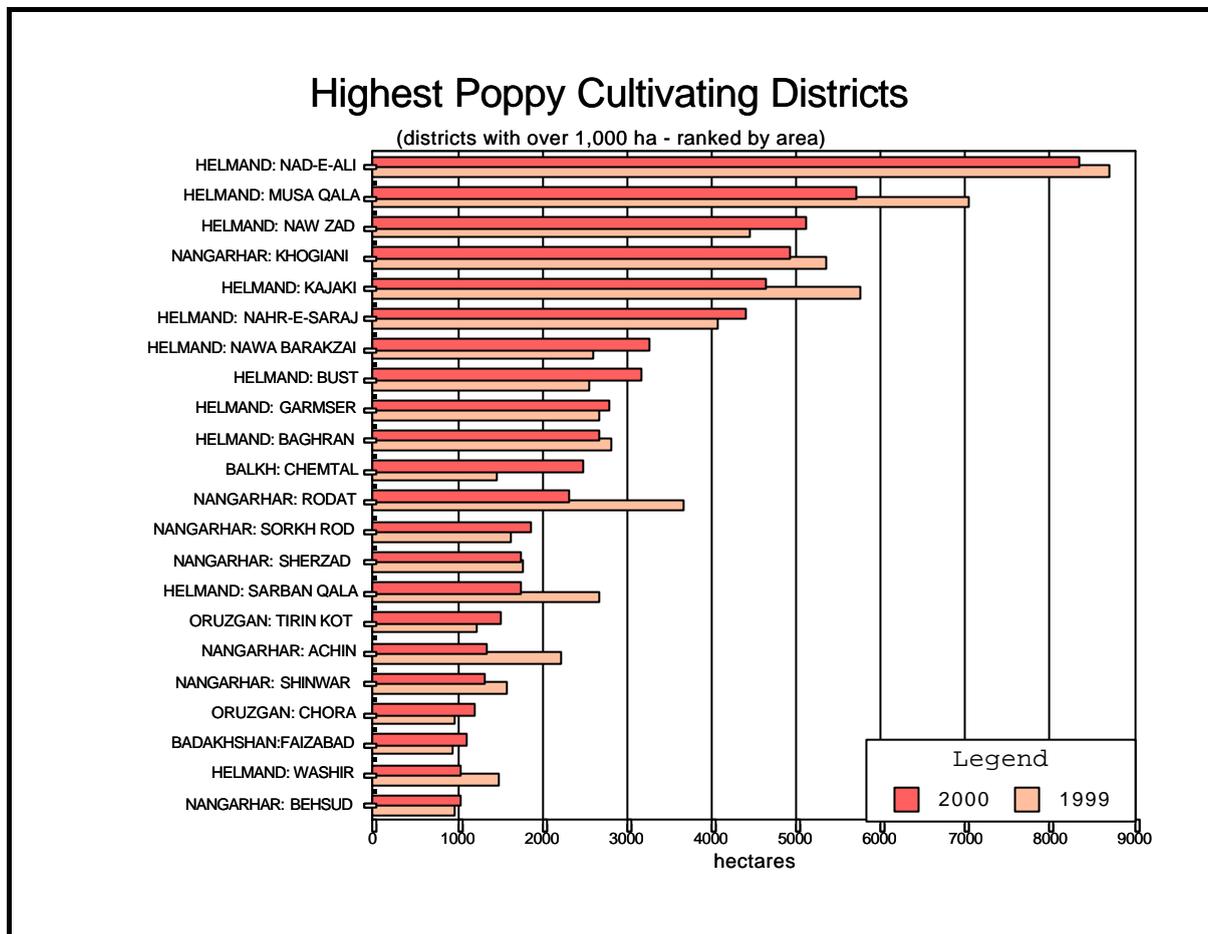


Figure 8. The highest poppy cultivating districts

There have been significant changes¹ within districts that are not reflected in provincial trends. In Helmand, decreases occurred in Kajaki (20%), Musa Qala (19%), Sarban Qala (35%) and Washir (31%). However these were countered by increases in Bust (24%), Nawa Barakzai (26%) and Naw Zad (15%). The net effect was only a 4% reduction in this province.

In Nangarhar significant decreases occurred in Achin (40%), Darae Noor (43%), Hesarak (27%), and Rodat (37%). Kama district recorded a 51% increase. In Qandahar there were significant decreases in Arghandab (39%), Ghorak (48%), Khakrez (49%), Maiwand (51%), and Nesh (23%).

Several districts surveyed last year and found to have no poppy were omitted from this year's survey. These are Ragh and Zebak in Badakhshan; Emam Saheb in Kunduz; Ajrestan and Gezab in Oruzgan;

¹ In this discussion *significant changes* in cultivation are considered to be those of more than 20% occurring in districts whose poppy area was more than 500ha in either 1999 or 2000.

and Qandahar City in Qandahar.

There were twenty-one new districts surveyed for the first time this year. These are listed in Table 4. The total contribution of new districts to the national poppy area was 1,053.7 ha or just 1% of the national total. This indicates that there is some time before cultivation in new districts is undertaken on a large scale.

Province	New District
Badghis	Ghowrmach and Morghab
Baghlan	Baghlan
Balkh	Dehdadi, Naher Shahi and Shulgarah
Farah	Khak-E Safid and Shindand
Faryab	Belcheragh, Meymaneh, Pashtun Kowt, Qeysar and Shirin Tagab
Helmand	Khan Neshin
Jawzjan	Khamyab, Sar-E Pol, and Shberghan
Samangan	Khuram O Sarbagh, and Samangan
Takhar	Bangi and Eshkamesh

Table 4 *New poppy growing districts*

Other significant changes have occurred in:

- c Badakshan: a 38% reduction in Jurm.
- c Baghlan: a 97% reduction in Dahaneh-E-Ghow.
- c Balkh: a 98% reduction in Char Bulaq while Chemtal increased by 72%.
- c Farah: a 98% reduction in Gulestan.
- c Jawzjan: a 60% reduction in Aqchah and 92% reduction in Manga Jek.
- c Oruzgan: a 28% reduction in Char Chasma and a 42% reduction in Dehrawud while Chora increased by 27% and Tirin Kot by 25%.

It is pleasing to note that three UNDCP target districts (Ghorak, Khakrez, and Maiwand) in Qandahar province have all recorded substantive decreases of around 50% in line with expected targets. Shinwar district in Nangarhar also recorded a 17% decrease in a contentious poppy growing area.

Poppy Growing Villages

The survey covered 7541 villages of which 6645 (88%) were found to cultivate poppy. This compares with last year's survey which detected 6842 villages that cultivate poppy.

As noted earlier, poppy cultivation is concentrated in relatively few districts. Notably, the same pattern is evident when we examine individual villages. Indeed, the survey reveals that the top 100 villages, ranked by poppy area, account for almost 20% of the national total poppy area; the top 200 villages account for 29%; and only 540 villages (8% of all poppy growing villages) account for 50% of the total poppy area.

Figure 9 shows this imbalance graphically. It shows, for any number poppy growing villages, the corresponding contribution of those villages to the total poppy area - *when the villages are ranked in decreasing order of poppy area*.

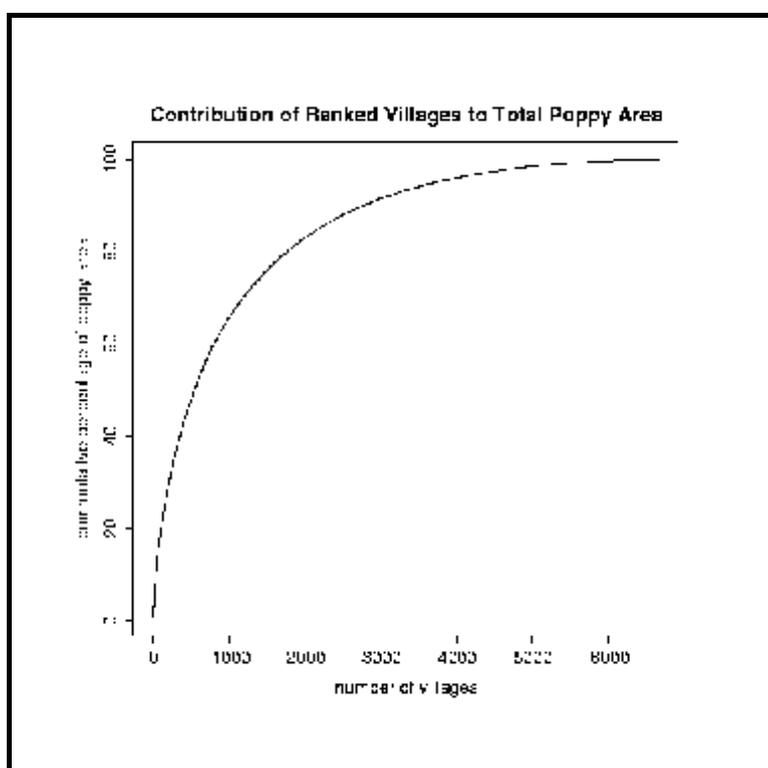


Figure 9. Contribution of ranked villages to total poppy area

This finding has implications for strategies aimed at poppy crop reduction. Firstly, it suggests that a small proportion of villages are highly geared towards the cultivation of poppy, while the remainder of villages cultivate significantly smaller areas.

Secondly, we can determine what the potential reduction in total poppy area would be if a strategy was focused on villages with high poppy areas - rather than a blanket approach for all poppy villages. Annex 2 explores some alternate scenarios for poppy crop reduction based on these findings.

Territorial Control

Of the 7541 villages surveyed in 2000, 6889 or just over 91% are thought to be in areas under the control of the Taliban. The remainder are under the control of the Northern Alliance. This translates into approximately 96% of the total poppy area being in Taliban controlled areas while the remaining 4% is within Northern Alliance areas. As the line of control between these two forces is shifted almost on a daily basis, these proportions are only estimates made at the time of writing.

Yield

The survey collects yield estimates for both irrigated and rainfed poppy for the coming harvest from village respondents in each village surveyed. Previous survey reports have noted that yields vary with agricultural practices, poppy varieties, climate and altitude. Furthermore the survey methodology for determining yield is dependant on the reliability of farmer reports. This year, for the first time, UNDCP has conducted a limited yield survey in Afghanistan aimed at making a preliminary assessment of the range of variability of opium crop characteristics, yield, and moisture and alkaloid content of opium gun. Results of this year's study, together with those of similar exercises in future harvesting seasons, will improve the scientific basis and objectivity of yield estimates in the future. The findings contained within this report are not based on the results of the limited yield survey, however, and continue to be based on reported farmer estimates.

District average yields for both irrigated poppy and rainfed poppy have been computed by averaging the farmer reported yields for each district. This reveals a national average yield for irrigated poppy of 35.7 kg/ha, while for rainfed poppy it is 16.8 kg/ha. These figures can be compared with the significantly higher national average yield reported in 1999 of 50.4 kg/ha. The 1999 survey reported a combined average yield for irrigated and rainfed poppy.

This decrease is mainly the result of the drought conditions that have been dominant throughout much of Afghanistan in contrast with the highly favourable conditions during the 1999 growing season.

As expected, there is considerable variability in yields. For irrigated poppy these range from 88.6 kg/ha in Shindand district (Farah) to 5.8 kg/ha in Shirin Tagab (Faryab). For rainfed poppy, yields range from 65.0 kg/ha in Bar Kunar (Kunar) to 2.1 kg/ha in Rodat (Nangarhar).



Figure 10: *Poppy lancing*

Production

The estimate of national production² in the year 2000 is 3,275.9 metric tons. This compares with 4,581 metric tons reported by the 1999 survey. Figure 11 shows the national production in the year 2000 by province, clearly showing the dominance of Helmand and Nangarhar, which account for 57% and 22% respectively of national production. Of the national total production, 3,249.6 metric tons (99%) was derived from poppy production on irrigated land.

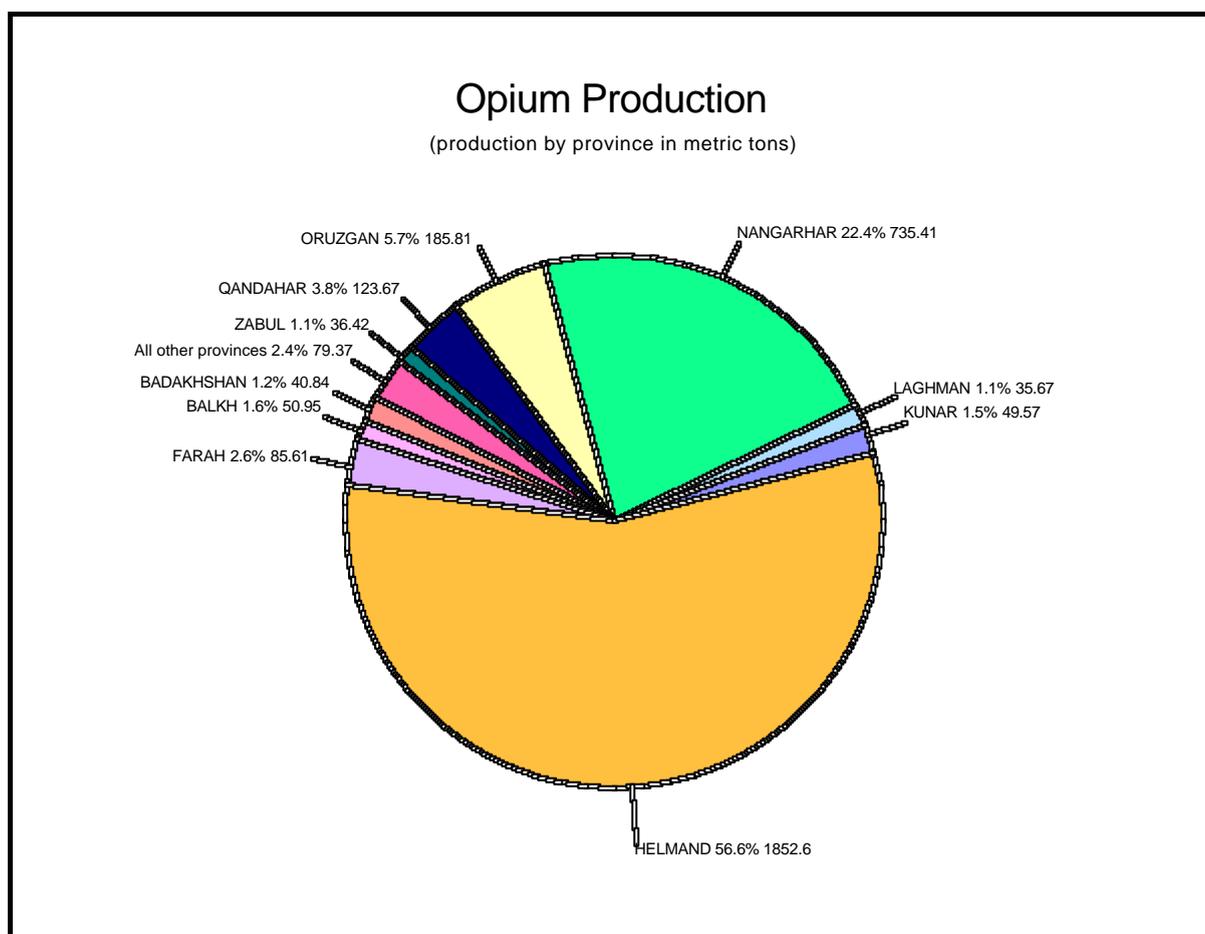


Figure 11: *Opium production by province*

At the district level, Nad-e-Ali in Helmand leads the production table, with 425 metric tons or 13% of the national total. The top six producing districts are all within Helmand province and jointly account for 43% of the national production total. The top ten producing districts jointly produce 59% of the national total - all but one of these districts are in Helmand province.

Clearly production in Helmand is boosted by a unique combination of large cultivated areas and higher than average yields. The fact that high yields in this province are possible, despite the drought

² District production is the sum of production on irrigated land and production on rainfed land. These are determined separately as the product of poppy area and yield. National production is the sum of district production.

conditions, suggests that in the distribution of precious water resources, poppy production takes precedence over other agricultural activities.

Figure 12 shows the twenty-seven highest opium producing districts - those producing over 25 metric tons. These districts collectively account for 83% of the national production total.

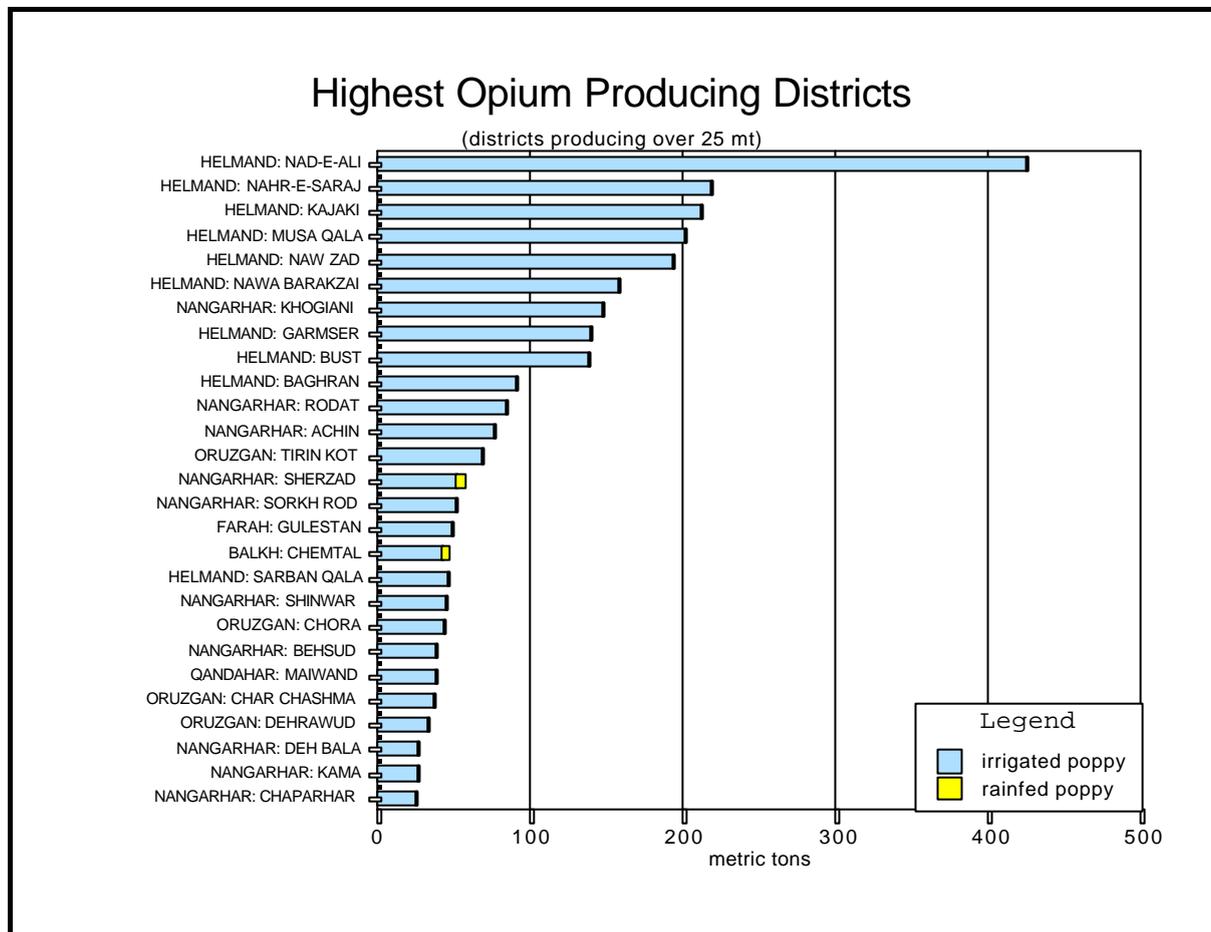


Figure 12: Highest opium producing districts

Opium Pricing and Income from Production

The price gained by farmers for fresh and dry opium varies by location and with time. Prices may be impacted by the amount of unsold surplus dry opium remaining from last year’s harvest and the demand from traders for fresh opium during the harvest period. Proximity to markets and borders is a major determinant of price. Traders are prepared to pay a premium



Figure 13: Weighing fresh opium

for reducing transport costs and avoiding border crossings.

In the 2000 season, the farmgate price for fresh opium ranged from a high of \$52/kg in Shahr-E-Bozorg (Badakshan) to just over \$10 in Bar Kunar³ (Kunar). The average price for fresh opium was \$30/kg. These figures compare with the significantly higher range of prices recorded in 1999 from \$72/kg down to \$27/kg as reported by the 1999 survey.

Based on the estimates of production and prices, the income to poppy farmers aggregated per district can be estimated. Assuming farmers sell all of their *fresh opium* crop⁴, the expected gross income would be \$91,055,877. Districts within Helmand and Nangarhar figure exclusively in the top ten income earning districts, the highest again being Nad-e-Ali in Helmand - earning an estimated \$9,930,936 from poppy cultivation. Notably, prices in high production areas are uniformly lower than average, indicating an oversupply in these areas. Collectively, these top ten income earning districts account for just over 54% of national income.

Farmer Report on Cultivation Change

During the survey, three poppy farmers in each village are asked if there had been any change in poppy cultivation since the past season. This identifies areas in which farmers are heeding local bans or have opted out of farming illicit crops. When aggregated at the provincial level, this data correlates well with the actual change in poppy area from last year.

For example, in Balkh which recorded a 34% decrease in cultivation, 77% of respondents said there had been a decrease. Similarly, in Jawzjan (71% decrease), all respondents said there was a decrease. In Qandahar (43% decrease), 78% of respondents said there was a decrease. A similar pattern was evident in provinces that recorded an increase in cultivation. In Farah, Herat, Kabul, Kapisa, Kunar, Kunduz, Logar, Samangan, and Zabul, all of which recorded significant increases, more than 75% of respondents said there had been an increase.

Damage to Poppy Crop

Farmers are asked whether there had been any damage to their crop this season, and to what extent the damage had destroyed their crop. Over 66% of respondents claimed that their crop had been damaged. The highest number of claims of damage came from Badakshan, Faryab, Jawzjan, and Nimroz, with 100% of respondents claiming crop damage. In Balkh, Farah, Helmand, Logar, and Takhar between 80% and 85% of respondents claimed damage, while more than 50% of respondents in Kunduz, Nangarhar, Oruzgan, Qandahar, and Zabul claimed damage.

³ This figure appears to be unusually low, and may be attributable to the district being surveyed before market prices had been established.

⁴ Experience shows that as much as 60% of fresh opium is retained by farmers and sold at a later time as dry opium. The weight of dry opium is approximately 30% less than fresh opium.

For those farmers who claimed damage to their crop, the average damage extent was 37%. The provinces in which respondents claimed more than 50% damage to their crop were Badakhshan (54%), Faryab (73%), Jawzjan (84%), and Takhar (60%).

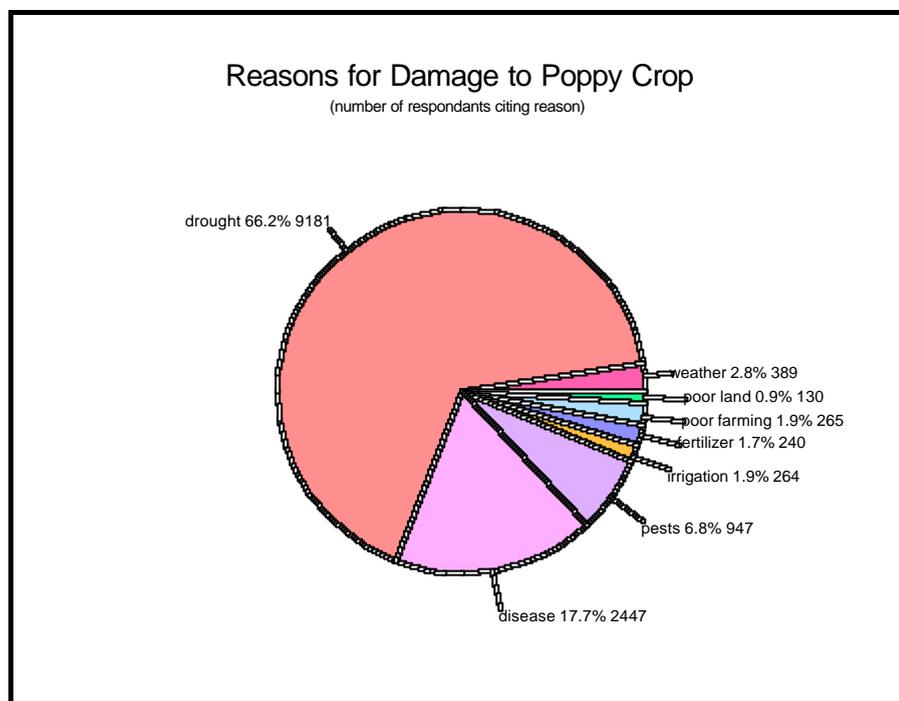


Figure 14: Reasons for damage to crop

The predominant reason for damage given by respondents was the drought that has severely affected many parts of Afghanistan this year. Secondary reasons given included disease, pests, bad weather, and poor farming technique. The reasons given for damage are summarised in Figure 14.

Poppy Eradication Efforts

The survey shows that, in Taliban controlled areas, there is widespread awareness of the ruling authorities' decree requiring all poppy farmers to reduce their cultivation area by one third. However, as shown by the survey, compliance with this decree has occurred only in parts of the country, while other parts have recorded increases.

Provinces in which more than 50% of respondents reported eradication efforts in their village are Helmand (93% of respondents), Laghman (62%), Nangarhar (71%), Nimroz (64%), Oruzgan (54%) and Qandahar (67%). However, these do not correlate well with the recorded reductions in cultivation area since 1999. For example, Laghman recorded a 138% increase in poppy area, and Nimroz an 8% increase. This suggests that eradication efforts by farmers are small scale, symbolic gestures, which are not making real inroads into poppy crop reduction.

It is also worth noting that, in nine of the twenty-two provinces surveyed, *all* of the respondents reported that there had been no eradication efforts. In a further five provinces, more than 70% of respondents reported that there had been *no* eradication efforts in their village.

These findings suggest that achieving compliance with the national decree regarding crop reduction remains a problem for national authorities. In an attempt to promote the national decree, DCCU officials, under the leadership of the State High Commission for Drug Control, have undertaken eradication measures in selected areas. Since the commencement of this year these have included:

1. A program of reduction in poppy area carried out in the district of Shinwar in Nangarhar Province between April 20th and 28th. This action was taken in response a 50% reduction order by the Governor made in October 1999. This was followed by a detailed physical measurement undertaken by UNDCP surveyors during February of this year. These measurements showed a reduction of only 17% had occurred since 1999. In response to this, authorities carried out further reduction. However, due to security concerns during the reduction programme, UNDCP monitors were unable to monitor this eradication. Consequently, the 2000 survey data for Shinwar does not reflect this reduction.
2. An internationally reported eradication throughout a 500m buffer along the Kabul - Torkham highway within the districts of Surkhrud, Behsud, Batikot, Shinwar, and Mohmand dara of Nangarhar province. This was undertaken between the dates of 2nd April and 10th April 2000 and resulted in eradication of 82.3 ha of poppy. The survey reflects this reduction as poppy surveyors visited these areas *after* the eradication took place.
3. A voluntary destruction by farmers of 38.4 ha of poppy crop in various districts of Helmand province as reported to UNDCP by the Qandahar DCCU on 23 March 2000. The survey results reflect this reduction.
4. Public destruction of banned substances including opium, hashish and wine in a ceremony that took place on 7 March 2000 in Qandahar.



Figure 15: *Poppy crop eradication*

Conclusion

The Annual Opium Poppy Survey for the year 2000 has shown that there were 82,172 hectares of opium poppy under cultivation in the 2000 season. This represents a reduction in total poppy area of just under 10% compared with the 1999 estimate of 90,983 hectares. The province of Helmand has retained its position as the major cultivating province, accounting for 52% of the total national poppy area. This is little changed from its share of 49% as reported by the 1999 survey.

The estimate of national production of fresh opium is 3,275.9 metric tons. This is substantially reduced from the 1999 reported figure of 4,581 metric tons. The protracted drought throughout Afghanistan has had significant impact on the yield of the 2000 harvest.

The survey shows that alternative development programmes, coupled with commitment by authorities to eliminate cultivation of illicit crops, can have a significant impact on poppy reduction. The poppy crop reduction in UNDCP target districts of Qandahar is evidence of this.

A major sustainable development initiative, the Integrated Inter-Agency Development Programme for Helmand Province, has included drug control objectives in conventional development projects in Afghanistan. The 2000 survey reveals that poppy cultivation is not evenly distributed across all villages surveyed, but that it is concentrated in a small proportion of the villages. Data from the survey can assist in targeting this programme to areas of high poppy cultivation.

Latest post harvest reports from Afghanistan indicate that the continuation of drought conditions may lead farmers to decide to cultivate wheat in the next season. However, this is far from certain. Some farmers may be unable to pay back their pre-season loans due to the poor harvest this year. There is a likelihood they may gamble on the drought breaking and sow the higher income generating poppy. There is an opportunity now for the Afghan authorities and the international community to influence the decision that farmers will make in October and November about what to grow (poppy or wheat) for the next season.

Research by UNDCP has shown that multiple factors lead to poppy cultivation at the micro level. These include the price of opium, access to credit, access to water, access to labour, the cost of labour, on-farm and off-farm opportunities, and the risk of exposure to punitive measures. Well-targeted interventions need to address all these factors in the most cost effective manner. *Truly sustainable* outcomes need long term engagement by the international community, the promotion of economic security, and the development of legal frameworks that also eliminate the demand side of illicit crop cultivation.

Annex 1a

Opium Poppy Cultivation, 1994–2000 (hectares)

Province	District	1994	1995	1996	1997	1998	1999	2000	Share of total poppy in 2000 (%)
Badakhshan	Baharak	111	64	116	9	202	23	86	0.11
	Eshkashem	0	0	3	0	0	0	0	0.00
	Faizabad	77	2,344	1,592	1,634	1,282	906	1,073	1.31
	Jurm	433	555	1,326	1,051	1,198	1,249	773	0.94
	Keshem	1,093	3	177	62	62	385	507	0.62
	Ragh	0	0	8	31	2	8	0	0.00
	Shahr-e-Bozorg	0	0	0	0	71	113	19	0.02
	Zebak	0	4	8	115	0	0	0	0.00
Total:		1,714	2,970	3,230	2,902	2,817	2,684	2,458	2.99
Badghis	Ghowrmach							20	0.02
	Morghab							21	0.03
Total:								41	0.05
Baghlan	Baghlan							152	0.19
	Dahaneh-e-Ghowri				328	929	967	27	0.03
	Pul-e-Khumri						38	20	0.02
Total:				328	929	1,005	199	0.24	
Balkh	Balkh				13	29	29	82	0.10
	Char Bulaq				165	530	2,600	53	0.06
	Chemtal			1,065	532	485	1,428	2,451	2.98
	Dehdadi							22	0.03
	Naher Shahi							33	0.04
	Shulgarah							28	0.03
Total:				1,065	710	1,044	4,057	2,669	3.25
Farah	Bakwah		1	13	129	31	129	259	0.32
	Bala Balok		8	19	169	36	186	183	0.22
	Farah			18	18	10	44	73	0.09
	Gulestan			581	252	94	428	849	1.03
	Khak-e Safid							0	0.00
	Shindand							146	0.18
Total:			9	630	568	171	787	1,509	1.84
Faryab	Belcheragh							6	0.01
	Meymaneh							1	0.00
	Pashtun Kowt							11	0.01
	Qeysar							16	0.02
	Shirin Tagab							3	0.00
Total:								36	0.04
Helmand	Baghran		2,519	1,267	2,754	2,910	2,794	2,653	3.23
	Bust	2,256	885	1,054	1,325	1,869	2,528	3,145	3.83
	Garmser	786	725	942	1,993	1,205	2,643	2,765	3.37
	Kajaki	979	4,087	2,814	3,904	3,959	5,746	4,625	5.63
	Khan Neshin							222	0.27
	Musa Qala	1,154	5,137	3,924	4,360	5,574	7,013	5,686	6.92
	Nad-e-Ali	12,529	5,983	4,035	5,102	5,156	8,667	8,323	10.13
	Nahr-e-Saraj	590	4,716	4,309	4,807	2,426	4,041	4,378	5.33
	Naw Zad	2,345	2,799	3,596	1,585	3,605	4,424	3,246	3.95
	Nawa Barakzai	6,074	1,254	505	722	1,150	2,581	5,085	6.19
Sarban Qala	2,866	973	1,909	1,971	1,734	2,646	1,711	2.08	
Washir		676	555	877	1,084	1,469	1,014	1.23	
Total:		29,579	29,753	24,909	29,400	30,673	44,552	42,853	52.15
Herat	Pashtun Zarghun	0	0	0	38	0	0	38	0.05
Total:		0	0	0	38	0	0	38	0.05
Jawzjan	Aqchah						532	208	0.25

Annex 1a

Opium Poppy Cultivation, 1994–2000 (hectares)

Province	District	1994	1995	1996	1997	1998	1999	2000	Share of total poppy in 2000 (%)
	Faizabad						43	105	0.13
	Khamyab							6	0.01
	Manga Jek						1,789	141	0.17
	Mardian						43	111	0.13
	Qarqin						186	10	0.01
	Sar-e Pol							146	0.18
	Sheberghan							19	0.02
Total:							2,593	746	0.91
Kabul	Sarobi						132	340	0.41
Total:							132	340	0.41
Kapisa	Tagab						5	104	0.13
Total:							5	104	0.13
Kunar	Asadabad						73	239	0.29
	Bar Kunar						47	72	0.09
	Chawki	13	11	0	0	8	9	50	0.06
	Khas Kunar	75	82	10	0	12	50	173	0.21
	Mazar (Nur Gul)	27	19	5	0	8	28	98	0.12
	Narang		15	1	0	13	27	84	0.10
	Sarkani		25	2	0	34	54	71	0.09
Total:		115	152	19	0	75	288	786	0.96
Kunduz	Aliabad						5	51	0.06
	Chahar Darreh						8	30	0.04
	Emam Saheb						3	0	0.00
	Khanabad						2	36	0.04
	Kunduz						9	51	0.06
	Qala-e Zal						11	321	0.39
Total:							38	489	0.60
Laghman	Alingar	0	0	0	0	2	71	131	0.16
	Alishang	0	0	0	0	3	26	88	0.11
	Metarlam	0	0	0	0	14	72	190	0.23
	Qarghai	0	0	0	0	58	128	298	0.36
Total:		0				77	297	707	0.86
Logar	Azro					4	29	46	0.06
Total:						4	29	46	0.06
Nangarhar	Achin	5,354	2,187	2,315	1,640	1,693	2,209	1,317	1.60
	Bati Kot	3,797	529	392	1,013	2,034	603	535	0.65
	Behsud	458	31	51	123	397	946	1,005	1.22
	Chaparhar	1,089	1,377	1,750	1,234	1,365	977	832	1.01
	Darae Noor	1,302	392	199	73	199	734	421	0.51
	Deh Bala	307	646	354	569	511	468	439	0.53
	Durbaba	29	78	38	39	56	50	33	0.04
	Goshta	1,249	467	116	77	122	240	238	0.29
	Hesarak	202	453	253	370	436	741	541	0.66
	Jalalabad City	0	0	0	0	0	33	16	0.02
	Kama	0	18	0	0	198	389	589	0.72
	Khogiani	4,347	2,577	2,628	3,385	3,808	5,338	4,913	5.98
	Kuz Kunar	293	233	115	15	105	236	399	0.49
	La'lpur	302	267	79	66	137	270	248	0.30
	Mohmand Dara	1,630	0	156	83	125	290	255	0.31
	Nazian	343	138	251	111	252	184	177	0.22
	Pachier wa Agam	768	571	681	400	488	731	630	0.77
	Rodat	1,026	2,038	1,959	1,583	2,147	3,649	2,302	2.80

Annex 1a

Opium Poppy Cultivation, 1994–2000 (hectares)

Province	District	1994	1995	1996	1997	1998	1999	2000	Share of total poppy in 2000 (%)
	Sherzad	1,954	2,351	1,646	1,689	1,302	1,741	1,719	2.09
	Shinwar	3,884	1,265	2,075	1,478	1,374	1,559	1,300	1.58
	Sorkh Rod	747	106	587	619	1,072	1,602	1,840	2.24
Total:		29,081	15,722	15,643	14,567	17,822	22,990	19,747	24.03
Nimroz	Kang	10	2	1	107	5	2	0	0.00
	Khash Rud	672	117	135	535	6	201	219	0.27
Total:		682	119	136	642	11	203	219	0.27
Oruzgan	Ajristan	313	0	0	0	0	0	0	0.00
	Char Chashma	1,337	12	0	0	1,158	1,110	802	0.98
	Chora	694	424	1,574	233	652	932	1,179	1.43
	Dehrawud	909	938	2,923	1,870	1,033	1,243	726	0.88
	Gezab	1,476	16	8	0	0	0	0	0.00
	Khas Oruzgan	0	4	0	0	0	0	130	0.16
	Tirin Kot	1,428	1,180	3,271	2,484	1,445	1,194	1,494	1.82
Total:		6,211	2,573	7,777	4,587	4,288	4,479	4,331	5.27
Qandahar	Arghandab	211	87	331	561	399	750	459	0.56
	Arghistan						38	13	0.02
	Daman						110	50	0.06
	Dand	299	53	234	21	73	227	156	0.19
	Ghorak	347	803	692	1,503	1,126	1,109	574	0.70
	Qandahar City	21	0	0	0	0	0	0	0.00
	Khakrez	362	274	627	286	518	632	320	0.39
	Maiwand	256	333	618	1,278	2,497	2,022	995	1.21
	Maruf	30	16	1	0	3	5	17	0.02
	Nesh	410	334	104	399	373	510	394	0.48
	Panjwai	250	357	266	255	134	132	184	0.22
	Shah Wali Kot	678	97	94	127	162	236	238	0.29
	Spin Boldak	1,170	107	194	91	317	261	26	0.03
Total:		4,034	2,461	3,160	4,521	5,602	6,032	3,427	4.17
Samangan	Khuram O Sarbagh							17	0.02
	Samangan							36	0.04
Total:								54	0.07
Takhar	Bangi							8	0.01
	Chah Ab						17	45	0.05
	Chal						8	17	0.02
	Eshkamesh							10	0.01
	Farkhar						6	6	0.01
	Kalafgan						101	93	0.11
	Khvajeh Ghar						9	57	0.07
	Rostaq						10	151	0.18
	Taloqan						16	97	0.12
	Warsaj						12	9	0.01
	Yangi Qala						22	154	0.19
Total:							201	647	0.79
Zabul	Arghandab	0	0	0	0	0	74	139	0.17
	Dai Chopan	0	0	0	0	0	41	114	0.14
	Jaldak	0	0	0	0	0	77	48	0.06
	Mizan	54	0	255	154	160	373	383	0.47
	Qalat	0	0	0	0	1	46	40	0.05
Total:		54	0	255	154	161	611	725	0.88
National Total:		71,470	53,759	56,824	58,416	63,674	90,983	82,172	100.00

Annex Ib

Data Summaries for Poppy Area 1999–2000

Note: NPV=number of poppy growing villages.
NVS=number of villages surveyed.
Area units are hectares.

Province	District	1999 Survey		2000 Survey							
		NPV	Poppy Area	NVS	NPV	Cultivated Land Area	Irrigated Poppy	Rainfed Poppy	Total Poppy	Change	Change %
BADAKHSHAN	BAHARAK	87	23.00	65	30	2,978.00	86.40	0.00	86.40	63.40	275.65
BADAKHSHAN	FAIZABAD	237	906.00	197	193	50,366.80	415.70	656.90	1,072.60	166.60	18.39
BADAKHSHAN	JURM	118	1,249.00	115	78	11,998.60	654.50	118.40	772.90	-476.10	-38.12
BADAKHSHAN	KESHEM	61	385.00	87	87	33,234.20	81.50	425.60	507.10	122.10	31.71
BADAKHSHAN	RAGH	25	8.00	0	0	0.00	0.00	0.00	0.00	-8.00	-100.00
BADAKHSHAN	SHAHR-E-BOZORG	55	113.00	23	12	6,988.00	1.80	17.00	18.80	-94.20	-83.36
<u>BADAKHSHAN Result</u>		<u>583</u>	<u>2,684.00</u>	<u>487</u>	<u>400</u>	<u>105,565.60</u>	<u>1,239.90</u>	<u>1,217.90</u>	<u>2,457.80</u>	<u>-226.20</u>	<u>-8.43</u>
BADGHIS	GHOWRMACH	0	0.00	10	10	4,200.00	19.70	0.00	19.70	19.70	n/a
BADGHIS	MORGHAB	0	0.00	11	11	4,742.00	21.10	0.00	21.10	21.10	n/a
<u>BADGHIS Result</u>		<u>0</u>	<u>0.00</u>	<u>21</u>	<u>21</u>	<u>8,942.00</u>	<u>40.80</u>	<u>0.00</u>	<u>40.80</u>	<u>40.80</u>	<u>n/a</u>
BAGHLAN	BAGHLAN	0	0.00	52	52	7,120.00	152.46	0.00	152.46	152.46	n/a
BAGHLAN	DAHANEH-E-GHOWRI	29	967.00	11	11	2,240.00	27.14	0.00	27.14	-939.86	-97.19
BAGHLAN	PUL-E-KHUMRI	14	38.00	5	5	1,000.00	19.80	0.00	19.80	-18.20	-47.89
<u>BAGHLAN Result</u>		<u>43</u>	<u>1,005.00</u>	<u>68</u>	<u>68</u>	<u>10,360.00</u>	<u>199.40</u>	<u>0.00</u>	<u>199.40</u>	<u>-805.60</u>	<u>-80.16</u>
BALKH	BALKH	49	29.00	30	30	10,220.00	81.80	0.00	81.80	52.80	182.07
BALKH	CHAR BULAQ	71	2,600.00	15	15	7,420.00	52.60	0.00	52.60	-2,547.40	-97.98
BALKH	CHEMTAL	100	1,428.00	73	73	31,764.80	2,013.80	437.00	2,450.80	1,022.80	71.62
BALKH	DEHDADI	0	0.00	12	12	4,816.40	22.00	0.00	22.00	22.00	n/a
BALKH	NAHER SHAHI	0	0.00	13	13	6,108.00	33.20	0.00	33.20	33.20	n/a
BALKH	SHULGARAH	0	0.00	29	29	128,270.80	28.20	0.00	28.20	28.20	n/a
<u>BALKH Result</u>		<u>220</u>	<u>4,057.00</u>	<u>172</u>	<u>172</u>	<u>188,600.00</u>	<u>2,231.60</u>	<u>437.00</u>	<u>2,668.60</u>	<u>-1,388.40</u>	<u>-34.22</u>
FARAH	BAKWAH	58	129.00	65	47	3,662.74	259.01	0.00	259.01	130.01	100.78
FARAH	BALA BALOK	22	186.00	25	25	3,927.60	182.70	0.00	182.70	-3.30	-1.77
FARAH	FARAH	44	44.00	56	55	2,881.60	72.69	0.00	72.69	28.69	65.21
FARAH	GULESTAN	52	428.00	52	52	1,140.80	849.20	0.00	849.20	421.20	98.41
FARAH	KHAK-E SAFID	0	0.00	1	0	0.00	0.00	0.00	0.00	0.00	n/a
FARAH	SHINDAND	0	0.00	61	48	3,055.60	145.89	0.00	145.89	145.89	n/a
<u>FARAH Result</u>		<u>176</u>	<u>787.00</u>	<u>260</u>	<u>227</u>	<u>14,668.34</u>	<u>1,509.49</u>	<u>0.00</u>	<u>1,509.49</u>	<u>722.49</u>	<u>91.80</u>
FARYAB	BELCHERAGH	0	0.00	4	4	3,100.00	6.40	0.00	6.40	6.40	n/a
FARYAB	MEYMANEH	0	0.00	1	1	300.00	0.70	0.00	0.70	0.70	n/a
FARYAB	PASHTUN KOWT	0	0.00	10	10	5,486.00	10.80	0.00	10.80	10.80	n/a
FARYAB	QEYSAR	0	0.00	9	9	5,380.00	15.80	0.00	15.80	15.80	n/a
FARYAB	SHIRIN TAGAB	0	0.00	2	2	1,400.00	2.70	0.00	2.70	2.70	n/a
<u>FARYAB Result</u>		<u>0</u>	<u>0.00</u>	<u>26</u>	<u>26</u>	<u>15,666.00</u>	<u>36.40</u>	<u>0.00</u>	<u>36.40</u>	<u>36.40</u>	<u>n/a</u>
HELMAND	BAGHRAN	195	2,794.00	199	198	4,779.40	2,653.10	0.00	2,653.10	-140.90	-5.04
HELMAND	BUST	48	2,528.00	53	53	10,185.40	3,145.26	0.00	3,145.26	617.26	24.42
HELMAND	GARMSER	105	2,643.00	108	105	14,472.50	2,765.14	0.00	2,765.14	122.14	4.62
HELMAND	KAJAKI	182	5,746.00	183	183	7,892.20	4,624.80	0.00	4,624.80	-1,121.20	-19.51
HELMAND	KHAN NESHIN	0	0.00	41	41	4,264.80	221.78	0.00	221.78	221.78	n/a
HELMAND	MUSA QALA	110	7,013.00	112	112	8,974.00	5,686.00	0.00	5,686.00	-1,327.00	-18.92
HELMAND	NAD-E-ALI	204	8,667.00	211	210	28,474.80	8,323.10	0.00	8,323.10	-343.90	-3.97
HELMAND	NAHR-E-SARAJ	89	4,041.00	91	90	14,188.60	4,377.78	0.00	4,377.78	336.78	8.33
HELMAND	NAWA BARAKZAI	98	2,581.00	106	106	11,940.40	3,246.10	0.00	3,246.10	665.10	25.77
HELMAND	NAW ZAD	120	4,424.00	128	128	9,255.60	5,085.00	0.00	5,085.00	661.00	14.94
HELMAND	SARBAN QALA	80	2,646.00	86	86	3,884.20	1,711.20	0.00	1,711.20	-934.80	-35.33
HELMAND	WASHIR	87	1,469.00	85	85	1,392.26	1,013.93	0.00	1,013.93	-455.07	-30.98
<u>HELMAND Result</u>		<u>1318</u>	<u>44,552.00</u>	<u>1403</u>	<u>1397</u>	<u>119,704.16</u>	<u>42,853.19</u>	<u>0.00</u>	<u>42,853.19</u>	<u>-1,698.81</u>	<u>-3.81</u>
HERAT	PASHTUN ZARGHUN	0	0.00	66	49	8,546.00	38.36	0.00	38.36	38.36	n/a
<u>HERAT Result</u>		<u>0</u>	<u>0.00</u>	<u>66</u>	<u>49</u>	<u>8,546.00</u>	<u>38.36</u>	<u>0.00</u>	<u>38.36</u>	<u>38.36</u>	<u>n/a</u>
JAWZJAN	AQCHAH	54	532.00	53	53	50,500.00	207.60	0.00	207.60	-324.40	-60.98
JAWZJAN	FAIZABAD	34	43.00	34	34	19,700.00	105.20	0.00	105.20	62.20	144.65
JAWZJAN	KHAMYAB	0	0.00	13	13	531.00	6.40	0.00	6.40	6.40	n/a
JAWZJAN	MANGA JEK	48	1,789.00	28	28	27,640.00	140.60	0.00	140.60	-1,648.40	-92.14
JAWZJAN	MARDIAN	20	43.00	21	21	22,960.00	110.60	0.00	110.60	67.60	157.21
JAWZJAN	QARQIN	33	186.00	16	16	639.00	10.30	0.00	10.30	-175.70	-94.46
JAWZJAN	SAR-E POL	0	0.00	72	72	18,216.00	145.80	0.00	145.80	145.80	n/a
JAWZJAN	SHBERGHAN	0	0.00	17	17	4,690.00	19.40	0.00	19.40	19.40	n/a
<u>JAWZJAN Result</u>		<u>189</u>	<u>2,593.00</u>	<u>254</u>	<u>254</u>	<u>144,876.00</u>	<u>745.90</u>	<u>0.00</u>	<u>745.90</u>	<u>-1,847.10</u>	<u>-71.23</u>
KABUL	SAROBI	118	132.00	120	105	2,022.00	340.30	0.00	340.30	208.30	157.80
<u>KABUL Result</u>		<u>118</u>	<u>132.00</u>	<u>120</u>	<u>105</u>	<u>2,022.00</u>	<u>340.30</u>	<u>0.00</u>	<u>340.30</u>	<u>208.30</u>	<u>157.80</u>
KAPISA	TAGAB	47	5.00	66	53	3,400.00	104.20	0.00	104.20	99.20	1984.00
<u>KAPISA Result</u>		<u>47</u>	<u>5.00</u>	<u>66</u>	<u>53</u>	<u>3,400.00</u>	<u>104.20</u>	<u>0.00</u>	<u>104.20</u>	<u>99.20</u>	<u>1984.00</u>
KUNAR	ASADABAD	18	73.00	54	53	4,246.00	141.05	97.62	238.68	165.68	226.96
KUNAR	BAR KUNAR	71	47.00	128	85	3,098.90	66.57	5.63	72.20	25.20	53.61
KUNAR	CHAWKI	38	9.00	38	29	677.80	49.70	0.00	49.70	40.70	452.22
KUNAR	KHAS KUNAR	39	50.00	35	35	1,431.60	173.40	0.00	173.40	123.40	246.80
KUNAR	MAZAR (NUR GUL)	31	28.00	29	27	786.20	97.50	0.00	97.50	69.50	248.21
KUNAR	NARANG	23	27.00	29	23	1,990.00	69.30	14.60	83.90	56.90	210.74
KUNAR	SARKANI	39	54.00	41	38	1,824.20	64.00	6.80	70.80	16.80	31.11
<u>KUNAR Result</u>		<u>259</u>	<u>288.00</u>	<u>354</u>	<u>290</u>	<u>14,054.70</u>	<u>661.52</u>	<u>124.65</u>	<u>786.17</u>	<u>498.17</u>	<u>172.98</u>
KUNDUZ	ALIABAD	4	5.00	17	17	4,620.00	51.10	0.00	51.10	46.10	922.00
KUNDUZ	CHAHAR DARREH	7	8.00	21	21	5,580.00	29.95	0.00	29.95	21.95	274.40
KUNDUZ	EMAM SAHEB	2	3.00	0	0	0.00	0.00	0.00	0.00	-3.00	-100.00
KUNDUZ	KHANABAD	2	2.00	14	14	3,510.00	35.80	0.00	35.80	33.80	1690.00
KUNDUZ	KUNDUZ	11	9.00	28	28	8,349.60	50.58	0.17	50.75	41.75	463.89
KUNDUZ	QALA-E-ZAL	8	11.00	10	10	5,972.00	321.49	0.00	321.49	310.49	2822.65

Annex Ib Data Summaries for Poppy Area 1999–2000

Note: NPV=number of poppy growing villages.
NVS=number of villages surveyed.
Area units are hectares.

Province	District	1999 Survey		2000 Survey							
		NPV	Poppy Area	NVS	NPV	Cultivated Land Area	Irrigated Poppy	Rainfed Poppy	Total Poppy	Change	Change %
<u>KUNDUZ Result</u>		<u>34</u>	<u>38.00</u>	<u>90</u>	<u>90</u>	<u>28,031.60</u>	<u>488.93</u>	<u>0.17</u>	<u>489.09</u>	<u>451.09</u>	<u>1187.09</u>
LAGHMAN	ALINGAR	65	71.00	71	68	2,154.20	130.65	0.00	130.65	59.65	84.01
LAGHMAN	ALISHANG	41	26.00	51	51	1,324.00	88.35	0.00	88.35	62.35	239.81
LAGHMAN	METARLAM	80	72.00	78	78	2,320.60	190.27	0.00	190.27	118.27	164.26
LAGHMAN	QARGHAI	74	128.00	78	77	2,820.80	296.46	1.20	297.66	169.66	132.55
<u>LAGHMAN Result</u>		<u>260</u>	<u>297.00</u>	<u>278</u>	<u>274</u>	<u>8,619.60</u>	<u>705.73</u>	<u>1.20</u>	<u>706.93</u>	<u>409.93</u>	<u>138.02</u>
LOGAR	AZRO	60	29.00	60	37	693.20	46.30	0.00	46.30	17.30	59.66
<u>LOGAR Result</u>		<u>60</u>	<u>29.00</u>	<u>60</u>	<u>37</u>	<u>693.20</u>	<u>46.30</u>	<u>0.00</u>	<u>46.30</u>	<u>17.30</u>	<u>59.66</u>
NANGARHAR	ACHIN	141	2,209.00	131	130	2,636.00	1,316.60	0.00	1,316.60	-892.40	-40.40
NANGARHAR	BATI KOT	61	603.00	60	56	3,370.40	534.80	0.00	534.80	-68.20	-11.31
NANGARHAR	BEHSUD	75	946.00	73	70	5,260.00	1,004.80	0.00	1,004.80	58.80	6.22
NANGARHAR	CHAPARHAR	77	977.00	81	81	2,654.20	831.50	0.00	831.50	-145.50	-14.89
NANGARHAR	DARAE NOOR	50	734.00	50	50	1,772.00	421.00	0.00	421.00	-313.00	-42.64
NANGARHAR	DEH BALA	79	468.00	78	78	965.24	439.05	0.00	439.05	-28.95	-6.19
NANGARHAR	DURBABA	36	50.00	36	32	138.60	25.25	7.35	32.60	-17.40	-34.80
NANGARHAR	GOSHTA	38	240.00	38	29	2,006.00	234.70	3.20	237.90	-2.10	-0.87
NANGARHAR	HESARAK	97	741.00	90	76	2,165.00	541.40	0.00	541.40	-199.60	-26.94
NANGARHAR	JALALABAD CITY	9	33.00	10	9	81.20	15.82	0.00	15.82	-17.18	-52.06
NANGARHAR	KAMA	47	389.00	51	49	7,192.00	588.53	0.00	588.53	199.53	51.29
NANGARHAR	KHOGIANI	101	5,338.00	122	122	8,518.60	4,913.00	0.00	4,913.00	-425.00	-7.96
NANGARHAR	KUZ KUNAR	53	236.00	53	52	1,865.20	399.34	0.00	399.34	163.34	69.21
NANGARHAR	LA'LPUR	34	270.00	34	34	915.80	248.00	0.00	248.00	-22.00	-8.15
NANGARHAR	MOHMAND DARA	38	290.00	40	38	1,209.40	255.20	0.00	255.20	-34.80	-12.00
NANGARHAR	NAZIAN	35	184.00	34	33	656.80	174.17	2.60	176.77	-7.23	-3.93
NANGARHAR	PACHIER WA AGAM	70	731.00	71	71	1,399.60	629.50	0.00	629.50	-101.50	-13.89
NANGARHAR	RODAT	98	3,649.00	103	102	6,691.20	2,288.00	13.80	2,301.80	-1,347.20	-36.92
NANGARHAR	SHERZAD	84	1,741.00	90	90	3,577.60	1,461.80	257.00	1,718.80	-22.20	-1.28
NANGARHAR	SHINWAR	47	1,559.00	47	47	4,288.40	1,300.15	0.00	1,300.15	-258.85	-16.60
NANGARHAR	SORKH ROD	100	1,602.00	103	103	9,825.00	1,839.98	0.00	1,839.98	237.98	14.86
<u>NANGARHAR Result</u>		<u>1370</u>	<u>22,990.00</u>	<u>1395</u>	<u>1352</u>	<u>67,188.24</u>	<u>19,462.60</u>	<u>283.95</u>	<u>19,746.55</u>	<u>-3,243.45</u>	<u>-14.11</u>
NIMROZ	KANG	15	2.00	15	0	0.00	0.00	0.00	0.00	-2.00	-100.00
NIMROZ	KHASH RUD	26	201.00	28	25	2,365.20	218.50	0.00	218.50	17.50	8.71
<u>NIMROZ Result</u>		<u>41</u>	<u>203.00</u>	<u>43</u>	<u>25</u>	<u>2,365.20</u>	<u>218.50</u>	<u>0.00</u>	<u>218.50</u>	<u>15.50</u>	<u>7.64</u>
ORUZGAN	CHAR CHASHMA	77	1,110.00	81	73	4,178.00	802.40	0.00	802.40	-307.60	-27.71
ORUZGAN	CHORA	50	932.00	51	51	5,850.00	1,179.00	0.00	1,179.00	247.00	26.50
ORUZGAN	DEHRAWUD	75	1,243.00	73	72	4,760.20	725.60	0.00	725.60	-517.40	-41.63
ORUZGAN	KHAS ORUZGAN	0	0.00	70	40	2,015.40	129.96	0.00	129.96	129.96	n/a
ORUZGAN	TIRIN KOT	88	1,194.00	90	84	20,266.00	1,493.80	0.00	1,493.80	299.80	25.11
<u>ORUZGAN Result</u>		<u>290</u>	<u>4,479.00</u>	<u>365</u>	<u>320</u>	<u>37,069.60</u>	<u>4,330.76</u>	<u>0.00</u>	<u>4,330.76</u>	<u>-148.24</u>	<u>-3.31</u>
QANDAHAR	ARGHANDAB	62	750.00	70	61	8,805.00	459.20	0.00	459.20	-290.80	-38.77
QANDAHAR	ARGHISTAN	128	38.00	145	27	753.00	13.35	0.00	13.35	-24.65	-64.87
QANDAHAR	DAMAN	70	110.00	71	34	3,595.80	50.31	0.00	50.31	-59.69	-54.26
QANDAHAR	DAND	72	227.00	81	59	3,793.20	155.95	0.00	155.95	-71.05	-31.30
QANDAHAR	GHORAK	68	1,109.00	67	67	1,497.40	574.30	0.00	574.30	-534.70	-48.21
QANDAHAR	KHAKREZ	164	632.00	162	157	2,403.40	320.40	0.00	320.40	-311.60	-49.30
QANDAHAR	MAIWAND	203	2,022.00	231	196	10,801.80	994.54	0.00	994.54	-1,027.46	-50.81
QANDAHAR	MARUF	113	5.00	85	17	322.60	17.00	0.00	17.00	12.00	240.00
QANDAHAR	NESH	77	510.00	78	75	3,263.00	393.80	0.00	393.80	-116.20	-22.78
QANDAHAR	PANJWAI	85	132.00	94	87	10,598.00	183.94	0.00	183.94	51.94	39.35
QANDAHAR	SHAH WALI KOT	103	236.00	126	109	3,700.00	238.35	0.00	238.35	2.35	1.00
QANDAHAR	SPIN BOLDAK	81	261.00	80	19	1,666.00	26.30	0.00	26.30	-234.70	-89.92
<u>QANDAHAR Result</u>		<u>1226</u>	<u>6,032.00</u>	<u>1290</u>	<u>908</u>	<u>51,199.20</u>	<u>3,427.44</u>	<u>0.00</u>	<u>3,427.44</u>	<u>-2,604.56</u>	<u>-43.18</u>
SAMANGAN	KHURAM O SARBAGH	0	0.00	6	6	440.00	17.40	0.00	17.40	17.40	n/a
SAMANGAN	SAMANGAN	0	0.00	12	12	1,050.00	36.40	0.00	36.40	36.40	n/a
<u>SAMANGAN Result</u>		<u>0</u>	<u>0.00</u>	<u>18</u>	<u>18</u>	<u>1,490.00</u>	<u>53.80</u>	<u>0.00</u>	<u>53.80</u>	<u>53.80</u>	<u>n/a</u>
TAKHAR	BANGI	0	0.00	4	4	2,210.00	2.00	5.80	7.80	7.80	n/a
TAKHAR	CHAH AB	6	17.00	11	11	7,896.00	25.60	19.40	45.00	28.00	164.71
TAKHAR	CHAL	2	8.00	8	8	4,970.00	2.60	14.20	16.80	8.80	110.00
TAKHAR	ESHKAMESH	0	0.00	5	5	1,920.00	1.00	8.80	9.80	9.80	n/a
TAKHAR	FARKHAR	2	6.00	6	6	6,780.00	0.60	5.40	6.00	0.00	0.00
TAKHAR	KALAFGAN	17	101.00	24	24	52,000.00	35.60	57.20	92.80	-8.20	-8.12
TAKHAR	KHVAJEH GHAR	3	9.00	24	24	18,015.00	27.40	29.20	56.60	47.60	528.89
TAKHAR	ROSTAQ	3	10.00	13	13	24,330.00	93.00	58.40	151.40	141.40	1414.00
TAKHAR	TALOQAN	4	16.00	32	32	24,460.00	46.60	50.80	97.40	81.40	508.75
TAKHAR	WARSAJ	6	12.00	6	6	4,930.00	0.80	8.40	9.20	-2.80	-23.33
TAKHAR	YANGI QALA	7	22.00	32	32	20,460.00	121.60	32.80	154.40	132.40	601.82
<u>TAKHAR Result</u>		<u>50</u>	<u>201.00</u>	<u>165</u>	<u>165</u>	<u>167,971.00</u>	<u>356.80</u>	<u>290.40</u>	<u>647.20</u>	<u>446.20</u>	<u>221.99</u>
ZABUL	ARGHANDAB	126	74.00	102	83	1,494.20	139.40	0.00	139.40	65.40	88.38
ZABUL	DAI CHOPAN	88	41.00	100	73	1,317.10	114.00	0.00	114.00	73.00	178.05
ZABUL	JALDAK	186	77.00	191	111	1,429.00	47.71	0.00	47.71	-29.29	-38.04
ZABUL	MIZAN	74	373.00	73	73	3,830.00	383.06	0.00	383.06	10.06	2.70
ZABUL	QALAT	63	46.00	74	54	4,165.00	40.44	0.00	40.44	-5.56	-12.09
<u>ZABUL Result</u>		<u>537</u>	<u>611.00</u>	<u>540</u>	<u>394</u>	<u>12,235.30</u>	<u>724.61</u>	<u>0.00</u>	<u>724.61</u>	<u>113.61</u>	<u>18.59</u>
<u>Grand Total</u>		<u>6821</u>	<u>90,983.00</u>	<u>7541</u>	<u>6645</u>	<u>1,013,267.75</u>	<u>79,816.53</u>	<u>2,355.27</u>	<u>82,171.80</u>	<u>-8,811.20</u>	<u>-9.68</u>

Annex 1c Data Summaries for Production 2000

Note: n/a = not applicable (poppy area=0)
Area units are hectares.

Province	District	Irrigated Poppy	Rainfed Poppy	Poppy Area	Yield Irrigated	Yield Rainfed	Production Irrigated	Production Rainfed	Metric Tons	Price Fresh Opium USD	Income USD
BADAKHSHAN	BAHARAK	86.40	0.00	86.40	16.31	n/a	1,408.80	0.00	1.41	20.24	28,517.77
BADAKHSHAN	FAIZABAD	415.70	656.90	1,072.60	18.76	8.31	7,800.00	5,458.25	13.26	25.20	334,150.92
BADAKHSHAN	JURM	654.50	118.40	772.90	30.99	5.63	20,285.29	666.00	20.95	25.95	543,784.47
BADAKHSHAN	KESHEM	81.50	425.60	507.10	28.70	6.37	2,339.13	2,709.31	5.05	27.59	139,276.91
BADAKHSHAN	SHAHR-E-BOZORG	1.80	17.00	18.80	13.33	9.00	24.00	153.00	0.18	51.93	9,190.91
BADAKHSHAN Result		1,239.90	1,217.90	2,457.80	21.62	7.32	31,857.22	8,986.56	40.84	30.18	1,054,920.97
BADGHIS	GHOWRMACH	19.70	0.00	19.70	6.17	n/a	121.48	0.00	0.12	29.80	3,620.33
BADGHIS	MORGHAB	21.10	0.00	21.10	7.27	n/a	153.45	0.00	0.15	30.03	4,608.41
BADGHIS Result		40.80	0.00	40.80	6.72	n/a	274.94	0.00	0.27	29.92	8,228.74
BAGHLAN	BAGHLAN	152.46	0.00	152.46	30.48	n/a	4,647.10	0.00	4.65	24.30	112,934.74
BAGHLAN	DAHANEH-E-GHOWRI	27.14	0.00	27.14	27.73	n/a	752.52	0.00	0.75	23.90	17,983.30
BAGHLAN	PUL-E-KHUMRI	19.80	0.00	19.80	43.33	n/a	858.00	0.00	0.86	22.85	19,602.31
BAGHLAN Result		199.40	0.00	199.40	33.85	n/a	6,257.62	0.00	6.26	23.68	150,520.35
BALKH	BALKH	81.80	0.00	81.80	13.89	n/a	1,136.11	0.00	1.14	15.63	17,762.78
BALKH	CHAR BULAQ	52.60	0.00	52.60	15.42	n/a	810.92	0.00	0.81	14.22	11,532.63
BALKH	CHEMTAL	2,013.80	437.00	2,450.80	21.07	8.82	42,433.64	3,853.12	46.29	18.12	838,772.94
BALKH	DEHDADI	22.00	0.00	22.00	10.83	n/a	238.33	0.00	0.24	18.09	4,311.93
BALKH	NAHER SHAHI	33.20	0.00	33.20	13.33	n/a	442.67	0.00	0.44	18.17	8,041.97
BALKH	SHULGARAH	28.20	0.00	28.20	72.30	n/a	2,038.83	0.00	2.04	20.83	42,477.49
BALKH Result		2,231.60	437.00	2,668.60	24.47	8.82	47,100.50	3,853.12	50.95	17.51	922,899.74
FARAH	BAKWAH	259.01	0.00	259.01	47.40	n/a	12,276.25	0.00	12.28	21.53	264,280.32
FARAH	BALA BALOK	182.70	0.00	182.70	49.26	n/a	8,999.21	0.00	9.00	22.28	200,477.45
FARAH	FARAH	72.69	0.00	72.69	39.03	n/a	2,836.89	0.00	2.84	24.59	69,755.11
FARAH	GULESTAN	849.20	0.00	849.20	57.21	n/a	48,584.04	0.00	48.58	21.51	1,044,942.41
FARAH	KHAK-E-SAFID	0.00	0.00	0.00	n/a	n/a	0.00	0.00	0.00	22.77	0.00
FARAH	SHINDAND	145.89	0.00	145.89	88.54	n/a	12,917.52	0.00	12.92	38.41	496,182.01
FARAH Result		1,509.49	0.00	1,509.49	56.29	n/a	85,613.91	0.00	85.61	25.18	2,075,637.31
FARYAB	BELCHERAGH	6.40	0.00	6.40	6.25	n/a	40.00	0.00	0.04	28.75	1,149.87
FARYAB	MEYMANEH	0.70	0.00	0.70	6.67	n/a	4.67	0.00	0.00	28.68	133.82
FARYAB	PASHTUN KOWT	10.80	0.00	10.80	6.95	n/a	75.06	0.00	0.08	28.90	2,169.34
FARYAB	QEYSAR	15.80	0.00	15.80	6.20	n/a	98.02	0.00	0.10	28.36	2,780.21
FARYAB	SHIRIN TAGAB	2.70	0.00	2.70	5.83	n/a	15.75	0.00	0.02	28.40	447.23
FARYAB Result		36.40	0.00	36.40	6.38	n/a	233.50	0.00	0.23	28.62	6,680.47
HELMAND	BAGHRAN	2,653.10	0.00	2,653.10	34.06	n/a	90,369.75	0.00	90.37	24.34	2,199,322.09
HELMAND	BUST	3,145.26	0.00	3,145.26	43.98	n/a	138,322.20	0.00	138.32	23.48	3,247,424.03
HELMAND	GARMSEER	2,765.14	0.00	2,765.14	50.61	n/a	139,935.40	0.00	139.94	25.37	3,550,054.61
HELMAND	KAJAKI	4,624.80	0.00	4,624.80	45.66	n/a	211,148.66	0.00	211.15	27.54	5,815,806.24
HELMAND	KHAN NESHIN	221.78	0.00	221.78	27.58	n/a	6,115.63	0.00	6.12	26.71	163,326.50
HELMAND	MUSA QALA	5,686.00	0.00	5,686.00	35.48	n/a	201,717.62	0.00	201.72	25.50	5,143,520.24
HELMAND	NAD-E-ALI	8,323.10	0.00	8,323.10	51.04	n/a	424,775.35	0.00	424.78	23.38	9,930,936.73
HELMAND	NAHR-E-SARAJ	4,377.78	0.00	4,377.78	49.98	n/a	218,819.79	0.00	218.82	24.23	5,302,880.95
HELMAND	NAWA BARAKZAI	3,246.10	0.00	3,246.10	48.70	n/a	158,069.67	0.00	158.07	25.64	4,053,294.46
HELMAND	NAW ZAD	5,085.00	0.00	5,085.00	37.97	n/a	193,071.09	0.00	193.07	25.72	4,966,028.13
HELMAND	SARBAN QALA	1,711.20	0.00	1,711.20	27.01	n/a	46,218.98	0.00	46.22	25.82	1,193,331.14
HELMAND	WASHIR	1,013.93	0.00	1,013.93	23.71	n/a	24,036.10	0.00	24.04	23.80	572,041.09
HELMAND Result		42,853.19	0.00	42,853.19	39.65	n/a	1,852,600.24	0.00	1,852.60	25.13	46,137,966.21
HERAT	PASHTUN ZARGHUN	38.36	0.00	38.36	69.12	n/a	2,651.28	0.00	2.65	34.50	91,473.59
HERAT Result		38.36	0.00	38.36	69.12	n/a	2,651.28	0.00	2.65	34.50	91,473.59
JAWZJAN	AQCHAH	207.60	0.00	207.60	8.19	n/a	1,699.47	0.00	1.70	20.88	35,477.39
JAWZJAN	FAIZABAD	105.20	0.00	105.20	8.13	n/a	854.75	0.00	0.85	18.59	15,888.17
JAWZJAN	KHAMYAB	6.40	0.00	6.40	17.56	n/a	112.41	0.00	0.11	19.27	2,165.94
JAWZJAN	MANGA JEK	140.60	0.00	140.60	35.72	n/a	5,022.23	0.00	5.02	20.40	102,446.85
JAWZJAN	MARDIAN	110.60	0.00	110.60	35.72	n/a	3,950.63	0.00	3.95	20.57	81,247.87
JAWZJAN	QARQIN	10.30	0.00	10.30	16.51	n/a	170.06	0.00	0.17	19.60	3,332.86
JAWZJAN	SAR-E-POL	145.80	0.00	145.80	7.82	n/a	1,140.75	0.00	1.14	25.91	29,551.46
JAWZJAN	SHBERGHAN	19.40	0.00	19.40	7.30	n/a	141.70	0.00	0.14	27.07	3,836.04
JAWZJAN Result		745.90	0.00	745.90	17.12	n/a	13,092.00	0.00	13.09	21.53	273,946.58
KABUL	SAROBI	340.30	0.00	340.30	44.82	n/a	15,250.78	0.00	15.25	20.24	308,709.92
KABUL Result		340.30	0.00	340.30	44.82	n/a	15,250.78	0.00	15.25	20.24	308,709.92
KAPISA	TAGAB	104.20	0.00	104.20	49.11	n/a	5,117.11	0.00	5.12	20.24	103,581.70
KAPISA Result		104.20	0.00	104.20	49.11	n/a	5,117.11	0.00	5.12	20.24	103,581.70
KUNAR	ASADABAD	141.05	97.62	238.68	67.41	49.44	9,508.08	4,826.96	14.34	23.59	338,155.04
KUNAR	BAR KUNAR	66.57	5.63	72.20	58.75	65.00	3,910.75	365.95	4.28	10.28	43,964.39
KUNAR	CHAWKI	49.70	0.00	49.70	43.97	n/a	2,185.09	0.00	2.19	42.17	92,142.40
KUNAR	KHAS KUNAR	173.40	0.00	173.40	73.54	n/a	12,752.33	0.00	12.75	40.17	512,302.32
KUNAR	MAZAR (NUR GUL)	97.50	0.00	97.50	47.75	n/a	4,655.32	0.00	4.66	24.91	115,945.84
KUNAR	NARANG	69.30	14.60	83.90	84.01	36.52	5,821.92	533.12	6.36	39.26	249,502.67
KUNAR	SARKANI	64.00	6.80	70.80	73.94	40.56	4,731.85	275.78	5.01	42.17	211,165.58
KUNAR Result		661.52	124.65	786.17	64.19	47.88	43,565.35	6,001.81	49.57	31.79	1,563,178.24
KUNDUZ	ALIABAD	51.10	0.00	51.10	33.53	n/a	1,713.35	0.00	1.71	23.04	39,477.04
KUNDUZ	CHAHAR DARREH	29.95	0.00	29.95	27.75	n/a	831.17	0.00	0.83	18.59	15,448.54
KUNDUZ	KHANABAD	35.80	0.00	35.80	30.00	n/a	1,074.00	0.00	1.07	23.48	25,212.87
KUNDUZ	KUNDUZ	50.58	0.17	50.75	9.49	3.33	480.22	0.56	0.48	21.64	10,402.73
KUNDUZ	QALA-E-ZAL	321.49	0.00	321.49	31.95	n/a	10,271.67	0.00	10.27	34.59	355,329.86
KUNDUZ Result		488.93	0.17	489.09	26.54	3.33	14,370.41	0.56	14.37	24.27	445,871.05
LAGHMAN	ALINGAR	130.65	0.00	130.65	51.93	n/a	6,784.89	0.00	6.78	28.89	196,013.11
LAGHMAN	ALISHANG	88.35	0.00	88.35	67.39	n/a	5,953.52	0.00	5.95	40.52	241,242.74
LAGHMAN	METARLAM	190.27	0.00	190.27	68.27	n/a	12,989.59	0.00	12.99	30.39	394,738.47
LAGHMAN	QARGHAI	296.46	1.20	297.66	33.40	36.67	9,900.83	44.00	9.94	35.30	351,081.01
LAGHMAN Result		705.73	1.20	706.93	55.25	36.67	35,628.83	44.00	35.67	33.78	1,183,075.33
LOGAR	AZRO	46.30	0.00	46.30	23.85	n/a	1,104.32	0.00	1.10	33.74	37,256.42
LOGAR Result		46.30	0.00	46.30	23.85	n/a	1,104.32	0.00	1.10	33.74	37,256.42
NANGARHAR	ACHIN	1,316.60	0.00	1,316.60	57.83	n/a	76,134.20	0.00	76.13	31.47	2,396,033.48

Annex 1c Data Summaries for Production 2000

Note: n/a = not applicable (poppy area=0)
Area units are hectares.

Province	District	Irrigated Poppy	Rainfed Poppy	Poppy Area	Yield Irrigated	Yield Rainfed	Production Irrigated	Production Rainfed	Metric Tons	Price Fresh Opium USD	Income USD
NANGARHAR	BATI KOT	534.80	0.00	534.80	43.30	n/a	23,158.75	0.00	23.16	36.64	848,426.36
NANGARHAR	BEHSUD	1,004.80	0.00	1,004.80	38.38	n/a	38,565.18	0.00	38.57	31.83	1,227,463.49
NANGARHAR	CHAPARHAR	831.50	0.00	831.50	30.53	n/a	25,389.33	0.00	25.39	34.14	866,739.18
NANGARHAR	DARAE NOOR	421.00	0.00	421.00	51.80	n/a	21,807.80	0.00	21.81	32.28	703,952.66
NANGARHAR	DEH BALA	439.05	0.00	439.05	61.00	n/a	26,783.93	0.00	26.78	35.01	937,670.13
NANGARHAR	DURBABA	25.25	7.35	32.60	26.96	25.56	680.65	187.83	0.87	30.97	26,900.39
NANGARHAR	GOSHTA	234.70	3.20	237.90	60.29	24.44	14,149.70	78.22	14.23	35.23	501,216.70
NANGARHAR	HESARAK	541.40	0.00	541.40	35.72	n/a	19,338.81	0.00	19.34	41.82	808,713.79
NANGARHAR	JALALABAD CITY	15.82	0.00	15.82	55.56	n/a	878.89	0.00	0.88	38.41	33,759.49
NANGARHAR	KAMA	588.53	0.00	588.53	44.65	n/a	26,277.86	0.00	26.28	36.00	945,992.75
NANGARHAR	KHOGIANI	4,913.00	0.00	4,913.00	29.99	n/a	147,320.21	0.00	147.32	29.29	4,314,697.78
NANGARHAR	KUZ KUNAR	399.34	0.00	399.34	51.38	n/a	20,517.37	0.00	20.52	36.36	746,003.35
NANGARHAR	LA'LPUR	248.00	0.00	248.00	47.94	n/a	11,889.41	0.00	11.89	29.23	347,520.26
NANGARHAR	MOHMAND DARA	255.20	0.00	255.20	49.61	n/a	12,659.26	0.00	12.66	36.94	467,646.53
NANGARHAR	NAZIAN	174.17	2.60	176.77	50.21	28.33	8,744.99	73.67	8.82	44.07	388,665.92
NANGARHAR	PACHIER WA AGAM	629.50	0.00	629.50	36.08	n/a	22,712.24	0.00	22.71	39.53	897,888.08
NANGARHAR	RODAT	2,288.00	13.80	2,301.80	36.99	2.08	84,635.93	28.75	84.66	36.05	3,052,378.92
NANGARHAR	SHERZAD	1,461.80	257.00	1,718.80	35.22	18.47	51,491.49	4,746.79	56.24	40.93	2,302,075.79
NANGARHAR	SHINWAR	1,300.15	0.00	1,300.15	34.84	n/a	45,293.31	0.00	45.29	33.74	1,528,061.97
NANGARHAR	SORKH ROD	1,839.98	0.00	1,839.98	28.19	n/a	51,864.04	0.00	51.86	35.06	1,818,362.49
<u>NANGARHAR Result</u>		<u>19,462.60</u>	<u>283.95</u>	<u>19,746.55</u>	<u>43.16</u>	<u>19.78</u>	<u>730,293.36</u>	<u>5,115.26</u>	<u>735.41</u>	<u>35.48</u>	<u>25,160,169.51</u>
NIMROZ	KANG	0.00	0.00	0.00	n/a	n/a	0.00	0.00	0.00	38.41	0.00
NIMROZ	KHASH RUD	218.50	0.00	218.50	41.74	n/a	9,120.72	0.00	9.12	30.29	276,225.87
<u>NIMROZ Result</u>		<u>218.50</u>	<u>0.00</u>	<u>218.50</u>	<u>41.74</u>	<u>n/a</u>	<u>9,120.72</u>	<u>0.00</u>	<u>9.12</u>	<u>34.35</u>	<u>276,225.87</u>
ORUZGAN	CHAR CHASHMA	802.40	0.00	802.40	46.48	n/a	37,294.88	0.00	37.29	37.33	1,392,207.95
ORUZGAN	CHORA	1,179.00	0.00	1,179.00	36.35	n/a	42,854.68	0.00	42.85	36.58	1,567,630.25
ORUZGAN	DEHRAWUD	725.60	0.00	725.60	45.94	n/a	33,337.29	0.00	33.34	25.72	857,559.70
ORUZGAN	KHAS ORUZGAN	129.96	0.00	129.96	34.01	n/a	4,420.35	0.00	4.42	38.41	169,792.50
ORUZGAN	TIRIN KOT	1,493.80	0.00	1,493.80	45.46	n/a	67,902.69	0.00	67.90	27.17	1,845,157.51
<u>ORUZGAN Result</u>		<u>4,330.76</u>	<u>0.00</u>	<u>4,330.76</u>	<u>41.65</u>	<u>n/a</u>	<u>185,809.90</u>	<u>0.00</u>	<u>185.81</u>	<u>33.04</u>	<u>5,832,347.90</u>
QANDAHAR	ARGHANDAB	459.20	0.00	459.20	41.04	n/a	18,844.76	0.00	18.84	29.11	548,619.24
QANDAHAR	ARGHISTAN	13.35	0.00	13.35	14.44	n/a	192.83	0.00	0.19	40.18	7,748.88
QANDAHAR	DAMAN	50.31	0.00	50.31	47.03	n/a	2,366.30	0.00	2.37	38.08	90,105.78
QANDAHAR	DAND	155.95	0.00	155.95	54.38	n/a	8,481.06	0.00	8.48	27.01	229,041.02
QANDAHAR	GHORAK	574.30	0.00	574.30	21.46	n/a	12,326.59	0.00	12.33	26.13	322,102.20
QANDAHAR	KHAKREZ	320.40	0.00	320.40	19.14	n/a	6,133.63	0.00	6.13	39.04	239,433.99
QANDAHAR	MAIWAND	994.54	0.00	994.54	38.66	n/a	38,448.49	0.00	38.45	24.22	931,115.32
QANDAHAR	MARUF	17.00	0.00	17.00	38.59	n/a	656.03	0.00	0.66	37.95	24,897.41
QANDAHAR	NESH	393.80	0.00	393.80	53.84	n/a	21,202.55	0.00	21.20	38.41	814,422.82
QANDAHAR	PANJWAI	183.94	0.00	183.94	17.09	n/a	3,144.41	0.00	3.14	34.31	107,886.03
QANDAHAR	SHAH WALI KOT	238.35	0.00	238.35	46.52	n/a	11,088.66	0.00	11.09	26.29	291,568.60
QANDAHAR	SPIN BOLDAK	26.30	0.00	26.30	29.81	n/a	784.04	0.00	0.78	37.95	29,755.72
<u>QANDAHAR Result</u>		<u>3,427.44</u>	<u>0.00</u>	<u>3,427.44</u>	<u>35.17</u>	<u>n/a</u>	<u>123,669.36</u>	<u>0.00</u>	<u>123.67</u>	<u>33.22</u>	<u>3,636,697.03</u>
SAMANGAN	KHURAM O SARBAKH	17.40	0.00	17.40	25.69	n/a	447.08	0.00	0.45	26.75	11,957.70
SAMANGAN	SAMANGAN	36.40	0.00	36.40	27.08	n/a	985.83	0.00	0.99	25.16	24,806.79
<u>SAMANGAN Result</u>		<u>53.80</u>	<u>0.00</u>	<u>53.80</u>	<u>26.39</u>	<u>n/a</u>	<u>1,432.92</u>	<u>0.00</u>	<u>1.43</u>	<u>25.95</u>	<u>36,764.49</u>
TAKHAR	BANGI	2.00	5.80	7.80	21.11	6.36	42.22	36.91	0.08	37.50	2,967.42
TAKHAR	CHAH AB	25.60	19.40	45.00	19.55	10.33	500.36	200.47	0.70	38.16	26,745.84
TAKHAR	CHAL	2.60	14.20	16.80	20.56	5.71	53.44	81.14	0.13	38.13	5,131.53
TAKHAR	ESHKAMESH	1.00	8.80	9.80	23.33	6.15	23.33	54.15	0.08	37.76	2,925.88
TAKHAR	FARKHAR	0.60	5.40	6.00	20.00	6.94	12.00	37.50	0.05	38.34	1,897.95
TAKHAR	KALAFGAN	35.60	57.20	92.80	21.84	6.67	777.58	381.33	1.16	48.92	56,692.51
TAKHAR	KHVAJEH GHAR	27.40	29.20	56.60	23.70	9.00	649.48	262.80	0.91	30.66	27,972.93
TAKHAR	ROSTAQ	93.00	58.40	151.40	23.70	9.17	2,204.44	535.33	2.74	37.24	102,023.86
TAKHAR	TALOQAN	46.60	50.80	97.40	25.31	7.02	1,179.38	356.49	1.54	35.68	54,798.62
TAKHAR	WARSAJ	0.80	8.40	9.20	21.67	6.11	17.33	51.33	0.07	39.34	2,701.64
TAKHAR	YANGI QALA	121.60	32.80	154.40	21.98	10.45	2,672.67	342.91	3.02	35.45	106,898.18
<u>TAKHAR Result</u>		<u>356.80</u>	<u>290.40</u>	<u>647.20</u>	<u>22.07</u>	<u>7.63</u>	<u>8,132.25</u>	<u>2,340.37</u>	<u>10.47</u>	<u>37.93</u>	<u>390,756.38</u>
ZABUL	ARGHANDAB	139.40	0.00	139.40	51.45	n/a	7,171.69	0.00	7.17	38.41	275,475.55
ZABUL	DAI CHOPAN	114.00	0.00	114.00	47.74	n/a	5,442.27	0.00	5.44	38.41	209,046.13
ZABUL	JALDAK	47.71	0.00	47.71	26.76	n/a	1,276.86	0.00	1.28	26.47	33,801.68
ZABUL	MIZAN	383.06	0.00	383.06	53.08	n/a	20,333.66	0.00	20.33	38.41	781,047.58
ZABUL	QALAT	40.44	0.00	40.44	54.41	n/a	2,200.19	0.00	2.20	27.09	59,598.81
<u>ZABUL Result</u>		<u>724.61</u>	<u>0.00</u>	<u>724.61</u>	<u>46.69</u>	<u>n/a</u>	<u>36,424.67</u>	<u>0.00</u>	<u>36.42</u>	<u>33.76</u>	<u>1,358,969.75</u>
<u>Grand Total</u>		<u>79,816.53</u>	<u>2,355.27</u>	<u>82,171.80</u>	<u>35.72</u>	<u>16.76</u>	<u>3,249,601.17</u>	<u>26,341.69</u>	<u>3,275.94</u>	<u>30.06</u>	<u>91,055,877.54</u>

Annex 1d Data Summaries for Farmers 2000

Note: NR=number of respondents
n/a=no data

Province	Reports of Change in Cultivation				Reports of Eradication Efforts			Reports of Damage to Crop			
	NR	Decrease	Increase	No Change	NR	Eradication	Eradication	NR	Damage	No Damage	Avg. Damage Extent
BADAKHSHAN	1200	36.7	15.7	47.7	1200	6.7	93.3	1182	99.7	0.3	53.7
BADGHIS	63	100.0	0.0	0.0	63	0.0	100.0	0	n/a	n/a	n/a
BAGHLAN	204	8.8	79.4	11.8	204	0.0	100.0	204	7.4	92.6	35.3
BALKH	516	76.7	20.3	2.9	516	16.9	83.1	378	83.3	16.7	45.2
FARAH	680	17.5	81.2	1.3	672	29.5	70.5	675	81.8	18.2	38.2
FARYAB	78	100.0	0.0	0.0	78	0.0	100.0	3	100.0	0.0	73.3
HELMAND	4179	80.1	9.4	10.5	4173	92.6	7.4	4186	85.1	14.9	31.5
HERAT	147	0.0	100.0	0.0	147	0.0	100.0	0	n/a	n/a	n/a
JAWZJAN	762	100.0	0.0	0.0	762	0.0	100.0	750	99.6	0.4	83.7
KABUL	315	2.5	97.1	0.3	315	0.0	100.0	315	45.7	54.3	13.1
KAPISA	159	1.9	96.2	1.9	159	0.0	100.0	156	25.0	75.0	11.3
KUNAR	867	20.6	77.3	2.1	862	37.9	62.1	599	34.2	65.8	21.9
KUNDUZ	270	0.0	100.0	0.0	269	3.7	96.3	216	69.9	30.1	34.4
LAGHMAN	819	15.9	58.4	25.8	822	62.3	37.7	813	44.0	56.0	22.7
LOGAR	90	12.2	75.6	12.2	111	0.0	100.0	108	80.6	19.4	20.4
NANGARHAR	4047	54.4	29.3	16.3	4032	71.1	28.9	4043	66.2	33.8	29.4
NIMROZ	75	56.0	44.0	0.0	74	63.5	36.5	75	100.0	0.0	49.0
ORUZGAN	960	73.4	11.6	15.0	960	54.4	45.6	834	55.0	45.0	15.1
QANDAHAR	2694	79.8	11.7	8.5	2692	67.0	33.0	2423	79.4	20.6	48.5
SAMANGAN	54	0.0	100.0	0.0	54	0.0	100.0	18	16.7	83.3	20.0
TAKHAR	495	32.9	48.3	18.8	495	0.8	99.2	417	85.9	14.1	60.1
ZABUL	1174	26.1	62.2	11.8	1165	31.2	68.8	1156	53.1	46.9	41.1
<i>Average of Responses</i>	<u>19848</u>	<u>40.7</u>	<u>50.8</u>	<u>8.5</u>	<u>19825</u>	<u>24.4</u>	<u>75.6</u>	<u>18551</u>	<u>65.6</u>	<u>34.4</u>	<u>37.4</u>

Annex 2 - Data Analysis

Introduction

Data analysis is an open-ended process of exploration and deduction based on the raw survey data. There are many possible topics for data analysis, however, the four contained within this Annex were chosen because they:

- C relate to the findings presented in Chapter Two;
- C suggest new approaches for future surveys; and,
- C identify future strategies for poppy crop reduction.

Each topic begins with a statement of the objective of the analysis, discusses the methodology, the findings, and finishes with a conclusion.

Distribution of Village Poppy Area

Objective

To examine the distribution of village poppy area and determine if the data is normally distributed. In the case that the data are normally distributed, there is justification for using sampling techniques in future surveys.

Methodology

Extract the variable “village poppy area” from the database, for all poppy growing villages. Determine a suitable transformation and compute quantiles¹ of raw and transformed data for various probabilities. Plot the histogram of the raw and the transformed data. Test the transformation for normality.

Findings

As Figure 16 shows clearly, the raw data is not normally distributed. The distribution is right-

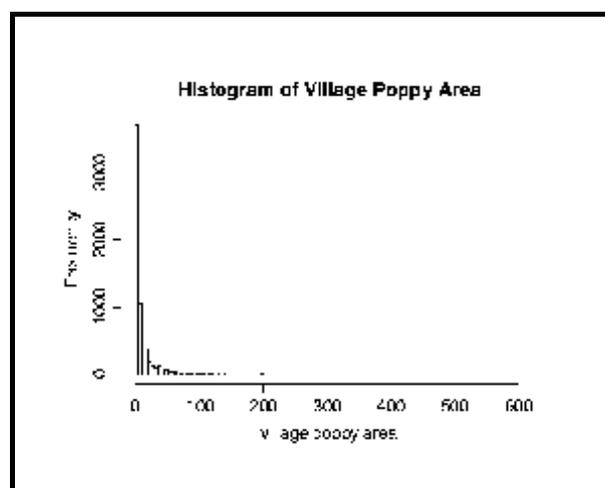


Figure 16: Histogram of village poppy area (hectares)

¹ A *quantile* is the data value that lies on a percentage boundary of the ranked data cases. Thus a 95% quantile is the data value for which 95% of the cases are below it in value and 5% are above it. *Quartiles* are 25% quantiles and *deciles* are 10% quantiles.

skewed, a common characteristic of agricultural land use data.

A log10 transformation appeared to have the best results. The quantiles of the raw and transformed data are shown in the following table, with their means.

percent	0	1	5	10	25	50	75	90	95	99	100	mean
raw	0.00	0.10	0.32	0.60	1.40	4.00	12.00	32.40	51.80	114.16	603.4	12.37
log10	-2.7	-1.0	-0.5	-0.2	-0.15	0.60	1.08	1.51	1.71	2.06	2.78	0.61

Table 5: Quantiles for raw and transformed data.

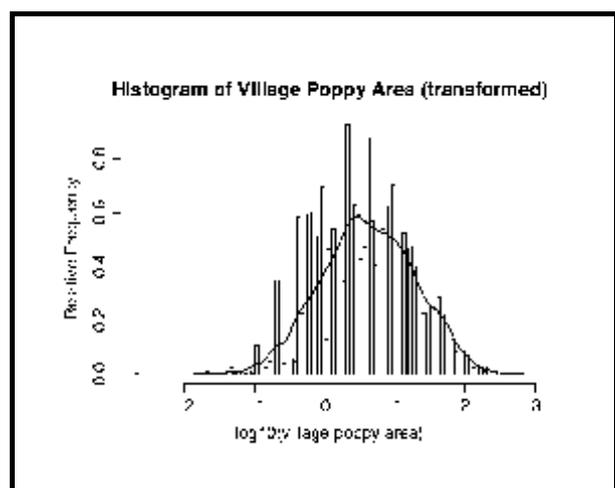


Figure 17: Histogram of transformed area

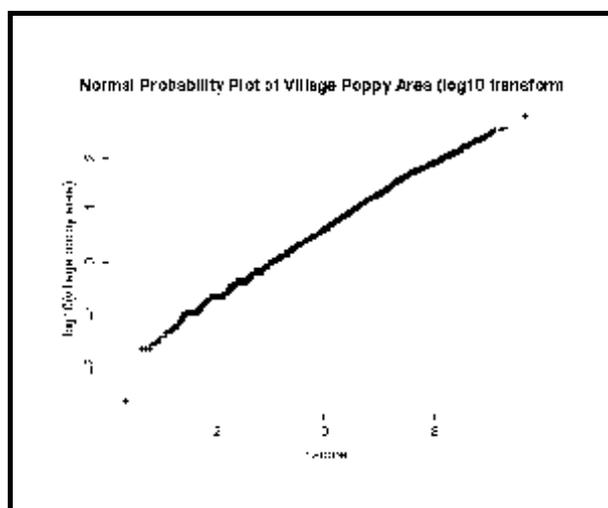


Figure 18: Normal probability plot

This table shows the percentage of data that lies below (or above) a certain data value. For example, 50% of the data (or 50% of the villages) have a poppy area less than 4.0 ha. This is the median point. Conversely, we can say that 1% of the villages have a poppy area more than 114.16 ha. Note the difference between the mean and median is quite high for the raw data, whilst they have similar magnitude for the transformed data.

The histogram of the log10 transformed data is shown in Figure 17. A smoothing line is also shown to give an indication of the shape of the distribution with noise filtered out. This gives a clear indication of the viability of the log10 transformation for normalisation.

To explore this further, a “normal probability plot” and test for normality² was carried out. The normal probability plot is a plot of $\{X_i\}$ against $\{z_i\}$ where:

$\{X_i\}$ is the vector of village poppy area, and, $\{z_i\}$ are the corresponding Z-scores from the normal standard distribution for a suitable probability function $\{p_i\}$. The function chosen is:

² Ref: Ryan, T. A., and Joiner, B. L., Normal Probability Plots and Tests for Normality. *Technical Report, Statistics Department, Pennsylvania State University, 1976.* (Minitab White Paper)

$P_i = \frac{i}{(n+1)}$ where n is the number of poppy villages. Hence, $z_i = Q^{-1}(P_i)$ where Q is the normal standard distribution.

The plot is shown in Figure 18. The straight line is indicative of a normal distribution.

The test for normality is based on computing the probability plot correlation coefficient R_p from derived from the $\{X_i\}$ and $\{z_i\}$ vectors. This is essentially equivalent to, but simpler than, the Shapiro-Wilk test.

The computed value of this coefficient for is: $R_p = 0.99$. This indicates a very high correlation between $\{X_i\}$ and $\{z_i\}$, and consequently is evidence that the log10 transformation of village poppy area yields a near normal distribution.

Conclusion

The log10 transformation of village poppy area has been shown to be a means of normalising this variable. This suggests the possible use of *sampling surveys* where the determination of population parameters assumes that the data is normally distributed.

Correlation Analysis

Objective

Correlation analysis can assist us to determine if any of the variables under investigation are related to each other. For example, it may determine if there is a link between the size of population and the area of poppy in poppy growing villages.

Methodology

The following variables were selected for correlation analysis:

- 1) total poppy area per village
- 2) total cultivated area per village
- 3) number of families per village
- 4) average poppy area per family: the ratio of variables 1) and 3)
- 5) cultivation intensity per village: the ratio of variables 1) and 2)

Cultivation intensity is the ratio of area under poppy cultivation to total cultivated area. It is an indicator of the perceived merit of poppy as an income generating crop relative to other crops such as wheat.

The data was restricted to poppy growing villages only. Correlation was performed using pairwise complete observations. That is, paired variables for each village only figured in the correlation if both had no missing values. Missing values were present in a small proportion of the population data.

Results

Weak correlations were found between the following variables:

variable	variable	correlation coefficient
Cultivated area	number of families	0.25
Poppy area	number of families	0.18
Poppy area	poppy area per family	0.29
Poppy area	cultivation intensity	0.36
Poppy area per family	cultivation intensity	0.35

Table 6: Correlation table

Conclusion

The main conclusion that we can reach is that there are no *strong* relationships amongst the variables under analysis. In particular we note that there is little evidence that poppy cultivation is related to size of population, or to the amount of cultivated land available.

There is some evidence, however, that cultivation intensity is higher in large poppy area villages. That is, a larger proportion of the arable land is taken up by poppy in large poppy areas. A similar correlation exists between cultivation intensity and poppy area per family. These correlations are in part due to the use of ratio variables, however, they merit further examination.

Village poppy area may also be correlated with other variables such as land suitability, climate, and availability of water. Further data collection would be required to establish whether these factors are conducive to poppy cultivation.

Survey Reliability

Objective

Part of the survey methodology involves survey coordinators performing a closed area traverse measurement of village poppy fields. This is a more accurate measurement than the estimation technique used by each surveyor. This check is carried out in five villages out of the total surveyed by each surveyor.

This analysis compares the village poppy area measurement of coordinators with that of surveyors for the set of villages that were checked.

Methodology

For the set of villages that were checked by a coordinator, a new difference variable was computed:

$$D = \text{surveyor area measurement} - \text{coordinator area measurement}$$

The distribution of D was examined to determine the difference in measurement between surveyor and coordinator.

Results

The distribution of D can be summarized by the following table (values are in hectares).

min	1 st quartile	median	mean	3 rd quartile	max
-4.2	-0.02	0	0.19	0.26	9

Table 7: Summary of differences

This shows that the greatest overestimation by a surveyor was 9 ha and the greatest underestimation was 4.2 ha. However, as the histogram in Figure 19 shows, the bulk of the observations lie between ± 2 ha. This suggests that the median is a better measure of central tendency. Note that the histogram excludes zero values.

Conclusion

The median difference between surveyor and coordinator measurement of village poppy area was 0 ha. This suggests that surveyors do not consistently under- or over-estimate poppy area.

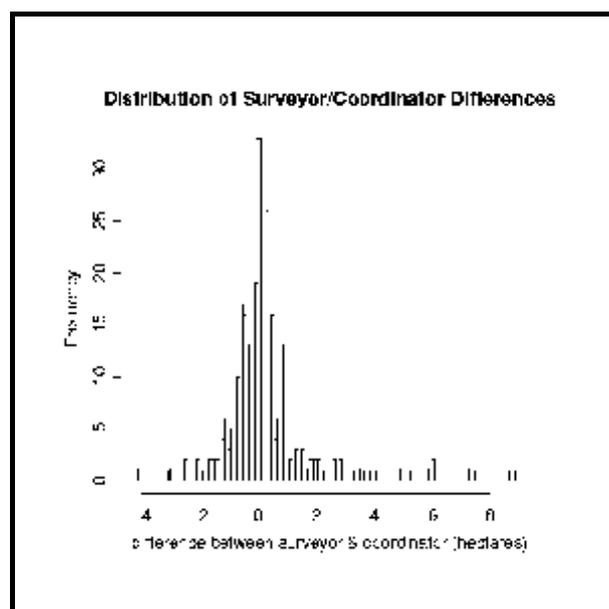


Figure 19: Difference histogram

Crop Reduction Scenarios

Objective

This analysis shows the potential reduction in total national poppy area that would result using two different reduction strategies. The optimal strategy is the one that yields the greatest reduction in area.

The strategies proposed involve application of reduction controls to a selected group of high poppy area villages. The remainder of the villages would be subject to bans on *expansion* of cultivation.

Methodology

The total number of poppy growing villages as determined by the survey is 6,645. A village poppy threshold area is defined as follows.

1. Rank the villages in order of poppy area.
2. Make *target groups* of the top 1%, 5%, 10%, 15%, 20%, and 25% of the villages. Note that the groups are nested. For example, the top 5% of the villages includes the top 1%, and so on.
3. Determine the quantile for each group. This is the threshold.

For example, the threshold area for the top 10% of villages is 32 ha because 10% of the villages have a poppy area greater than 32 ha and 90% of the villages have a poppy area less than 32 ha.

Now, *for each target group*, we examine two alternative strategies:

Strategy A: reduce poppy area by 50% in the target group.

Strategy B: reduce poppy area to the threshold in the target group

For example, if we chose to apply Strategy A to the 10% target group, then the top 10% of poppy villages (ranked by area of poppy) would be required to *halve* their poppy area. Alternately, if we chose to apply Strategy B to the 10% target group, then the top 10% of poppy villages would be required to *reduce cultivation* to the threshold area of 32 ha.

There are 6 target groups of villages and 2 strategies, hence there are 12 alternative outcomes. To determine the potential reduction for each outcome we apply the strategy to each village within the group (using the 2000 survey data) and then re-compute the total poppy area for all villages. The potential reduction for each target group+strategy combination is the total poppy area before application of the strategy (82,172 ha) minus the new poppy area.

Results

The following table shows the potential reductions in absolute terms and percentages from the year 2000 national total of 82,172 ha for each target group+strategy pair.

Target Groups				Strategy A		Strategy B	
% of villages	no. of villages	poppy area of group	threshold (ha)	reduction (ha)	reduction (%)	reduction (ha)	reduction (%)
1	66	12,407	115	6,203	8	4,844	6
5	332	31,863	52	15,932	19	14,666	18
10	665	45,355	32	22,678	28	23,907	29
15	997	53,803	21	26,902	33	33,076	40
20	1329	59,361	16	29,680	36	38,753	47
25	1661	64,419	12	32,209	39	44,703	54

Table 8. Crop reduction scenarios

As an example of using this table, suppose we select the top 5% of poppy villages as our target group. Then reading across the 5% row, we can see that application of Strategy A would result in a 15,932 ha reduction or 19% down from present levels. Application of Strategy B would result in a 14,666 ha reduction or 18% down from present levels.

These results compare with a blanket approach such as a one-third reduction which would yield 33% reduction = 27,117 ha., *but requires enforcement in 6,645 villages.*

It is notable that Strategy B yields the optimal results for between 15 and 25% of the villages.

Conclusion

The strategies suggested above assume that both national and international agencies have limited resources to eradicate poppy cultivation. Given that this is the case, their primary objective should be how to allocate those resources so that the maximum reduction occurs.

Based on a successful implementation of strategy B in the top 25% (1661) of poppy growing villages, we can see that there would be a 54% reduction in national poppy area. Poppy cultivation would not be allowed to expand beyond present levels in the remaining villages. The threshold would be revised annually according to survey results.

Annex 3 - Report of Survey Team Leader

Introduction

This Annex contains a summarised version of the Survey Team Leader's Report. This is based, in turn, on the reports from Survey Coordinators. These reports have been compiled and translated where necessary. The original text of the authors has been retained as much as possible, however, some minor corrections have been made to improve readability.

Survey Implementation in the South-East (Nangarhar) Zone

The South-East (Nangarhar) zone consists of the provinces of Nangarhar, Kunar, Lagman, Kabul, Logar and Kapisa. In total 38 surveyors and 3 survey coordinators conducted the survey of this zone over a period of two months from March 20th until May 20th 2000. The work was undertaken in conjunction with 3 NDCCU trainee coordinators and local guides after the training held in UNDCP office in Jalalabad. Survey team members were selected based on their past experience, as well as an evaluation before and after training. Approximately 30% of the survey team was changed from last year. The actual survey work commenced after receiving a letter of authorization from DCCU on March 20th.

Each of the coordinators was responsible for the supervision and coordination of surveyors in the above-mentioned provinces. Coordinators visited all areas and made physical measurements and sampling cross check of five villages per each surveyor. At the end of the survey each coordinator submitted a final report to the Survey Team Leader.

Comments from the Survey Team Leader

The cultivation of poppy in Nangarhar zone especially in the districts of Rodat, Chaperhar and Shinwar was common more than 80 years ago. However, large-scale production for commercial purposes is a relatively recent phenomenon, caused by post war hardship and civil strife. These conditions, added to its high market value, has resulted in farmers seeking to earn a living by cultivating poppy.

In comparison to 1999 there is not any major change in the cultivation of poppy in the Nangarhar zone. However, the regional authorities and communities mention that the sanctions, increased enforcement at border crossings, low market price, and the one third reduction decree issued by the Taliban are justification in themselves for a reduction in cultivation.

*There is expected to be a significant reduction in the opium yield because of the drought. The question is what will happen next year if there is plenty of irrigation water available in this area? One would expect that there would be a significant reduction in the cultivation of the poppy for next year because of the economical impact of the drought. However, should there be plenty of irrigation water available, there would be a significant **increase** in the cultivation of poppy because the farmers must make up for their losses in the year*

The following are the highlighted summaries of each coordinator's report.

Coordinator Nangarhar-A

The coordinator mentioned in his report that the districts of Batikoot, Momandara, Lalpura, Nazian, Achine, Dara-e-Noor, Dur baba, Kuz Kunnar, Goshta, and Kama were seriously effected by drought.

He noted that farmers had leased land at the rate of between 280 and 700 kg. of wheat for one jerib of land. The current poppy yield would not cover this overhead. For the coming year, the farmers fear the same situation and most of them stated that they will not take the same risk. This would mean a reduction in poppy cultivation for next year. Also landowners and farmers are not satisfied with the yield from poppy production and that would also be a main factor for the increase of wheat cultivation over poppy. He added that in almost in all districts in comparison to the year 1999 there has been reduction in poppy cultivation in 2000. The reasons for this are the drought and order of supreme leader of Taliban for one third reduction in poppy cultivation.

Coordinator Nangarhar-B

The coordinator noted that the country of Afghanistan has been destroyed during the past years by war. About 70% of the agricultural infrastructure has been destroyed and the electricity, bores, and water management are the first priorities for national reconstruction.

He mentioned that to facilitate progress of the survey some of the big villages were divided into smaller villages to enable the surveyors to effectively estimate the total cultivated land and the land under poppy. This was to enable more accurate estimates over the previous year's survey.

At the last part of the report the coordinator mentioned the cooperation of NDCCU and regional authorities during the implementation of the survey and at the last closing statement of his report he thanked UNDCP Poppy Survey Specialist and Survey Team Leader for provision of intensive training, instruction and advice. He noted that he had not been faced with any kind of problem during the implementation of the survey.

A coordinator discusses the causes of poppy cultivation...

There was almost no tradition of poppy cultivation in Laghman and Kunar Provinces in the past. The people were not familiar with this crop. They have started sowing this crop only recently. The basic reasons are as follows:

Firstly, the people are poor and do not have any other means of income and they have to support their large families so they cultivated poppy. That is the only source of income in the present situation.

Secondly, due to the destruction of the social and physical infrastructure as a result of 20 years of war and the instability of the recognized government in Afghanistan; about 90% of the population is jobless. So they have selected poppy as a good means of income.

Thirdly, internal conflicts among Afghan groups are a result of foreign interventions in Afghan affairs and can also be an indirect reason for the extent of poppy cultivation in the country.

Finally, the UN sanctions is another factor affecting the extent of poppy in most of the areas.

Based on my experience and discussions with villagers in Laghman and Kunar I have the following comment.

The UNDCP works to control poppy cultivation and other illicit drugs all over the world and spends a lot of money in this way. It would be very effective to stop poppy cultivation if UNDCP kept its attention on the needs of the people and searched for real alternative ways to solve this problem.

Coordinator Kunar and Lagman

The coordinator noted that there were no major problems encountered during the implementation of the survey. He added that the surveyors said that they have surveyed accurately, without facing any kind of problems. In case of some constraint, it was easily solved by the cooperation of district authorities and shuras.

He discusses the basic causes of the increase in poppy cultivation in recent times and makes some recommendations for reversing the trend. These are contained in the sidebar on the previous page.

The coordinator concluded that the opium poppy survey for the year 2000 is conducted and finalized accurately. All the surveyors and coordinators have tried their best to collect the accurate data and submit these to the UNDCP survey section through the proper channel.

Survey Implementation in the South-West (Qandahar) Zone.

The South-West zone consists of the provinces of Qandahar, Zabul, Oruzgan, Helmand, Farah, Nimroz and Herat. In total 51 surveyors and 6 survey coordinators conducted the survey of this zone over a period of two months starting from March 25th until May 25th 2000. This was carried out in conjunction with 6 QDCCU trainee coordinators and 37 local guides after the intensive training held in the UNDCP site office in Qandahar. Approximately 30% of the survey staff were changed from the last year's team. The actual practical work was started after forwarding a letter of authorization from DCCUs to the district administrators two days after the initial start of the survey.

At the end of the survey each coordinator submitted a final report to the Survey Team Leader. The summarised reports of the Head Coordinator and the Coordinator of upper Helmand Province follow.

Head Coordinator of South West Zone

Poppy was found to be cultivated in all surveyed districts except Kang district of Nimroz province. The drought situation, and the fluctuation of the ground water table had an adverse effect on poppy cultivation with about 30 to 50% being completely damaged with no yield expected. A large amount of remaining poppy has been affected by different diseases during the second and third stage of cultivation. In some districts the poppy seedlings were eaten by seasonal birds. People said that these birds had come from the desert in the south-west of Afghanistan to the cultivated agricultural areas. About 50 to 60% of the farmers and landowners thought that chemicals had been mixed with the fertilizer by the UN and USA in order to have an adverse effect on poppy yield.

Based on the survey data, 81% of the total amount of poppy in this zone comes from Helmand province.

At the last part the coordinator attested the hard work and interest of surveyors during the implementation of 2000 survey and at the last part his report he requested the central office of UNDCP to think more for the betterment of the survey in the year 2001 by recruitment of a well qualified

permanent team.

Coordinator of Helmand Province

In Musa Qala, Sarban Qala, Kajaki, Naw Zad, and Baghran districts of Helmand province, poppy is cultivated in huge amounts. People have accepted poppy cultivation in the same way as other crops and it has become a tradition for the past many years. In today's situation, people accept poppy cultivation as the only source of living and they even do not have any kind of information about alternative sources of income and they never think about its consequences. Even though some young people have become addicted by poppy and heroin lately, yet people still do not consider poppy cultivation detrimental. In fact, it is considered as the only source of improving the economy. Villagers in this area are much more skilled and experienced in cultivating and fertilizing poppy than villagers of other regions of Afghanistan. The climate in this region is perfect for cultivating poppy and its yield is much higher than other regions. That is why in this region one man (4.5kg) of opium is sold at a price of 100,000 Afghani higher than other regions.

The main reasons for cultivating poppy in Helmand

- c A lack of job opportunities and other occupations for people.*
- c Having adequate resources for cultivating, fertilizing and harvesting poppy.*
- c The high costs of food items and other necessities and gaining plenty of income from poppy.*
- c Gaining of yield in a comparatively short time.*
- c Sufficiency of skill and experience in poppy cultivation and lack of enough experience in other crops.*
- c The suitable soil and climate of this region for poppy cultivation.*
- c Existence of a high demand for purchasing opium, even though it is available in huge quantity.*
- c Lack of controls for preventing poppy cultivation.*
- c If needed opium can be sold at one's doorstep in less than one hour.*
- c Farmers can earn cash in advance for the coming year. The required amount can be earned even if it is a huge amount. In other words they will never face problems concerning money.*
- c Smugglers and wealthy people make efforts to give more money in advance so that people won't face any kind of trouble concerning poppy cultivation for the next year.*

To be precise, one can say that poppy cultivation in this region is the best source of income for landlords and tenants, it is the only alternative in an uphill struggle.

Ways to prevent poppy cultivation

- c Give practical assistance to farmers by providing them with other suitable crops which might have a price equal to opium.*
- c Provide job opportunities for lodgers and wage earners.*

The box above summarises the main reasons why people cultivate opium poppy in this Province.

In respect of the change in poppy cultivation from last year we can say that this year's survey has shown

that poppy cultivation has decreased from previous years. The reasons for this decrease are as follows:

Firstly, the issuance of the Islamic Emirate's edict regarding a one third reduction in poppy cultivation by farmers.

Secondly, landlords and farmers were faced with many problems because of the increased poppy cultivation last year. For instance, there was a shortage of lancers, and a shortage of straw for animals, and so its price increased.

Thirdly, the cost of cultivating poppy was high but the price of wheat increased.

The effects of drought

This year due to drought, the water level of karez, springs, and bawary and even rivers had completely dried or was 50-80% down from normal. For this reason some of poppy was completely dried.

This year we have seen that poppy cultivation desperately requires rain. If there is not enough water its yield is not enough. For instance, in those areas where poppy was irrigated even after two or three days by the Bawari water and was given the required amount of fertilizer, the result was big and strong capsules, yet due to the lack of monsoon rain, the yield was extremely low, with only two or three fruitful cuts. This compares with previous years when gum could be collected up to the sixth cut.

There have been major changes in the climate this year. There was no spring season this year. Winter just changed to summer. In the middle of March, for some days, the weather was extremely cold, so the poppy was frozen. However, after some days, in the beginning of April, poppy cultivation was suffering from shortage of water due to the abnormal hot weather and hot wind.

This year the poppy was not only suffering from shortage of water and unsuitable weather, but also it was affected by different diseases, such as spinkay, magas, tor, and jeep and all these had damaged poppy a lot. These diseases affected between 50 to 70% of poppy cultivation.

Comments from the Survey Team Leader...

According to the comments of the coordinator, the amount of poppy in Helmand province is 81% of the total Qandahar zone. I think that there is no reason for this extent of poppy cultivation in that province (for example, the destruction of social and physical infrastructure leading the people to cultivate poppy). Especially in the lower Helmand which was directly under the HAVA (Helmand and Arghandab Valley Authority) development project. It should be mentioned that Helmand is one of the top agricultural producing areas within Afghanistan. A small change in the extent of poppy cultivation in this province will change the total production figure for the country. The authorities should note this fact.

Due to the drought from 10 to 90% and in some districts even 100% of poppy had dried. One could estimate that the yield has decreased from 50 to 70%.

Due to this decrease in poppy yield, a number of problems and misunderstandings were created between people. Those who had leased lands and could not amass sufficient yield, could not provide the landlord with the specified amount of opium in payment. Some of them even left their crop and ran

away. Those who had taken advance payment, were also unable to return the full amount of owed opium and also some of them just ran away and concealed themselves.

Poppy smuggling in this area

Opium in this area is taken to Musa Qala and Sangeens bazaar by local smugglers or by people and then it is taken to the borders of the country by smugglers. At the border it is transformed to heroin or kept its raw form, then it is taken to neighbouring countries and overseas.

The Performance of Surveyors

All nine surveyors who were assigned in six districts of Helmand province performed their task with a sense of responsibility, patience and consistence against problems. They have done their job according to the training, which was attended by them in Qandahar province.

Surveyors experience new things every year and they do their job better every year. This year's training has left a positive effect on surveyor's skill, and they came to know the exact measurement of land under poppy cultivation better.

In terms of this year's survey, I can say that this year there was no interruption or any kind of problems in this year's survey for which I have done the coordination and every thing has been done according to UNDCP's guidance.

Survey Implementation in the North-West (Mazar) Zone

Beside the direct implementation of the survey activities in the zones of Nangarhar and Qandahar through DCCUs, UNDCP Afghanistan Program has been sub-contracting the opium poppy survey in northern Afghanistan. This includes the north-eastern provinces around Badakhshan, and the north-western provinces around Mazar. This work has been carried out since 1995 by a very qualified and well-known Afghan NGO called PRB (Pamir Reconstruction Bureau). This is mainly due to the social and political situation and the limited resources available to UNDCP in the northern areas.

The north-west zone (Mazar) consists of the provinces of Balkh, Jawzjan, Sari Pul, Faryab, Badghis, Samangan, Baghlan and Kunduz. A total of 16 surveyors and 3 survey coordinators conducted the survey of the Mazar zone through PRB in 40 days time starting from May 20th until June 30th 2000. This was in conjunction with 1 trainee coordinator from DCCU and 10 local guides. Training was held in PRB site office in Mazar city. The selection of the survey team members was based on their past experience with PRB. The actual practical work was started after PRB received the letter of authorization from the Drug Control High Commission of the Islamic Emirate of Afghanistan and forwarding the letter of authorization to the district administrations.

During the debriefing of the surveyors of Mazar zone it was clear that the cultivation of the poppy compared to 1999 has increased because a number of poppy cultivating districts were not surveyed last year because of security problems due to fighting between Taliban and opposition. The drought had

also damaged more than 50% of the cultivated poppy, especially in the northern part of Mazar, Jawzjan and Faryab provinces.

Survey Implementation in the North-East (Badakhshan) Zone

Badakhshan zone is the only zone, which is under the control of the main opposition force. This zone consists of the provinces of Badakhshan and Takhar. A total of 14 Surveyors and 1 survey coordinator conducted the survey in 40 days time starting from June 1st until July 10th 2000.

During the debriefing of the surveyors of Badakhshan zone in Faizabad city it was clear that the cultivation of the poppy compared to 1999 had decreased in Badakhshan province. This was because of the work of one NGO by the name of FOCUS who had started large-scale agriculture, irrigation and construction work in the areas of the Ismailiya tribe people. The Ismailiya people live in the upper portion of Badakhshan province. According to the NGO's report, poppy cultivation is completely stopped and replaced by other crops within those districts.

During the debriefing of the surveyors of Badakhshan zone in Faizabad city it was clear that the cultivation has increased in Takhar province compared to last year, due to expansion of poppy in districts that were not surveyed last year.

Comments and recommendations from PRB

There are two main comments and recommendations in which surveyors and coordinators from PRB have made.

Firstly, almost all of the coordinators commented that the survey should start one month earlier and should be extended to three months.

Secondly, all of the surveyors and coordinators strongly recommended a review of resources for survey personnel (salary, travel, and transportation), based on the amount of work and working conditions. They mentioned that the properly qualified personnel should be identified based on their output and technical qualifications.

Annex 4 - Survey Form

OPIUM POPPY SURVEY 2000 QUESTIONNAIRE

SURVEYOR: _____ DATE: _____ TIME: _____
 PROVINCE: _____ DISTRICT: _____ AREA: _____
 VILLAGE: _____ VILLAGE CODE: _____

1. How many households are in this village? _____
2. How many families are in this village? _____
3. Is there poppy cultivation in this village? Yes: _ No: _
4. What is the total area of cultivated land in jerib?
 (Surveyor's estimation) Irrigated: _____ Rainfed: _____
5. What is the total area of land under poppy cultivation in jerib?
 (Surveyor's estimation) Irrigated: _____ Rainfed: _____
6. What is the respondent's estimation of total cultivated land and land under poppy cultivation in this village?

Respondent	Total Cultivated Land (jerib)		Land Under Poppy Cultivation (jerib)	
	Irrigated	Rainfed	Irrigated	Rainfed
No. 1				
No. 2				
No. 3				

7. What is the respondent's estimation of Opium & Wheat yield in kg/jerib last year (1999) and this year?

Respondent	1999 Actual Yield (kg/jerib)				2000 Estimated Yield (kg/jerib)			
	Opium		Wheat		Opium		Wheat	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
No. 1								
No. 2								
No. 3								

8. Has there been any change in poppy cultivation since 1999 in this village? (Place an (X) in the appropriate box)

<i>Respondent</i>	<i>No Change</i>	<i>Increased</i>	<i>Decreased</i>
No. 1			
No. 2			
No. 3			

9. Have there been any poppy eradication efforts in this village this season? (Place an (X) in the appropriate box). If yes explain in the 'Comments & Observation Section'

<i>Respondent</i>	<i>Yes</i>	<i>No</i>
No. 1		
No. 2		
No. 3		

10. Has the poppy crop suffered any damage in the village this season?

<i>Respondent</i>	<i>Yes</i>	<i>No</i>	<i>Extent(%)</i>	<i>Reason</i>
No. 1				
No. 2				
No. 3				

11. What is the present price of Opium and Wheat in afs/kg in this village?

<i>Respondent</i>	<i>Dry Opium Price (afs/kg)</i>	<i>Fresh Opium Price (afs/kg)</i>	<i>Wheat (afs/kg)</i>
No. 1			
No. 2			
No. 3			

Comments and Observations:

- 1) What is the total number of poppy fields in this village? _____
- 2) What is the total land under poppy cultivation as per physical measurement in jerib?

- 3) What is the exchange rate: (afs=\$1)? _____
- 4) Comments: _____



UNDCP

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