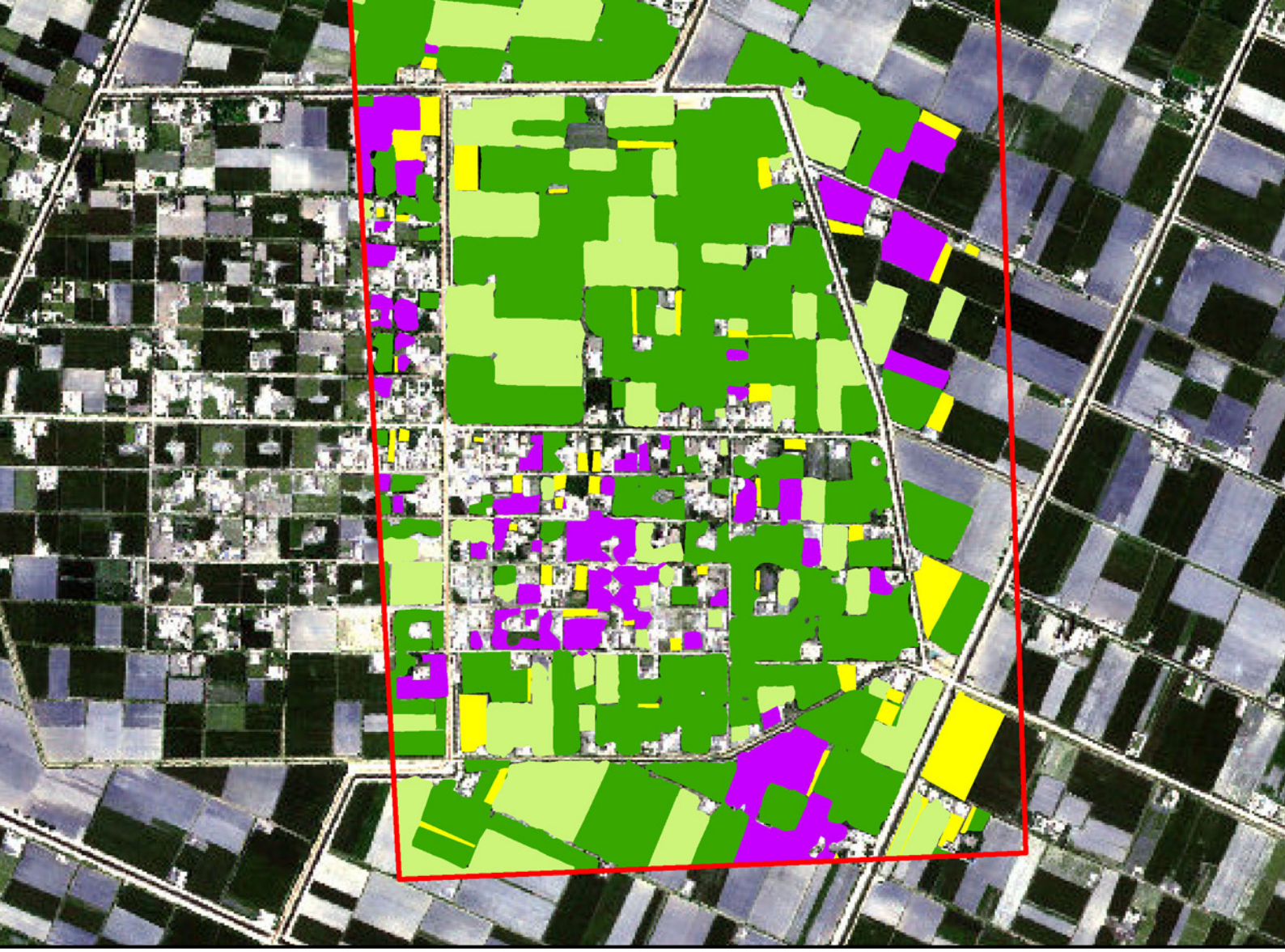

Managing Concurrent and Repeated Risks

Explaining the Reductions in Opium Production in Central Helmand Between 2008 and 2011

David Mansfield, Alcis Ltd & OSDR

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Alcis Ltd is a specialist in geospatial mapping and analysis and has spent seven years building an unparalleled knowledge of geospatial data in Afghanistan. Richard Brittan (Director) and Tim Buckley were responsible for research design, managed Alcis Ltd's geospatial analysis and mapped products, and supported the development of the final report.

The Organisation for Sustainable Development and Research (OSDR) is an Afghan nongovernmental organisation based in Kabul. They specialise in livelihoods research and have worked across rural Afghanistan for a variety of different donors and organisations. The core team at OSDR have been conducting fieldwork together for over 23 years.

About the Afghanistan Research and Evaluation Unit

The Afghanistan Research and Evaluation Unit (AREU) is an independent research institute based in Kabul. AREU's mission is to inform and influence policy and practice through conducting high-quality, policy-relevant research and actively disseminating the results, and to promote a culture of research and learning. To achieve its mission AREU engages with policymakers, civil society, researchers and students to promote their use of AREU's research and its library, to strengthen their research capacity, and to create opportunities for analysis, reflection and debate.

AREU was established in 2002 by the assistance community working in Afghanistan and has a board of directors with representation from donors, the United Nations and other multilateral agencies, and non-governmental organisations. AREU currently receives core funds from the governments of Denmark, Norway, Sweden and Switzerland. Specific projects in 2011 are funded by the European Commission (EC), the International Development Research Centre (IDRC), the Humanitarian Aid Department of the European Commission (ECHO), the UK Department for International Development (DFID), and UN Women.

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David Mansfield
May 2011

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Acronyms

ANP	Afghan National Police
ANSF	Afghan National Security Forces
ATV	all-terrain vehicle
AVIPA	Afghanistan Vouchers for Increased Production in Agriculture
DAP	diammonium phosphate
FZP	Food Zone Programme
GLE	government-led eradication
ISAF	International Security Assistance Force
MAIL	Ministry of Agriculture, Irrigation and Livestock
PEF	Poppy Eradication Force

Glossary

Afghani (Afs)	Afghan unit of currency. During the research phase US$1 was worth approximately 50 Afs, although it did drop to as low as 45 during 2010
jerib	unit of land measurement equivalent to roughly one-fifth of a hectare
malik	village representative
mirab	village water master
Nar Kilin	people who have been settled in Helmand from other provinces such as Wardak, Laghman, Nangarhar and Farah
seer	unit of weight equivalent to roughly seven kilogrammes
zaranj	three-wheel scooter taxi

Executive Summary

This paper seeks to explore what factors have driven recent reductions in poppy cultivation in Helmand and how sustainable they are. It finds that while household concerns about food security because of high wheat prices were key in driving down poppy cultivation between 2008 and 2009, the coercive power of the Afghan state and international military forces has been significant in determining levels of cultivation in central Helmand in 2010 and 2011. Sustainability of these effects will vary among different communities. Broadly speaking, this research suggests that reductions in poppy cultivation are:

- most sustainable among communities close to urban centres with access to diverse income opportunities, government support programmes and better security;
- least sustainable among communities that have responded to the government's poppy ban but lack viable alternatives and remain exposed to violence and intimidation by both sides in the conflict;
- and non-existent among a growing number of communities in the desert north of the Boghra Canal where opium production has provided the means to own and cultivate land, and the Taliban is increasingly seen to provide a relatively secure environment for households to secure income and accumulate assets.

Policymakers should urgently consider:

- the impact of opium bans on communities that are exposed to repeated and concurrent shocks and lack access to viable alternatives and government-supported economic development
- the detrimental impact of eradication on the consent of local populations, especially when it is conducted in areas recently "cleared" of antigovernment elements under predatory and corrupt government officials
- the need to focus development assistance on interventions that will support livelihood diversification in the canal command area in central Helmand
- the importance of understanding the local socioeconomic, political and environmental context of opium poppy cultivation in designing effective interventions
- the need for more emphasis on measuring livelihood outcomes, including the transition out of opium poppy cultivation, and how these differ by location and socioeconomic group

Background

Since 2008, the amount of land cultivated with opium in Helmand Province has fallen by an estimated 37 percent. Further dramatic reductions are anticipated in the canal command area of the province in the 2010-11 growing season. These reductions have occurred alongside the deployment of a growing number of national and international troops in the province, changing levels of violence, dramatic shifts in the terms of trade between opium poppy and wheat, the distribution of increasing amounts of development assistance and the launch of a counter-narcotics effort known as the "Food Zone Programme." In this complex environment, it is difficult to identify the underlying causes of the reduction in opium production without conducting long-term, detailed research since so many variables are potentially influencing farmers in their cropping choices. This study represents such a body of analytical work and was commissioned

to answer two specific questions: (1) what has driven the recent reductions in opium poppy cultivation in Helmand Province, and (2) how sustainable will these reductions be? The study also offers a series of recommendations for policymakers and programmers that may help deliver a more enduring counter-narcotics outcome without undermining current stabilisation efforts.

Methodology

The study draws on both remote sensing and household data collected over a three year period and focuses on 23 research sites in the rural areas of of Nahre Seraj, Nad-i-Ali, Lashkar Gah, Marjeh and Nawa Barakzai Districts in central Helmand. These particular sites offer sharply contrasting socioeconomic, political and environmental conditions against which to examine reductions in opium cultivation; they also offer an opportunity to identify the differing impact of these reductions on households with differing resource endowments and levels of exposure to risk and uncertainty. For example, some sites located near the cities of Gereshk and Lashkar Gah have experienced an improvement in security, gained from enhanced service provision and an expansion of the livelihood options available to them over the period of the study. Other more remote sites have been exposed to repeated and concurrent shocks, such as chronic conflict, a ban on opium production, and a dramatic increase in wheat prices. Finally, there are sites where the Taliban dominate, opium persists and livelihood options are severely limited by environmental factors.

Findings

The study considered a wide range of factors that can effect levels of opium poppy cultivation in Helmand. These include rates of eradication, access to labour and agricultural markets, the provision of development assistance, the security environment, food security and environmental stresses. Around Lashkar Gah, the effect of a more enduring state presence and growing economic opportunities could already be seen on levels of opium production during the 2007-08 and 2008-09 growing seasons. However, the study shows that two other factors have been more important in driving the significant decline in opium poppy cultivation since 2008: the dramatic increase in wheat prices, and the governor's counter-narcotics stance backed by an increased national and international security presence.

The dramatic rise in wheat prices in Afghanistan that took place from mid-2007 to late-2008 led to growing concerns over food security in Helmand Province and in turn to an increase in levels of wheat cultivation to meet household food requirements. These concerns over food security were in part driven by excessive opium production in 2008 and a consequent growing reliance on wheat flour imports from Pakistan. However, increasing uncertainty over the supply from Pakistan, given the deteriorating security situation across the border, and the imposition of higher transport and transaction costs also played a role.

Between 2008 and 2009 the amount of land cultivated with wheat almost doubled across Helmand Province, increasing in areas where wheat seed and fertiliser were not distributed by aid agencies as well as in areas where there was little fear of opium poppy eradication due to the presence of the Taliban. In the canal command area this expansion of wheat production largely occurred at the expense of opium; outside of it, wheat expanded at a similar rate but was largely accommodated through the expansion of the total area under cultivation by encroachment into desert land. The study shows that despite falling wheat prices, the residual effect of the initial price shock was felt

even in the 2009/10 growing season, deterring farmers in most areas from cultivating opium poppy at the expense of self-sufficiency in wheat production.

The second factor that has been decisive in reducing levels of opium production in central Helmand—particularly in the 2009-10 and the 2010-11 growing seasons—has been the governor's counter-narcotics stance. This has been backed by the coercive power of the Afghan state and, perhaps more importantly, the enhanced international military presence supporting it. By the 2009-10 growing season, the enhanced military presence had a significant effect on levels of cultivation in central parts of Nawa Barakzai and Garmsir. In 2010-11, the same effect was seen in parts of the canal command area in Nad-i-Ali and particularly in Marjeh. In fact, reductions in the command area have recently been observed in many areas close to security infrastructure such as checkpoints and forward operating bases.

The study also found that it is not just the act of crop destruction itself but rather the ongoing presence of the state that has determined the level of cultivation in central Helmand in subsequent growing seasons. Where the state has not been able to establish a more permanent presence in an area due to the prevailing security conditions, eradication has been seen by farmers as a random act that can be managed through patronage and corruption, a perception that has led to increasing resentment. However, where the state has established itself in rural areas and is delivering a range of public goods and services, the threat of crop destruction has played a role in raising the risks associated with opium production and in supporting livelihood diversification. In fact, cultivation has fallen in a number of the research sites in central Helmand even though there has been no eradication or a perceived risk of it. The study highlights that in areas where the population is already exposed to high levels of risk and uncertainty and viable alternatives to opium are absent, eradication and coercion not to plant can undermine support for the government and the presence of international forces.

Critically, the study shows that the populations in those areas that are exposed to repeated and concurrent shocks are the least able to manage a ban on opium production. This is of particular significance in the districts of Marjeh and Nad-i-Ali, where the increase in the number of security forces has coerced farmers into reducing levels of planting in the 2010-11 growing season, but (as of November 2010) has not led to an improvement in physical security. To the contrary, the study suggests that people in these areas believe they are exposed to increasing levels of violence now that they live in contested territory, and have the added shock of a ban on opium to manage. Furthermore, many of those beyond the environs of the urban centres report that they are unable to take advantage of development assistance because of both Talban intimidation and the patronage systems that govern the distribution of assistance. This has contributed to fuelling resentment toward the local administration. The provision of wheat seed and fertiliser in these areas is typically seen as inconsequential and misplaced given the scale of the problems communities face, but is accepted as a form of cash transfer.

Those households that are having to deal with the loss of income due to the opium ban on top of the direct cost of conflict, other shocks such as death or illness and a lack of non-farm income are adopting coping strategies that suggest signs of economic distress and are likely to undermine their future earning capacity. They are likely to fully realise the impact of these concurrent shocks once the winter cropping season has finished and they consider the financial implications of the loss of their opium poppy crop over the summer season. Their situation will stand in stark contrast to the population in the areas north of the Boghra Canal, who can continue to cultivate opium poppy, are exposed to lower levels of violence and attribute this to the dominance of the Taliban in the area.

Recommendations

Policymakers should urgently consider:

The impact of opium bans on communities that are exposed to repeated and concurrent shocks and lack access to viable alternatives or government-supported economic development: Those looking to deliver counter-narcotics and stabilisation effects in central Helmand are confronted with a policy dilemma in the run-up to the 2011-12 growing season. Without a reduction in their exposure to risk or effective ways to manage it, many communities in the canal command area may look to return to the risk mitigation strategy that has proven successful in the past (and continues to be for farmers north of the Boghra Canal): opium poppy cultivation. If the government and international community seek to prevent a return to cultivation through continued coercion, there is a real risk that the rural population in these areas will reach out to anti-government elements for protection. After all, this is a trend that can be seen at work in other parts of Afghanistan and has created the environment for increasing levels of cultivation in a number of the southern districts of Nangarhar, as well as in the northern districts of Laghman, Surobi in Kabul Province and parts of Balkh Province in the 2010/11 growing season. Both the penetration of the insurgency and the resurgence in cultivation in those parts of Nangarhar where the population has limited resource endowments and are exposed to concurrent and repeated shocks are warning signs given the fragility of the situation in an area like central Helmand, where despite better resource endowments the population is subject to chronic conflict and where the Taliban traditionally have a stronger political base.

The detrimental impact of eradication on the consent of local populations, especially when it is conducted in areas recently "cleared" of antigovernment elements under predatory and corrupt government officials: Eradication campaigns in Helmand have been subject to allegations of corruption and patronage, and government officials have often been accused of using crop destruction for extracting rent from rural communities. Crop destruction in Helmand has tended to target the land of both more marginal communities outside the well irrigated central parts of the province, and more marginal members of communities in areas of greater agricultural potential. In 2010, eradication was conducted in a more systematic manner in areas within the canal command area following military efforts to clear the Taliban there. In late 2010, the population in these same areas was subject to considerable pressure to reduce levels of planting. Without accompanying improvements in both the physical and economic security of the rural population and in the absence of sufficient controls on how eradication is conducted, these efforts are likely to lead to increasing instability.

The need to focus development assistance on interventions that will support livelihood diversification: The study shows that there is much to be learned from those areas and households in central Helmand whose livelihoods are resilient to a ban on opium production. Specifically, it suggests that diversification has been critical. In the rural areas close to the cities of Lashkar Gah and Gereshk, growing demand for high value horticulture has supported a process of crop diversification that has spread risk and increased household incomes. Employment and trade opportunities have been more available to the population in these areas, further supporting the transition out of opium production. In addition, improvements in security as well as access to education and health services have bolstered the conditions for a social contract between the population and the state. Beyond the environs of the urban centres, however, agricultural diversity remains limited. Here, it is those households with nonfarm income opportunities—often funded from the proceeds of opium production—that are more resilient to the loss of

income imposed by the opium ban. Given these findings, much greater emphasis needs to be given to supporting crop diversification and creating employment opportunities for communities in the canal command area of central Helmand. Investments in wheat seed and fertiliser distribution alone are too limited to enable the necessary diversification.

The importance of understanding the local socioeconomic, political and environmental context of opium poppy cultivation in designing effective interventions: The study highlights the need to design interventions based on a clear understanding of the different livelihood trajectories in place across Helmand. Important elements to consider include the types of shocks that the population is exposed to; the assets they can draw on; whether livelihoods can adapt to shocks; or whether significant numbers of households are adopting strategies that undermine their future earning capacity, expose them to physical hazards, and potentially undermine stabilisation efforts. This data is crucial for future planning, especially in identifying the appropriate timing for the implementation of an opium ban in a given area.

The need for more emphasis on measuring livelihood outcomes, including the transition out of opium poppy cultivation, and how these differ by location and socioeconomic group: It is not wise to reduce the assessment of the lives and livelihoods of the rural population into ordinal data on how much of the population is economically "better off" or "supports the government" compared to the previous quarter. Such measurements are notoriously problematic in chronically insecure environments like central Helmand, and offer few warnings of the economic and political fault lines that lie beneath. Nor is it sufficient to measure the quantities of development inputs distributed without understanding who has benefited, who has not, and the effect of this distribution on both the livelihood portfolios of the rural population and the local political environment.

Remote sensing data offers a useful means to assess the process of diversification into high value horticulture, and to understand how farmers are using the agricultural assistance they have been given, the different income streams they have, and their resilience to livelihood shocks. It can also offer warning signals for areas that persist with low-risk, low-return agricultural systems and have been highly dependent on opium production. As such, geospatial data on cropping patterns should be seen as both a source of impact data and as a diagnostic for identifying areas that require further examination and possibly a refocusing of interventions.

1. Introduction

In the minds of many, Helmand Province has become synonymous with opium production. During the 1990s, it was one of the primary opium producing provinces in the country, typically cultivating between 30,000 and 40,000 hectares (ha) each season. With the fall of the Taliban regime and the collapse of the ban on opium production, levels of cultivation increased in Helmand until they reached a peak of 103,000 ha in the 2007-08 growing season. Over the last three growing seasons, however, levels of opium cultivation in Helmand have fallen by over a third and further reductions are expected in the 2010-11 growing season.

These reductions have largely been concentrated in the central part of the province in areas under the Helmand canal system, and have coincided with efforts to reduce both opium production and the threat of the insurgency in the same areas. At the same time, a number of other factors have also favoured a reduction in opium poppy. These include the dramatic rise in food prices from mid-2007 to late-2008, and the significant increase in the presence of international military forces in central Helmand beginning in June 2009 in the districts of Nawa Barakzai and Garmsir, and culminating in the spring of 2010 in Marjeh and Nad-i-Ali.

In contrast, other factors have encouraged higher levels of opium poppy cultivation. For instance, the continuing conflict has exposed many communities in Helmand to the risk of injury, illness, death, and damage to property and other assets; it has also hampered the movement of agricultural commodities and constrained the delivery of public goods such as education and health services. These conditions may drive households to pursue short-term livelihood strategies such as opium production as a way to secure income and accumulate assets, whether for short-term gain or to mitigate risk.

The purpose of this work is to answer two major questions: The first is what has driven the recent reductions in opium poppy cultivation in central Helmand Province. The second is how sustainable will these reductions be. In answering these questions it is necessary to develop a detailed understanding of the area under study and its inhabitants, the different policies and shocks that households are exposed to, and the livelihood strategies and outcomes these produce.

Opium poppy cultivation does not take place in a vacuum; it is shaped by local, national and international institutions, as well as a range of different stresses and shocks, such as drought, conflict and economic crises. For the household, opium production is only one livelihood activity in a broader portfolio. This might include the cultivation of a variety of field and horticultural crops, tending livestock, and earning cash income working for other farmers on their land or through employment in the nonfarm sector. Even when the price of opium is high and the risk of crop destruction is low, farmers in Helmand will not monocrop opium, investing instead in a range of different activities as a rational strategy for managing the multiple risks they are exposed to.

Given the context of chronic insecurity and the role that opium plays as a risk mitigation strategy, an effective framework for exploring the causes of recent reductions in opium poppy cultivation in central Helmand must analyse the different risks that communities are exposed to, including the risk of a successful ban on opium production. Through this analysis, it will be particularly important to identify how these different risks might encourage or discourage opium production and how exposure has varied by location, socioeconomic group and over the duration of the study period. Finally, it will be necessary to map those areas where the population is most exposed to repeated and concurrent

risks and identify which risks have proven to be the most decisive (if any) in reducing the amount of land cultivated with opium poppy.

Clearly, an understanding of the reasons for the fall in opium production is critical in assessing the sustainability of such reductions. However, there is also a need to understand what has replaced opium, not just physically in terms of crop substitution, but also economically in terms of livelihood activities and outcomes among different socioeconomic groups. For example, if opium poppy is no longer grown, how does a household access advance payments or credit when required? Which on-farm, off-farm and nonfarm activities generate sufficient cash income to meet basic needs, accumulate assets, and provide a buffer against future shocks? What livelihood options are now available to land-poor farmers who once obtained land due to the significant labour requirements of opium production or received wages during the labour-intensive opium harvest season?

The most appropriate way to answer the question of sustainability is to explore how resilient livelihoods in central Helmand are to shocks. A resilient livelihood has the flexibility to adapt and recover from exposure to shock, including the shock of a ban on opium production. Households unable to do so adopt what are referred to as coping or survival strategies that undermine future earning capacity by depleting productive assets, leaving them more vulnerable than before.[1] In examining the resilience of livelihoods across central Helmand, it is necessary to look beyond responses to a ban on opium production in itself since this is unlikely to occur in isolation. It is thus not always possible to distinguish between strategies adopted in response to successful counter-narcotics efforts and those pursued due to the other risks. It is necessary, then, to examine the cumulative effect of shocks on both the portfolio of households' livelihood activities and the overall wellbeing of their members.

Identifying areas where the population is most exposed to concurrent and repeated shocks and livelihoods are at their least resilient will be critical in two respects: first, to developing a better understanding of the sustainability of a ban on opium production; and second, to understanding the potential for current counter-narcotics strategies to undermine stabilisation efforts. Households that are exposed to repeated and concurrent shocks and respond by adopting strategies that undermine their future earning capacity or expose them to hazards should be considered at risk of returning to opium poppy cultivation in the absence of coercion. However, if coercion continues without policies or programmes that either reduce or manage their exposure to risk, households will also be vulnerable to increasing deprivation. Wherever a concentration of households lack livelihood resilience and show increasing signs of deprivation, the social compact between the state and the population is likely to be fragile. This is especially true where the population believes it is more exposed to risk due to the actions of the state; where the rural elite is both corrupt and lacks the support of the people; and where the state (and those supporting it) lacks a monopoly on the means of violence.

To answer these two fundamental policy questions, this paper will be divided into five further parts. The first outlines the methodology used for this study. The second provides the context for the study, offering an overview of Helmand Province and the different counter-narcotics efforts that have been pursued in the last decade. The third looks at the different risks that households and communities in Helmand are exposed to and how this has changed over time. The fourth examines how resilient livelihoods in different parts of central Helmand are to risks, as well as the responses households have adopted in response to repeated and concurrent risks. Finally, the paper offers a conclusion and recommendations.

1 D. Start and C. Johnson, "Livelihood Options? The Political Economy of Access, Opportunity and Diversification" (London: Overseas Development Institute, 2004).

2. Methodology

2.1 Approach

Socioeconomic, political and environmental conditions can vary across relatively short distances in Afghanistan, and especially in Helmand Province due to the prevailing security environment. Some areas in Helmand have a reliable, year-round source of irrigation, fertile land, and are close to urban centres and the agricultural and labour markets they offer. These areas tend to be relatively secure and their populations are recipients of a range of government services. Other areas nearby may be subject to an ongoing presence of armed antigovernment groups, have poor soils, unreliable (and costly) irrigation, and little public or private sector investment. The tribal makeup of an area can also vary. One community might consist largely of tribes with a long history in the province and access to patronage systems within both government and insurgent groups. By contrast, a neighbouring village might host a multitude of different tribal groups from across the country and find itself marginalised by both state and anti-state actors alike.

Within each of these communities there will be households whose particular resource endowments allow them to manage and recover from the different shocks that are a regular feature of life in rural Afghanistan. They may have access to political and economic capital that renders them less vulnerable to intimidation by insurgent groups or crop destruction and raids by local security forces. They will also be better placed to take advantage of any public and private sector investments made in their area. In these same communities, however, there will also be households that are disadvantaged because they are landless, lack access to local patronage systems, have high dependency ratios, or have been resettled from areas outside the province. These households are potentially more vulnerable to shocks and are more likely to adopt coping strategies in response that undermine their future earning capacity.

Cultivators of opium poppy in Helmand also defy crude generalisations. Attempts to correlate broad socioeconomic and political data with opium production have typically failed to offer adequate explanations for the complex factors that influence levels of cultivation and how these vary over time, space and socioeconomic group. In Afghanistan, opium production has often been attributed to “poverty,” “greed,” “insecurity” or “insurgency.” But these explanations fail to account for the socioeconomic, political and environmental diversity that exists both across Afghanistan and within individual provinces. as well as the role local factors play in encouraging and dissuading opium poppy cultivation.

This research seeks to explore both the local factors and the wider structures and processes that shape rural livelihoods and levels of opium poppy cultivation in central Helmand. In doing so, it recognises that conducting large-scale surveys using probability sampling techniques makes little sense in rural Helmand, where robust data on the most basic variables including population size and its composition is largely absent.[2,3] It also recognises the constraints that the security situation in the province has imposed on

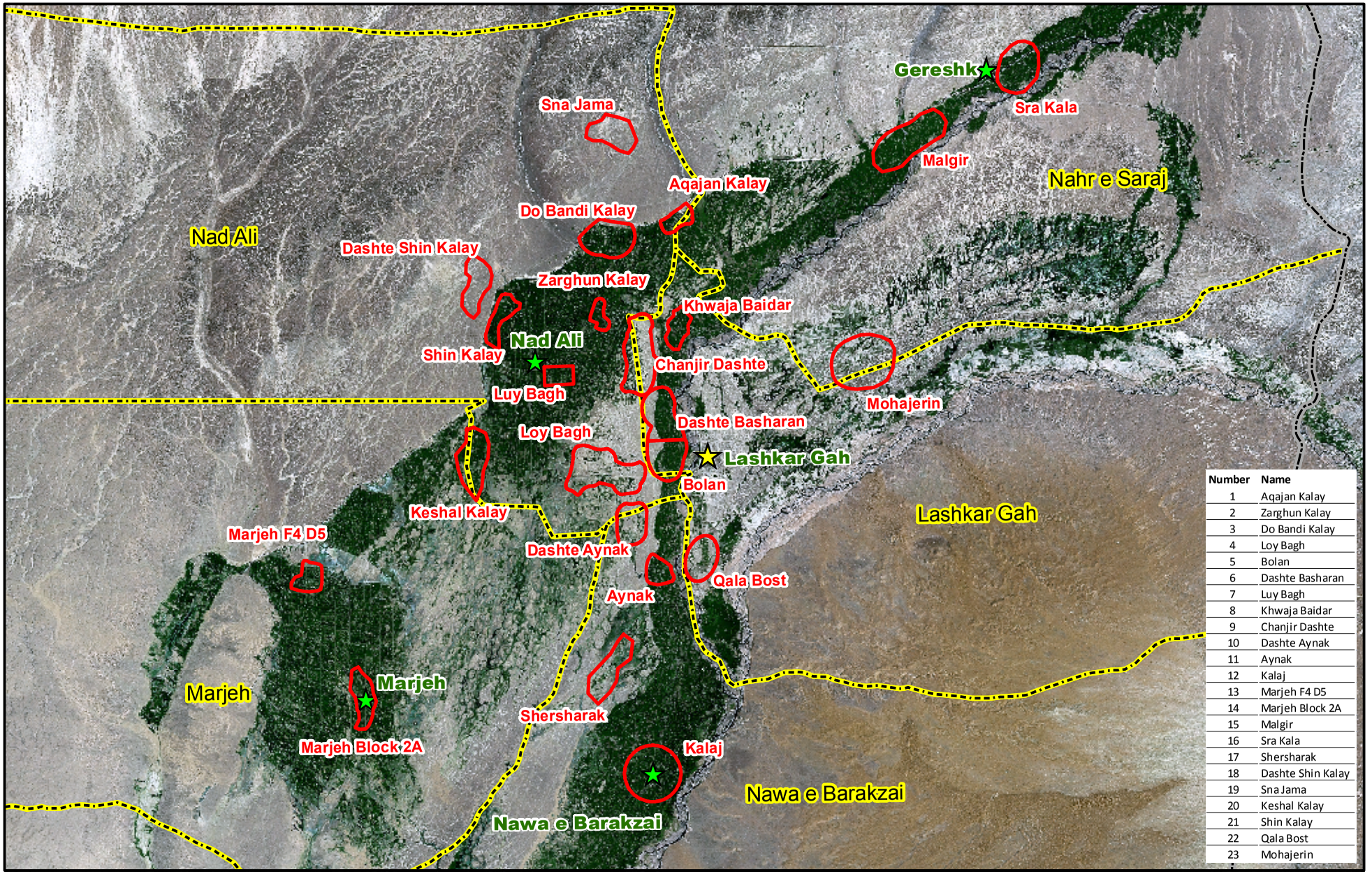
2 See B. Berg, *Qualitative Research Methods for Social Sciences* (Boston: Pearson Education Inc., 2007), 42: “This procedure is intended to produce a representative sample. The process draws subjects from an identified population in such a manner that every unit in that population has precisely the same chance (probability) of being included in the sample.”

3 D. Kandiyoti, “Poverty in Transition: An Ethnographic Critique of Household Surveys in Post-Soviet Central Asia,” *Development and Change* 30, No 3: 1999.

UTM / WGS 1984 Zone 41N

Figure 1: Research sites, 2007/08 to 2010/11 cultivation seasons

Scale 1:250,000



Number	Name
1	Aqajan Kalay
2	Zarghun Kalay
3	Do Bandi Kalay
4	Loy Bagh
5	Bolan
6	Dashte Basharan
7	Luy Bagh
8	Khwaja Baidar
9	Chanjir Dashte
10	Dashte Aynak
11	Aynak
12	Kalaj
13	Marjeh F4 D5
14	Marjeh Block 2A
15	Malgir
16	Sra Kala
17	Shersharak
18	Dashte Shin Kalay
19	Sna Jama
20	Keshal Kalay
21	Shin Kalay
22	Qala Bost
23	Mohajerin

Data Sources:
Imagery: Natural View Dated 2006

Legend
- Research Site Location
- District Centre
- Provincial Centre
- District Boundary

0 2.5 5 10 15 20 25 Kilometres

Scale 1:250,000

Produced by Alcis Ltd
5 May 2011

research, especially on attempts to generate supposedly representative samples of the population of the province as a whole. The insurgency controls parts of the province, rendering them largely inaccessible; in others, they maintain a presence and what limited access there is remains based on existing contacts and experience. Formal surveys are treated with suspicion by insurgent groups and the rural population. Those conducting surveys are seen to be working for the Afghan government or the international community and can be subject to punishment. This results in an understandable bias toward urban and periurban areas when data is collected using more quantitative techniques.

In recognition of the inherent constraints of producing a statistically representative sample in a chronically insecure environment such as Helmand, the research design deploys a number of alternative methods more suited to both the context and the subject matter under examination.

Firstly, the project takes a case study approach focusing specifically on 23 different research sites in central Helmand (see Figure 1). These were selected on the basis of maximum variation in order to compare and contrast locations where the population has different assets, exposure to stresses and risks, and varying experiences of interventions such as the Helmand Counter-Narcotics Plan or the ongoing military effort. By conducting comparative analysis of levels of cultivation across the research sites between the 2008-09 and 2010-11 growing seasons, the study aims to identify how reductions in cultivation relate to location. Specifically, it seeks to establish whether they are specific to areas where the population has similar assets or has been subject to specific interventions or shocks, or whether they can be seen across the research sites and are therefore due to more generic and possibly external factors. By identifying the causes of reduction in these different sites, as well as generating a detailed understanding of how the lives and livelihoods of the population have changed over the study period, it may be possible to identify whether these reductions in opium poppy cultivation will be sustained.

Secondly, the research design limits the scope of its enquiry to the central region and the districts of Lashkar Gah, Nad-i-Ali, Nawa Barakzai, Nahre Seraj and Marjeh, where the security situation is more stable. These are the areas where counter-narcotics efforts have been focused under the so-called Food Zone Programme (FZP). The inclusion of areas in these districts that have fallen outside the boundaries of the Food Zone, as well as those within the Food Zone that have not been subject to the different interventions involved, allows for a comparison of patterns of cultivation both “with” and “without” the counter-narcotics programme.

Thirdly, the study adopts a composite approach for each research site. This draws on a variety of data including remote sensing data on crops cultivated during the winter season; household socioeconomic data documenting assets, shocks and livelihood portfolios; and, where available, data on the different types of interventions implemented in each of the different sites and their environs. Historical data is available for each of the research sites covering the 2007-08 to 2010-11 growing seasons, allowing for analysis of changes in cropping patterns over time. An initial round of fieldwork was conducted in April-May 2008. This was followed up with further fieldwork in April-May 2009, November 2009 and in April-May and November 2010. In late 2010, the number of research sites was increased to expand coverage of areas both within the Food Zone and outside. This increase included two areas north of the Boghra Canal where the Taliban are seen as the dominant force. Remote sensing data is available for each of the 2007-08, 2008-09 and 2009-10 growing seasons except in Shna Jama (RS19) and Dashte Shin Kalay (RS18), where coverage is not available for 2009.

Fourthly, the study attempts to recognise and mitigate the inherent problems with primary data collection when researching an "illegal" or "underground" activity by focusing its enquiry on household livelihood strategies. The pressure to act against opium cultivation and its trade has made the subject of illicit drugs a more sensitive topic for discussion with farmers and other stakeholders than it was in the 1990s and early 2000s. However, the rural household is the most accessible unit of analysis when looking at the opium economy in Afghanistan; it offers a basis for cross-referencing findings both with other work on rural livelihoods in Afghanistan, and other research on the specific role of opium poppy in rural livelihood strategies in Afghanistan and elsewhere.

Interviews focused on the portfolio of livelihood activities and the shocks households may have experienced. The study approaches opium as a crop within a wider range of activities that households are involved in. This recognises that simply asking households why they do or do not cultivate opium is insufficient since the complex and interconnected factors that inform household decision-making cannot be distilled to a single answer. Interviewers also avoided asking direct questions about opium. This was to reduce the risk of households exaggerating the returns on opium as a way to "negotiate" for greater development assistance in return for giving up the crop. Experience has shown that where opium poppy is cultivated, respondents will typically include it when recounting the different crops that they grow and sell. The fact that interviews were conducted in the field during the planting and harvest season for the winter crops, including opium poppy, allowed fieldworkers to verify—and where necessary challenge—the truth of respondents' answers.

Discussions also focused on the direct experience of respondents and their households rather than of a wider geographic area, where answers become increasingly speculative.[4] Individual interviews with farming households were conducted in the field as farmers tend their crop, since holding interviews in the household compound can attract attention from others and become subject to repeated interruption and bias. Group discussions with farmers were avoided as they tend to be dominated by community elites, are inappropriate for discussing sensitive issues and increasingly represent a security threat in rural Helmand.[5] To verify information on crop sales and the functioning of agricultural markets, a range of different wholesale and retail traders were interviewed in each of the main bazaars in the study districts, as well as in Kandahar and Kabul.

Finally, the research recognises the levels of socioeconomic differences that exist within communities in central Helmand. Within each research site, selection of interview households attempted to reflect a cross-section of different socioeconomic

4 See Swedish Committee for Afghanistan, "Farming Systems of Nad Ali District, Helmand Province," in *Agricultural Survey of Afghanistan*, Report 15 (Pesharwar: SCA, 1992), 1: "[The ASA's national surveys] are based on specific information that a farmer gives directly to the enumerator about his own, and no one else's farming operations. This, we believe, is essential to quantitative data collection. If the respondent is asked questions about his village or district his answer in many cases is likely to be vague simply because the question is extremely difficult to answer with any degree of accuracy. From experience we have also found that generalised agricultural information resulting from group interviews or from village elders is of poor quality when compared to that derived from individual farmers speaking about their own farms."

5 See I.M. Stevens and K. Tarzi, "Economics of Agricultural Production in Helmand Valley, Afghanistan" (Washington, DC: United States Department of the Interior Bureau of Reclamation, 1965), 1: "At the beginning of the study we chose the names of farmers to be interviewed from lists supplied by the village chief. These names were chosen at random and farmers were usually called to the village chiefs' home where we interviewed them. After following this procedure for several days, however, we changed our method and began contacting farmers in their homes or in their fields without previous knowledge of the village chief. We felt this procedure eliminated some of the bias we seemed to have been getting by the previous method." See also J. Goodhand, "Reseach in Zones of Violent Conflict" (Manchester: CPRC, 2001 [unpublished]), 13; and F. Shairzai et al, "1975 Farm Economic Survey of the Helmand Valley" (Kabul: USAID, 1975 [unpublished]), 13.

and tribal groups to explore which are more likely to benefit from assistance and which are more vulnerable to crop eradication. By interviewing such cross-sections at different times in the growing season (as well as drawing on historical data), the study also attempted to understand their involvement and reactions to any collective decision-making, and their responses to the state's efforts to curb opium poppy cultivation.

2.2 Caveats

Research in Afghanistan is always subject to bias. This is even more so in a chronically insecure environment like Helmand, where the paucity of reliable demographic data hinders establishing a representative sample, where both fieldworkers and respondents have legitimate concerns for their own safety (particularly in rural areas), and where it is difficult to provide oversight for data collection in the field. The research methodology outlined above is designed to address these challenges, but it is nevertheless worth offering a number of caveats, particularly given the security environment in Helmand and the types of sensitive issues the study raises.

The most important caveat is the impact the conflict had on fieldwork even in the central part of the province. During the course of the research fieldworkers have been fired at and robbed by criminals on the main highway, subjected to a number of checks on their mobile phones by Taliban fighters, and repeatedly exposed to self-professed Taliban either during interviews, travelling between sites in taxis, or attending Friday prayer. One fieldworker was arrested by a Taliban commander and only released when a respondent in one of the research sites vouched for him. Fieldworkers have also been exposed to firefights between the Afghan National Security Forces (ANSF), international military forces and the Taliban, and been subject to intimidation from the Afghan National Police (ANP). These kinds of events are not unusual and reflect the experiences of the rural population of Helmand.

It is these very conditions that limit the geographic coverage of fieldwork (often at short notice), rule out formal structured interviews in more insecure rural areas and ultimately make central Helmand a difficult environment for conducting field research. While a focused research design and a core team of experienced local staff allowed fieldwork to proceed in areas exposed to the ongoing conflict, the results of the research are still inevitably shaped by the prevailing security situation. In fact, security issues have prevented visits to each research site during each round of fieldwork, with Doh Bandi (RS3) and Aqajan Kalay (RS1) on the Boghra Canal in Nad-i-Ali District proving particularly insecure. Nevertheless, visits have been made to these locations at least once and remote sensing and other geospatial tools have allowed cropping patterns to be examined over the three growing seasons of 2007-08, 2008-09 and 2009-10 (see Table 1).

Donor interest in increasing the geographic coverage of the fieldwork in November 2010 (and subsequently in May 2011) has also led to the inclusion of additional research sites that were not visited during the initial phases of the study. Again, this gap has been at least partially filled by remote sensing data. The findings from initial visits to fewer sites with more limited numbers of respondents in May 2008 were enhanced with repeat visits in both May and November 2009, which collected data on the 2007-08 and 2008-09 growing seasons.

It is also worth noting that the security situation in the province has prevented the same households from being visited for each round of the fieldwork. Repeated visits to

the same households every six months would arouse suspicions from antigovernment elements and their supporters and would place both fieldworkers and respondents at risk. In the more insecure parts of the canal command area and north of the Boghra Canal, fieldworkers have had to work with existing contacts in a research site as well as establish new ones without alerting those in the wider community to their work as researchers.

Fieldworkers have had to be discreet, preferring to interview individual farmers who are at work in their fields where there are no bystanders and an outsider's presence is not as conspicuous. Notes are not taken during interviews but written up after the fieldworker and respondent have parted company. While this approach presents some challenges with regard to recall or memory bias, it is diminished by the high level of experience of the fieldworkers. The less formal and more conversational style of the interview has also reduced the potential for social desirability bias[6] that has been shown to affect the results of more quantitative techniques, such as polling, in chronically insecure provinces such as Helmand.[7]

The research does not claim to offer a representative sample of households or communities in Helmand Province, or even central Helmand, as this is unattainable in the current environment. Instead, it draws on household livelihood trajectories and geospatial data collected over a three year period in 23 specific and quite different research sites. However, by merging such detailed and historical household and geospatial data across such diverse areas in central Helmand, it is hoped that this research will produce what Yin has referred to as "analytic generalization,"[8] offering findings that are relevant to other parts of Helmand and Afghanistan.

6 The tendency of respondents to reply in a manner that will be viewed favorably by others.

7 A. Pinney. "DFID Afghanistan Data Quality Assessment of the Asia Foundation (TAF) Surveys of the Afghan People 2006-2009, September 2010" (unpublished).

8 R. Yin, *Case Study Research: Design and Methods* (London: Sage, 1994), 31.

Table 1: Remote sensing and household data for selected research sites, May 2008 to November 2010

	2007-08 Growing Season		*2008-09 Growing Season*		*2009-10 Growing Season*			*2010-11 Growing Season*
Area	No. of Household Interviews April-May 2008	Remote Sensing	No. of Household Interviews April-May 2009	Remote Sensing	No. of Household Interviews November 2009	No. of Household Interviews April-May 2010	Remote Sensing	No. of Household Interviews November 2010
1. Aqajan Kalay	Insecure	Yes	Insecure	Yes	Insecure	Insecure	Yes	15
2. Zarghun Kalay	6	Yes	12	Yes	11	12	Yes	12
3. Do Bandi Kalay	6	Yes	9	Yes	10	Insecure	Yes	Insecure
4. Loy Bagh	-	Yes	-	Yes	-	-	Yes	12
5. Bolan	6	Yes	12	Yes	15	10	Yes	12
6. Dashte Basharan	-	Yes	-	Yes	-	-	Yes	15
7. Luy Bagh	6	Yes	12	Yes	12	12	Yes	15
8. Khwaja Baidar	-	Yes	-	Yes	-	-	Yes	15
9. Chanjir Dashte	6	Yes	9	Yes	10	Insecure	Yes	15
10. Dashte Aynak	-	Yes	-	Yes	-	-	Yes	15
11. Aynak	-	Yes	9	Yes	12	12	Yes	12
12. Kalaj	-	Yes	-	Yes	-	-	Yes	15
13. Marjeh F4 D5	-	Yes	-	Yes	-	-	Yes	15
14. Marjeh A2	-	Yes	-	Yes	-	-	Yes	15
15. Malgir	-	Yes	12	Yes	11	9	Yes	10
16. Sra Kala	-	Yes	-	Yes	-	-	Yes	15
17. Shershorak	-	Yes	-	Yes	-	-	Yes	15
18. Dashte Shin Kalay	-	Yes	-	-	-	-	Yes	15
19. Shna Jama	-	Yes	-	-	-	-	Yes	15
20. Keshal Kalay	-	Yes	-	Yes	-	-	Yes	15
21. Shin Kalay	-	Yes	-	Yes	7		Yes	15
22. Qala Bost	6	Yes	12	Yes	12	12	Yes	12
23. Mohajerin	6	Yes	12	Yes	12	12	Yes	11

3. Context

3.1 Provincial overview

Helmand is the largest province in Afghanistan, occupying approximately 62,000 square kilometres. It has an estimated population of 1.4 million people, mainly Pashtuns, with some Baluch and Hazaras. The province is located in the southwest of the country and is surrounded by the provinces of Kandahar, Day Kundi, Uruzgan, Nimroz, Farah and Ghor. It also shares a 160 kilometre border with Baluchistan, Pakistan. The province is mostly clay or sand desert in the South, and dry rocky mountains in the North. Only four percent of the land is cultivable and only two and a half percent is irrigated. Rainfall varies from two to nine inches per year. The summer is hot and dry. While winters are mild with average temperatures above freezing, the number of sub-freezing days hampers the growth of tropical crops and fruit.

Much of the province's population and productive agricultural land straddles the Helmand River and the irrigation systems it feeds. However, the desert areas brought under cultivation in the 1950s and 1960s though the Helmand Valley Authority—later the Helmand and Arghandab River Authority—suffer from flat gradients, poor soils, high evaporation rates and poor water management, resulting in drainage and salination problems. Alluvial or old river terrace soils of moderate to low fertility predominate in the Helmand area. Subsoils frequently sit on top of an impermeable layer of conglomerate, and waterlogging has created a persistent weed problem, particularly in Nad-i-Ali and Marjeh. Despite this, "the hot days and relatively cool nights in summer, the mild climate of winter with good light intensity are all favourable factors for plant growth in Helmand."[9]

The province is economically dependent on agriculture. There are few nonfarm income opportunities available and small industry is largely absent. In 2008-09, wheat occupied the greatest amount of active agricultural land during the winter season at an estimated 85,493 ha. Opium poppy was the second most prolific crop at 75,076 ha. Other winter crops include fodder crops such as alfalfa for livestock, as well as seasonal vegetables which are grown primarily for household consumption in most areas outside the urban centres of Lashkar Gah and Gereshk. In the spring and summer there is greater agricultural diversity in the province's central districts; watermelon is planted in both spring and summer and is considered premium quality. Cotton production also persists despite the relatively low prices offered by the state factory that continue to influence the market.

While the province has agricultural potential there are many constraints on its realisation. The main market for agricultural production from the province is not in Lashkar Gah, which only has a population of around 200,000, but in Kandahar City, with onward destinations to Kabul and Quetta, Pakistan. However, insecurity along the main highway between Gereshk and Kandahar City, particularly in Zahre District, hampers the movement of goods along this road. Due to the risks of violence or robbery, transportation costs are high in the South. Nuisance taxes are also considerably higher in Helmand and Kandahar than they are anywhere else in the country.

There is no official border crossing with Pakistan in Helmand, so government revenues from imports and exports are zero. What crosses these borders unofficially are guns, drugs and people—some of whom are armed and belong to antigovernment elements. The

9 N. Cullather, "Damming Afghanistan: Modernization in a Buffer State," *Journal of American History* 82, no. 2 (2002): 3.

border areas currently lie beyond the control of the provincial authorities and any rents generated there do not flow to the government.

Politically the province is deeply divided. The rise of the former jihadi commanders that were ejected during the Taliban period into formal positions of authority within the provincial administration in 2001 alienated much of the rural population. They were already associated with corruption, violence and involvement in the drugs trade; their return to power was a surprise to the population, who remembered the role they had played in the collapse of the mujahidin government and the rise of the Taliban movement in response. Tribes who were prominent in the Taliban regime found themselves marginalised and largely ignored in the division of government jobs and patronage that took place following the regime's collapse.

The lack of development progress in the province reinforced the view among the rural population that those in the government had little interest in the provision of public goods and were more concerned with increasing their private wealth. These sentiments and growing tribal grievances have given the Taliban entry points into rural areas, particularly in the north of the province and areas bordering Pakistan. Counter-narcotics efforts that have been criticised for being partial—eradicating the crops of the poor and the powerless while interdicting the drugs of competitors—have further undermined support for provincial authorities.

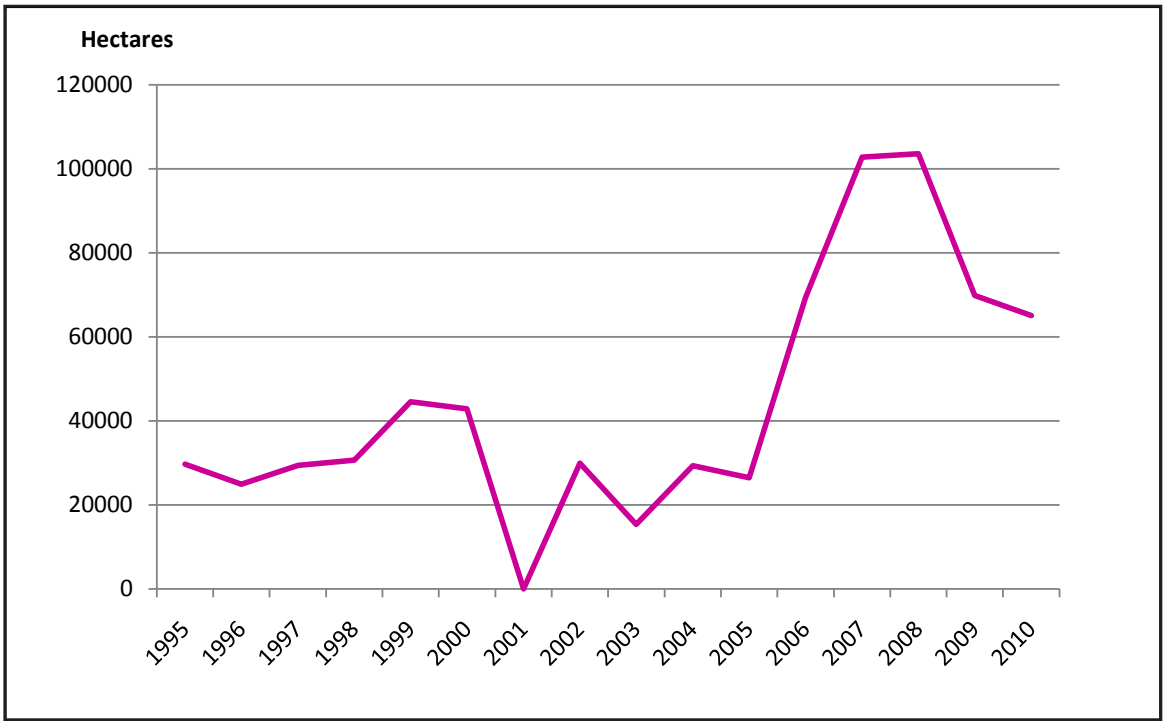
3.2 Drugs and counter-narcotics interventions

Levels of opium poppy cultivation in Helmand rose steadily in the years prior to 2008, increasing from an estimated 29,579 ha in the 1993-94 growing season to a peak of 103,590 in 2007-08 (see Figure 2). While farmers experienced significant crop losses during this period due to insects and disease (1995-96, 1997-98, 2003-04, 2009-10) as well as drought (1999-00), there have only been three documented instances where the authorities actively attempted to impose significant reductions in cultivation. These were the Taliban ban in 2000-01, the efforts by then-governor Sher Mohammed Akhudzade in 2003-04, and Governor Mangal's Food Zone Programme which began in the 2008-09 growing season. Each of these efforts involved a combination of coercion, persuasion and an offer of increased development assistance. The first two delivered dramatic reductions in cultivation, although on both occasions the results proved short-lived. The third has been associated with a decline in cultivation that has endured beyond a single season. This section provides a brief overview of each of these efforts in turn.

Early efforts to reduce opium production: The Taliban and Sher Mohammed Akhundzade

Both the Taliban and Sher Mohammed Akhundzade's counter-narcotics efforts focused on dissuading farmers from planting the crop rather than destroying it once it was already in the ground. Promises of development assistance were combined with both the threat of eradication and coercion. Gaining the compliance of key local powerbrokers through negotiation, and where necessary payment, proved critical to success. However, Governor Akhundzade's efforts to reduce opium production were marred by accusations that prohibition and eradication were largely targeted at competitors in the drugs trade, and it is often alleged that the Taliban imposed a ban on opium production to drive up opium prices.

Figure 2: Levels of opium poppy cultivation in Helmand Province 1995 – 2010



The Taliban prohibition imposed the most significant reduction in cultivation.[10] It was implemented across Taliban-controlled territoriy in the 2000-01 growing season, and reduced cultivation in Helmand province alone from an estimated 42,853 ha in June 2000 to negligible levels 12 months later. It also had a significant effect on the rural economy and consequently on support for the Taliban regime. For example, during the course of the ban the price of opium increased from around US$100 to $500 per kilogramme (kg) between September 2000 and July 2001. It also led to a significant rise in the level of opium-denominated debt and a dramatic increase in levels of rural unemployment. The economic downturn and problems repaying accumulated debts led to increasing migration to Pakistan, the mortgaging of land and the exchange of daughters as payment for outstanding loans.[11]

The pressure to return to cultivation in the 2000-01 growing season was intense. At the time, senior Taliban leaders recognised the impact the ban had on the population; they saw that a second consecutive year would require a far more draconian approach and would lead to even greater hardship. Mullah Mohammed Hassan Akhunde, Governor of Kandahar and widely considered one of the most influential leaders in the regime, claimed a second year of the ban would be pursued but implementation would require "many people to be killed and others to face starvation."[12] Senior Taliban leadership may have hoped that the ban would result in a massive inflow of development assistance to mitigate these risks. However, it ultimately established the socioeconomic conditions for a dramatic rise in the price and level of cultivation—not just in traditional poppy-growing areas but also where cultivation had previously been marginal. It also did little to bolster support for the

10 For a much more detailed account of the Taliban prohibition and its impact on the rural economy, see D. Mansfield and A. Pain, "Counter-narcotics in Afghanistan: The Failure of Success?" (Kabul: AREU, 2008).

11 Mansfield and Pain, "The Failure of Success?"

12 He also said the responsibility for this would lie directly with the international community if it failed to deliver sufficient development assistance to the people of Afghanistan. Donor Mission, pers. comm., May 2001.

Taliban among the rural population in the strategic Pashtun provinces once the events of 11 September 2001 unfolded.

After the Taliban's collapse, opium poppy cultivation in Helmand reached an estimated 29,950 ha in the 2001-02 growing season, despite attempts to implement compensated eradication in the center of the province. By the 2002-03 growing season, Governor Akhunzade had launched his own counter-narcotics effort. While this did not deliver as dramatic a reduction in cultivation as the Taliban prohibition, it did succeed in reducing cultivation by an estimated 50 percent between 2002 and 2003.[13] Over this twelve month period reductions were concentrated in the central districts of Nad-i-Ali, Nawa Barakzai, Sarban Qala as well as in Musa Qala, with total cultivation falling to 15,371 ha in the 2002-03 growing season. However, increases in cultivation in the northern districts of Kajaki and Baghran offset the potential for greater reductions.

The failure to deliver on the promises of development assistance led to a loss of political capital for Governor Akhundzade by late 2003, and he claimed he was unable to push for low levels of cultivation in the 2003-04 growing season.[14] It could also be argued that Akhundzade may have prioritised soliciting votes for his political patron Hamid Karzai in the upcoming presidential election over further, unpopular efforts to reduce cultivation. By the 2003-04 growing season, cultivation had rebounded to an estimated 29,353 ha.[15]

After 2005, levels of opium poppy cultivation in Helmand increased dramatically from an estimated 26,500 ha in 2004-05 to an unprecedented level of 103,590 ha in the 2007-08 growing season. These rises occurred under Governor Akundzade's successors Governor Daud (2006-2007) and Governor Wafa (2007-2008), and coincided with a significant deterioration in the security situation in the province.

The Food Zone Programme 2008-09 to 2010-11

There are currently a number of development programmes operating in Helmand Province aimed at improving the welfare of the population. These include efforts to improve physical and social infrastructure, the business environment, the capacity of government institutions, and licit livelihood opportunities for the rural population. These interventions are designed to contribute to stabilisation efforts in the province, as well as supporting economic growth and the movement out of opium production.

However, since the 2008-09 growing season there has also been a specific counter-narcotics programme in the form of the FZP. This was initially targeted at reducing the level of opium production within a specified geographic area that included all of Lashkar Gah District and the most fertile parts of Nad-i-Ali, Nawa Barakzai, Garmsir and Nahre Seraj Districts. It has now expanded to include the river-irrigated parts of Musa Qala, Marjeh, Khan Nishin, Sangin and Nawzad Districts. It was designed to explicitly tie the provision of development inputs—primarily wheat seed and fertiliser—to a signed agreement with farmers not to cultivate opium poppy, as well as the specific threat of eradication by the authorities for those that broke the agreement.

13 J. Hafvenstein, *Opium Season: A Year on the Afghan Frontier* (Guilford, CT: The Lyons Press, 2007), 193.

14 Sher Mohammed Akhundzade, pers. comm., 2003.

15 J. Goodhand and D. Mansfield, "Drugs and (Dis)order: A Study of the Opium Economy, Political Settlements and State Building in Afghanistan" (London: London School of Economics Crisis States Research Centre, 2010).

Wheat seed and fertiliser distribution

The provision of wheat seed and fertiliser is at the heart of the FZP. This is intended to offer an alternative to opium production for some of the farmers within the Food Zone. Not all farmers within the Food Zone receive wheat seed and fertiliser each year owing to resource and logistical constraints. The programme prioritises both specific areas and farmers for distribution, placing emphasis on the most productive areas. Over the three years of the FZP, efforts have been made to target different communities for the distribution of wheat seed and fertiliser, although data from the 2008-09 and 2009-10 campaigns suggests that some areas received inputs in both years (see Figure 3).[16]

The distribution of agricultural inputs has presented a significant logistical and security challenge, particularly in the first two years of the programme when the security environment was less permissive.[17] Nevertheless, in the 2008-09 season an estimated 33,000 households received 100 kg each of wheat through the programme, with 15,000 receiving an enhanced package from USAID that included 100 kg of diammonium phosphate (DAP) and 200 kg of Urea.[18] In the 2009-10 growing season, there were 39,640 recipients of wheat seed and fertiliser[19] and by autumn 2010 this number had reached over 48,200—almost 50 percent of the estimated population of the target districts.

The distribution of agricultural inputs under the FZP typically takes place prior to the winter cropping season. Eligible farmers—those owning land in the target areas whose names are on the beneficiary list—are required to visit the district centre to collect them. They must then make a co-payment for the inputs that they receive. These payments have risen from around seven percent in the initial year of the programme to 35 percent in the autumn of 2010.[20] They are also required to sign a commitment not to cultivate opium poppy.

The beneficiary lists have presented challenges since the inception of the FZP. The lists are produced by the local administration in conjunction with village elders and it is generally accepted that they tend to favour local elites—especially the direct relatives of elders and local officials. More serious accusations of corruption are also levelled at elders and local officials, with allegations that they have conspired to enter false names on the list and misappropriate inputs for their own advantage (See Box 9). Recognising some of these, Phase III of the FZP in 2010 offered fertiliser and seed for spring and summer vegetables to farmers on a first come, first served basis. However, directives from the Ministry of

16 The data used to derive this map was produced by a combination of a number of site visits by the organisation responsible for the distribution of wheat seed and fertiliser and other data about the areas targeted by the programme obtained from the Provincial Reconstruction Team and USAID. Security constraints and the challenges of verifying the data collected on beneficiaries mean the data presented in this map should be considered indicative. At the time that this report was completed no data was available regarding the areas where wheat seed and fertiliser were distributed for the 2010-11 growing season.

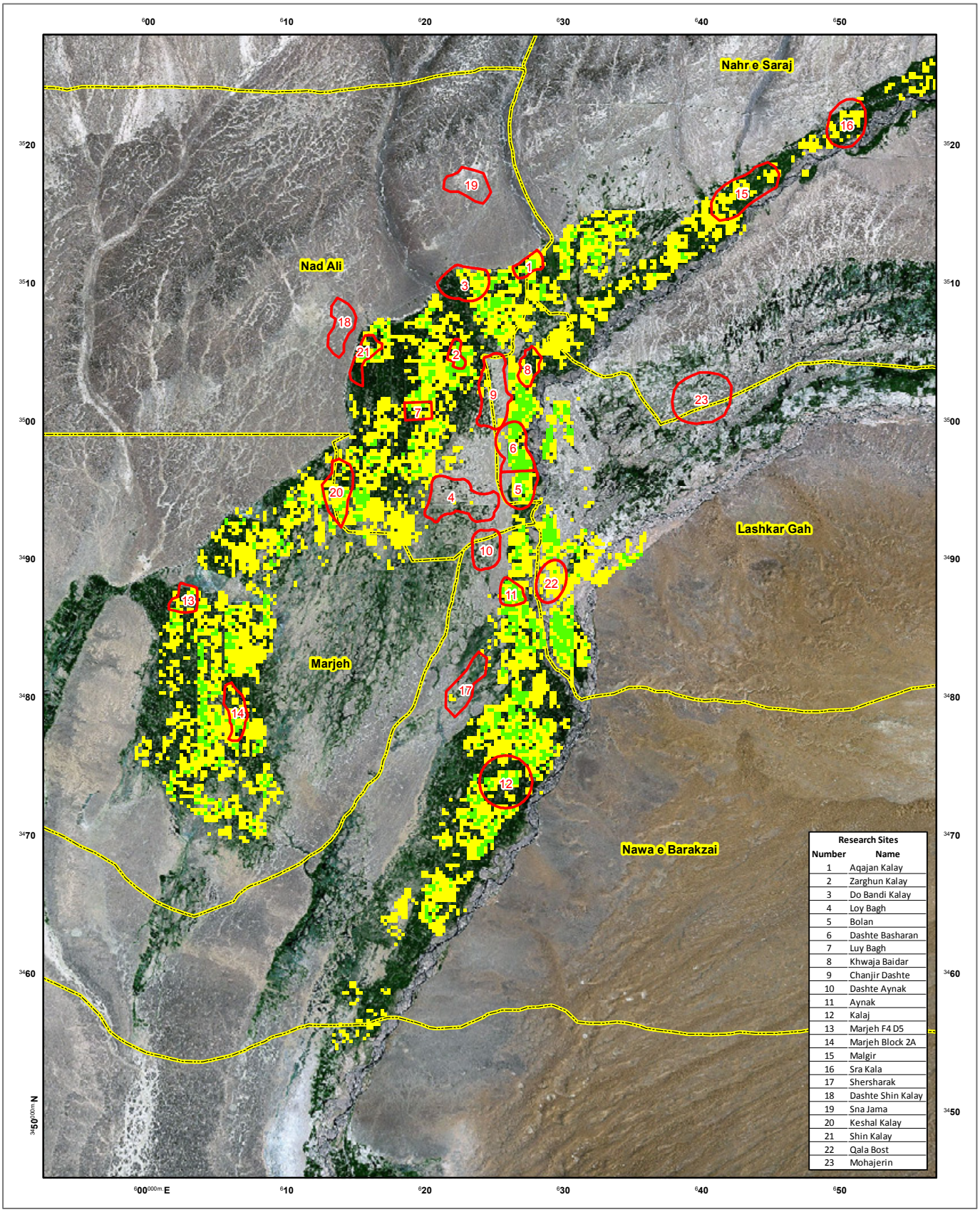
17 In the initial year of the FZP, much of the distribution was centred in Lashkar Gah and Gereshk due to the security conditions. Following the improvement of security conditions in many of the district centres it was possible to decentralise the distribution by autumn 2009 to everywhere except Marjeh District, whose farmers were still required to come to Lashkar Gah to receive their wheat seed and fertiliser. In the 2009-10 growing season, inputs were distributed in the ten districts covered by the programme, including from a Forward Operating Base in Marjeh.

18 M. Ryder, and C. Read, "Review of Helmand CN Plan" (London: Afghan Drugs Interdepartmental Unit of the Foreign and Commonwealth Office, 2009 [unpublished]), Annex D.

19 S. Macpherson and C. Hannah, "Review of the Helmand Provincial Counter-Narcotics Strategy: Third Report" (Lashkar Gah: Helmand Provincial Reconstruction Team, 2010 [unpublished]), 43.

20 This increase was at the behest of MAIL to ensure consistency across the country and compliance with the National Wheat Seed Distribution Programme.

Figure 3: Reported beneficiary locations: Helmand Food Zone Program 2009 and 2010



Data Sources:
Imagery: Natural Vue Dated 2006
Boundaries: AGCHO dated 2010

Produced by Alcis Ltd
6th May 2011

Agriculture, Irrigation and Livestock (MAIL) resulted in a return to the beneficiary lists for the distribution of wheat seed and fertiliser for the 2010-11 growing season.

There have also been some efforts to expand the range of crops on offer through the FZP and other agricultural programmes in light of the population's preference for higher-quality wheat flour from Pakistan. For example, in the 2009-10 growing season FZP also offered a package of vegetable seeds and fertiliser for the spring and summer cropping season. In the autumn of 2010, farmers could choose a base package of 50 kg certified wheat seed, 100 kg urea and 100 kg DAP combined with either a "Forage Package" or a "Winter Vegetable Package."[21] The FZP has also been supported by the distribution of grape vine and saplings as well as vegetable seeds, fertiliser and polytunnels under the Afghanistan Vouchers for Increased Production in Agriculture (AVIPA) Plus programme implemented by International Relief and Development.

The counter-narcotics information campaign

The second element of the FZP is the information campaign. This is aimed at dissuading the rural population from planting opium poppy in the first place and is typically conducted between July and October in the run-up to the winter planting season. The campaign involves a range of activities that aim to highlight the social costs of opium production, such as its illegality, its forbidden status under Islam, and its impact on drug addiction within the country. It also stresses the practical implications of cultivating opium poppy. The threat of eradication is highlighted as a risk that farmers cultivating opium poppy will face, as has been the threat of arrest. This has become more credible with the increased presence of ANSF and international military forces in the run up to the 2010-11 growing season. The campaign has also highlighted alternative economic opportunities as ways of deterring opium production. It points to "success stories" or points of contact where agricultural support might be obtained, as well as reminding farmers that certain types of development aid are tied to reducing poppy cultivation.

The primary means for disseminating these messages have been tribal *shuras*, religious institutions, the media and a variety of public information products. The governor has often played a prominent role in the campaign, travelling to different district centres to meet village elders prior to the planting season. In areas of Taliban influence, rural elders often avoid passing these messages to the rural population for fear that they will be seen as acting on behalf of the government and punished as a consequence. However, radio messages and word of mouth have ensured that the rural population has become increasingly aware of the provincial administration's position on opium production and the role of the FZP.

Crop eradication

The eradication campaign is the third and final element of the FZP, but it also predates the programme. In fact, eradication has been conducted in Helmand each year since the Taliban ban on opium production in the 2000-01 growing season, including a compensated eradication campaign in 2002 after the fall of the Taliban regime.

Since 2006, eradication has become more institutionalised and has been conducted by two distinct operations. The first is Governor Led Eradication (GLE) and uses a large number of tractors, protected by the Afghan National Police and directed by the Governor of Helmand's Eradication Committee. This operation has continued to implement eradication in the 2010-11 growing season. The second operation was the Afghan Eradication Force,

21 The Forage Package contained 10 kg of alfalfa seeds and the Winter Vegetable Package consisted of seeds for spinach (500 grammes), cauliflower (100 g), cabbage (100 g), cucumber (500 g) and white radish (400 g).

Figure 4: Eradication in Sangin

later renamed the Poppy Eradication Force (PEF), which operated between 2005 and 2009 until funding ceased. The PEF was funded by the United States Government and implemented by a private contractor. It was deployed from Kabul, consisted of a mix of tractors and all-terrain vehicles supported by a sizeable security force and logistics, and spent much of its time in Helmand during the eradication season. Both of these operation have been subject to a significant number of violent attacks over the years and have had personnel killed. Both have also been charged with corruption, with reports that farmers could elude eradication in return for payment.[22]

Perhaps understandably given the security environment, assessing the amount of crop eradication that has actually taken place has been a challenge. The fact that eradication has been used as a metric for judging the authorities' performance and that governors have been compensated for the cost of eradication on the basis of the area destroyed have both created the incentives for over-reporting. On occasions, ground verifiers have been placed under considerable duress to inflate figures. Final reporting also failed to take the quality of eradication into account, leading to the inclusion of some fields where much of the crop remained intact. However, while this was a particular problem in the 2005-06 growing season (see Figure 4), it has become much less of an issue in 2009-10. In this instance, both imagery and farmer reports suggest a more robust campaign with much less scope for patronage and bribery. The 2009-10 season also saw an increasing concentration of GLE in the more productive land where wheat seed and fertiliser were distributed (see Figure 6). Earlier GLE campaigns in both 2007 and 2008 typically targeted more marginal communities in less productive land. Even in 2009, GLE concentrated its efforts in the less well-irrigated areas in the east of Nad-i-Ali and to the west of the city of Lashkar Gah. As can be seen when compared with Figure 3, neither of these areas were beneficiaries of agricultural inputs under the FZP. During the same season PEF concentrated much of its efforts outside the Food Zone in the former desert area to the north of the Boghra Canal. However, by the 2009-10 growing season 95 percent of eradication took place within the

22 Gordon, "Winning Hearts and Minds?" 28.

Food Zone and occurred on what is considered the more productive agricultural land in the province.

In sum, this section shows that there is a history of both opium poppy cultivation and counter-narcotics programmes in Helmand Province. While there have been a number of efforts by the authorities to reduce opium production over the last decade, only three counter-narcotics campaigns have led to significant reductions in the province, each of which has sought to use a mix of coercion, persuasion and reward. The reductions delivered by the Taliban prohibition in the 2000-01 growing season were dramatic but short-lived. Moreover, it led to an increase in opium-denominated debt and rural underemployment. Combined with the drought that had been in effect in the South since the late 1990s, this led to heightened levels of economic distress and deprivation among many rural households. These conditions did little to win the Taliban favour with the rural population or the rural elite in the events following 9/11. The scale of the reduction across the country also led to a significant rise in the farmgate price of opium, which stimulated a boom in opium production following the collapse of the Taliban regime. Governor Akhundzada's efforts to reduce the level of opium poppy cultivation between 2002 and 2003 were less dramatic but equally as short lived. The governor was unwilling to expend his political capital by pushing for reductions for a second year, particularly in the face of the upcoming presidential election and in the absence of any significant increase in development assistance.

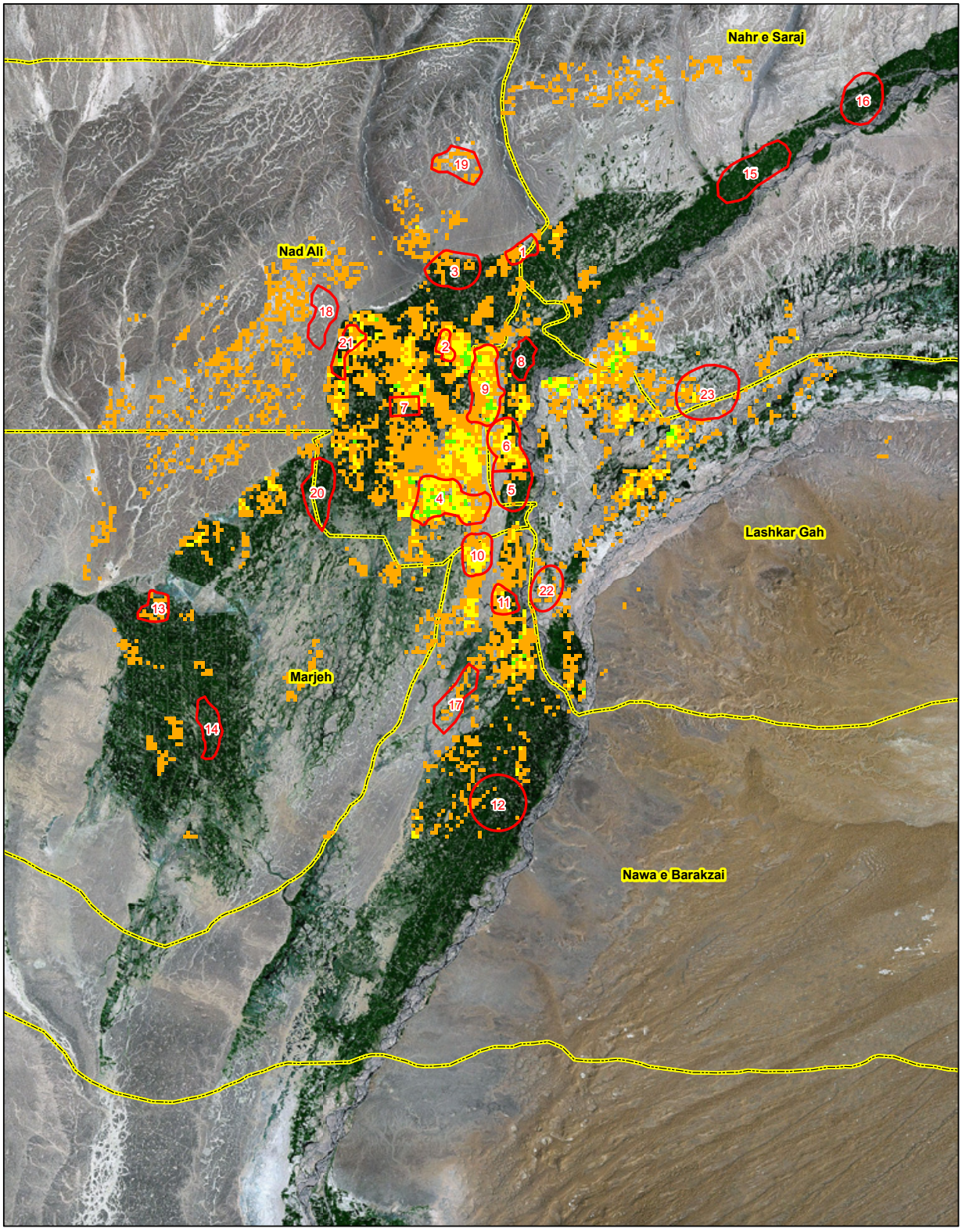
Between the 2007-08 and 2009-10 growing seasons, the amount of land cultivated with opium fell by an estimated 38,000 ha. Further dramatic decreases are expected within the Food Zone in the 2010-11 growing season. Like the two counter-nartcotics drives before it, the FZP implemented under governor Mangal's tenure contains a balance of persuasion, coercion, and some kind of reward. The difference is that the reward—development assistance—has been distributed at the same time as the efforts to coerce farmers not to plant opium poppy as well as the campaign to destroy the crop if farmers ignore the warning.

The FZP has also been conducted during a period of considerable risk and uncertainty, with fluctuating wheat and opium prices, increasing concerns over food security, a significant increase in levels of violence in the province and the inflow of international and national military forces. The next section seeks to identify the effect that exposure to these different risks has had on cultivation in the province between 2008 and 2010.

Figure 5: Eradication 2007 to 2010

UTM / WGS 1984 Zone 41N

Scale 1:250,000



Data Sources:
Imagery: Natural Vue Dated 2006
Boundaries: AGCHO dated 2010

0 2.5 5 10 15 20 25 Kilometres

Scale 1:250,000

Produced by Alcis Ltd
6th May 2011

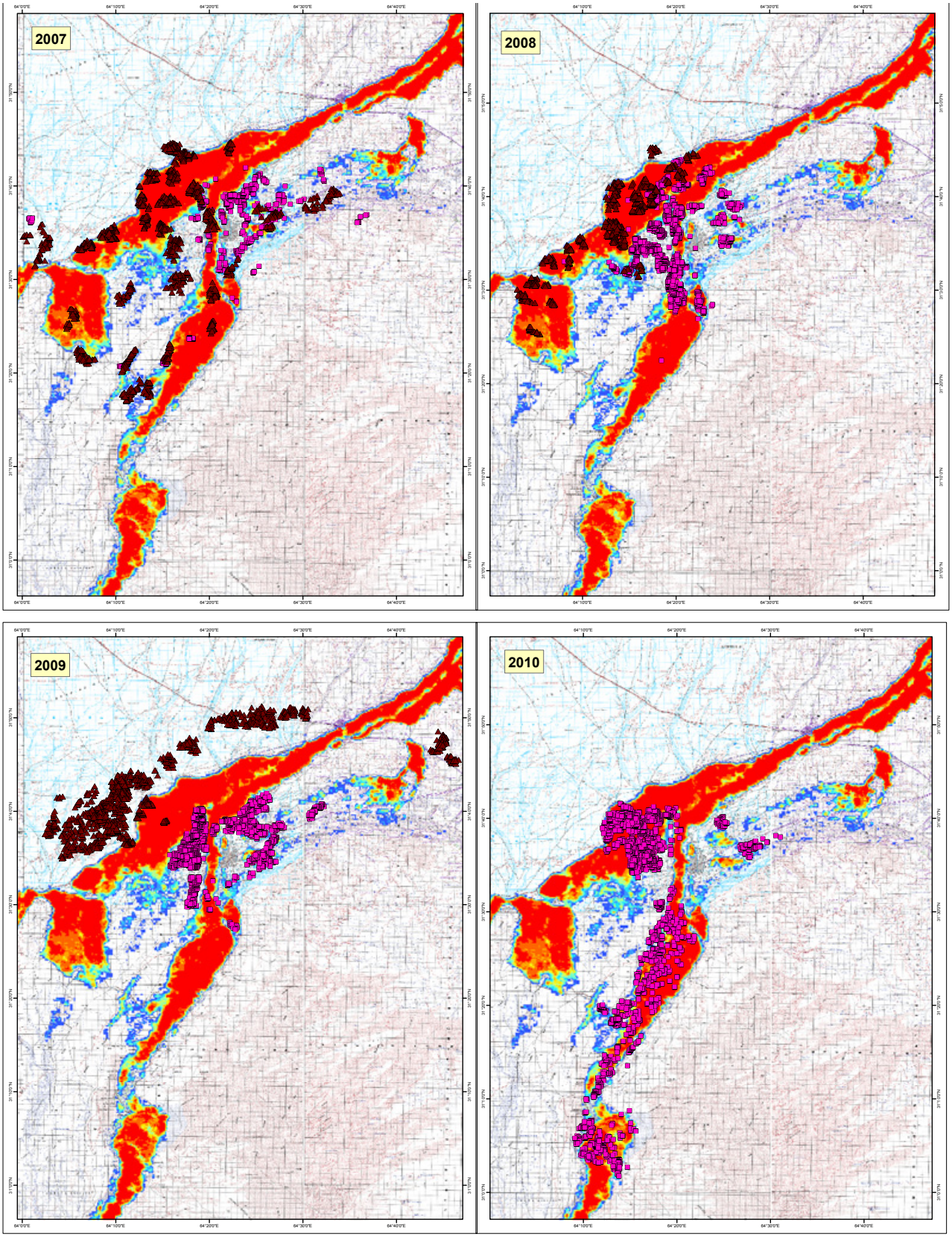
Legend

Research Site Locations
Province Boundary
District Boundary

Eradication Occurrences

1 year in 4
2 years in 4
3 years in 4
4 years in 4

Figure 6: Eradication delivery by year and force on ten year double cropping ability



Data Source:
Boundary Dataset - AGCHO dated April 2010
Eradication Points - UNODC
Mapping - HQ ISAF

Legend
UNODC Verified Eradication Force
PEF
GLE
Occurences of 2 Cycles 2000 to 2009
Not 2 cycles or non-ag
2 cycles in only 1 year
2 cycles in 2 out of 10 years
2 cycles in 3 out of 10 years
2 cycles in 4 out of 10 years
2 cycles in 5 out of 10 years
2 cycles in 6 out of 10 years
2 cycles in 7 out of 10 years
2 cycles in 8 out of 10 years
2 cycles in 9 out of 10 years
2 cycles in 10 out of 10 years

5 2.5 0 5 10 15 20 25 30 35 40 Kilometres

Scale 1:400,000

Force	Year 2007	2008	2009	2010
GLE Ha	1003	1416	1475	1602
AEF/PEF Ha	3000	1121	2644	No PEF
Total	**4003**	**2537**	**4119**	**1602**

Produced by Alcis Ltd
24th February 2011

4. Risk, Stress and Shock in Central Helmand

All households in rural Helmand are exposed to risk—the possibility that adverse effects will occur as a result of natural events or human activities.[23] Stress and shock represent the materialisation of risk, but along different timescales. Stress is ongoing and represents a continuous or slowly increasing pressure that is generally within a "normal" range of variability, while shock is intense and sudden.

Risks can be natural or the result of human activity; they can affect individuals (idiosyncratic) or particular groups (covariate), or they can affect most or all of the population (macro). Risks can reoccur over time (repeated) or occur concurrently with other risks (bunched). They can also materialise infrequently but have a dramatic effect on welfare (catastrophic) or occur frequently but have limited impact (non-catastrophic).[24] A household's capacity to manage risk is dependent on its assets and capacities and the nature of the risk or risks it is exposed to.

The implementation of a ban on opium production represents a risk to farmers in Helmand, with consequences for both those cultivating the crop on their own land and a range of other socioeconomic groups both within and outside the province. While the crop represents an important source of on-farm income for many farmers, its labour-intensive nature means that it also provides opportunities for the land-poor to either rent or sharecrop land, as well as offering off-farm employment to labourers during the weeding and harvest seasons. The harvest is a particularly busy period, and labourers from both within and outside of the province can receive as much as 1,000 Afs ($20) per day plus food. Harvesters can also take advantage of the fact that the harvest season is staggered across the province. The disposable income generated by opium production also has a multiplier effect within the province, supporting the sales of food items, agricultural inputs and a range of different consumer goods.

As Table 2 shows, the ban on opium is not the only risk that households and communities are exposed to in Helmand. Moreover, it is not a risk to which all communities or households are equally exposed. Communities in central Helmand in particular are also exposed to the ongoing conflict; like the ban on opium, however, its impact also extends far beyond the immediate conflict zone. For example, while the inhabitants of Lashkar Gah have had less direct experience of violent conflict since late 2008, the city has seen an influx of displaced people; some inhabitants have been obliged to offer accommodation to their relatives from districts like like Marjeh and Nad-i-Ali, which have seen an upsurge in levels of fighting. Other risks such as environmental hazards and economic shocks show similar characteristics, with exposure to a given risk varying over time, location and socioeconomic group.

Given the range of risks that a household, community or area may be exposed to, it is not possible to analyse either the causes of reductions in opium poppy cultivation, or its sustainability, in isolation. It is first necessary to understand the range of risks involved, and identify how they affect both livelihood strategies and levels of opium poppy production.

This section provides a review of each of the main covariate risks that communities in the research sites are exposed to: (i) the violent conflict; (ii) environmental risks (iii)

23 R. Holzmann, L. Sherburne-Benz and E. Tesliuc, "Social Risk Management: The World Bank's Approach to Social Protection in a Globalizing World" (Washington, DC: The World Bank, 2003), 6.

24 Holzmann et al, "Social Risk Management."

Table 2: Types of risk and effects in central Helmand

Risk		*Effect on Livelihood*	*Type*	*Effect on Level of Opium Production*
Food Insecurity	Inflation	• Dramatic rise in price of wheat favours an increase in food crop production, particularly when combined with market failures due to conflict	Macro and Repeated	Negative
Environmental	Drought	• Fall in yields of winter crops • Limited potential for summer crops • Increased cost of irrigation due to greater reliance on water pumps and tubewells (rented and owned) • Need to maximise economic returns on winter cash crop	Covariate and Repeated	Positive
	Soil Depletion	• Low yields of horticultural crops • Preference for salt-tolerant crops • Input intensive farming including use of fertilisers and tractors • High ground water leading to excessive weeds	Covariate and Repeated	Positive
Conflict		• Injury and loss of life • Damage to property • Inflationary effect, including on cost of transportation costs and increased rent seeking behaviour • Reluctance to engage in nonfarm income opportunities due to concerns over individual and household security • Psychologically leads to activities that favour short-term returns and deters investment in activities that yield in medium- to longer-term • Intimidation by armed nonstate actors • Limits state and other agencies' ability to deliver public goods and development assistance	Covariate and Repeated	Positive
Drugs Law Enforcement	Poppy Ban	• Potential loss in on-farm income • Loss of wage labour opportunities during harvest period • Less land available for cultivation on sharecropping basis for land-poor • Rent-seeking behaviour during eradication campaign • Wider deflationary effects on economy due to fall in disposal incomes	Covariate and Repeated	Negative
	Seizures in Household Compounds	• Loss of investment funds to support expansion of livelihood portfolio • Loss of financial capital to manage shocks or pay for life cycle events	Idiosyncratic	Negative/ Positive
Health	Illness	• High economic costs of treatment especially if patient needs to go to Pakistan	Idiosyncratic	Positive
	Injury	• High economic costs of treatment especially if patient needs to go to Pakistan	Idiosyncratic	Positive
	Death	• High economic cost of funeral and social obligations	Idiosyncratic	Positive

the prohibition of opium production; and (iv) the economic shocks imposed by rising food prices. It also discusses idiosyncratic risks such as illness, injury and death, but primarily with reference to the increased exposure that households have to such risks in areas of violent conflict. The section concludes that parts of the population in central Helmand have much higher exposure to risk than others. This is largely due to the fact that many of these risks are coincidental and repeated. The role that opium production has played in

managing the impact of the conflict, market failures and ongoing environmental stresses renders the population in these particular areas most vulnerable to the imposition of a ban on opium production and least likely to comply over an extended period.

4.1 The risk of violent conflict

Violent conflict is seen as a cause of chronic poverty. Aside from the obvious role it plays in increasing the risk of death, injury and poor health, violent conflict affects the educational opportunities of the population, the provision of health services and access to other public goods. It also reduces trading opportunities, increases transaction costs and dissuades both public and private investment in agriculture and the business sector, particularly in activities with long-term returns. In many areas violent conflict can disrupt migratory labour opportunities and lead to the displacement of the settled population. It can also erode social networks and systems of reciprocity and trust; when combined with the failure of state services, this can leave the poor with no support networks.

In central Helmand much of the population has direct experience of the risk and effects of violent conflict. Perhaps not surprisingly, those living in the areas where only one side dominates experience lower levels of violence, while those who inhabit the contested space where the government, the international community and the Taliban fight for control are most exposed. This contested space has shifted over the study period, exposing different communities to different levels of violence.

These shifts have affected almost all of the study areas. Even respondents in areas close to Lashkar Gah, such as Qala Bost (RS22), Bolan (RS5) and Mohajerin (RS23) reported that they were exposed to the risk of violent conflict through much of 2008 and 2009. For example, during fieldwork in May 2009 the Taliban were perceived as particularly active around Lashkar Gah—especially at night—and those interviewed expressed concerns over their security while in their fields and en route to Lashkar Gah. Attacks in the city were relatively commonplace, and the major Taliban offensive on Lashkar Gah in October 2008 left the population concerned that the government might fall. Respondents in Bolan referred to the Taliban's control over many of the villages in the area. In Mohajerin (RS23) and Qala Bost (RS22), they referred to repeated attacks along the road into Lashkar Gah. In all three areas respondents anticipated a worsening of the situation in the run up to the Presidential election in August 2009.

However, by May 2010 the security situation was seen as improving in the environs of Lashkar Gah. In Bolan respondents attributed this to efforts by the government and international forces to clear the Taliban from the area in late 2009; in Qala Bost (RS22) it was the efforts to secure the airport. Respondents reported further improvements in 2010, including greater economic opportunities in the city and a reduced risk of violent attack along the roads. By late 2010 respondents reported that the direct risk of violence to the population around Lashkar Gah was largely limited to acts of intimidation against people seen to be taking assistance from the government.

Some progress can also be seen around the city of Gereshk, although reductions in the violence appear to have been slower, and the threat of violence and intimidation remains relatively high according to both fieldwork and International Security Assistance Force (ISAF) data. However, reports of Taliban fighters residing in the area, the incidence of firefights and suicide bombs have all declined dramatically since fieldwork in 2008 and 2009, and interviews with traders and farmers suggest that security on the main road to Kandahar has improved in the latter half of 2010. The Taliban's withdrawal from around

Gereshk to the surrounding areas on the edge of Malgir (RS15) and Sra Kala (RS16) seems to have reduced the risk of violence to the local population.

In contrast to those living close to urban areas, respondents in the canal command area—primarily in Nad-i-Ali—argue that they have experienced consistently high levels of violent conflict throughout the study period. Respondents in areas such as Aqajan Kalay (RS1), Doh Bandi (RS3), Zarghun Kalay (RS2) and Luy Bagh (RS7) reported incidents of bombing as well as firefights between ISAF, Afghan security forces and Taliban fighters both before and after the military campaign in 2010. Indeed, during each round of fieldwork a number of respondents in these areas talked of the deaths and injuries suffered by their immediate family due to armed conflict.

There are also multiple reports of property being damaged and destroyed, livestock killed and crops damaged. Households have incurred the costs of healthcare for their injured and of funerals where family members have died. Where households have had the means, damaged buildings have been rehabilitated at some expense to the home owners, who have often incurred debts to pay for them. The conflict has also had a significant impact on access to education and health services due to a shortage of qualified staff willing to work under such dangerous conditions. Those that can afford it transport the sick for treatment in Kandahar or Quetta in Pakistan and send their children to school in Lashkar Gah. In some cases, family members have migrated to Lashkar Gah to escape the violence; in others, the entire family has sold its land and moved there. Respondents in these locations regularly complained of their increased vulnerability to acts of violence and intimidation from the different armed actors in the conflict seeking to deny the other side succour in the rural areas.

In 2010 there was a dramatic increase in the presence of both government and international forces and their accompanying security infrastructure in this area as they fought to push Taliban fighters from Nad-i-Ali and Marjeh Districts. However, fieldwork in November-December 2010 suggests that the vast majority of farmers in these districts did not believe that the increase in the presence of ANSF and ISAF forces had resulted in an improvement in the security situation. To the contrary, there was an overwhelming view that the security situation had deteriorated between November 2009 and November 2010 across the research sites in Nad-i-Ali and Marjeh. ISAF's records of the reported number of violent acts including assassinations, murders and mines for the period would seem to support this (see Figure 7 and 8).

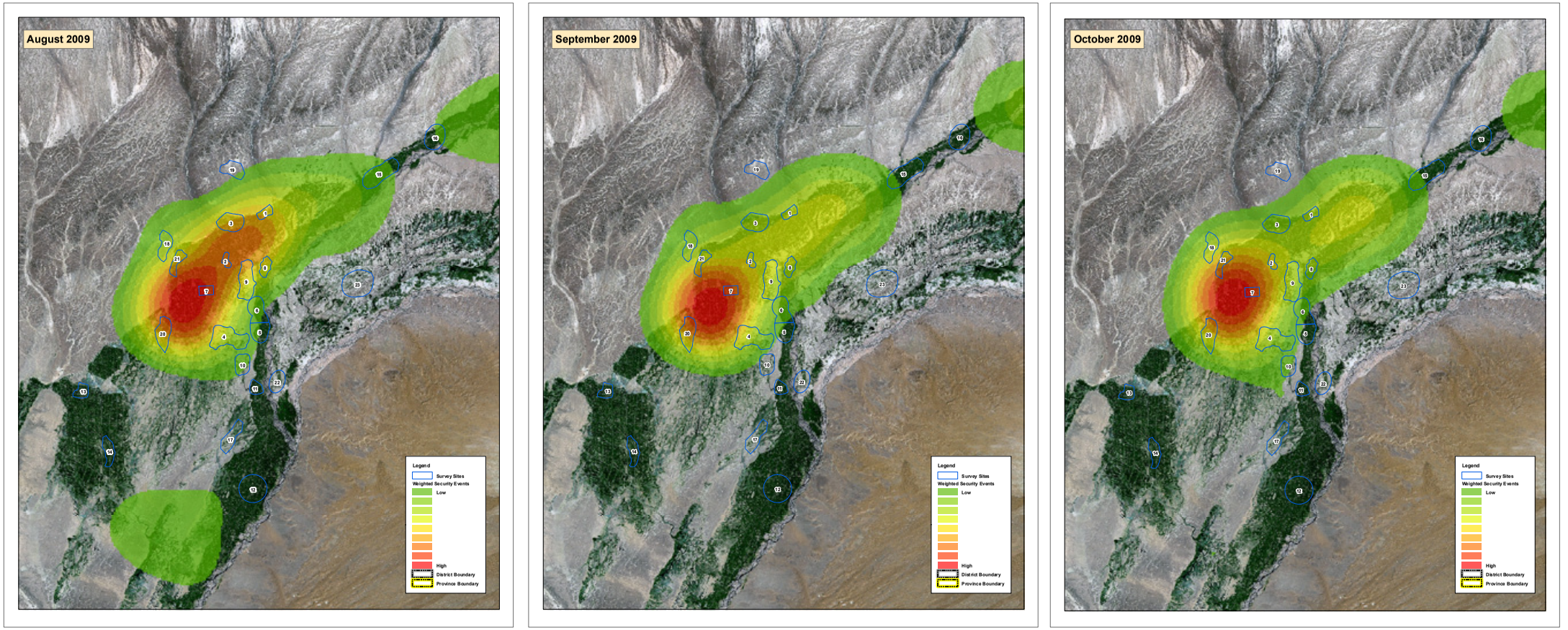
In late 2010, respondents in Marjeh further emphasised the views expressed during fieldwork at the time of the 2010 opium harvest. In particular, they commented on the increase in levels of violence since the departure of the Taliban and their perceptions of a much more unpredictable environment. Farmers across each of the research sites—including in those areas where opium production has been abandoned such as Bolan (RS5) and Qala Bost (RS22)—complained that the upswing in violence in Marjeh and Nad-i-Ali during the opium harvest had deterred them from travelling to the area in search of work.

Respondents across Nad-i-Ali and Marjeh cited the risk of mines, suicide bombings, attacks on ANSF bases and checkpoints, aerial bombardment, and the arrest and execution of those accused of being informants by the Taliban, as evidence of the deteriorating security situation. Perhaps not surprisingly, a review of ISAF data highlights the fact that acts of violence often correspond with the presence of security infrastructure such as checkpoints and military bases. Farmers were unwilling to cultivate crops requiring regular irrigation in such an environment since they were reluctant to leave their compounds at

Figure 7: Security events pre-planting season 2009-10

UTM / WGS 1984 Zone 41N

1:255,000



Data Sources:
Provincial & District Boundaries:
AGCHO April 2008 Province & District Boundary
Security density data provided by IJC Geo Cell
Imagery Natural Vue 2006.

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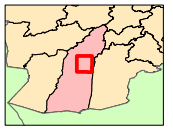
Kilometers



Geographic Reference System

Universal Transverse Mercator
World Geodetic System 84
Grid Zone 41N

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Figure 8: Security events pre-planting season 2010-11

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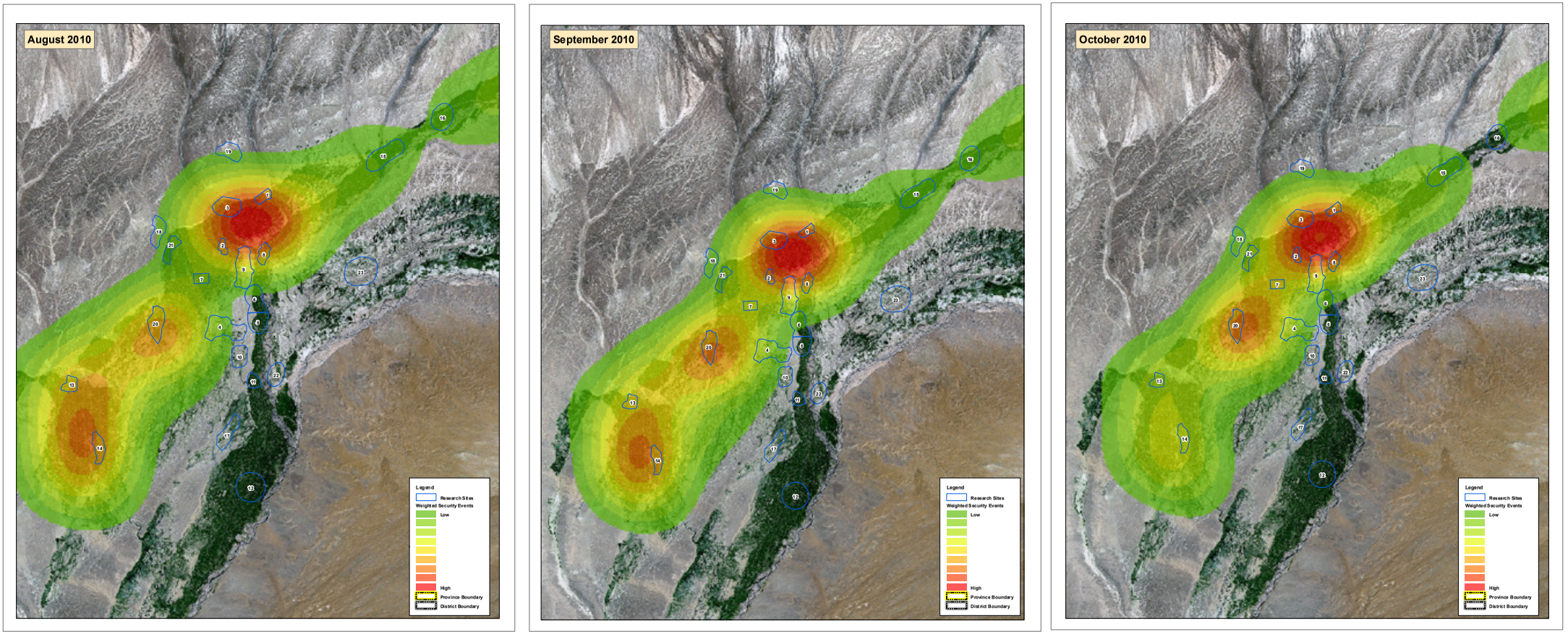

Data Sources:
Provincial & District Boundaries:
AGCHO April 2008 Province & District Boundary
Security density data provided by IJC Geo Cell
Imagery Natural Vue 2006.

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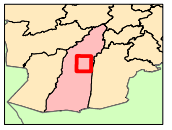

Geographic Reference System
Universal Transverse Mercator
World Geodetic System 84
Grid Zone 41N

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Box 1: Clearing Luy Bagh, November 2010

At the start the people were happy that the government came to the area. The people said welcome. But the government did not send good people to the area, they were uneducated. When the villagers went to the district centre to request assistance and see that the people the government had sent were not good and that all they wanted was money, the villagers returned to the Taliban to ask them to solve their problems.

night to divert the necessary water. They were also wary of growing vegetables, which are more time-sensitive in terms of plant husbandry and harvest and cannot be stored for extended periods of time. This has deterred vegetable production and favoured crops such as opium, as well as cotton, maize and mung bean—which are considered relatively robust despite their relatively low returns—and can be easily stored for sale at a later date.

Predation by the authorities is also a major challenge for communities affected by the conflict. Respondents refer to robberies and the looting of houses, often accusing the ANP and recently formed local police forces of theft and intimidation during house searches. The seizure of opium by the authorities is often seen as "theft" rather than law enforcement due to the lack of trust in the security forces in the area. Those interviewed in these contested areas refer to the low moral standards of government employees and often compare them unfavourably to Afghan Taliban fighters (See Box 1). The ANP, and in particular the local police, are also blamed for the imposition of "taxes" and the humiliation and beating of farmers who travel by road.

Even in November-December 2010, the population around Nad-i-Ali and Marjeh still believed the Taliban were very much present and able to make demands on the people across much of the canal command area, even in areas close to military bases and checkpoints. For example, farmers in one village in Nad-i-Ali reported that their *mirab* (village water master) made annual requests for tax payments on land on behalf of the Taliban,[25] as well as for a post-harvest tax on the opium crop.[26] Respondents also referred to the punishments meted out to those that ignored the Taliban instruction that farmers should not work for the government or take development assistance. Even in Aynak (RS11), farmers reported that a Taliban commander was granted the opportunity to speak to the worshippers during Friday prayer in early December. Combined with the military action of international forces and the behaviour of the national security forces, these incidents have resulted in a population that feels particularly vulnerable to acts of violence and predation. As one respondent put it, "there is government during the day and at night there is the Taliban."

Within these contested areas some groups believe they are more vulnerable to violence than others. For example, the *Nar Kilin* (people who have been settled in Helmand from other provinces such as Wardak, Laghman, Nangarhar and Farah) believe that they are subject to greater levels of intimidation from both the Taliban and government forces than those from local tribes such as the Barakzai, Ishaqzai and Alikozai. These are influential due to their numbers within the province and their representation in the political leadership of

25 In this particular village payments were made per unit of land known as a *firma*. In 2008 the tax paid per *firma* was $170, in 2009 it was $80 and in 2010 it was $70.

26 In 2010 a payment of the value of one to three *khord* of opium (the equivalent of 110 to 330 g) was demanded. In this particular village, *ushr*—an agricultural tithe of ten percent of the crop—was paid to the mullah.

both the provincial government and the Taliban. The resource-poor also consider themselves at greater risk from the conflict since they cannot afford to migrate to the urban areas to escape the fighting, are in desperate need of income from the opium harvest, and lack the necessary social and financial capital to deter the predatory behaviour of armed groups.

By contrast, inhabitants of the area north of the Boghra Canal believe they are much less exposed to the risks of violent conflict. Respondents in Shna Jama (RS19) and Dashte Shin Kalay (RS18) do not see the conflict as a direct risk at all. They believe that security to the north of the Boghra Canal is better than in the canal command area to the south. Those interviewed in Shna Jama (RS19) and Dashte Shin Kalay (RS18) during the planting time for the 2010-11 growing season did not report any incidents of injury, death or damage to houses or crops due to fighting and attribute stable security conditions to the presence of the Taliban. They blame the government and international forces for the conflict in the canal command area.

It is only when these farmers travel in the canal command area that they see the conflict as a risk. The ANP is accused of intimidation, assault and demands for bribes, while mines and explosive devices are also seen as a threat to those travelling to Lashkar Gah or other urban areas to purchase food and consumer goods or seek medical care. In fact, respondents north of the Boghra Canal appear quite content to remain there. Although they are aware of the absence of health or education facilities in the area, they are keen to limit their exposure to both the conflict and to government authorities attempting to impose an opium ban.

4.2 Environmental risks

An awareness of the differing settlement histories that exist in central Helmand is critical to a better understanding of the different environmental risks that communities are exposed to and how they manage them. For example, some of the study areas, such as Qala Bost (RS22), Bolan (RS5) and Sra Kala (RS16), are situated in the floodplains of the Helmand River. These have been under cultivation for centuries, have fertile soils and year-round irrigation.[27] By contrast, Marjeh and Nad-i-Ali Districts were largely desert land until they were settled in the 1950s. Still, parts of the canal command area[28] have been settled in the last 20 years through a process of land grabs, which have increased dramatically since the fall of the Taliban (see Figure 9).

The population in each of these different areas is exposed to different types of environmental risks and stresses. For example, farmers who lack access to water from canals or the Helmand River and cannot afford to irrigate their land by water pump or tubewell are vulnerable to drought and the loss of agricultural land. In 2010, it was estimated that the installation of a tubewell would cost around $1,200 to $1,800. Recurrent costs include the cost of diesel for each irrigation; opium poppy requires between 10 and 12 irrigations over the season, wheat 6 to 7 and cotton, mung bean and maize from 4 to 6 irrigations. Opium production has often provided the finance for the installation and cost of running these wells, cross-subsidising the irrigation of other crops. Where opium production has been curtailed in areas reliant on tubewells, such as in Dashte Aynak (RS10), Dashte Basharan (RS6) and Mohajerin (RS23), there is evidence of a subsequent reduction in the total amount of cultivated land (see Figure 10).

27 A. Michel, "The Kabul, Kunduz and Helmand Valleys and the National Economy of Afghanistan: A study of the Regional Resources and the Comparative Advantages of Development" (Arlington, VA: Office of Naval Research, 1959), 48.

28 Such as Dashte Aynak (RS10) and parts of Dashte Basharan (RS6), as well as areas to the east of Lashkar Gah, such as Mohajerin (RS23) and the desert to the north of the Boghra Canal.

Figure 9: Expansion of agricultural land in central Helmand

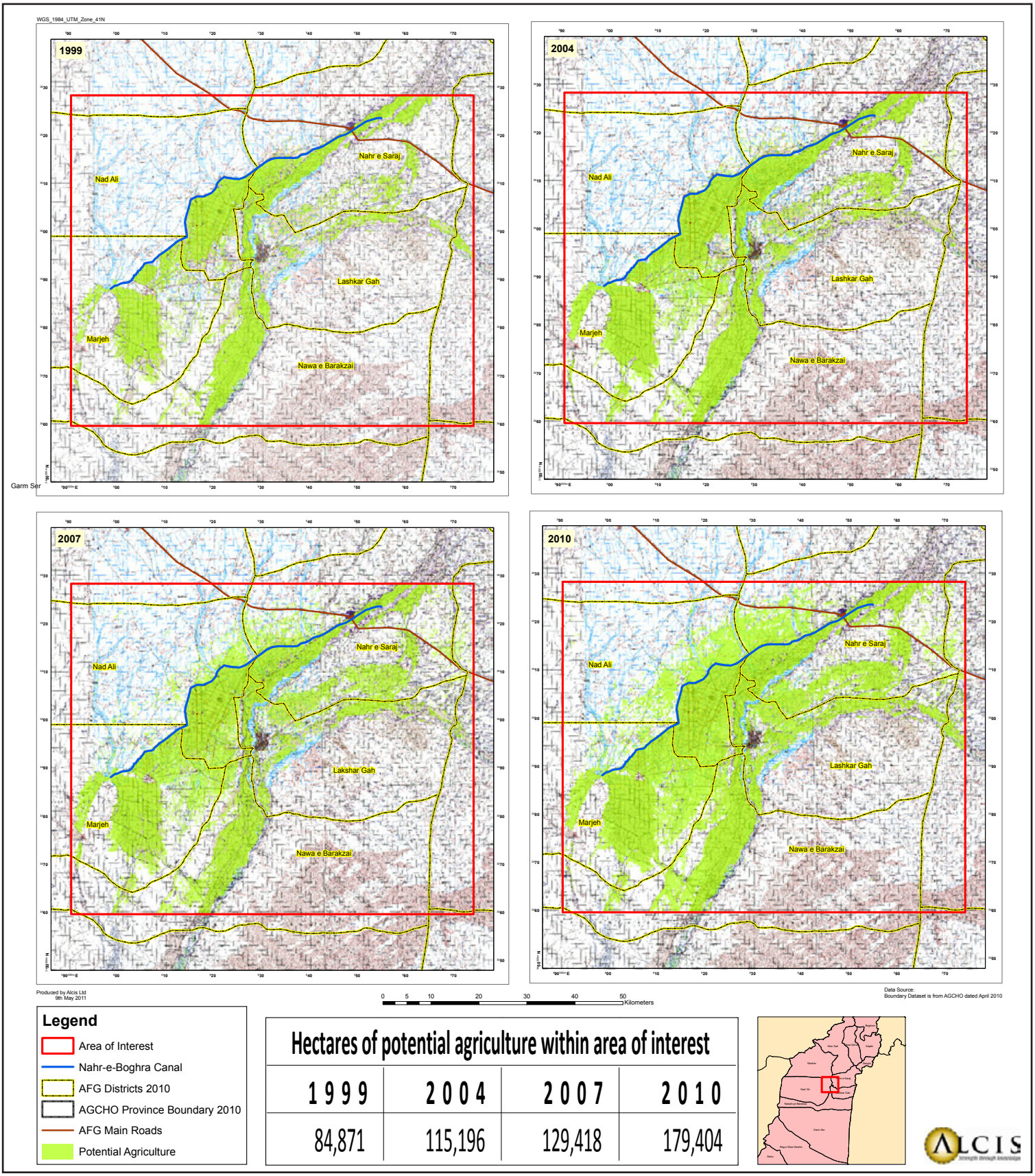
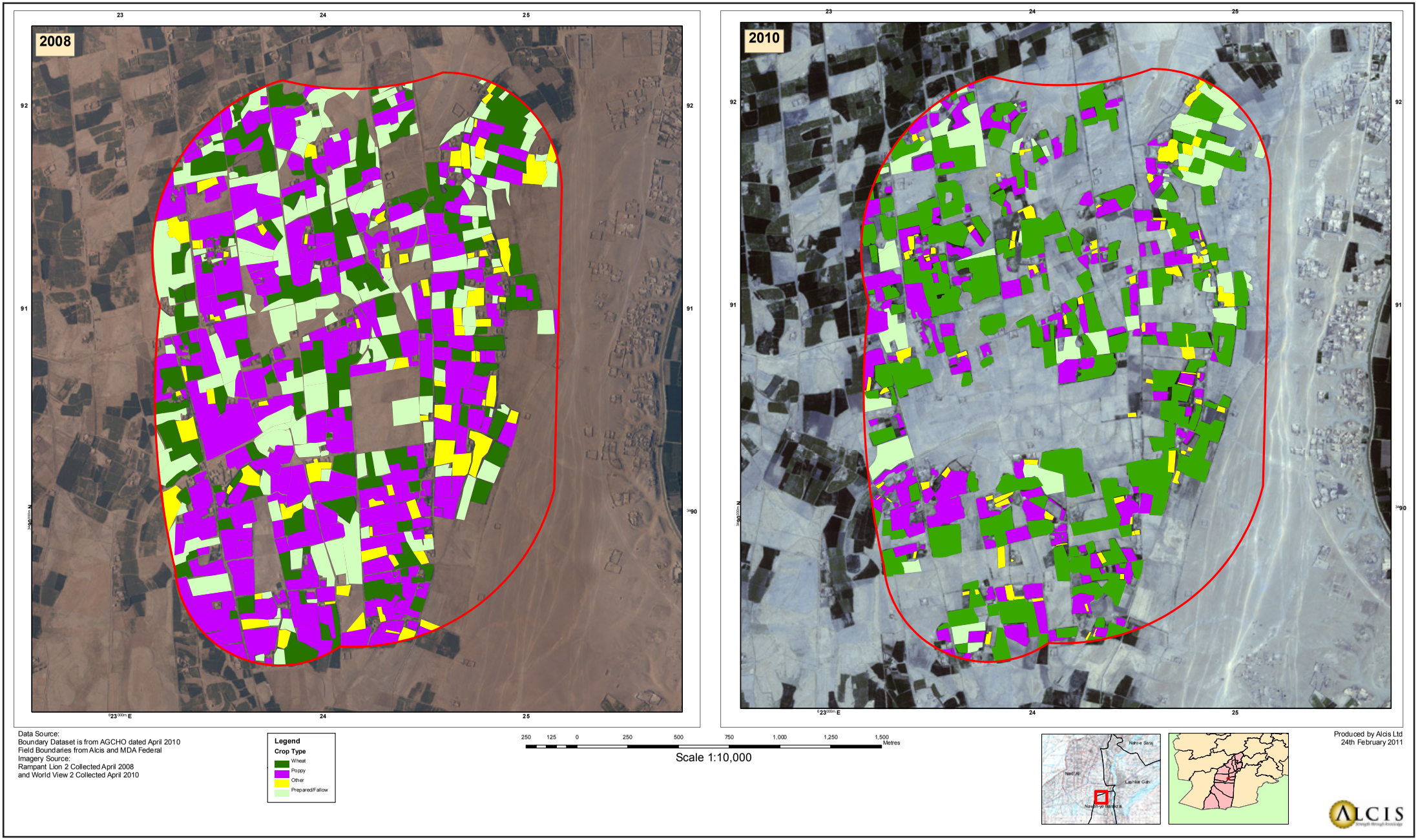


Figure 10: Research site 10, Dashte Aynak



Inside the canal command area, by contrast, having too much water is itself a risk. High water tables and salination have been a problem throughout the history of the development of the Helmand canal system. This has been a particular problem in Nad-i-Ali and Marjeh, where the soils were considered "shallow, underlain by dense gravelly subsoils poorly drained and saline in places."[29] The completion of the Boghra Canal served to raise the water table in both of these areas and led to the accumulation of salt on the soil surface.[30] While efforts were made in the 1950s and 1960s to resolve the drainage problem, deposits of salt can still be seen across large tracts of land in both districts (see Figures 11 and 12).

Figures 11 and 12: Soil salinisation

29 Michel, "The Kabul, Kunduz and Helmand Valleys," 152.

30 Michel, "The Kabul, Kunduz and Helmand Valleys," 174.

The soils in Nad-i-Ali and Marjeh are also particularly poor-quality. Some of the initial soil surveys conducted in the 1950s classified the majority of the land under the canal command areas in these two districts to be of "marginal and restricted suitability, requiring careful management for even fair to good yields of adapted crops"; much of the remaining land was considered "of limited use for common tilled crops."[31]

Even before the war in 1979, farmers in Nad-i-Ali and Marjeh used tractors and fertiliser to improve the productivity of the land. Surveys in the 1970s revealed that a large proportion of farmers in Nad-i-Ali used tractors since the hard clay soils in the area made it difficult to till the land with oxen.[32] During the same period rates of fertiliser use in the district were among the highest in the country.[33] In fact, the costs of farming in the area were so high that farmers' net incomes were similar to those in the upper, drier parts of Helmand,[34] and lower than those farming under the Shamalan and Darwishan Canals.[35]

During the early period of the settlement of Nad-i-Ali and Marjeh, the combination of salinisation, poor soils and high ground water led to an overall drop in wheat yields.[36] While yields recovered in the 1960s and 1970s with the introduction of fertiliser and improved seed,[37] the land brought under cultivation by the Helmand Valley Project remained plagued by environmental problems. These only increased with the onset of the war in 1979 and the subsequent loss of the necessary investment and institutional capacity needed to tackle them (Cullather 2002).

In the absence of external support both during and after the war, farmers in the canal command area have had to find ways to manage the environmental risks that they face. Over the last two decades, opium production has clearly become part of the risk management process. Fieldwork in the 1990s revealed that the cultivation of opium poppy gave farmers the financial capital they needed to purchase vital supplies of fertiliser prior to and during the planting season.[38] For farmers with insufficient cash to purchase fertiliser prior to the planting season, growing poppy gave them access to credit either in the form of cash or in-kind.[39] In more recent years, fertiliser has been provided to farmers as part of the Food Zone Programme and wider agricultural support in Helmand.

The cash generated by opium has also given farmers in central Helmand better access to tractors to tackle the problem of soil quality. Farmers with larger tracts of land and a surplus of opium have been able to purchase tractors, which they then lease to smaller farmers as an important source of cash income. For smaller farmers, opium production has provided them with the means to rent tractors and prepare their land

31 Michel, "The Kabul, Kunduz and Helmand River Valleys," 170-173.

32 R. Scott, "Tribal and Ethnic Groups in the Helmand Valley" (New York: The Asia Society, 1980), 8.

33 Shairzai et al., "1975 Farm Economic Survey," 75.

34 Scott, "Tribal and Ethnic Groups," 8.

35 G.P. Owens, "1970 Farm Economic Survey: Helmand and Arghandab Valleys of Afghanistan" (Kabul: USAID, 1971 [unpublished]), 59; C. Clapp-Wincek and E. Baldwin, "The Helmand Valley Project in Afghanistan AID Evaluation Special Study No. 18" (Washington, DC: USAID, 1983), 14.

36 Cullather, "Damming Afghanistan," 33; Scott, "Tribal and Ethnic Groups," 7.

37 Owens, "1970 Farm Economic Survey," 4.

38 D. Mansfield. "The Economic Superiority of Illicit Drug Production: Myth and Reality—Opium Poppy Cultivation in Afghanistan." Paper prepared for the International Conference on Alternative Development in Drug Control and Cooperation, Feldafing (January 7-12, 2002).

39 This is a practice that persists in areas north of the Boghra Canal and in other areas where opium persists in the canal command areas in the 2010-11 growing season.

for agricultural production. The fact that those growing opium are given preferential access to credit allows the resource-poor to hire a tractor even where they lack the necessary cash reserves.

Opium production has also proven an effective method for tackling the persistent weed problems associated with the high water table in the canal command area. In Helmand, irrigated land cultivated with opium will typically be weeded three times each season. If there is insufficient family labour (including women and children) available, hired labour will be used to complete the task. Farmers claim that once the land is weeded intensively over the opium poppy season and fertiliser is added to improve its yields, it will produce a good summer crop of maize and require less weeding during winter wheat cultivation.

Farmers manage the problem of salinisation by growing crops that are relatively salt-tolerant, such as melon, watermelon and alfalfa—also useful for increasing soil fertility if grown for a prolonged period.[40] In the canal command area, these three crops are grown most extensively outside of the fertile areas around Lashkar Gah. Opium poppy also appears to be relatively salt-tolerant and research suggests that applying salt can actually increase morphine production.[41]

A review of these different environmental risks indicates that Helmand is not, as sometimes described, the "bread basket of Afghanistan." History shows that before the war, the concentration of poor soils, salinisation and high water tables in Nad-i-Ali and Marjeh Districts meant that farmers there had some of the lowest net incomes in the province. In the late 1950s Michel suggested "that the whole problem of handling the problem soils of Nad-i-Ali is one that transcends the ability and resources of the settlers and highlights the need for the drainage problem to be solved and for larger landholdings to be given to settlers in Nad Ali and Marjeh so that pasture and hay could be cultivated and the fertility of the soil improved."[42] Over the last three decades, drains have become silted, salination has worsened and farm sizes have shrunk, limiting the opportunities for investing in the fertility of the soil as recommended by the Helmand Valley Project. During this period, it would appear that opium production has flourished, providing settlers with the resources to manage growing environmental risks in the absence of state support.

4.3 The risk of a poppy ban

Programmes aimed at reducing opium production have been implemented throughout the study period. The focus of these efforts has been the Food Zone Programme, which has sought to integrate an information campaign and the provision of alternative agricultural inputs with a campaign to destroy the opium crop once it is cultivated. As the objectives of both the eradication and information campaigns are to raise the risks associated with opium production, these will be discussed here. The provision of agricultural inputs will be covered later as part of the analysis of the provision of public goods and social protection mechanisms.

Fieldwork reveals that by late 2010, a growing body of respondents within the canal command area believed that government could impose a ban on opium production in

40 Michel, "The Kabul, Kunduz and Helmand Valleys," 175-6.

41 L. D. Kapoor, *Opium poppy: Botany, chemistry and pharmacology* (Binghampton, NY: The Haworth Press, 1995), 104.

42 Michel, "The Kabul, Kunduz and Helmand Valleys," 175-6.

central Helmand and in the areas east of Lashkar Gah straddling the road to Kandahar (see Box 2). This stands in contrast to the 2008-09 growing season, when respondents believed that the government's capacity to enforce a ban was restricted to the environs of Lashkar Gah, in areas such as Qala Bost (RS22), Bolan (RS5) and Mohajerin (RS23). In each of these areas, farmers saw eradication as a credible risk throughout the study period, even though the actual level of crop destruction has been relatively low.

In other areas, respondents believed that the risk of a poppy ban being imposed has increased significantly. For example, respondents around Gereshk had little confidence in the government's capacity to enforce a poppy ban in the 2008-09 growing season due to the dominance of the Taliban in areas such as Malgir (RS15) and Sra Kala (RS16). This view was reiterated during the planting season for the 2009-10 crop, when many respondents reported that despite the government's threats of crop destruction and arrest, it was in no position to enforce them. However, by the spring of 2010 farmers reported that the authorities had implemented an effective eradication campaign including the arrest and imprisonment of farmers and the destruction of their opium crop in areas such as Malgir (RS15). Under this scheme farmers were held and fined $12 per night until the authorities had verified that the crop had been destroyed, on which an additional sum of $230-350 was imposed and the farmer released. By the 2010-11 growing season all but those respondents on the periphery of Malgir (RS15) and Sra Kala (RS16) believed that eradication was a risk.

For farmers beyond the environs of the cities of Gereshk and Lashkar Gah, the risk of crop eradication has also increased over the study period. In 2008-9, the population in these areas believed that the main targets for eradication were farmers living near the provincial and district centres and along the main roads. Beyond these areas, eradication was seen as less systematic and a risk that farmers could largely manage through systems of corruption, patronage and the volatile security environment. In these conditions, some households are less likely to lose their crop than others. Even as the risk of eradication has increased, those with relatives or contacts in the government still claim they are less vulnerable; in the past, they have also admitted to facilitating contacts with the eradication force to help deter crop destruction in the village. However, more marginal groups within the area such as the *Nar Kilin* and the land-poor believe they face a greater risk of eradication because they lack both the necessary influence and the money to pay bribes.

Farmers in both the canal command area and the area north of the canal also see insecurity and the presence of the Taliban as important in determining whether their crop is vulnerable to eradication. In the 2008-09 growing season, respondents in Nad-i-Ali District believed eradication was particularly unlikely, claiming that the eradication force was afraid to enter the area after Taliban attacks. The limited eradication efforts in areas such as Doh Bandi (RS3) were viewed with some suspicion by respondents, who reported that a significant incursion into the area by foreign and Afghan eradication forces in the spring of 2009 had only led to the destruction of a small number of more accessible fields. During the same season, the threat of eradication also appeared to have little resonance with respondents in places such as Aynak (RS11), who did not believe that the authorities would be able to destroy their crops due to the presence of Taliban fighters.

However, in the 2009-10 growing season the eradication campaign was seen as more resolute in the canal command area. Farmers highlighted the fact that crop destruction was more comprehensive in 2010 than in earlier campaigns; implementation was

more uniform and fewer fields were spared. Even attempts to bribe the eradication team were reportedly spurned. Where farmers reported that their crop had escaped destruction, it was typically attributed to the fact that their land was some distance from the village centre and the eradication team did not have the time to destroy it. Others claimed divine intervention. There were still some respondents who reported that their crop was spared because they had relatives or contacts in the government, but these were very much in the minority.

Fieldwork during planting for the 2010-11 growing season revealed that those in the canal command area now believe there is a high risk of eradication, even in areas on the Boghra Canal where the Taliban allegedly maintained a fairly permanent presence in 2008-09, such as Aqajan Kalay (RS1) and Dashte Shin Kalay (RS18). This change is primarily due to the significant presence of national and international forces across the area. For farmers, this increased presence typically manifests itself in the form of more ANSF bases, checkpoints and increased military activity by both Afghan and what are often referred to as "American" forces. Respondents report that there are now military bases near Aqajan Kalay (RS1), and Dashte Shin Kalay (RS18) in Nad-i-Ali, and a major base near Block F4-D5 (RS13) in Marjeh. According to respondents, checkpoints are now littered throughout the canal command area, with marked increases in Dashte Chanjir (RS9) and Khwaja Baidar (RS8). To farmers, these bases represent a capacity to enforce a ban on opium production and eradicate the crop.

Farmers in the canal command area beyond the environs of the urban centres also cite the increased threat of arrest and fines during the 2010-11 counter-narcotics campaign. Many indicate that this is a new message in the information campaign that was not present in the 2009-10 growing season. Arrest is a particular concern, not only because it is associated with physical assault while in custody and the payment of money to obtain release, but because incarceration of the male member of a household can leave its women and children unprotected for days on end in an insecure and unpredictable environment. The significant increase in ANSF and ISAF presence during the 2010-11 growing season has led people to believe that the government now has the capacity to make such arrests.

The growing perception among farmers in the canal command area that the government can impose a ban on opium production is in stark contrast with the views of respondents north of the Boghra Canal. In this area, the government's eradication efforts are seen as irrelevant except in the southern part of Dasht-i-Shin Kalay (RS18), where the agricultural land is near to a checkpoint. Furthermore, the Taliban have reportedly encouraged opium production in the area, disseminating their message at Friday prayer in the mosques north of the canal and at the bazaars in Loy Manda and Naray Manda. It is claimed that the district governor only disseminates the government's message that opium is banned with significant military support from both Afghan and national security forces. In Aqajan Kalay (RS1), which is close to both these bazaars, it is the physical presence of a military base located to the east of the area that gives the message resonance. As in other areas prior to the increase in ANSF/ISAF presence, the government's attempts to disseminate its counter-narcotics message north of the canal without the capacity to enforce only serves to highlight how weak it is.

The perception of the government's authority in a given area has been an important theme theme across the different research sites over the study period. While the physical act of crop destruction is clearly evidence of the government's capacity to enforce its will, this is not in itself seen as sufficient to deter cultivation; without a more permanent and resounding physical presence, the government simply does not pose a high enough risk, especially in the absence of other livelihood options.

Remote sensing data further illustrates that levels of opium poppy cultivation have not been determined by levels of eradication. For example, many farmers who have experienced eradication both in the canal command area and in the area north of the Boghra Canal in the 2007-08 and 2008-09 growing season continued to cultivate opium poppy in subsequent years (although they did reduce cultivation in the wake of a significant shift in the terms of trade between opium and wheat and growing concerns over food security in the 2008-09 growing season). Areas such as Aqajan Kalay (RS1), for instance, have seen cultivation fall by 70 percent between the 2007-08 growing season and 2009-10 yet experienced the destruction of 23 of a 103 hectares crop in the area in the 2007-08 growing season. None of the standing crop was destroyed in Aqajan Kalay during the eradication campaign in 2009 yet cultivation continued to fall. The area of Khwaja Baidar (RS8) has not experienced eradication at all yet cultivation has fallen by almost 95 percent between 2008 and 2010; and the amount of land cultivated with opium poppy in Marjeh A2 (RS14) fell by 15 percent between 2007-08 and 2008-09 despite no crop destruction occurring and the dominance of the Taliban in the area.

In contrast to evidence from the canal command area and the area north of the Boghra Canal, data from the environs of Lashkar Gah suggests farmers did not necessarily need to experience crop destruction to reduce or abandon opium production in the 2007-08 growing season. For example, Khalaj (RS12) did not see any eradication in the 2007-08 and 2008-09 growing seasons, but cultivation fell by 99 percent in line with the increased presence of national and international forces in the area and growing development investments. Furthermore, cultivation in areas such as Mohajerin (RS23), Bolan (RS5) and Qala Bost (RS22) had already begun its downward trajectory before experiencing relatively small amounts of eradication in the 2007-08 and 2008-09 growing season.

In sum, a farmer's perception of the risk of the government successfully enforcing a ban on opium does not appear to be directly related to the level of eradication that occurs in a given area and certainly not on the level of eradication in the province or the country as a whole. In Helmand, farmers have often found ways to manage the risk of eradication in areas where the government does not have a more permanent presence. The eradication force itself has in the past been keen to minimise its exposure to acts of violence by reducing its time in the field and has therefore achieved only limited crop damage (see Figure 6). If the eradication force can extract rent from farmers in the process, unwatched by other state institutions or international forces, they tend to do so.

Evidence from this study does not suggest that eradication has increased the legitimacy of the government in contested spaces. In fact, in the 2010-11 growing season farmers in the canal command area associated contact with the government with greater exposure to violent conflict and the risk of a loss of income through effective implementation of the opium ban. Farmers also anticipate a heightened risk of the loss of any opium they may have stored (as well as other items of value due) to an increase in house to house searches by ANSF. Farmers in the canal command area also saw their situation in stark contrast to those north of the canal, who are not as exposed to the predatory behaviour of the ANP, can continue to cultivate opium poppy, and experience lower levels of violence—all of which is attributed to the Taliban's dominance in the area.

Box 2: Quotes from respondents reflecting the increasing risk of the imposition of a poppy ban between the 2008-09 and 2010-11 growing seasons

Zarghun Kalay (RS2)

"After the suicide attack, the eradication team were afraid to come here. The Taliban does not allow them to come here."

"Last year they destroyed half a jerib of my land. I contacted a relative in the government and the rest was left."

"Our behaviour [growing poppy] will never change. We are against the government. If the government collapses it will be good."

— May 2009

"I heard that the ANA would be involved in eradication this year but it is impossible to implement in this area."

"We are far from the road. They only eradicate those areas near to the road—it is only for show."

"They announced the ban five years ago, but those that pay money never face this problem."

— November 2009

"When the government and NATO came they destroyed poppy near the road but not mine."

"I will cultivate poppy next year. Maybe less, maybe more but I will cultivate it."

"If the government becomes strong I will cultivate melon or watermelon and cotton but if it stays the same I will cultivate part of my land with poppy."

— May 2010

"*The Government is under the control of the foreigners. If the foreigners say destroy the wheat the government would do that as well!"*

"Those people who lost their crop last year are against the government; those who got a yield are not oppposed until now."

"The eradication campaign came to the village but they only destroyed near the road and district centre."

"If this situation continues I will take a gun against this government."

— November 2010

Loy Bagh (RS6)

"It is impossible to eradicate poppy in this area. We know that the Taliban will come again."

"When day by day the security in this area becomes worse how will they conduct an eradication campaign in this area?"

"We heard from the radio and people about the ban on poppy: that the governor had announced a ban and the government would not allow it to be grown and would eradicate it. But the government has no power here."

"I am afraid my land is on the road, I am not able to cultivate poppy but other people in the area cultivate it."

— May 2009

"*I will cultivate in the future. In the time of Zahir Shah when the country was under control of the government we cultivated; now the government doesn't have any authority to destroy the crop."*

"My brother's crop was destroyed by the Dah Kheli Kafir. It was his mistake to cultivate too close to the road."

"Each year the same statement. Each year they threaten to destroy the crop but each year they cannot do anything."

— May 2010

"*Because of the poppy ban the government has lost the support of the people."*

"I am not opposed to the government but I am unhappy with eradication and the poppy ban."

"I lost my poppy, I don't have food, I don't have bread for my children, I don't have money. This government is my enemy."

"I am very poor. If I had money I would have paid the eradication team. I asked them and they wanted $120. I went to the Haji and asked for the money. He didn't have it but said he would try and get it. But by the next day my crop was destroyed."

— November 2010

Aynak (RS11)

"The government are only wasting their time saying they can eradicate poppy."

"The Taliban will never allow the government to come here and destroy the land."

"Day by day the attacks by the Taliban increase in our area—the Taliban have taken control of several villages."

"I have heard about the ban from the mullah. I cultivate poppy. It has no affect on my cultivation."

"Every year they announce this and every year they don't take any action."

— May 2009

"Every year they announce and every year they don't take any action. The government thinks that all the people in this area are Taliban."

"I heard about eradication last year but the crop was not destroyed. The government is weak, it is not able to destroy the poppy. If you pay money to the police then they will not eradicate the crop."

"This year they announced "don't grow poppy, we will distribute seed to you" but it is not the reality, they are cheating us."

— November 2009

"When they came to the village the eradication force threatened to destroy my crop. I explained I only had one jerib of poppy and they did not destroy it. I am pleased that they listened to the problems of the people."

"The government has banned poppy. They are not true people. They don't hear the voice of the poor people."

"The government is weak they can't provide security. They start their operation then they go back. They create more security problems as the Taliban return and threaten the people, saying 'you support the government, you work for the government.'"

"For whom will they destroy this crop? There are a lot of government people who grow poppy in this area."

— May 2010

"When my crop was destroyed I had a lot of problems. Now I can't provide good food for my family or send my children to school. I have no interest with the government. It is a good chance for the Taliban. From one side the government came and destroyed the crop on the other it has not provided an alternative. The problem is with the government making promises it cannot deliver."

"By the eradication of poppy the government has lost the support of the people."

"The government is responsible for finding an alternative before it bans poppy, but we don't have an alternative and they banned it."

— November 2010

Bolan (RS5)

"It is the big cheat of the government that they eradicate the land of the poor people who have no support from the government."

"I don't know, maybe they eradicate, maybe they do not. I have not cultivated poppy since 2007. I don't have any interest in it."

"The Taliban have control of several villages near here. If the election is won by Karzai we know we will lose our land and we will have to migrate to Pakistan. I don't know about eradication as no one cultivates opium poppy in our village."

"It is impossible to eradicate in Helmand this year due to the presidential election."

"Eradication is common here. It is not right that eradication takes place only in areas near the city."

— May 2009

"I am aware of the ban. No one can cultivate here. It is on the main road and near the city."

"There is no eradication as I have not planted."

"Talking about eradication is easy; doing it is difficult!"

"When the eradication force goes outside into remote areas the Taliban will kill them."

— May 2010

"When we lost poppy in 2008 our income suddenly decreased. But now life is getting better we have vegetables and my son has a job as a driver."

"Poppy was not a good crop when I cultivated it. I got a lot of income but my life was not so good. Every time I needed money I got a loan from someone. When I finished poppy my life became better. Now I have a beautiful house and good food due to money from our shop. The Karzai government does not provide a service but it provides an opportunity. Now I have a shop in the city and we benefit from this."

"In 2007 one jerib of my poppy was destroyed. After that I did not cultivate poppy. They eradicated the crop of people who did not have a relationship with the government—those who did have a relationship had their crop saved."

— May 2010

"There is no poppy in the area. It is under government control."

"There is no poppy this year of last year. It is haram, I will not cultivate it."

"I am happy with my life as I can buy fruit and meat; my two sons and two daughters go to school in Lashkar Gah. I want to support this government. In the future I will also cultivate vegetables and continue my life."

— November 2010

4.4 The risk of food insecurity

Wheat is an integral part of rural livelihoods in both Helmand Province and in Afghanistan more broadly. The grain is a household staple, while livestock consumes the straw. Straw is also used in the construction of walls and roofs in household compounds. Few farmers would choose not to grow the crop, since relying solely on the market for supply would expose the household to unnecessary risk in the event of price or supply fluctuations.

In central Helmand the market for wheat grain has traditionally been weak. Insecurity has resulted in high transport costs and commodity prices, while cost inflation due to the high incomes associated with opium production have typically rendered Helmand's wheat crop uncompetitive compared to better-quality imports from Pakistan and Kazakhstan.[43] Consequently, wheat is typically grown for consumption and not for sale. Farmers will often calculate how much wheat they need to cultivate to meet household food requirements (accounting for social obligations and potential losses) and plant accordingly. However, in the 2008-09 growing season there was a dramatic increase in the amount of land allocated to wheat compared to the previous season. The shift to wheat did not just take place in the canal command area, but occurred across the province. Analysis by Cranfield University estimated that the total amount of land allocated to wheat increased from 43,292 ha in the 2007-08 growing season to 85,493 ha in 2008-09, an increase of 97 percent (see Table 3).

At the time, much of the attention of the international community was focused on the impact that this shift to wheat production had on levels of opium poppy cultivation, and how this differed between areas inside and outside the Food Zone. The 37 percent fall in the area of opium poppy cultivation within the Food Zone between 2007-08 and 2008-09 compared with an eight percent increase in in those areas outside was taken as evidence of the success of the counter-narcotics efforts in Helmand that year.

43 Wheat prices in the south are typically higher than the national average and in Kabul. See the "Agricultural Commodity Price Bulletins" by the Ministry of Agriculture, Irrigation and Livestock. Consumers within Helmand Province also express a preference for wheat flour from Pakistan, and increasingly Kazakhstan, rather than local wheat that is milled in mobile mills. See AG Consulting, "Analytical Review of the Helmand Agriculture Market: Assessment Report" (Kabul: DFID, 2010 [unpublished]), 45, 53; David Mansfield, "Where Have all the Flowers Gone? Assessing the Sustainability of Current Reductions in Opium Production in Afghanistan" (Kabul: AREU, 2010).

Table 3: Patterns of cultivation inside and outside the Helmand Food Zone, 2007-09

	2007	*2008*	*2009*	*Change 2008-2009 (ha)*	*Change 2008-2009 (%)*
Helmand Food Zone					
Opium Poppy	38,235	33,937	21,452	-12,485	-37%
Wheat	15,924	18,603	36,591	17,987	97%
Other	40,488	45,514	38,685	-6,829	-15%
Total	94,646	98,054	96,728	-1,326	-1%
Outside Helmand Food Zone					
Opium Poppy	50,418	49,872	53,624	3,752	8%
Wheat	23,339	24,689	48,902	24,213	98%
Other	111,105	114,557	107,962	-6,596	-6%
Total	184,861	189,118	210,488	21,370	11%
Helmand, Total					
Opium Poppy	88,652	83,809	75,076	-8,733	-10%
Wheat	39,262	43,292	85,493	42,201	97%
Other	151,593	160,072	146,647	-13,425	-8%
Total	279,507	287,172	307,216	20,044	7%

However, the analysis offered by Cranfield University at the time presented a picture in which farmers favoured wheat cultivation in the 2008-09 growing season regardless of location and circumstance. In fact, levels of wheat cultivation almost doubled both inside and outside the Food Zone. However, while the 97 percent increase in wheat cultivation within the Food Zone was achieved through lower levels of opium poppy cultivation and some reductions in cultivation of annual horticultural crops, outside the Food Zone the increase was predominantly on newly-cultivated land. This was planted in 2009 due to better precipitation and an expansion in the amount of land being brought under cultivation through the settlement of former desert land.

Box 3: Sarkawal, Lashkar Gah, November 2009

"In October 2008 I got six jeribs of land from Mohammed Khan as a sharecropper. After two months Mohammed Khan came to the land and started arguing with me. He said that he wanted the land back and that I should leave as he had no need for me. I told him that I had worked and spent money on the land. It was clear to me that he wanted the land because of the high price of wheat. We fought and I broke his tooth. I left the land after I had harvested my winter crop but the conflict is continuing. Mohammed Khan says I should give him my daughter because I broke his tooth."

A review of both remote sensing data and field evidence from the 2007-08 and 2008-09 growing season offers a more in-depth account of developments on the ground at the time. What can be seen is a shift to wheat across all of the research sites where data is available. In each of the research sites except Qala Bost (RS22), the cultivation of wheat expanded by at least 40 percent, often considerably more. In the canal command area much of this expansion occurred at the expense of opium production, even in those areas where the population had not experienced crop destruction the previous year and faced little prospect of eradication in 2008-09. In Doh Bandi (RS3), for example, there was no eradication in either 2008 or in 2009, and the Taliban were considered very much

entrenched in the 2008-09 growing season. Yet opium cultivation fell by almost 17 percent and wheat production rose by over 50 percent. Both research sites in Marjeh (RS13 & RS14) saw a similar pattern, despite the Taliban's dominance in the area.

The move to wheat production in the 2008-09 growing season was not just evident among opium cultivators. Farmers in areas nearer the cities of Lashkar Gah and Gereshk, such as Bolan (RS5), Sra Kala (RS16) and Mohajerin (RS23)—where opium was already contracting—also reduced the amount of land devoted to a variety of different cash crops to sow more wheat.

Fieldwork suggests that this overwhelming preference for wheat cultivation across Helmand had less to do with counter-narcotics efforts than it did farmers' concerns over food security in the face of a significant rise in food prices. For instance, between May 2007 and April 2008 the price of bread and cereals rose 183 percent. At the same time, the farm-gate price of opium fell to levels not seen since before the Taliban ban on opium in July 2000. The decline in the terms of trade between opium and wheat meant that farmers in Central and Northeastern Afghanistan (where opium yields are more marginal) were able to obtain more wheat by growing it on their own land than by producing opium, selling it and then purchasing wheat, as had been the case in these areas since 2001. In Helmand, the relative prices of opium and wheat translated to roughly equal net returns on each.

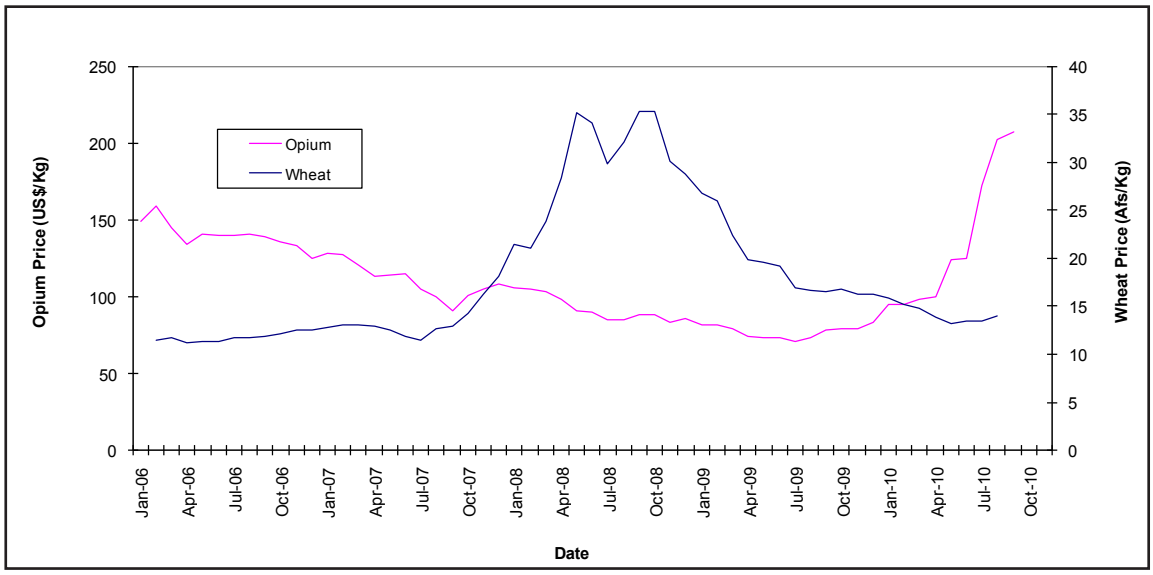
Box 4: Nahre Seraj, November 2009

"I am 38 years old. We are nine people in my family and I have eight jeribs of land. I used to cultivate three jeribs of wheat and five jeribs of poppy during the winter. The yield of these three jeribs of wheat was enough for us. But when the foreigners started their mission in Garmsir in June [2009], 11 members of my brother's family came to live in my home as their house had been destroyed. For four months all their expenditures were paid for from my pocket. My wheat was finished and I had to buy a lot of wheat flour from the bazaar. Now they have said they will stay here and build a home. I have to grow more wheat to feed these people as well. This year [2009/10] I am growing five jeribs of wheat and three jeribs of poppy."

With the price of wheat reaching as high as 35 Afs ($0.7) per kg in Helmand in November 2008 and opium prices falling to around $70 per kg at harvest time in May, some reprioritisation in the 2008-09 growing season was inevitable. The rise in the price of cereals due to growing insecurity in Pakistan and a continued ban on the export of wheat flour fuelled concerns that prices would rise further. The problems farmers faced purchasing wheat both locally and in Lashkar Gah in mid-2008 led many to conclude they had overextended their opium crop and needed to give greater priority to cultivating enough wheat to meet their household needs.

By the 2009-10 planting season the price of wheat had fallen back to 15.5 Afs per kg. However, farmers remained preoccupied by the price of wheat and the possibility that it would rise again. At the time of planting, most respondents in central Helmand anticipated that prices would increase in 2010 due to the high price of wheat flour in Pakistan, an increase in the cost of smuggling goods through its Federally Administered Tribal Areas, and the expectation that the security situation there would deteriorate further. Interviews also revealed that the negative impact of prioritising opium over wheat on household food security in the 2007-08 growing season remained a vivid memory and continued to influence farmer's cropping decisions in many areas (see Boxes 4 and 5). While some reductions in wheat cultivation did occur in a number of study sites during the 2009-10 growing season, these were not uniform; typically they were accompanied by an

Figure 13: Price of dry opium and wheat in Afghanistan, January 2006 to November 2010



increase in the amount of land cultivated with spring crops—such as melon, watermelon and cotton—and not a return to opium production.

Meanwhile, the price of opium continued to fall. Prices for wet opium in Helmand in November 2009 were between $32-37/kg, down from $44-50/kg during the early harvest period in April 2009 and from $70/kg in April 2008. At the time of planting farmers did not expect the price of opium to rise in the foreseeable future—a prognosis that was to prove wildly inaccurate in the spring of 2010 when dramatic price increases accompanied the outbreak of a blight on the opium crop.

The literature on rural economics suggests that there should be little surprise that farmers made a shift to wheat production following such a dramatic rise in wheat prices.[44] Farmers are known for being risk averse and have a preference for subsistence security over high income—what Scott has referred to as "safety first."[45] Fafchamps argues that:

> *…because staples constitute a large share of total consumption and have low income elasticity, farmers are adamant to protect themselves against food price risk. In most cases, this is optimally achieved by emphasizing food self-sufficiency.*[46]

The same is true for farmers cultivating illicit drug crops. For example, Miles has shown that in northern Thailand the Lisu were known to forego further work on their opium crop to clear land for grain.

In Afghanistan, Phillips reports that once wheat becomes too expensive or too difficult to purchase, farmers will reduce the amount of land planted with poppy and increase wheat production to ensure food security.[47] The persistence of wheat in areas like Bolan (RS5)

44 See J.C. Scott, *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia* (New Haven: Yale University Press, 1976); S. Popkin, *The Rational Peasant: The Political Economy of Rural Society in Vietnam* (Berkeley, University of California Press, 1979); A. Chayanov, *The Theory of Peasant Economy* (Madison, WS: University of Wisconsin Press, 1986); and F. Ellis, *Peasant Economics: Farm Households and Agrarian Development* (Cambridge: Cambridge University Press, 2000).

45 Scott, *The Moral Economy of the Peasant*.

46 M. Fafchamps, "Rural Poverty, Risk and Development" (Oxford: Oxford University Centre for the Study of African Economies, 1999), 71.

47 United Nations International Drug Control Programme (UNDCP), "*Assessment Strategy and Programming*

Box 5: Luy Bagh, November 2010

"In 2007-08 I cultivated my land with six jeribs of poppy and only one jerib of wheat. It was not enough wheat for my family. At harvest time I asked my neighbours to sell their wheat to us, as the price of wheat in the city [Lashkar Gah] was too high. At that time we did not have enough money to buy wheat in the city as our opium was still fresh and we would have got a low price. But my neighbours refused. I had to borrow money from another person to buy wheat flour in Lashkar Gah. In 2008-09 I decided to grow three jeribs of poppy and four jeribs of wheat so I never have to face this problem again. I have cultivated the same this year [2009/10]."

and Qala Bost (RS22) highlights the continuing importance that farmers give to managing food security even in an area of considerable economic potential for cash crops. The significant increase in wheat cultivation in 2008-09 and the contraction in the amount of land cultivated with cash crops (both opium and others) compared with 2007-08 reinforce this point.

For the vast majority of farmers in Helmand, expanding wheat cultivation in the 2008-09 growing season was a strategy aimed not at maximising the economic returns, but at guarding against the risk of food insecurity. Those households with enough land typically cultivated as much wheat as they needed to be self-sufficient. Those unable to do so increased the amount of land allocated to wheat to reduce some of the risks and costs involved in purchasing wheat flour on the market, but on the whole still incurred a dramatic increase in their cost of living.

In the current circumstances it is clear that wheat is not a viable and sustainable alternative to opium poppy for most farmers in Helmand, and that some source of cash income is required from livestock, cash crops or wage labour.[48] It remains a daunting challenge that in response to an increased ANSF/ISAF presence in central Helmand and associated pressure to reduce opium production since 2009, wheat has become the dominant crop in the canal command area. By contrast, the amount of land allocated to perennial or annual horticultural crops remains rather limited beyond the environs of Lashkar Gah and Gereshk. In the 2010-11 growing season, many farmers in the canal command area face the prospect of being self-sufficient in wheat but lacking the necessary cash income to meet their other basic needs. The full impact of the ban on opium will ultimately depend on the other shocks that households and communities are exposed to in the 2010-11 growing season, as well as the assets households can draw on when required.

4.5 Exposure to concurrent and repeated risks

It is clear from this section that the population of Helmand is not only exposed to a variety of different risks, but has different levels of exposure that vary by location, socioeconomic group and time. Each of these risks has a distinct and sometimes contrary effect on the livelihood options of farmers, including the amount of opium poppy grown.

The particular characteristics of opium poppy and the kinds of risks that communities are exposed to have meant that opium production has been well-suited as a risk mitigation strategy for many farmers across central Helmand. It has helped finance soil improvements

Mission to Afghanistan, May-July 1995" (Vienna: UNDCP, 1995).

48 "The characteristics of wheat—relatively low value, low labour intensity and correspondingly high usage of Afghanistan's scarce land and water resources—make it a poor and unsustainable alternative to poppy in the Afghan context. Moreover given that in good harvest years the country already comes close to self sufficiency in wheat and there are no export prospects, stimulating substantial increases in wheat production would be counterproductive." In C. Ward et al, "Afghanistan: Economic Incentives and Development Initiatives to Reduce Opium Production" (Washington, DC and London: The World Bank/DFID, 2008), 29.

in areas that suffer from salinity, high water tables and poor soils; it has funded the installation and running costs of shallow wells in areas that lack access consistent irrigation; and it has allowed for the repair of property, the care of the injured and the burial of the dead in areas most affected by violent conflict. Opium production has also provided a cushion against both idiosyncratic risks such as illness and death, and life-cycle events including marriage.

It is also apparent that some areas and socioeconomic groups in central Helmand have experienced far greater exposure to risk than others due to the repeated and concurrent nature of the risks they are subject to. Some risks, such as environmental issues of salinity or poor soil quality are enduring and have to be managed on an ongoing basis. The exposure to other risks has varied over time—the population's experience of the conflict has changed quite dramatically in some areas over the study period. The population's exposure to the opium ban has also changed over the course of the last three growing seasons, expanding from areas close to Lashkar Gah in the 2007-08 growing season and penetrating into much of Nawa Barakzai, Nad-i-Ali and Marjeh with the incursion of military forces and the establishment of a permanent presence in these districts.

It is where these different risks overlap that communities are most vulnerable, particularly in areas where opium production has served as a risk mitigation strategy. People living near Lashkar Gah and Gereshk are currently the least exposed to risk. The population in these areas cultivate on fertile land and have seen the threat of violence decline compared with levels in 2008 and early 2009. However, they have also been more at risk of a poppy ban being implemented and have curbed levels of cultivation accordingly, even though levels of crop destruction have been negligible over the last four growing seasons.

Another area where the population believes it is relatively shielded from risk is north of the Boghra Canal. While this is an area under environmental pressure due to the rapid growth in the amount of land being settled and the increase in the number of tubewells, opium production has mitigated the risk of drought. It has done so by financing well installation and running costs, as well as cross-subsidising the irrigation of food and fodder crops. The local population do not believe they are directly exposed to violent conflict or at risk from a ban on opium production due to Taliban dominance in the area. The experience of travel within the canal command area with the risk intimidation, threat of violence and visions of opium eradication it brings only serves to reinforce their opposition to the government and international community.

Currently, those in the canal command area who live beyond the environs of the urban centres currently have the greatest exposure to risk. Despite enjoying relatively good access to irrigated land, these communities experience repeated and concurrent risk due to the confluence of violent conflict and environmental stresses. In the 2009-10 growing season, communities in Nawa Barkzai and in the more accessible parts of Nad-i-Ali came under increasing pressure to reduce opium poppy cultivation and abandon what has become an effective way of managing the risks they constantly face. In the 2010-11 growing season, the pressure to reduce opium production has intensified in the districts of Marjeh and Nad-i-Ali and has become closely associated with the inflow and presence of foreign soldiers. Household and community responses to this ban will largely depend on how resilient livelihoods in these areas are to these concurrent shocks, and on whether the government and international community can maintain its current security presence without a more inclusive political settlement.

5. Livelihood Resilience and the Sustainability of Opium Reductions

Experience shows that household responses to the efforts of the government and international community to deter opium production will vary by location and socioeconomic group. Responses typically vary according to households' available capabilities and assets as well as the other shocks they and their communities are exposed to.[49] Some livelihoods are resilient to shocks; households can abandon opium poppy cultivation and experience little immediate loss to welfare by shifting focus and investment to a number of different livelihood options. These households tend to be located in areas better endowed with natural resources—most importantly irrigated land—and in close proximity to the labour and agricultural markets of regional economic hubs. They can also take advantage of their privileged access to a range of public goods including education and health services, as well as other available forms of development assistance.

Other households respond to a ban on opium production and other shocks by adopting coping strategies that reflect high levels of economic stress and will harm their future earning capacity. Livelihood responses include eating less or poorer-quality food, postponing health-related expenditure, selling long-term productive assets such as livestock and land, removing children from school and seeking hazardous forms of employment.[50] These households are typically located in remote areas vulnerable to a range of different and often simultaneous shocks, such as the effects of drought and conflict. They are typically land-poor, have few nonfarm income opportunities, and experience high transport and transaction costs that deter licit cash crop production. These households are the most reliant on opium production and typically cultivate the crop as a way to manage the repeated and concurrent risks that they are exposed to.

In contrast to communities in more remote and resource-poor areas, the population in central Helmand is often seen as capable of abandoning opium poppy without experiencing significant losses in welfare and subsequent destitution. This assumption is in part due to the natural resource endowments of the canal command area, where the bulk of the population can obtain both a good winter and summer crop each year. Furthermore, an average household in the canal area will own a relatively generous amount of irrigated land compared with other parts of Afghanistan. The concentration of opium production in central Helmand for well over a decade has also provided rural households a relatively assured cash crop and an accompanying economic stimulus to those trading consumer goods or providing services such as construction. Given the relatively large landholdings and the extent of cultivation in the province over the years, it is also assumed that farmers have accumulated stocks of opium that they can draw on when needed.

However, data from both remote sensing and qualitative research suggest that despite such assumptions, the population in central Helmand has diverse assets and capacities, and quite different levels of exposure to asset-depleting risks. While some households in central Helmand have livelihoods that are more resilient to shocks, others are likely to be far more vulnerable to the impact of dramatic reductions in opium poppy cultivation than has typically been expected. This is especially true when when a ban on opium production is imposed on communities that are already experiencing the effects of other shocks.

49 D. Mansfield, "The Ban on Opium Production across Nangarhar–A Risk Too Far?" *International Journal of Environmental Studies* 68, no. 3 (2011): 381-395.

50 Mansfield, "The Ban on Opium Production across Nangarhar."

Livelihood diversification is the main way for rural households to accumulate assets and manage risks. This includes on-farm diversity—the maintenance or expansion of a spread of crop and livestock production activities—as well as employment in the nonfarm sector.[51] Diversification can give households the flexibility to respond to risks as they materialise. While some households may actively diversify their livelihoods as a way to build resilience to future hazards, others may diversify as a coping strategy after a shock has occurred. Access to public goods, such as health and education, as well as social protection mechanisms, also helps build resilience and cushion the impact of asset-depleting risks.

This section aims to distinguish between areas in central Helmand where livelihoods are resilient and diversification is a strategy for accumulating assets, and those where households are adopting copings strategies (including livelihood diversification) that undermine future earning capacity and expose their members to greater risks.[52] It will draw on data collected from the 23 research sites in central Helmand over the last four growing seasons. The data from remote sensing will be used to examine the degree of crop diversification in the different sites and how this has changed over the study period. The results of fieldwork conducted between May 2008 and November 2010 will then be used to develop a more detailed picture of the extent of crop diversification in the different research sites, as well as to investigate diversification into the nonfarm sector and the nature of employment. Finally, data from household interviews will be used to explore access to public goods and social protection mechanisms and how this varies across the different research sites.

The 23 research sites have been classified into three distinct zones to help identify themes in livelihood resilience that stem from the data. The first zone is located around the environs of urban centres. It is characterised by the high degree of income diversification among the population, with the majority of households drawing on sales of a multitude of different crops as well as nonfarm incomes. This area has seen progressive reductions in opium production since 2007 and has all but abandoned opium production in the 2010-11 growing season. Both public and private investment are concentrated in this zone and have offered employment opportunities as well as public services. These appear to be providing some support to the minority of farmers who have not diversified their crops and continue to substitute wheat for opium production.

The second zone is north of the Boghra Canal. This is an area that is heavily dependent on opium production whose population shows little evidence of other sources of income. Agricultural production comes at a high price due the need for tubewells (with high running costs), fertiliser inputs, and high transport and transaction costs associated with travelling to the markets in the provincial centre. There is little evidence of access to nonfarm income, public goods are not available, and development assistance is only obtained by farmers who have access to patronage networks within the canal command area. Although under the control of the Taliban, the population in this zone believes it is less exposed to the threat of violence than those in the canal command area. Despite lower levels of opium poppy cultivation this season, the population in this area anticipates a rise in their income and standard of living due to the dramatic rise in opium prices over the last 12 months.

51 Ellis, *Peasant Economics*.

52 M.J. Marschke and F. Berkes, "Exploring strategies that build livelihood resilience: A case from Cambodia," Ecology and Society 11, no. 1, (2006): 42, http://www.ecologyandsociety.org/vol11/iss1/art42/ (accessed 16 July 2011).

The third zone is an intermediate zone located between the environs of the urban centres and the area north of the Boghra Canal. There are some signs of agricultural diversification in this zone but it remains limited. While there is evidence of dramatic reductions in opium production in the 2010-11 growing season, it has largely been replaced by heightened levels of wheat production and some increases in the amount of land allocated to crops such as cotton, melon and watermelon. Insecurity constrains livelihood options, inflates living costs and exposes households to risk. Development investments are being made in this area but access is largely a function of government patronage and the benefits are limited by Taliban intimidation. This is an area where the population is exposed to high levels of mainly conflict-related risk. Some of the population is already showing signs of economic distress and most anticipate a fall in their income and living standards in the 2010-11 growing season.

The rest of this section will discuss each of these zones in turn, examining the resilience of livelihoods in each, as well as the sustainability of current reductions opium poppy cultivation.

5.1 Zone 1: The environs of the urban centres

There are a number of research sites which show far higher levels of crop diversification and access to nonfarm income than any others. These are Bolan, Qala Bost (RS22) and Mohajerin (RS23) in Lashkar Gah District, Sra Kala (RS16) in Nahre Seraj District and Khalaj (RS12) in Nawa Barakzai District. Bolan (RS5), Qala Bost (RS22) and Mohajerin (RS23) are within eight kilometres of the city of Lashkar Gah; Sra Kala (RS16) is close to Gereshk; and Khalaj (RS12) is the district centre of Nawa Barakzai (see Figure 1). These areas have been cultivated for centuries, have good soils and strong links to markets and have been the focus of development assistance in recent years. They are not dependent on opium production, and livelihoods have generally shown resilience despite the population's exposure to high wheat prices (2007-08), violent conflict (2008-09) and the imposition of a ban on opium production (2008-10).

Livelihood diversification

Two major changes in cropping patterns can be noted in this zone: the first is the continuing decline in the amount of land cultivated with opium poppy in each of the research sites; the second is the dramatic increase in the amount of land allocated to wheat in the 2008-09. While some of this expansion was at the expense of opium poppy, significant amounts of horticultural land were also shifted to wheat in Bolan (RS5), Sra Kala (RS16), Mohajerin (RS23) and Qala Bost (RS22). The subsequent return to horticultural production in 2009-10 once wheat prices had fallen highlights the impact of the significant rise in wheat prices in late 2007 and 2008.

In reviewing the imagery of the sites in this zone, it is important to recognise that it has consistently seen cultivation of a wide range of crops cultivated in the winter, spring and summer seasons. No single cash crop dominates; instead, farmers typically cultivate a range of different vegetables and legumes, alongside wheat in the winter and maize in the summer. It is not unusual for farmers to cultivate five different crops over the year, with some farmers cultivating as many as nine. In contrast with other parts of central Helmand, there is also a tendency to maximise the use of land and not leave land idle during autumn. For example, in Qala Bost (RS22), Bolan (RS5) and Sra Kala (RS16) short season crops such as celery, turnip, water cress and spinach are grown prior to the planting of spring crops. It is also possible to find a number of farmers in this zone that focus exclusively on cash crop production and do not cultivate either wheat or maize.

Cash crops such as melon and watermelon are grown extensively in the spring, covering as much as 40 percent of some farmers' land in the 2010-11 growing season. Tomato, aubergine, potato, cucumber and okra are common spring crops. Gandana is also becoming an increasing popular crop, offering multiple harvests throughout the year.

In the summer, maize is grown by the majority of farmers but typically covers only one-third of cultivable land. This is considerably less than either areas north of the Boghra canal or the "intermediate zone." Another third of household land is given over to mung bean, while crops such as spinach, cauliflower, radish, bean and tobacco can occupy a further one or two *jeribs*. Small plots of marijuana are seen, sometimes intercropped with cotton as it is in northern Afghanistan.[53] In general, however, cotton does not appear to have the same presence around the urban centres as it has in the rest of the canal command area.[54]

Each of the research sites in this zone benefits from its proximity to urban centres and the market for fresh vegetables. Farmers close to urban areas sell an expansive range of cash crops (see Table 4), and there is better access to nonfarm income than in other parts of the canal command area and north of the Boghra Canal. Since late 2009, security has improved on the roads to market and predation by the ANP is not as extensive as it was before. Traders purchase agricultural products at the farmgate in Bolan (RS5) and Qala Bost (RS22). Farmers also shift their products to Lashkar Gah and Gereshk using their own vehicles or by hiring transport locally. Some households have purchased shops or handcarts and sell their own vegetables in the city.

During May and November 2010, both traders and farmers in this zone reported an increase in the demand for fresh vegetables in Lashkar Gah, citing the growth in the civilian population and the increased ANSF presence as the primary reason. In Gereshk, traders report that improved security on the roads north and an increase in the demand for agricultural products has led to increasing amounts of trade to the northern districts of Musa Qala and Sangin. Improvements in the security on Highway One to Kandahar City also aided trade in 2010. This growth in demand and improved trading conditions in Lashkar Gah and Gereshk in 2010 follow on from more challenging years in 2008 and 2009, when greater insecurity coincided with a fall in sales associated with the rise in wheat prices and falling levels of opium production.

The population in this zone has also gained greater access to nonfarm income due to its proximity to the cities of Lashkar Gah and Gereshk. In November 2010, more than half of those interviewed in this zone had a family member working in the nonfarm sector. Some farmers have family members with shops in the bazaar or salaried employment with the government, including the ANP. Others are employed in the private sector working in hotels, restaurants, shops or as mechanics. Opportunities for both skilled and unskilled labour are on the rise, especially in the construction industry. In Khalaj (RS12), over half of those interviewed worked in donor-funded cash for work programmes in 2010.

A popular diversification strategy in this zone has been to purchase a vehicle to ferry passengers or goods around the city. Farmers reported financing these purchases through the sale of cash crops such as opium, as well as livestock, and in some cases by incurring debt. Those working as drivers reported an increase in revenues during the opium poppy harvest season due to the high demand for transport to rural areas.

53 In Balkh it is claimed that the marijuana crop deters telia, an insect that attacks the cotton crop.

54 Except in Sra Kala, where it is grown with marijuana.

Table 4: Gross returns reported on crops in the environs of the urban centres of Lashkar Gah, Gereshk and Khalaj in the 2009-10 growing season (Afs/jerib)

Season	*Crop*	*Area*				
		Bolan	**Mohajerin**	**Qala Bost**	**Sra Qala**	**Kalaj**
Autumn						
	Spinach	25,000	38,000	-	10,500-28,000	-
	Wheat	10,800-12,000	9,000-11,500	9,450-11,500	9,450-11,500	14,000-16,560
	Cucumber	42,000	40,000	-	-	
	Turnip	-	-	-	-	25,000-30,000
Spring						
	Melon	18,500-45,000	20,000-50,000	40,000	37,500-55,000	20,500-32,000
	Watermelon	-	-	30,000	28,000	21,000-30,000
	Potato	25,000	43,300	30,000	32,000	25,000
	Onion	-	32,000-45,000	32,000	31,000	-
	Tomato	35,000	25,000	25,000	24,000-32,000	-
Summer						
	Maize	6,800-8,500	6,400-8,000	6,400-8,000	6,000-9,000	4,400-6,500
	Mung Bean	8,700-16,000	8,100-15,500	8,700-16,000	8,700-16,250	8,400-14,000
	Watermelon	-	-	-	10,000	19,000
	Melon	-	-	-	-	22,000
	Cucumber	-	-	-	18,000	-
	Okra	35,000	-	-	-	-
	Cauliflower	-	55,000	-	-	-
	Onion	-	12,000	-	-	-
	Bean	-	-	-	12,000	-
	Carrot	-	2,500	-	-	-
	Radish	-	-	-	11,500	-
	Celery	-	-	-	24,000	-
	Aubergine	-	-	-	20,000-22,000	-
Year round						
	Alfalfa	-	6,000	-	-	-
	Gandana	-	-	28,000	-	-

Other businesses also reported enjoying the continued multiplier effect of the opium economy despite the negligible levels of cultivation nearby. Shop owners and wheat and vegetable traders all gained from increased sales, in part due to the disposable income generated by the opium economy in the province. Farmers in Mohajerin (RS23) and Sra Kala (RS16) also reported sending family members to neighbouring districts and to Kandahar and Farah Provinces to work during the opium harvest.

Direct benefits from the production of opium are now less apparent in this zone. Cultivation is largely limited to the more inaccessible areas. In November 2010, none of those interviewed in Bolan (RS5) and Qala Bost (RS22) had grown opium poppy in the 2009-10 season or were growing it in 2010-11. In Moharjerin (RS23), only two respondents cultivated opium in 2009; both had only five *jeribs* of land and cultivated only one *jerib* of opium poppy. Neither had planted opium poppy in the 2010-11 growing season. In Khalaj (RS12) in Nawa Barakzai District, farmers with land some distance from the district centre did cultivate poppy in the 2009-10 season, but most claimed their crop had been destroyed. None reported planting opium in the 2010-11 growing season.

In Sra Qala (RS16) some cultivation persisted in the 2009-10 growing season but farmers complained that they had had been compelled to destroy their crop by the authorities. One farmer reported that he had been imprisoned until his family had destroyed his crop and paid a $360 fine. Despite these efforts, there are reports of some residual cultivation in the 2010-11 growing season. A respondent in Qala Bost (RS22) claims to have returned to opium production in the 2010-11 growing season. He was unsure whether his crop would be destroyed or not but had an outstanding loan of 200,000 Afs ($4,000) that needed repaying. He had used this money to purchase a car which he used as a taxi, earning an average of 400 Afs ($8) per day. While he had income from his taxi and from the cultivation of tomato, gandana and potato, this respondent saw little choice but to return to cultivating opium in the 2010-11 growing season in order to repay the loan.

Public Goods and Social Protection

Respondents in this zone are generally beneficiaries of a number of different public goods, including education, health and in many cases some form of agricultural support. Farmers highlight the advantages of being close to the city and having their children educated. In November 2010, more than half of interviewees in this zone had children in school or the madrassa; many indicate that both boys and girls are attending school.

Development assistance has also been concentrated in the urban centres of Lashkar Gah, Gereshk and more recently Khalaj (RS12). Agricultural inputs such as wheat seed and fertiliser have been distributed each year since late autumn 2008. In the spring of 2010, further assistance was provided in the form of maize seed, fertiliser and vegetable seeds and polytunnels. More than half of those interviewed in November 2010 had received wheat seed and fertiliser that autumn, as well as in previous years. As one farmer illustrated, the security situation has also improved: “In the past we could not go to Lashkar Gah because of the Taliban, but now the number of ANA and ANP has increased we are not afraid of them.”

However, while public services are more available, respondents complained about the quality of service and problems of access for more marginal groups. For example, household socioeconomic position was the primary reason for not attending school. In Sra Kala (RS16) and around Gereshk City, there was a higher incidence of children studying in madrassas and a number of complaints about the poor quality of teaching. Health provision is available in Lashkar Gah, Gereshk and in Khalaj (RS12); however, it was often

Box 6: The transition out of opium in the environs of the urban centres

Last year my son worked and got $2.50 per day but this year he has a job with a construction company and is getting paid $6 a day. On one side we have lost poppy but on the other my son has gained a well paid job. We now have fruit and meat once a week. I have now bought two carpets worth $145 each and crockery for $110.

— Qala Bost, May 2010

When poppy was banned two years ago we had a lot of problems. I sold two jeribs of land (leaving 9 jeribs) for $1,500. I bought 12 goats. After six months there were two kids for every goat and after one year 36 goats. I sold some of them and bought a zaranj [three wheeled scooter taxi] for my son. Each day he earns $3.60 to $4.70. Now I have married my son; we have a lot of milk and yoghurt for the family to sell; we have income from the zaranj and enough wheat to eat. I am happier now than when we had poppy—it [poppy] was not so good.

— Qala Bost, May 2010

I am happy with life as I can buy fruit and meat. My two sons and two daughters go to school in Lashkar Gah. I want to support the government. In the future I will also cultivate vegetables and continue my life.

— Bolan, Nov 2010

I have cultivated poppy for 30 years but there was no improvement in my life. I did not get any capital. When the government announced a ban in 2004 I stopped growing poppy and started growing vegetables. At that time I had only three jeribs of land in Qala Bost. When I cultivated vegetables and got a yield I saw that it was better than poppy. After two years I bought two jeribs of land, a cow and two sheep, and built some more rooms in my house. I also married my two sons. Now I have two shops in Lashkar Gah bazaar and I am very happy with my life. Based on my experience vegetables are better than poppy. I have one daughter who is married and in Charburjak district in Nimroz. One month ago I went there. After a few days I became familiar with the village and the mullah in the mosque. One day when I was in the mosque a Talib asked me "Where are you from?" I told him that I was from Lashkar Gah. "You come from small America!" he said. He asked me "What is happening there? Did you cultivate poppy this year?" I told him that I had not grown poppy for several years. The Talib said "We know this is because you are American. America has distributed a lot of dollars to you so that you will not cultivate poppy!" I told him "That this is your idea but I am not American. I get more benefit from vegetables." He asked me how this was possible. I explained my story to him and that this year I had received $1,400 from one jerib of tomato. The Talib did not accept this. He said "It was the force of the dollar that banned poppy.

— Qala Bost, Nov 2010

seen as "poor quality" and compared unfavourably to education services. Respondents with family members with serious injuries or illnesses still tended to travel to Kandahar or Quetta for treatment.

Farmers also report some incidences of Taliban intimidation of those receiving government or international assistance, and even refer to negotiations with local Taliban commanders to allow education facilities or women's vocational programmes to continue. Despite these incidents, the population typically has better access to services that in the other zones and is less subject to levels of intimidation and patronage apparent in the rest of the canal command area.

Respondents in this zone with varied sources of income sufficient to avoid shocks generally remained supportive of the government's efforts. In many cases, the combination of crop diversification and nonfarm income had allowed them to prosper despite abandoning opium poppy. Given the concentration of public goods, improved security and agricultural support, these respondents believed that their situation would improve over the course of the 2010-11 growing season. The concentration of development efforts and the economic opportunities around Lashkar Gah in the villages of Bolan (RS5) and Qala Bost (RS22), and in Khalaj (RS12) in Nawa Barakzai are reflected in the more positive attitudes to the government.

However, there was also a small number of farmers who expressed little support for the government. These individuals typically had sizeable outstanding loans incurred due to marriage commitments or sickness or injury within the family, and did not see how they would be able to meet their financial obligations even with the nonfarm income and sale of cash crops they had available. Others had family members who were sick but could not afford treatment. This particular group of respondents expressed frustration that without opium production or assistance from the government their situation would deteriorate further. There were also a number of cases in Sra Kala (RS16)—near Gereshk—where there was continued resentment associated with the 2009-10 eradication effort and the perceived failure of the government to deliver on its promises. Some of these farmers continued to cultivate opium poppy in the 2010-11 growing season and resented the prospect that their crop could be destroyed again. These examples highlight the challenges for the government and its international backers where they are perceived as exposing the population to greater risk, a point that will be returned to while examining developments in the intermediate zone.

5.2 Zone 2: North of the Boghra Canal

The exact chronology of the settlement of land north of the Boghra canal remains unclear. Reports suggest that land was initially brought under cultivation after 2002 through a series of land grabs by powerful commanders, many of them linked with officials in the central and provincial government. The commanders reportedly then gifted the land to their families and associates or sold it.

Reports from the area suggest that this initial land grab was followed up by a dramatic increase in the amount of land settled. Data from remote sensing suggests that the amount of land under cultivation in this area increased from 834 ha in 1999 to 11,579 ha in 2007; and that between 2007 and 2010 there was a further 130 percent increase in the amount of land under cultivation (see Figure 9). Evidence suggests that households settling during this later stage have been drawn both by the success of those who preceded them and by increasing levels of violence in the canal command area. The vast majority of settlers were landless and had been sharecropping land in the canal command area before moving north of the canal. Most of those moving north of the canal seem to rely on links with those already settled there—either to the commanders who captured the area during the initial phase of settlement, or relatives who have taken or bought land subsequently. Many also claim existing tribal rights over the land. Fieldwork from the 1970s suggests that the area between the Boghra Canal and Highway One had a number of wells that were established by different tribal groups and used as winter camps by migratory groups of Kuchi (Pashtun nomadic pastoralists). There are reportedly clear patterns of ownership over these established wells among the various tribes involved.

Livelihood Diversification

Sources of cash income north of the canal are limited and the population is heavily dependent on revenue from opium sales. There is little evidence of rural households with nonfarm income opportunities. Some revenue is earned through livestock sales but this is limited.

The land north of the canal is irrigated by tubewells (see Figure 14). During the winter season up to one-third of the land is left idle; this increases to over one-half in the summer. Wheat and opium poppy occupy around 90 percent of cultivated land during the winter months. A small proportion of land is dedicated to fodder crops, typically alfalfa.

Figure 14: Tubewell north of the Boghra Canal

Households typically grow enough wheat to meet their basic requirements, but none for sale. Wheat yields are low—around 50-70 *seer* (350-490 kg) per *jerib*, as opposed to 90-100 *seer* (630-700 kg) in the canal command area.

All respondents in this zone grow opium poppy, and in the 2010-11 growing season it typically covered around half of the land under cultivation. However, despite the dramatic increase in the farmgate price of opium over the previous 12 months, most of those interviewed reported that the amount of land dedicated to opium poppy would actually fall in the 2010-11 growing season. This was largely attributed to farmers reprioritising wheat after shortfalls in the 2009-10 growing season, although those with land in the southern parts of Dasht-i-Shin Kalay (RS18) also expressed concerns about the proximity of the military base on the Boghra Canal and the possibility of eradication. Most farmers were looking to balance food security in terms of sufficient wheat cultivation with cash income in the context of high opium prices.

At the time of planting in 2010-11, the farmgate price of opium north of the Boghra Canal had reached as high as $315 per kg, compared to $50-55 per kg in the same area in November 2009. Respondents complained of lower opium yields in the 2009-10 growing season due to disease, but anticipated a rise in their income and quality of life during 2011 due to the dramatic rise in opium prices. In contrast to the canal command area, respondents in this zone were satisfied with the quality and quantity of food they were consuming, and anticipated that this would remain stable later as the season progressed.

Most farmers in this zone leave as much as half of the land they cultivate in the winter fallow during the summer months. Maize is the dominant crop in the summer, grown by all those interviewed and typically occupying around 60 percent of the cultivated land. Mung bean is grown by some farmers but it is not as common as in the canal command area. Melon is cultivated but only in small amounts (as is cotton), and farmers report

that this is a low-yielding summer crop grown for family consumption. In general, the yields of summer crops are lower than in the canal area. Alfalfa is grown throughout the year but typically occupies only half to one *jerib* of land per household.

The sale of licit agricultural crops is largely confined to maize, mung bean and small amounts of cotton. Only one farmer reported that he had sold wheat, selling 300 *seer* in Shna Jama for 80 Afs ($1.60) per *seer*. Some farmers report a small surplus but were reluctant to sell due to concerns over food security. Maize is consumed by the household, but part of the crop is sold to Kuchi travelling through the area for between 55 and 70 Afs per *seer*. Those few farmers willing and able to travel to Lashkar Gah reported receiving from 80 to 85 Afs per *seer* for their maize crop, but they were in a minority.

A minority of farmers interviewed sold mung bean, typically in Lashkar Gah for between 280 and 320 Afs per seer. Cotton was grown by only two of those interviewed, and was sold mixed with seed in Lashkar Gar for between 260 and 280 Afs ($5.20-5.60) per *seer*. Despite the considerably lower returns, cotton was grown as a spring crop—cutting across the opium poppy season and reducing the amount of land available for opium production. Farmers complained of the risk of mines on the roads, fighting between ISAF/ANSF and Taliban forces and the threat of intimidation from the ANP when travelling to market in the canal command area.

Only one respondent in this zone had a member of the household with a nonfarm income. This individual was a mechanic in Lashkar Gah, earning almost $6 per day. All the other households interviewed relied solely on agricultural income, primarily opium production.

Public Goods and Social Protection

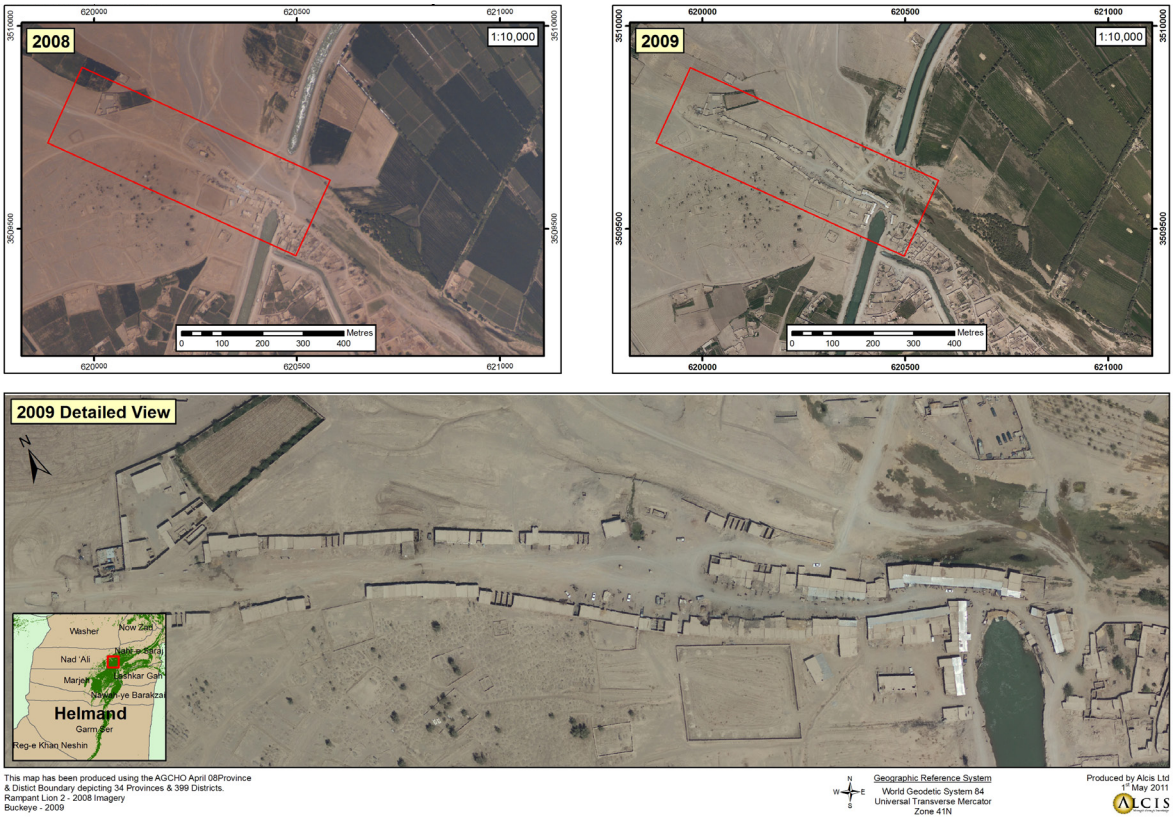
Those living north of the Boghra Canal consider the area under Taliban control and believe that the government has little influence. The area's *maliks* (village representatives) reportedly live not in the village but in Lashkar Gah since they are fearful of Taliban reprisals. During fieldwork in November 2010, armed men could be seen in the village of Shna Jama (RS18). In Dasht-i-Shin Kalay (RS18) the Taliban presence was more low-key and weapons are typically not on display, although they are still seen as the dominant force in the village.

There are no public services north of the canal, and government presence appears to be limited to the actions of the security forces. A number of respondents did report recieving agricultural inputs prior to the 2010-11 growing season, but this was largely through their contacts in the canal command area. Fearing Taliban reprisals, they sold these at the point of distribution in Nad-i-Ali.

Although the public sector is largely absent, there is increasing provision by the private sector. Markets such as Naray Manda and Shawal that lie on the "desert" side of canal appear to have expanded since 2009 (see Figure 15). Respondents on both sides of the canal report that this has largely been due to the growing population on the north side and their increasing purchasing power.

In sum, livelihoods in this zone are resilient as long as there is opium production. Were opium poppy to fail or be destroyed, the population would lose both its primary source of income and its capacity to irrigate the land to produce the food crops. Farmers in these areas have limited exposure to the government and when they do have it is not positive. Currently, they seem content to live relatively secluded existences north of the canal rather than risk intimidation and violence in the canal command area. Efforts to ban opium production, particularly through crop eradication, are thus likely to have

Figure 15: Expansion of Shawal Bazaar 2008-2009



far-reaching negative consequences here given the population's dependence on the crop and the dominance of the Taliban in the area.

5.3 Zone 3: The Intermediate Zone

The intermediate Zone is located within the canal command area but beyond the environs of the urban centres of Lashkar Gah, Gereshk and Nawa Barakzai. It consists of sixteen research sites: Aqajan Kalay (RS1), Zarghun Kalay (RS2), Do Bandi Kalay (RS3), Loy Bagh (RS4), Dashte Basharan (RS6), Luy Bagh (RS7), Khwaja Baidar (RS8), Chanjir Dashte (RS9), Keshal Kalay (RS20) and Shin Kalay (RS21) in Nad-i-Ali District; Dashte Aynak (RS10), Aynak (RS11) and Shersharak (RS17) in Nawa Barakzai District; Marjeh A2 (RS14) and Marjeh F4 D5 (RS13); and Malgir (RS15) in Nahre Seraj District. When cultivating opium poppy, livelihoods in these areas proved resilient to shocks and stresses. However, without opium poppy there are growing signs of economic distress and the adoption of coping strategies that will undermine future earning capacity.

Livelihood diversification

Despite the zone's agricultural potential there is little evidence of crop diversification. Wheat and, until recently, poppy have dominated the landscape, covering between 80 to 90 percent of cultivated land during the winter season. There has been growing evidence to suggest farmers in this zone have shifted to a low risk, low return cropping pattern over the course of the 2009-10 and 2010-11 growing seasons. This has come as ANSF and international forces have consolidated their positions in central Helmand and the provincial authorities' counter-narcotics campaign has taken effect. In the absence of opium poppy, farmers have typically cultivated increasing amounts of wheat in the winter, followed by a combination of cotton, melon and watermelon in the spring, and a summer crop of maize and mung bean. Those with livestock typically cultivate no more

Box 7: Intimidation in Malgir, November 2010

Jan Mohammed came from Dehrawud. His father was a policeman who was killed by the Taliban one year ago. Jan Mohammed came with his family to Gereshk and got land as a sharecropper. In September he worked for one month as a labourer on a road construction project and received 9,000 Afs [$180]. After he was paid, Jan Mohammed was arrested by the Taliban. They asked him why he had worked on the project. They beat him and held him captive for two days. They demanded $120 as payment for his release. Jan Mohammed told them that he did not have the money and that he still had $350 in unpaid debts in Dehrawud. The Taliban took Jan Mohammed back to his house to get the money. Jan Mohammed had to get a loan from his neighbour to pay the Taliban the money they demanded. Now Jan Mohammed is injured and cannot work because of the beating. He needs medical treatment. He has given his young daughter [seven years old] into marriage for $3,500 so that he can pay for his medical treatment and living expenses.

than one jerib of alfalfa. None of these crops offers high returns, but they are easily stored and not particularly vulnerable to damage during transportation.

There is evidence that levels of opium poppy cultivation have been falling in most of the research sites in this zone since the 2007-08 growing season. Poppy was initially replaced by wheat in 2008-09, and subsequently by a shift to a combination of both wheat and cotton, melon or watermelon, depending on the location. Reductions in opium production have also prompted a move to leave land fallow in autumn and plant cotton, melon and watermelon in the spring, rather than cultivate lower-yielding summer crops following either wheat or opium poppy. Remote sensing imagery confirms a marked increase in the amount of land left fallow in a number of the research sites in the intermediate zone, particularly in the 2009-10 growing season when wheat prices began to fall and pressure to reduce opium production rose.

In areas such as Luy Bagh (RS7), for example, the amount of land left fallow between October and March increased from four percent in 2007-08 to 32 percent in 2009-10. Much of this land was planted with cotton in spring, and with growing pressure to cut opium cultivation further respondents anticipate that more will be cultivated in the 2010-11 season. Fieldwork in November 2010 suggests that as opium poppy declines in the 2010-11 growing season, research sites including Zarghun Kalay (RS2), Marjeh F4D5 (RS13), Marjeh 2A (RS14), Shin Kalay (RS21), Kheshal Kalay (RS20) and parts of Malgir (RS15) will see increased levels of wheat cultivation in the winter and larger amounts of land left fallow for planting in spring 2011.

Many farmers in this zone are conscious that without opium production in the 2010-11 growing season, their economic prospects look bleak. This is largely due to the prevalence of wheat cultivation among respondents, and the limited opportunities to generate income via cash crops or wage labour. Fieldwork suggests that while wheat is being sold in increasing amounts in the zone, most farmers are not looking to produce a surplus because they regard it as a subsistence crop with a limited market and low returns. One-third of those interviewed in late 2010 produced and sold a surplus of wheat. Of this group, two-thirds sold five hundred *seer* or less, earning around 46,000 Afs ($920).

Cotton cultivation persists in this zone despite low prices and returns; gross returns from cotton in 2010 ranged from 16,000 to 22,000 Afs ($320-440) per *jerib*. Alfalfa remains attractive since it is salt-tolerant, increases soil fertility and can be used as a fodder crop for livestock. In the summer, maize and mung bean occupy an average of 75 percent of cultivated land in this zone. However, in 2010 mung bean earned only 14,000 to 16,000 Afs ($280-320) per *jerib*, while the returns on maize could be as little as 6,000 to 8,000 Afs ($120-160) per *jerib*.

Watermelon is one of the few crops that can generate a reasonable return—a spring crop could earn between 45,000 to 60,000 Afs ($900-1,200) per *jerib* in 2010 (though this drops to 25,000 to 30,000 for a summer crop). However, owing to market constraints the cultivation of these crops rarely exceeds 25 percent of a households' cultivated land, typically covering no more than two *jeribs*.

While this kind of high value horticulture has expanded in the environs of Lashkar Gah and Gereshk, it remains limited within this zone. In parts of Malgir (RS15) and in Zarghun Kalay (RS2) there are growing signs of agricultural diversification, but it remains limited in scope and tends to be concentrated in those areas nearest the bazaar. This lack of diversification comes despite efforts by development agencies to encourage high value horticulture through provision of agricultural inputs such as improved seeds and polytunnels. Farmers in this zone typically cite inadequate demand for these crops in Lashkar Gah and Gereshk, with low market prices and high transport and transaction costs rendering them uncompetitive compared to farmers living closer to the cities as in Bolan (RS5) or Qala Bost (RS22).

The dearth of income earning opportunities in the intermediate zone is further exacerbated by a shortage of employment and wage labour opportunities in the area. For example, less than a quarter of respondents from this zone had a household member with a salary or earning a daily wage. This state of affairs appears to be a result of the security situation. Interviewees were unwilling to travel to find work since this meant leaving family members alone and exposed to the potential threat of violence. Those households with only one male member of working age were especially constrained given the cultural constraints on heads of household leaving women and children unattended. Farmers also noted that they were unwilling to work in Marjeh and Nad-i-Ali Districts during the April-May 2010 opium poppy harvest due to the military operations at the time.

Those that did have access to nonfarm income in the intermediate zone were typically involved in trade or daily wage labour. Those with a trade often had a village shop, sold vegetables in the bazaar or had a business in Lashkar Gah. While some of these were large businesses trading in cotton or selling cars, most only earned around 4,000 to 8,000 Afs ($80-160) a month, often requiring full-time work from multiple family members. Other income earning opportunities included leasing out tractors and using cars as taxis to transport passengers to Lashkar Gah. Where respondents were more forthcoming about their nonfarm income, it was clear that the diversification into these businesses had been funded by opium production. Only two respondents reported that they had a household member with salaried income: one whose son worked for a nongovernmental organisation (NGO), and a further respondent with three sons in the ANP.

Daily wage labour opportunities were largely limited to Lashkar Gah and Kandahar City, and restricted to households with more than one male of working age. Those with a skill, such as masons, earned 500 Afs ($10) per day, while unskilled labourers were typically paid between 200 and 250 Afs ($4-5) per day. Donor-funded cash-for-work programmes also paid 250 Afs per day, but these were largely limited to Keshal Kalay (RS 20) and Shersherak (RS17). Remittances from Iran and Pakistan were potentially more lucrative, but these remained infrequent.

In the absence of opium poppy in the 2010-11 growing season and with limited wage labour opportunities in Lashkar Gah, it is anticipated that more families will look to send their sons to Kandahar or across the border into Pakistan and Iran to find work. Those without an income but with relatively liquid assets are beginning to sell them. For some, this means the sale of opium stocks, for others, livestock or valuable items, and

for those with accumulated debts, daughters into early marriage. As early as November 2010, a number of households reported that they had sold their only dairy cow, typically an early sign of economic distress. Those storing opium are pleased about the rise in prices that accompanied the blight, but are increasingly concerned about the capacity of both national security forces and the international military to search their properties and confiscate their stock—a potentially important asset in the absence of opium production in the 2010-11 growing season.

Public Goods and Social Protection

Access to public goods such as health and education along with social protection mechanisms is one way for households to build resilience and cushion the impact of asset-depleting risks. However, farmers in the intermediate zone described how access to public goods and services is typically constrained and always subject to negotiation. For example, respondents sometimes had to negotiate with representatives from both sides of the conflict, gaining access to assistance via government officials and the village elite before negotiating permission to actually use it with local Taliban commanders.

Reports of intimidation by the Taliban within this zone are widespread (see Box 7). In Malgir (RS15), two respondents reported that Taliban threats had led family members to abandon the cash for work programme and migrate across the border in search of employment. Another farmer in Malgir (RS15) claimed that he did not risk travelling the 12 kilometres to Gereshk to receive wheat seed and fertiliser in case he was punished by the Taliban. Another respondent in Malgir (RS15) reported that he had been fined $700 for receiving wheat seed and fertiliser. Others reported that they had received assistance but did not speak openly about it for fear of reprisals.

In Marjeh A2 (RS14), a young man was reportedly tied and dragged behind a motorcycle for working on a canal cleaning project. Farmers in Marjeh and Nad-i-Ali Districts claimed that they had received vegetables seeds along with polytunnels but had stored the polytunnel in their houses for fear of Taliban reprisals. A review of aerial imagery supports these claims, suggesting that despite the distribution of over 50,000 polytunnels across Lashkar Gah, Nahre Seraj, Nawa Barakzai, Nad-i-Ali and Marjeh Districts, their use is limited to a few specific areas mostly close to the urban centres or checkpoints and military bases (see Figure 16). In Marjeh, the tunnels appear to be restricted to the area close to the military base to the north of the district (see Figure 17). Wheat seed and fertiliser distributed as part of the 2010-11 FZP also carried the threat of Taliban intimidation, and some farmers sold their seed at distribution points rather than risk returning to their village with it (see Box 9).

Allegations of corruption against those responsible for distributing development assistance—especially agricultural inputs—are commonplace in the intermediate zone. Respondents suggest that the bulk of assistance is sidelined by government officials and the rural elite. For example, imagery of those who have actually erected polytunnels shows that some households have as many as 60 to 80 tunnels, while FZP recommendations suggest those on the beneficiary list should receive only two to four. In Luy Bagh (RS6), a local commander reportedly received as many as 400 tunnels. Respondents also suggest that polytunnels are resold after distribution and end up for sale in the bazaar.

Interviewees in this zone are resentful but fearful. Much of their anger is directed at a government they believe has failed to protect them and concentrates the benefits of development assistance in the hands of a favoured few. Services such as education and healthcare are often dismissed as poor quality due to a lack of skilled staff. The vast majority of farmers interviewed in this zone report that their children do not

Figure 16: Locations of polytunnels in central Helmand, February 2011

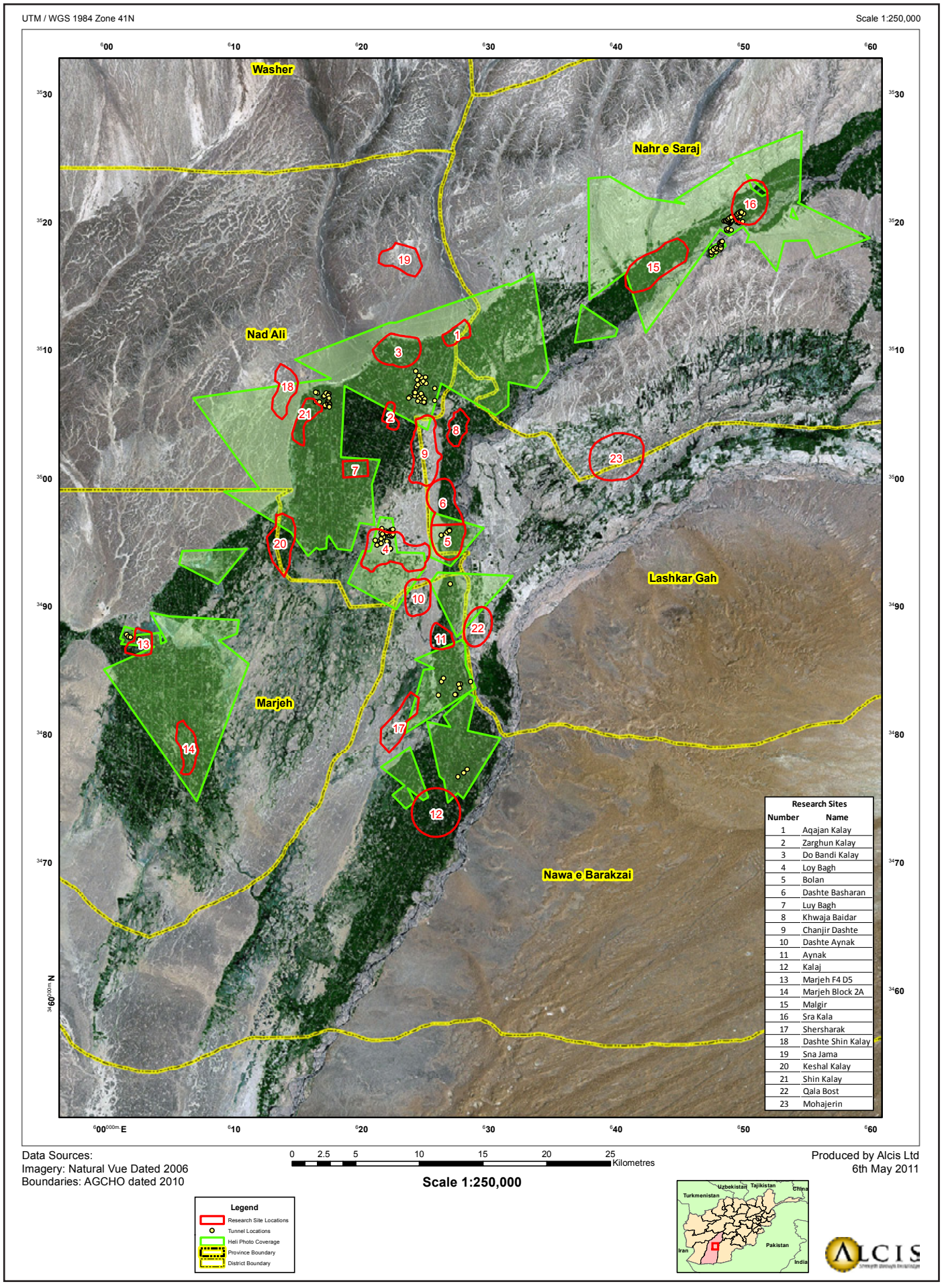
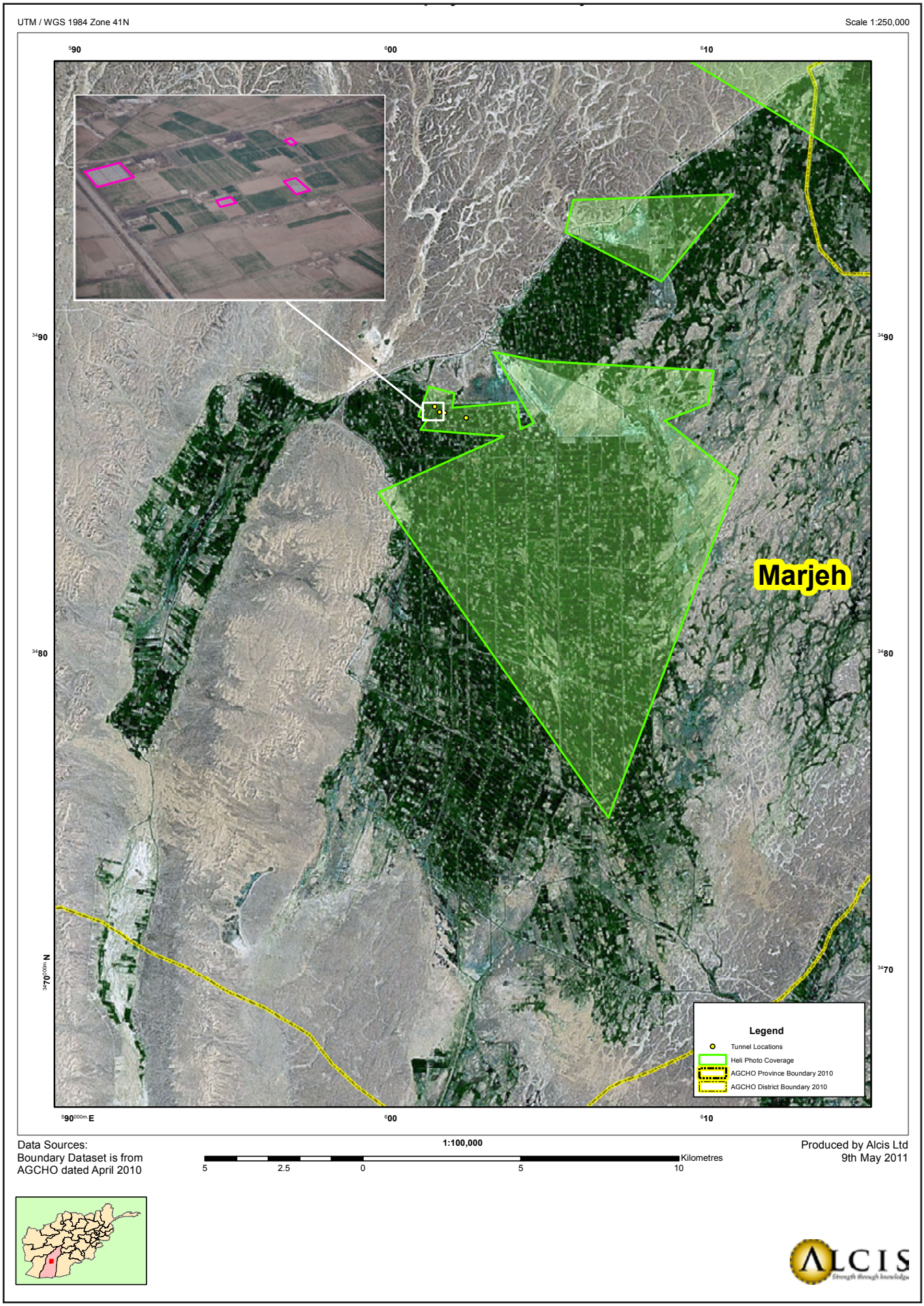


Figure 17: Locations of polytunnels in Marjeh, February 2011



Box 8: Selling Opium in Nad-i-Ali, November 2010

"Twenty days ago in Aynak there were rumours that the American soldiers were searching houses looking for opium. I was worried that the two man [nine kg] of opium I had stored in my house would be found. My neighbour told me that I should take the opium to Nad-i-Ali bazaar where there is a trader who is originally from our village. I travelled with my son to Nad-i-Ali by motorbike, hiding the opium under my hat. When I got to the bazaar I got down from the motorbike and went in search of the shop of the trader from our village. When I was walking in the bazaar someone shouted: 'Where do you take that Haji Sahib?' I was scared but it was a shopkeeper who wanted to buy it. I went to the man's shop and asked about the price of opium. He said, 'The price is 45,400 Afs [$908] per man but I will check the quality of it.' He paid 46,400 Afs [$928] per man. He brought tea and food. I asked him: 'In our village we are all afraid to have opium but here you are not.' He said, 'Don't ask about this Haji Sahib! Here each shopkeeper pays the police 3,000 Afs [$60] each month and when the Americans come to the bazaar the police tell us to hide the opium and ban it from the bazaar.'"

attend school because of the quality of education, fear of the Taliban, suspicion of the curriculum and the need for their children to help them on the land. Others complain that the journey to the nearest school is too far, particularly given the security situation in the area. Those with sufficient resources send their children to Lashkar Ghar for education and to Kandahar or Quetta if they are sick or injured.

Complaints against the ANP remain commonplace across this zone and there were repeated references to the "poor character" of those sent to work for the government in Helmand following the 2010 military operations. While in some cases complaints to the governor had resulted in the replacement of locally-recruited police, respondents typically viewed those working for the government with disdain. Seizures of opium by the ANP are typically seen as theft, and farmers believe they are sold rather than destroyed. Examples of rent extraction by the ANP are numerous (see Box 8), and the enhanced capacity to enforce a ban on opium within the canal command areas is also causing particular resentment toward the ANSF and the provincial administration.

With such limited on-farm and off-farm income opportunities and restricted access to public goods and social protection, those most affected by the ban on opium production in this zone are those without an avenue of nonfarm income. Households that lost their crop during the eradication campaign in 2010 are even more vulnerable, while the loss of stocks through law enforcement activities further reduces a household's capacity to absorb the shock of ongoing suppression of opium cultivation in 2010-11.

The high cost of living has added to the economic burden of those who have reduced levels of opium production. Farmers point to the debts that they have incurred due to injury, illness, death, or damage to their property during the conflict. The costs of marriage are also high. Bride payments range between $4,700 and $8,200, and respondents report an inability to fulfil their wedding obligations in the absence of opium production. By November 2010, most respondents in the intermediate zone had lowered their household expenditures through reducing their intake of fruit and meat, not killing their sheep for dried meat as is the tradition in winter, and leaving unwell members of the household untreated. In some cases, even relatively wealthy households withdrew their children from school in Lashkar Gah. These responses highlight the potential for the opium ban to lead to households adopting coping strategies that will undermine their future earning capacity, particularly when it coincides with other asset-depleting risks.

Ultimately, the government and governor Mangal himself are increasingly associated with the problems that a ban on opium—often perceived as foreign-imposed—has brought. As one respondent put it, "the foreigners make the ban [on opium] and implement it by Afghan people." Some farmers openly discuss their opposition to the government: "The government is cruel and Allah will destroy them because they destroy the poppy. The

Box 9: Distributing wheat seed in the intermediate zone

Although farmers in the intermediate zone have travelled to the district or provincial centre to receive the agricultural inputs distributed as part of the FZP, respondents were often dismissive and sometimes hostile toward the wheat seed distribution. Those who were more positive welcomed the free inputs when the price of wheat was particularly high at the beginning of the 2008-09 growing season, even if many did complain that they received the seed after the planting season and remained unsure of its quality. For most, however, the programme requirement that farmers receiving wheat seed should abandon opium poppy was seen as unrealistic given the differing roles of opium and wheat in the household economy, the absence of alternative sources of cash income, and the prevailing security situation in many areas.

In areas in the intermediate zone where the conflict has been at its most acute farmers considered the provision of wheat seed and fertiliser inconsequential and a reflection of poor judgement. Many viewed the scale and nature of the assistance as inadequate given the development needs and security situation in their areas. The fact that farmers have had to travel to the district centre to receive agricultural inputs was also viewed as an indication of the limits of government authority. With the recent emergence of a market for the resale of the agricultural inputs distributed, farmers started to see wheat seed and fertiliser distribution as a cash transfer mechanism.

Patronage, corruption and insecurity are viewed as the primary factors shaping the distribution and subsequent use of the agricultural inputs provided. The distribution mechanism is largely seen to benefit those with positions of authority and influence within the village, provincial government or line departments. Farmers believe contacts within the provincial or district administration and with the village elders or maliks responsible for producing FZP beneficiary lists are a prerequisite to receiving support from the programme. Typically, maliks are accused of producing lists that favour their own family and relatives. Farmers without a direct relationship with the malik complain that they must pay half of the inputs to the malik to be included on the list. There are also allegations of more systematic corruption, such as the submission of fictitious names on lists and the employment of "wage labourers" to collect the wheat seed and fertiliser for subsequent resale. There are claims from both farmers and the truck drivers involved in transporting the agricultural inputs that the quantities of wheat seed and fertiliser diverted in this way can be significant. These allegations of patronage and corruption have further fuelled hostility among many respondents toward those percieved as responsible—the rural elite and the district and provincial administrations.

Security has also had a strong impact on the distribution of development assistance in the intermediate zone. Over the three years of the study, farmers have consistently claimed to fear accepting agricultural inputs because of the risk of Taliban reprisals. Some reported feeling so intimidated that they did not tell anyone about the inputs they did recieve, suggesting that under-reporting may be an issue in this case. Others reported being fined and beaten, or having their inputs dumped into the canal or river by local Taliban commanders.

Study evidence suggests that the Taliban ban on receiving assistance from the government has led some farmers to repackage wheat seed in the district centres. Repackaging has allowed them to transport the seed back to their farms without it being identified as assistance from the government or the international community. Farmers report that the seed distributed is initially packaged in bags that identify the variety of seed, the date of production, and the seed enterprise responsible for it. Those interviewed report that this information, written in Pashto, Dari and English, identifies the seed as distributed by either national or international development organisations since the product is not commercially available. This is not the case for distributed fertiliser, which is packaged in the same way as commercially available products and typically has a higher rate of use by farmers.

Aside from Taliban intimidation, concerns over the quality of distributed wheat seed have also reduced the numbers of farmers claiming to use it. For example, in the autumn of 2010, half of those interviewed in the intermediate zone reported receiving wheat seed; of these, just less than half claimed to have actually planted it. Almost a third reported that they did not use it, arguing that they were unclear about the quality of the seeds. Those that had obtained a good yield from their own wheat crop the year before favoured seeds from their own crop rather than distributed seed, despite quality assurances. Three respondents reported offering distributed seed for their sharecroppers to plant, only for it to be refused. Others report feeding it to their animals.

To bypass concerns about both Taliban intimidation and uncertainty over the quality of wheat seed, farmers also report reselling the agricultural inputs immediately after receiving them from the distribution centre. By the autumn of 2010, it was reported that the resale of agricultural inputs had turned into a thriving business, with prospective buyers approaching farmers as soon as they left the distribution centre. These buyers reportedly tend to work for shopkeepers from Lashkar Gah and Gereshk on a commission basis. Almost a quarter of those in the intermediate Zone that had received agricultural inputs in the autumn of 2010 reported selling their wheat seed and fertiliser, receiving around $120 for a "package" of agricultural inputs that had cost them only $40.

people are poor, what are they to do?"; "Allah will beat the government and remove them. The Taliban was better than the government as they allowed me to cultivate poppy"; "If the government remove the Taliban from the area we will get a lot of problems. The government are non-believers." A smaller group of respondents talk about taking up arms against the government in support of the Taliban: "If the situation continues I will take a gun against the government'; "If I get the chance I will slit the throat of the government workers"; "If the government continues the ban on poppy maybe a lot of people will join the Taliban."

5.4 The risk of resurgence

This section has explored both livelihood diversification and access to public goods and social protection mechanisms across three distinct zones in central Helmand as a way to examine the resilience of livelihoods to the reductions in opium production. It has used data from both remote sensing and fieldwork in 23 different research sites.

As summarised in Table 6, the data suggests that there is much greater diversification in livelihood activities in areas around the urban centres of Lashkar Gah, Gereshk and Khakaj. These areas have better access to government services and development assistance, and the population is not subject to the same levels of intimidation by the Taliban. Whether due to better knowledge of what is available or better access to patronage systems, people are able to both obtain and use the assistance that is distributed. While households in this zone are exposed to risks, they are of a considerably lower order and frequency than the risks faced by those living in the canal command area further away from the urban centres. While illness, injury and death continue to pose a risk to the welfare of individual households in these areas—as they do across rural Afghanistan—there is considerably less probability that the population as a whole will experience the intensity of conflict that has beset those in the canal command area.

In contrast, many in the intermediate zone have not been able to absorb the multiple shocks that they have been exposed to in the 2009-10 and 2010-11 growing seasons. The combined effect of violent conflict and the implementation of a ban on opium production have imposed significant costs. Farmers that lost their opium crop to eradication in 2010 and have not cultivated opium poppy in the 2010-11 growing season generally anticipate a significant fall in income. Increased law enforcement activity across the zone means that households also risk the loss of any stocks that they might have accrued, which is creating further uncertainty.

The shift to a low risk, low return cropping strategy—wheat in the winter, cotton, melon and watermelon in the spring, and mung bean and maize in the summer—reflects the limited market opportunities for high-value horticulture in the intermediate zone. Nonfarm income opportunities remain limited across the area and are largely restricted to households that have earned enough of a surplus from opium to invest in trade opportunities. There is still potential for those with opium stocks in storage to invest in a business venture that would support them in the absence of actual production. However, the loss of these stocks would inhibit livelihood diversification and the capacity of households to absorb the impact of the ban on opium production.

At the beginning of the 2010-11 planting season, there were already signs of economic distress among farmers in the intermediate zone who lacked significant opium stocks or access to nonfarm income. The reduction in the quantity and quality of food consumed is the most apparent sign of hardship and was commonplace across the

Table 5: Livelihood diversification and access to public goods and government services

		Zone 1: The Environs of Urban Areas	*Zone 2: North of the Boghra Canal*	*Zone 3: The Intermediate Zone*
Crops	***Winter***	Wheat and short season horticultural crops; Residual poppy only	Opium poppy limited to areas away from the road and insecure locations within the canal	Primarily wheat (70%) and some alfalfa, with increase in land left fallow
	Spring	Melon, watermelon and extensive spring vegetable production	-	Cotton, melon and Watermelon
	Summer	Maize and mung bean plus summer vegetables	Primarily maize and mung bean	Primarily maize and mung bean
Nonfarm income		High-range of trade and employment opportunities in cities with access to wage labour opportunities; cash for work not subject to intimidation	Rare	Low. Primarily trade opportunities originally financed by opium production; wage labour in Lashkar Gah and Gereshk for those with sufficient males in the household; cash for work subject to intimidation
Health		Full range of services in Lashkar Gah and Gereshk; those with sufficient resources and serious conditions travel to Kandahar and Pakistan	Private doctors and pharmacies in the bazaar; those with sufficient resources and serious conditions travel to Kandahar and Pakistan	Health clinics but complaints regarding quality of service and lack of medicine; those with sufficient resources and serious conditions travel to Kandahar and Pakistan
Education		Full range of schools with demand from outside the area	No schools	Schools, but low levels of attendance due to quality, security and labour demands of rural households; those with resources send children to Lashkar Gah
Security		Government/ISAF dominance	Taliban dominance	Contested space
Access to agricultural Assistance		Low levels of patronage and intimidation	Only available to those with access to elites south of the canal. Subject to high levels of intimidation by Taliban	Subject to patronage and corruption by government officials and rural elite and vulnerable to high levels of intimidation by Taliban

zone. The removal of children from school so that they can be sent in search of paid work, particularly by wealthier families who had sent their children to Lashkar Gah, highlights the far-reaching effect of the reductions in opium production in the area. The postponement of wedding ceremonies reflects both the financial and social costs that the ban imposes.

Farmers in the intermediate zone will not begin to realise the full financial implications of the ban on opium production until the end of the winter cropping season in May 2011. Those with seasonal debts will be asked to repay them, and will either need to reschedule their loans or sell assets to meet their payments. The sense of financial loss for those coerced out of planting opium in 2010-11 will be exacerbated by the fact farmers who reside in more remote and insecure areas of the canal command area, or who have links with the government, are likely to obtain a crop. The contrast between those in the canal command area and those north of the Boghra Canal is likely to be all the more stark. This is likely to provoke further resentment toward the government unless there are improvements in security and a significant increase in income earning opportunities.

Farmers north of the Boghra Canal have been the least exposed to risk in the 2010-11 growing season, as a ban on opium production has not been imposed and levels of violence are generally low. However, it is worth noting that livelihoods north of the canal are the least resilient to a ban on opium production. The purchase of land, its improvement, and consequently all agricultural production in this former desert area has been largely financed by opium production. Moreover, it has allowed a large and growing group of previously landless farmers to become landowners, build houses, and improve their quality of life. Given the terrain, the expensive method of irrigation, and the lack of viable agricultural alternatives in this area, the population north of the Boghra Canal has the most to lose from a ban on opium production, including their houses, land and villages.

6. Conclusion

In the minds of many, Helmand Province has become synonymous with opium production. During the 1990s it was one of the primary opium producing provinces in the country, typically cultivating between 30,000 and 40,000 ha every year. With the fall of the Taliban regime and the collapse of their one year ban on opium production, levels of cultivation increased until they reached a peak of 103,000 ha in the 2007-08 growing season. However, over the last three growing seasons levels of opium cultivation have fallen by over a third, and further reductions are expected in 2010-11. These declines have largely been concentrated in the central part of the province in those areas under the Helmand canal system. They have also coincided with both efforts to reduce opium production and the threat of the insurgency in these areas.

Over this same period, a number of external factors have also worked in favour of a contraction in the area devoted to opium poppy cultivation. The dramatic increase in the global price of wheat in late 2007 and much of 2008 combined with restrictions on wheat flour imports from Pakistan led farmers to prioritise wheat production over cash crops. The fall in the price of opium in Afghanistan—particularly in the South—further diminished the purchasing capacity of farmers relying on the sale of opium to purchase wheat flour. This shift in the term of trade between wheat and opium encouraged further wheat production in 2007-08 and affected farmers' price expectations into 2009-10.

Beyond the environs of urban centres in canal command area, the increase in the area dedicated to wheat in the 2008-09 growing season typically occurred at the expense of opium due to the finite amount of land available and the already small proportion of land allocated to horticultural crops. In areas north of the Boghra Canal, land grabs and incursions into "government land" have supported a dramatic increase in the amount of land cultivated with wheat, accompanied by much smaller increases in opium poppy. Despite significant increases in the amount of land brought under cultivation in these newly-settled areas, farmers still favoured wheat. This was the case even in areas not receiving wheat and fertiliser from the government or the international community, and where communities had little to fear from opium eradication efforts due to the dominance of the Taliban.

By the 2009-10 planting season, there was a reversal in the terms of trade between wheat and poppy as wheat prices in Afghanistan fell. However, the response to this varied by location. Farmers in central Nad-i-Ali and Lashkar Gah Districts did not increase opium production. This was due to ongoing concerns over food insecurity given the potential instability of wheat prices, and an awareness of the ongoing fall in opium prices and the continuing efforts of the governor and international community to tackle opium production in the province. In central areas of Nawa Barakzai and Garmsir, the significant reductions in the level of planting in late 2009 were closely associated with the uplift in the international military presence in the district that began in June of the same year. Raids on household compounds—primarily for security and counter-insurgency objectives—also raised the risks associated with storing opium in many of these areas. In Marjeh District, however, there was an upswing in opium production in the 2009-10 growing season. Although the population there anticipated the much-publicised arrival of significant numbers of foreign soldiers in early 2010, they had been told by local interlocutors that opium production would be tolerated that year.

In the spring of 2010 there were further dramatic changes in the socioeconomic and political environment in central Helmand. The influx of foreign soldiers into Marjeh in February 2010 and renewed efforts to rout the Taliban from Nad-i-Ali increased

international military presence in two of the most prolific opium poppy growing districts in the country. At the same time, the governor's eradication efforts grew more comprehensive in areas of Nad-i-Ali, Lashkar Gah and Nawa Barakzai and around the city of Gereshk that were targeted for crop destruction. As opposed to previous efforts at crop destruction, this campaign was not accompanied with the same allegations of predation and patronage that had once given the farmers the impression that eradication could be managed by the use of social and financial capital.

The spring of 2010 also saw the outbreak of disease in the opium crop across much of central Helmand, which reduced yields by as much as 40 percent. Cultivators gained in returns at least what they lost in production due to the fourfold increase in farmgate prices that accompanied the disease. Those that did not plant, or lost their crop to eradication, felt particularly aggrieved due to the direct losses they incurred and the sense that those that did successfully cultivate the crop had prospered. By late 2010 and the time of the 2010-11 planting season, the price of opium was almost six times higher than it had been prior to the previous planting season in November 2009, challenging claims that significant stockpiles of opium had accumulated in Afghanistan. Even with a 30 percent rise in wheat prices following floods in Pakistan and damage to the wheat crop in Russia, the terms of trade favoured a return to opium production the following season.

The 2010-11 growing season has been shaped by two strong and opposing forces: while the dramatic rise in opium prices has favoured a return to production, this has been largely countered by the significant increase in international military presence within the canal command area, which has successfully deterred cultivation well beyond the coverage of previous counter-narcotics efforts. What this demonstrates is that the act of crop destruction itself is not a major determinant of opium poppy cultivation. Rather, it is the state's ability to establish its presence and outreach convincing the population that the authorities have the capacity to enforce a ban on opium production over a given geographic space. In areas where the state does not have a robust presence, farmers typically see eradication as a transitory risk that can be managed through bribery and corruption. This is further compounded when officials require farmers to travel into the district centre to receive agricultural inputs and counter-narcotics messages due to security concerns. The marked increase in the presence of international and national military forces in the canal command area, symbolised in the minds of Afghan farmers by the expansion in security infrastructure, has clearly served to convince the population of the coercive power of the state in the run-up to the 2010-11 growing season.

In the 2010-11 growing season, farmers in the canal command area have resorted to well-practiced risk management strategies, cultivating behind walled compounds, intercropping wheat and opium poppy, and delaying planting to see how the government and international community might respond. However, members of rural elites and tribal groups that once used privileged access to state actors to protect their crop recognised that they could not do so in given the overwhelming international military presence and inflow of state institutions from outside the province. It is only in the more inaccessible and insecure areas that significant amounts of opium persist, especially where Taliban presence reduces the risk of a ban on opium being implemented.

While patronage, corruption and insecurity no longer work as effective strategies for farmers and communities in the canal command area to reduce the risk of poppy ban enforcement, they nontheless continue to shape who benefits from the distribution of aid. Mechanisms for aid delivery, in particular the production of village lists by government officials and rural elites, are seen to favour those with links to the district and provincial

government. By contrast, those most exposed to the concurrent risks associated with the conflict, the ban on opium production and ongoing environmental stresses are least well-placed to receive this assistance. It is farmers in these same areas and communities—across much of Nad-i-Ali, Marjeh and Nawa Barakzai Districts—that most fear intimidation and punishment if they ignore the Taliban's ban on receiving government or international development assistance.

For farmers in these areas, there is currently a disconnect between the government and international community's ability to enforce a ban on opium production and its failure to improve the delivery of public goods and services. The perception that development assistance has been concentrated in the hands of a few at a time when many in Nad-i-Ali and Marjeh have experienced greater exposure to violence and the loss of their opium crop is unlikely to translate into greater support for the government and stabilisation efforts. Pockets of economic growth remain limited to the environs of the urban centres and remain largely unattainable for the majority of farmers, who are confronted with limited market demand, as well as the high transaction and transport costs associated with living in contested space. The risk-management model in areas north of the canal, where opium persists under the protection of the Taliban, currently appears more attainable.

In the parts of the canal command area that lie beyond the environs of the urban centres, there are already signs of economic distress. These have emerged from the confluence of a ban on opium production, increased exposure to the impact of the conflict, and ongoing exposure to the environmental stresses prevalent in the area. The most vulnerable of households have experienced an injury, death or loss of property during the conflict or have been exposed to serious illness. When combined with life cycle events such as marriage, these shocks have led to farmers adopting coping strategies that undermine their future earning capacity. In the past, opium production was a way of managing some of these risks, financing investments in farm improvements, strengthening social capital and supporting asset accumulation; the enforcement of a ban on its cultivation means that these avenues are no longer available.

Experience in both Helmand and other provinces has shown that the initial response to the imposition of a ban on opium in such conditions has been to substitute wheat for opium poppy. In areas with agricultural potential, this has been followed in subsequent years by an increase in the amount of land allocated to a multitude of high-value horticultural crops. The same process can be seen in Sra Qala, near the city of Gereshk, as well as in Bolan and Qala Bost close to Lashkar Gah. In these areas, over half the land cultivated during the winter and spring season is dedicated to high-value horticultural crops and even more land is grown with cash crops during the summer. As in other provinces, these areas are adjacent to the provincial centre and have better access to both nonfarm income opportunities and public goods such as education and health services. In Helmand, the increased international presence has brought further investment and economic growth in such areas. Their population generally has little interest in a return to opium production, favouring instead livelihood diversification and the opportunities that better access to public goods provides.

The challenge for both counter-narcotics and stabilisation efforts is thus not in these areas, but in those where wheat continues to occupy the majority of land more than 12 months after the initial imposition of a ban on opium. The expansion of wheat production in Helmand was initially driven by concerns over food security and subsequently by overwhelming military force; it has not been motivated by the commercial interests of Helmandi farmers. For the majority of farmers, rising wheat prices are seen as a risk and not a market opportunity. High transport costs and commodity prices due to insecurity—

as well as cost inflation due to the high incomes associated with opium production—typically renders farmers that can produce a marketable wheat surplus uncompetitive compared to better-quality imports from Pakistan and Kazakhstan. Wheat is not a viable and sustainable alternative to opium poppy, and there is a need for significant increases in cash income derived from livestock, cash crops or wage labour if farmers are to avoid a significant loss of wellbeing.

However, Helmand appears to be structurally disadvantaged in this respect. While it is a border province, it sees none of the high-value official cross border trade enjoyed by provinces such as Balkh, Nangarhar, Kandahar and Herat; it does not have an abundance of mineral resources; and growth in its agricultural sector is determined by demand in Kandahar, Kabul and Quetta—all of which can source produce elsewhere at lower cost. Moreover, its political elite are divided and their relationship with the population has a coercive and predatory quality. Those that have best managed the shift out of opium production have used revenue from its production to invest in other livelihood options such as livestock, transport and trading. With a significant reduction in opium production, this population will thus also see a contraction in the economic benefits they earn from their investments in the legal economy.

At this juncture, the reduced levels of opium cultivation in the central command area appear to be largely shaped by the presence of international military forces. As we have seen over the last two seasons, first in central Nawa Barakzai and Garmsir, and then in the districts of Nad-i-Ali and Marjeh, overwhelming force can lead to dramatic reductions in cultivation. However, even if current troop levels are maintained, sustaining the current reductions in opium production will not be easy in areas where the state lacks a monopoly on the means of violence, the rural elite is divided and lacks popular support, the price of opium remains high and the population is exposed to concurrent and repeated shocks. Building a social compact between the state and the people is likely to prove even harder in these areas when communities believe the state has dramatically increased the level of risk they are exposed to and impoverished sections of the population.

Policymakers should urgently consider:

The impact of opium bans on communities that are exposed to repeated and concurrent shocks and lack access to viable alternatives or government-supported economic development: Those looking to deliver counter-narcotics and stabilisation effects in central Helmand are confronted with a policy dilemma. In the run-up to the 2011-12 growing season. Without a reduction in their exposure to risk or effective ways to manage it, many communities in the canal command area may look to return to the risk mitigation strategy that has proven successful in the past (and continues to be for farmers north of the Boghra Canal): opium poppy cultivation. If the government and international community seek to prevent a return to cultivation through continued coercion, there is a real risk that the rural population in these areas will reach out to antigovernment elements for protection. After, all this is a trend that can be seen at work in other parts of Afghanistan and has created the environment for increasing levels of cultivation in a number of the southern districts of Nangarhar, as well as in the northern districts of Laghman, Surobi in Kabul Province and parts of Balkh Province in the 2010/11 growing season. Both the penetration of the insurgency and the resurgence in cultivation in those parts of Nangarhar where the population has limited resource endowments and are exposed to concurrent and repeated shocks are warning signs given the fragility of the situation in an area like central Helmand, where despite better resource endowments the population is subject to chronic conflict and where the Taliban traditionally have a stronger political base.

The detrimental impact of eradication on the consent of local populations, especially when it is conducted in areas recently "cleared" of antigovernment elements under predatory and corrupt government officials: Eradication campaigns in Helmand have been subject to allegations of corruption and patronage, and government officials have often been accused of using crop destruction for extracting rent from rural communities. Crop destruction in Helmand has tended to target the land of both more marginal communities outside the well-irrigated central parts of the province and more marginal members of communities in areas of greater agricultural potential. In 2010, eradication was conducted in a more systematic manner in areas within the canal command area following military efforts to clear the Taliban there. In late 2010, the population in these same areas was subject to considerable pressure to reduce levels of planting. Without accompanying improvements in both the physical and economic security of the rural population and in the absence of sufficient controls on how eradication is conducted, these efforts are likely to lead to increasing instability.

The need to focus development assistance on interventions that will support livelihood diversification: The study shows that there is much to be learned from those areas and households in central Helmand whose livelihoods are resilient to a ban on opium production. Specifically, it suggests that diversification has been critical. In the rural areas close to the cities of Lashkar Gah and Gereshk, growing demand for high value horticulture has supported a process of crop diversification that has spread risk and increased household incomes. Employment and trade opportunities have been more available to the population in these areas, further supporting the transition out of opium production. In addition, improvements in security as well as access to education and health services have bolstered the conditions for a social contract between the population and the state. Beyond the environs of the urban centres, however, agricultural diversity remains limited. Here, it is those households with nonfarm income opportunities—often funded from the proceeds of opium production—that are more resilient to the loss of income imposed by the opium ban. Given these findings, much greater emphasis needs to be given to supporting crop diversification and creating employment opportunities for communities in the canal command area of central Helmand. Investments in wheat seed and fertiliser distribution alone are too limited to enable the necessary diversification.

The importance of understanding the local socioeconomic, political and environmental context of opium poppy cultivation in designing effective interventions: The study highlights the need to design interventions based on a clear understanding of the different livelihood trajectories in place across Helmand. Important elements to consider include the types of shocks that the population is exposed to; the assets they can draw on; whether livelihoods can adapt to shocks; or whether significant numbers of households are adopting strategies that undermine their future earning capacity, expose them to physical hazards, and potentially undermine stabilisation efforts. This data is crucial for future planning, especially in identifying the appropriate timing for the implementation of an opium ban in given area.

The need for more emphasis on measuring livelihood outcomes, including the transition out of opium poppy cultivation, and how these differ by location and socioeconomic group: It is not wise to reduce the assessment of the lives and livelihoods of the rural population into ordinal data on how much of the population is economically "better off" or "supports the government" compared to the previous quarter. Such measurements are notoriously problematic in chronically insecure environments like central Helmand, and offer few warnings of the economic and political fault lines that lie beneath. Nor is it sufficient to measure the quantities of development inputs

distributed without understanding who has benefited, who has not, and the effect of this distribution on both the livelihood portfolios of the rural population, and the local political environment.

Remote sensing data offers a useful means to assess the process of diversification into high value horticulture, and to understand how farmers are using the agricultural assistance they have been given, the different income streams they have, and their resilience to livelihood shocks. It can also offer warning signals for areas that persist with low-risk, low-return agricultural systems and have been highly dependent on opium production. As such, geospatial data on cropping patterns should be seen as both a source of impact data and as a diagnostic for identifying areas that require further examination and possibly a refocusing of interventions.

Annex 1: Research Site Crop Maps 2008 to 2010

Overview map

RS 1 Aqajan Kalay

RS2 Zarghun Kalay

RS3 Do Bandi Kalay

RS4 Loy Bagh

RS5 Bolan

RS6 Dashte Basharan

RS7 Luy Bagh

RS8 Khwaja Baidar

RS9 Chanjir Dashte

RS10 Dashte Aynak

RS11 Aynak

RS12 Kalaj

RS13 Marjeh F4 D5

RS14 Marjeh Block 2A

RS15 Malgir

RS16 Sra Kala

RS17 Shersharak

RS18 Dashte Shin Kalay

RS19 Sna Jama

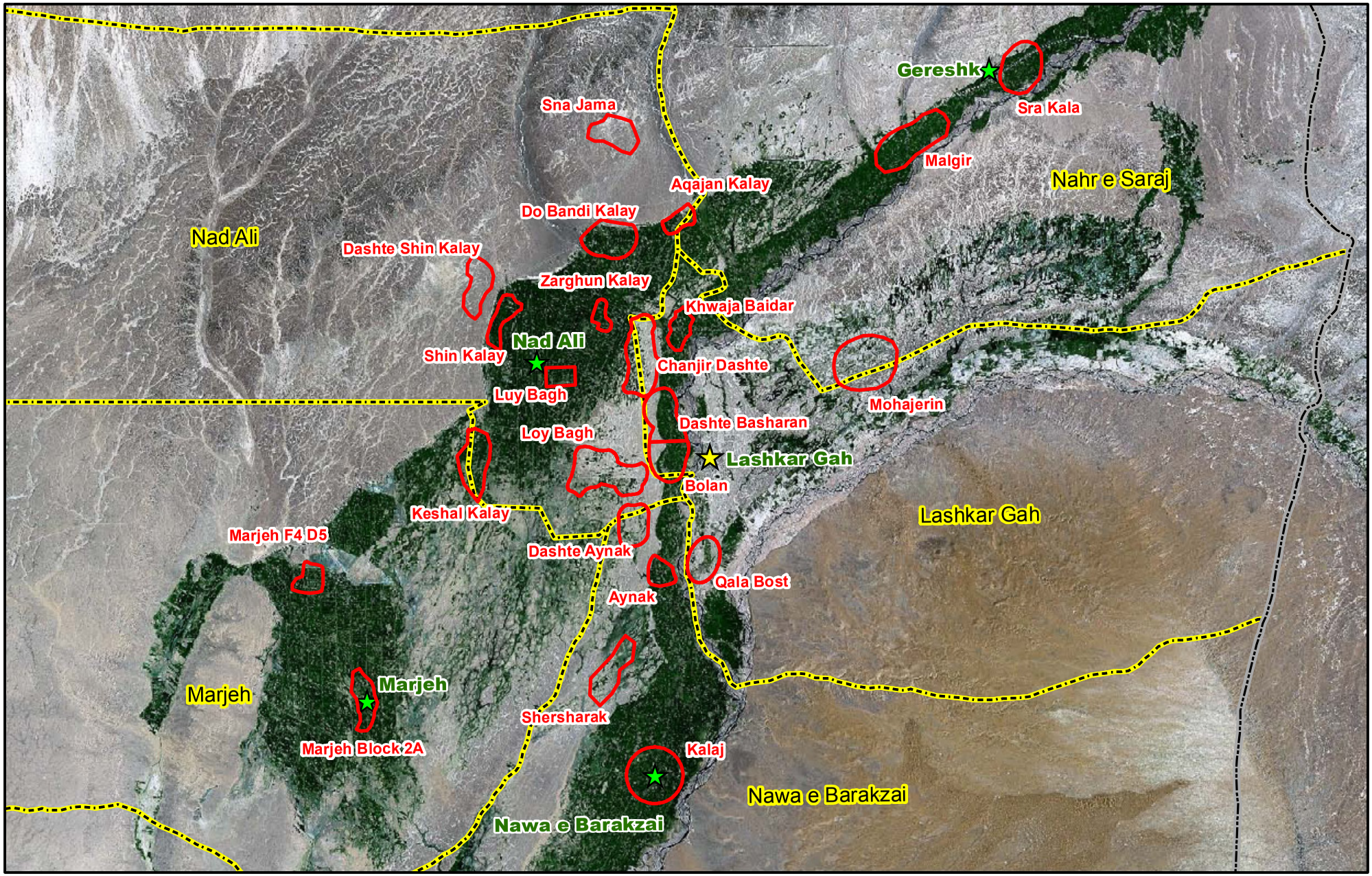
RS20 Keshal Kalay

RS21 Shin Kalay

RS22 Qala Bost

RS23 Mohajerin

Research sites 2007/08 to 2010/11 cultivation seasons



Data Sources:
Imagery: Natural View Dated 2006

Legend
- Research Site Location
- District Centre
- Provincial Centre
- District Boundary

0 2.5 5 10 15 20 25 Kilometres

Scale 1:250,000

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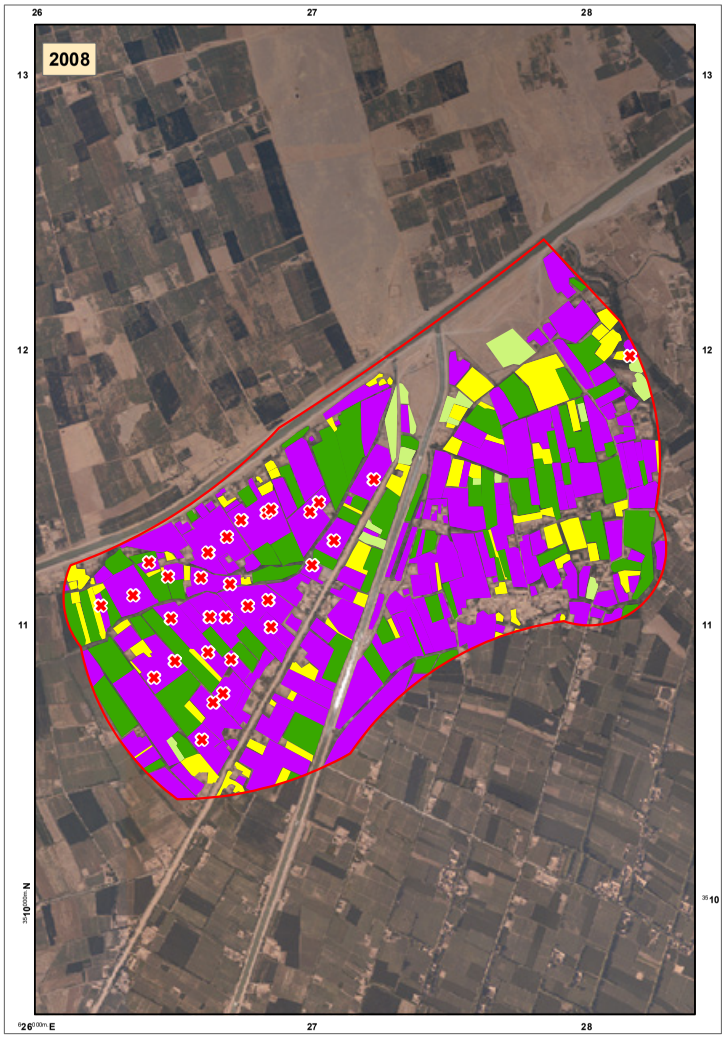
5 May 2011

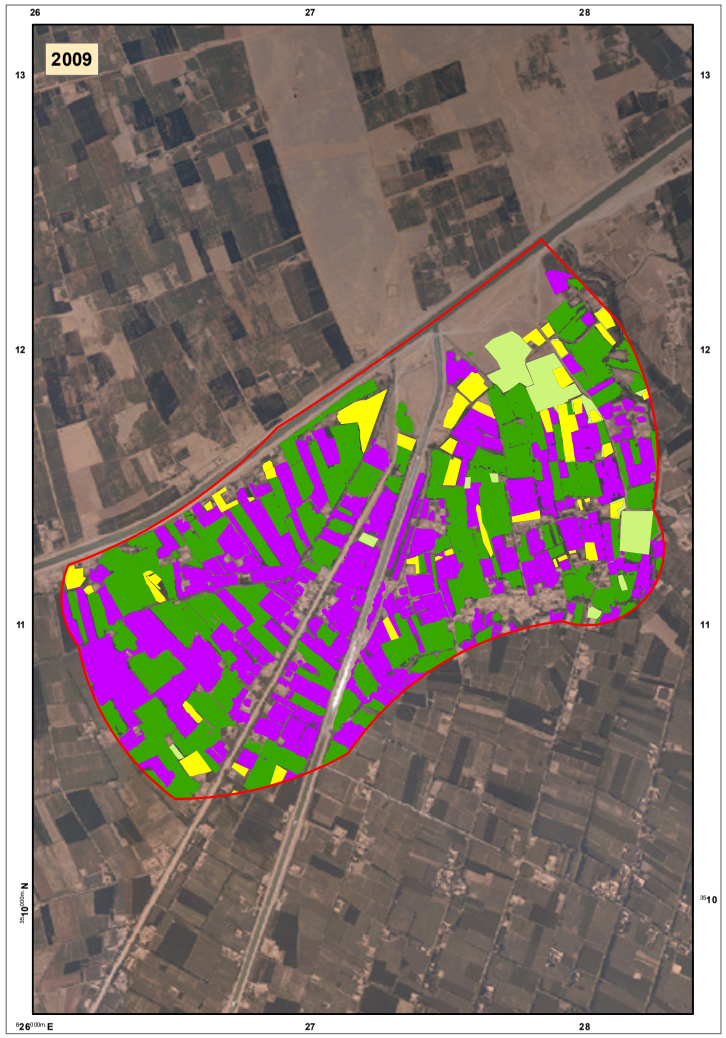
ALCIS
Strength through knowledge

Research Site 1: Aqajan Kalay
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:12,000





Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
201 - World View 2 Dated April 2010

500 250 0 500 1,000 Metres

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6th May 2011

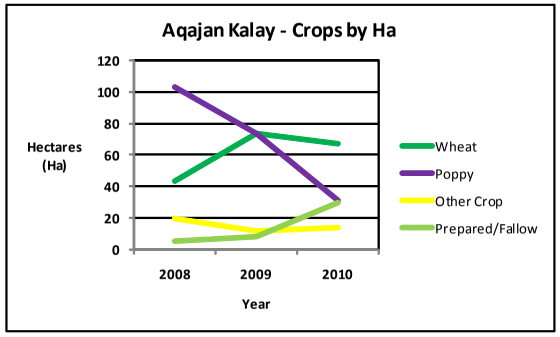
ALCIS

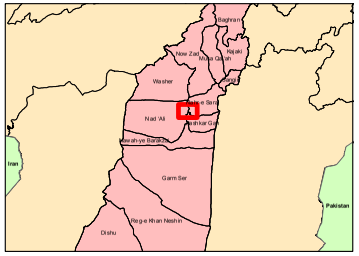
Legend

- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow





Research Site 2: Zarghun Kalay
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

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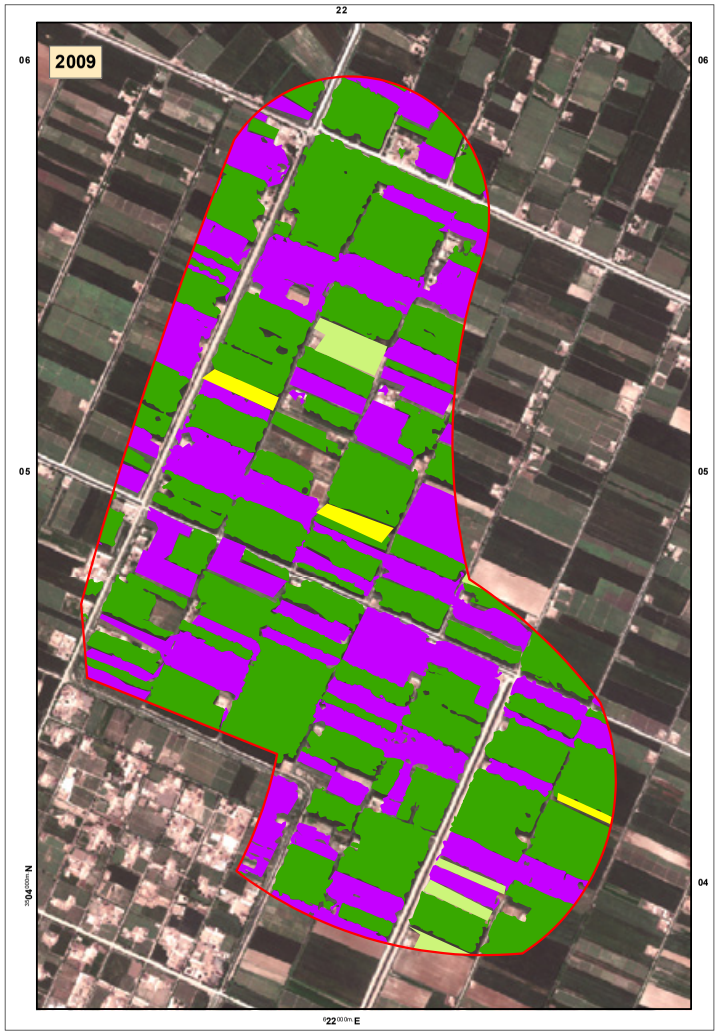

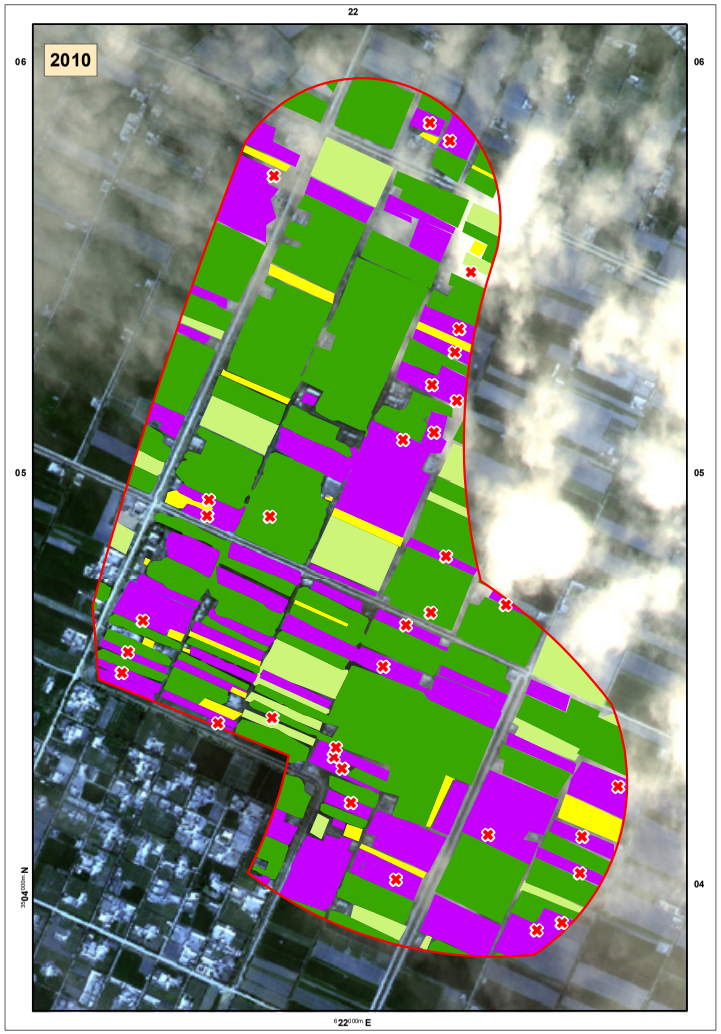

Imagery Data Source:
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2009 - Geoeye Dated April 2009
2010 - World View 2 Dated April 2010

500 250 0 500 1,000 Metres

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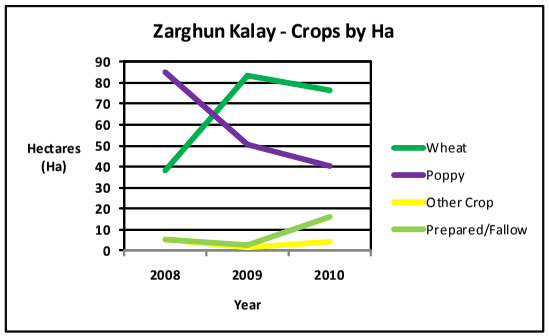
6th May 2011

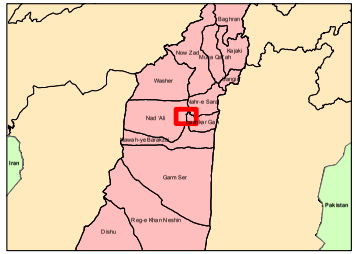
Legend

- Eradication Locations
- Research Sites

Crop Type

- Poppy
- Wheat
- Other Crop
- Prepared/Fallow





Research Site 3: Do Bandi Kalay
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

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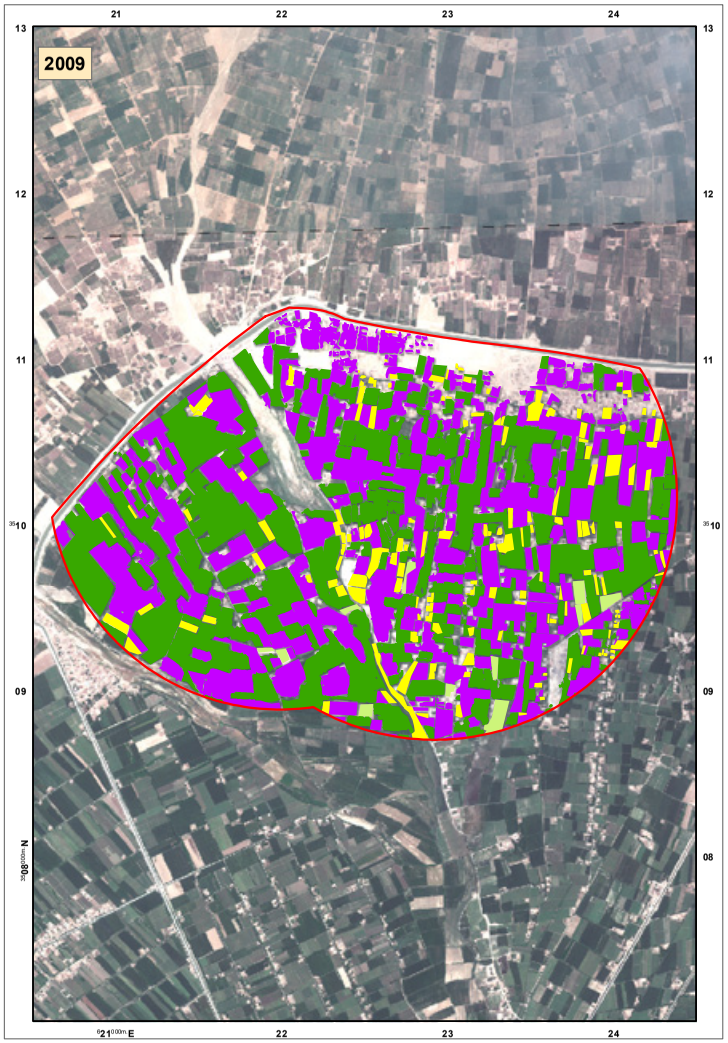
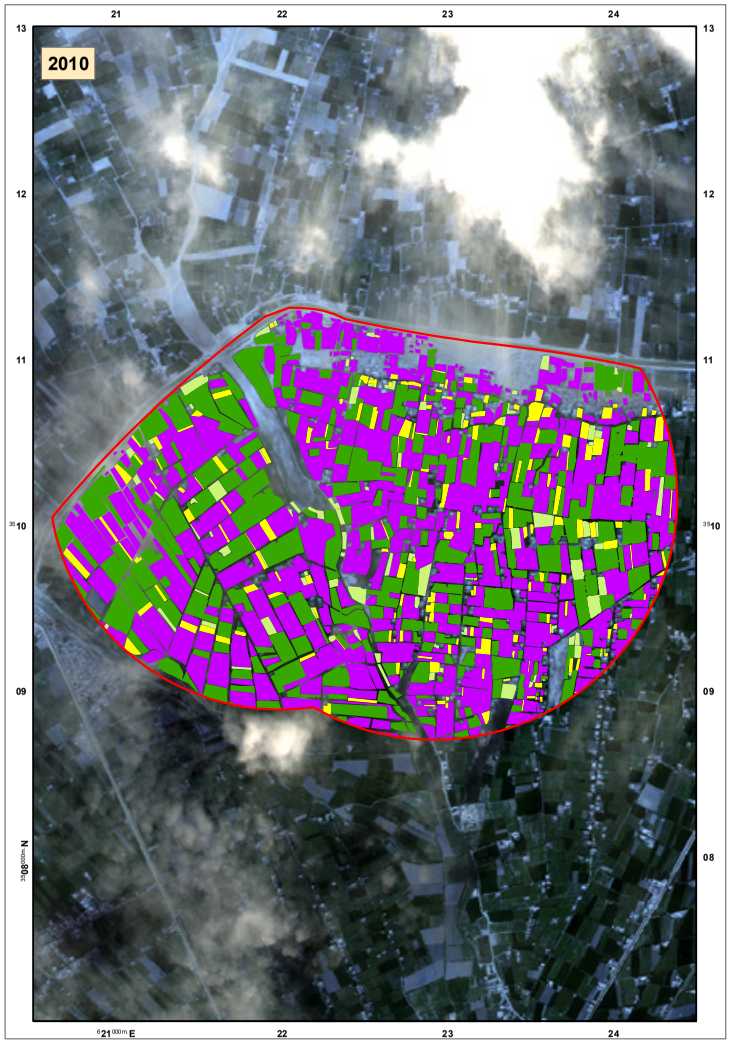




500 250 0 500 1,000 Metres

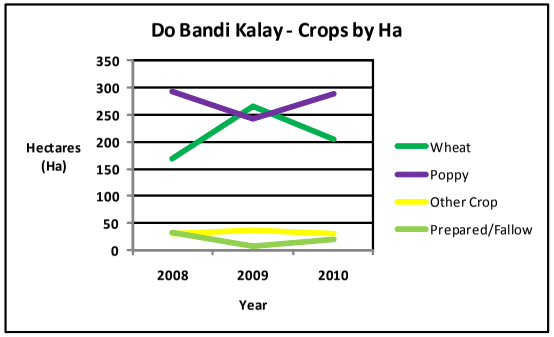
Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Geoeye Dated April 2009
2010 - World View 2 Dated April 2010

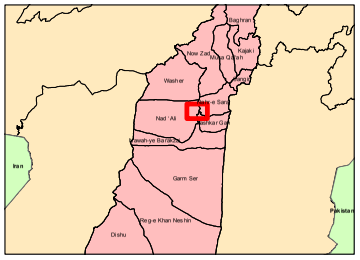
Legend

- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other Crop
- Prepared/Fallow





Produced by Alcis Ltd
6th May 2011

Research Site 4: Loy Bagh
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

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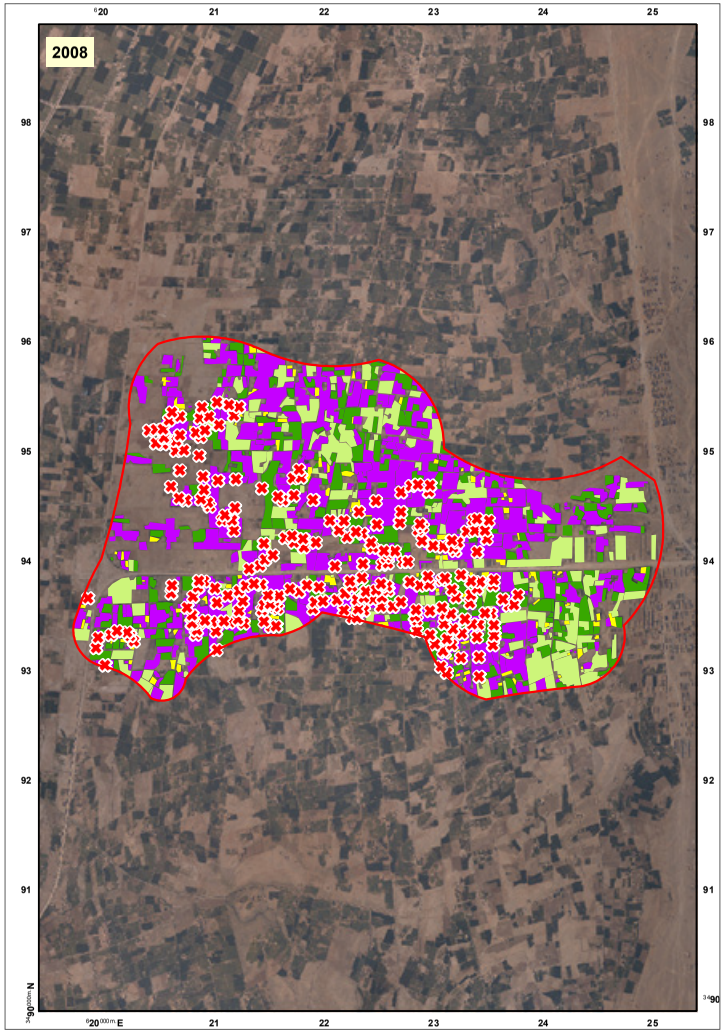
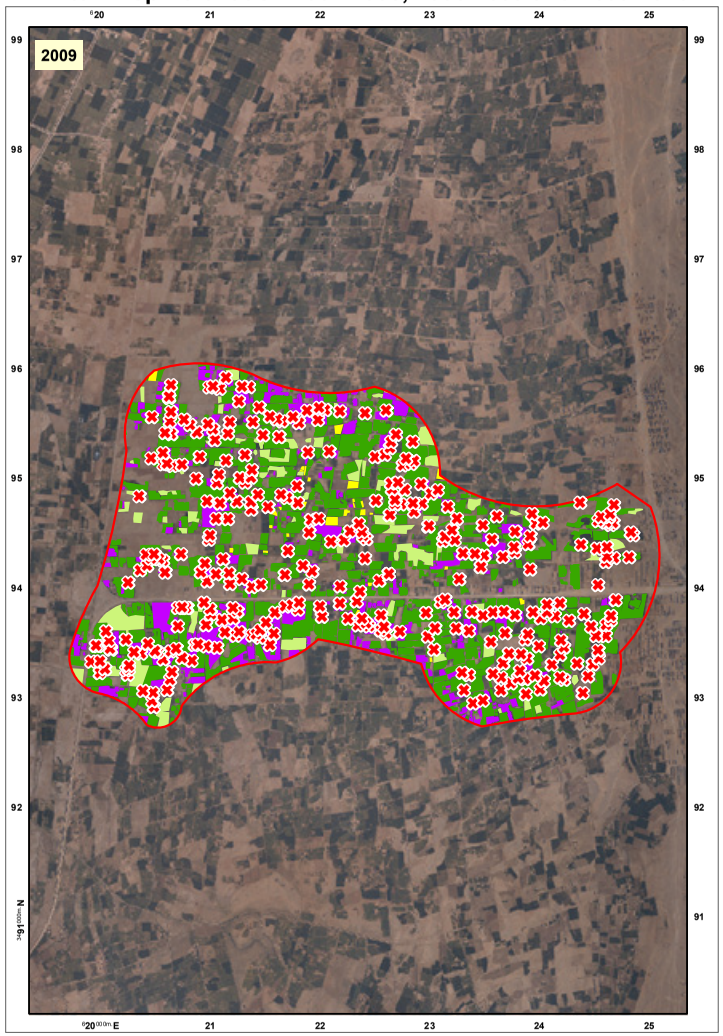
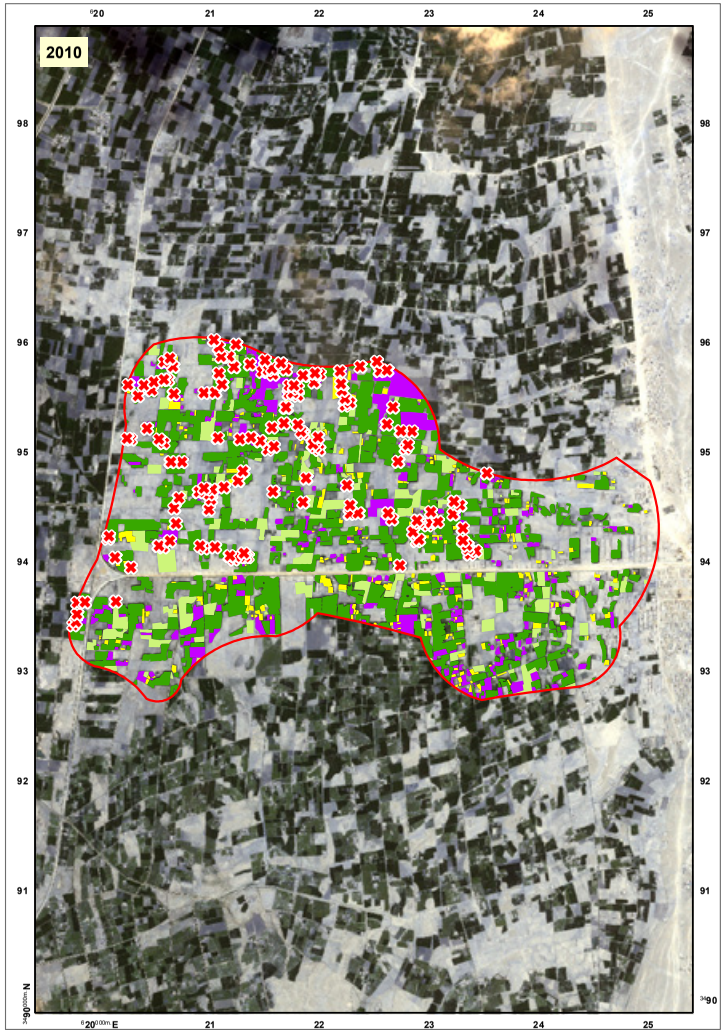






Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

Kilometres

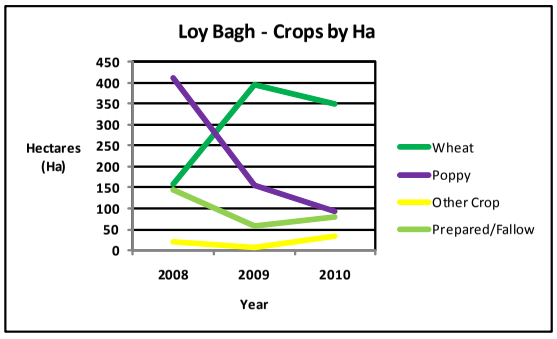
Produced by Alcis Ltd
6th May 2011

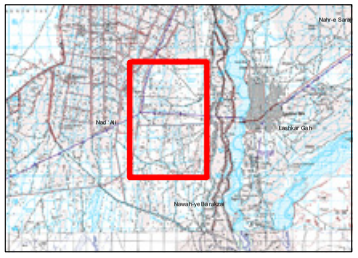
Legend

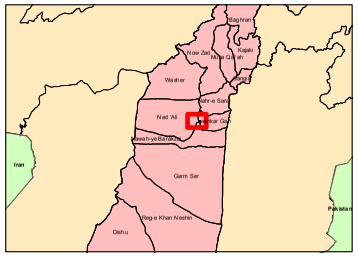
- Eradication Locations
- Research Locations

Crop Type

- Poppy
- Wheat
- Other Crop
- Prepared/Fallow



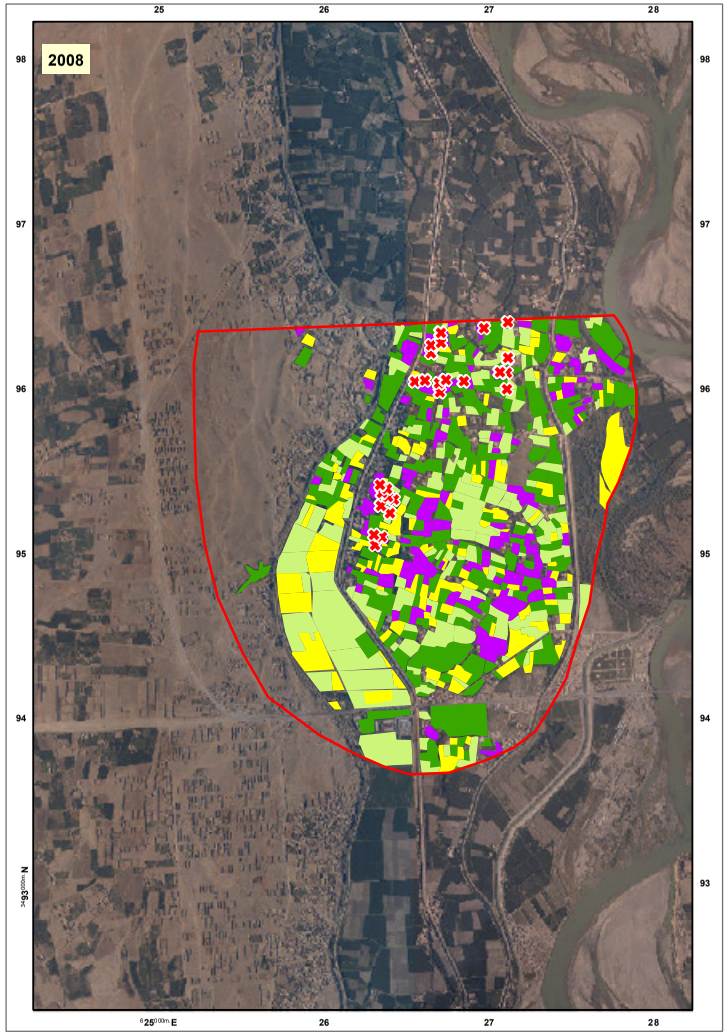


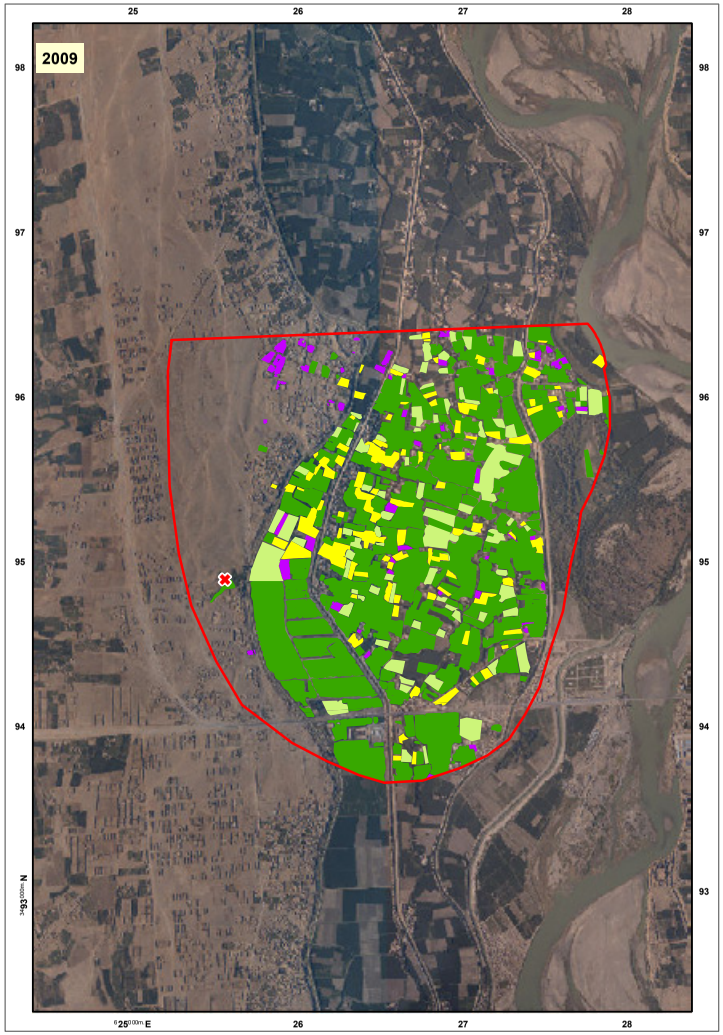


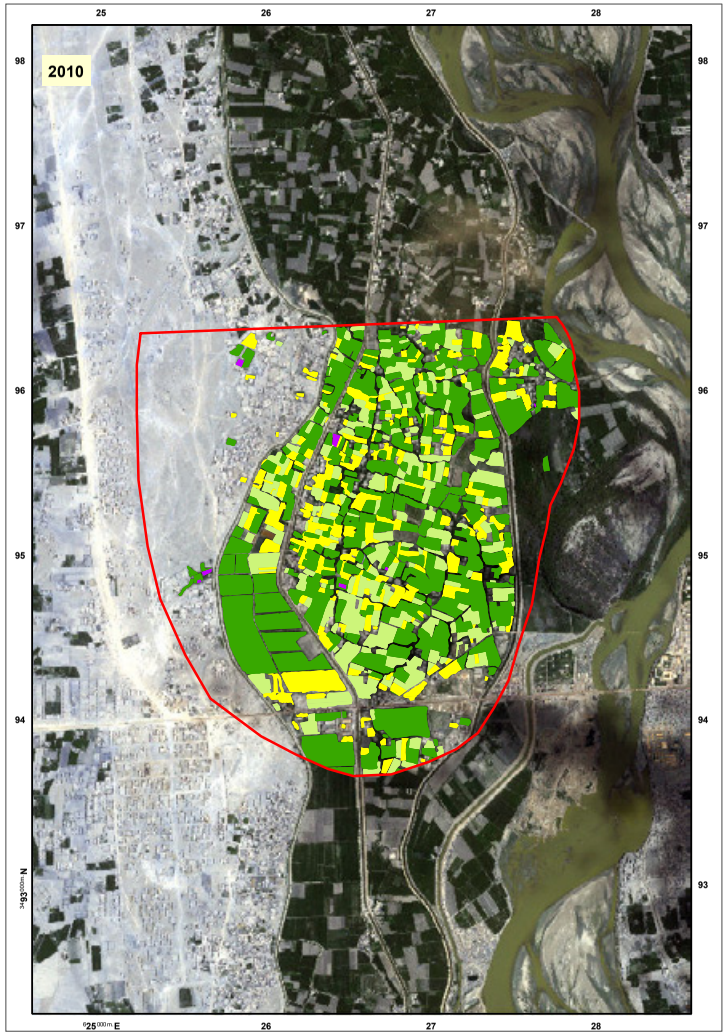
Research Site 5: Bolan
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:20,000







500 250 0 500 1,000 1,500 2,000 2,500 Meters

Imagery Data Source:
2008: Rampant Lion 2 Dated April 2008
2009: Rampant Lion 2 Dated April 2008
2010: World View 2 Dated April 2010

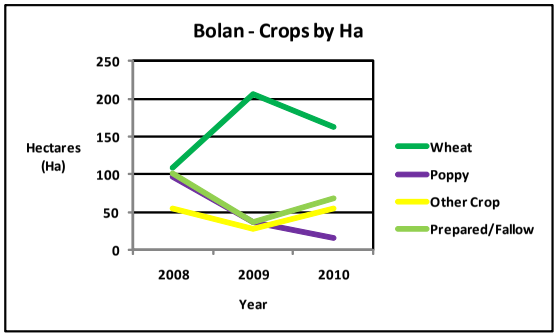
Produced by Alcis Ltd
6th May 2011

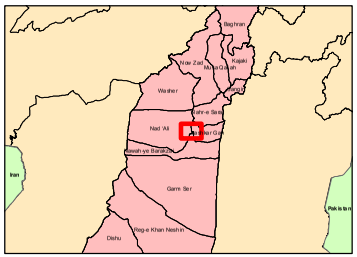
Legend

- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow

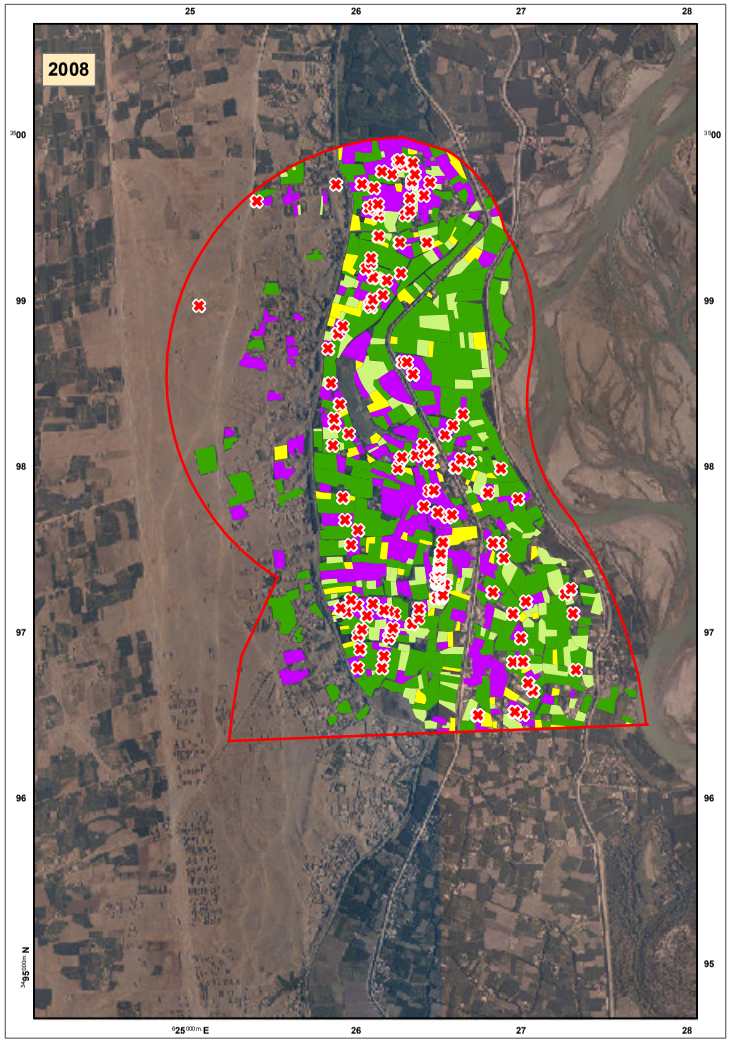


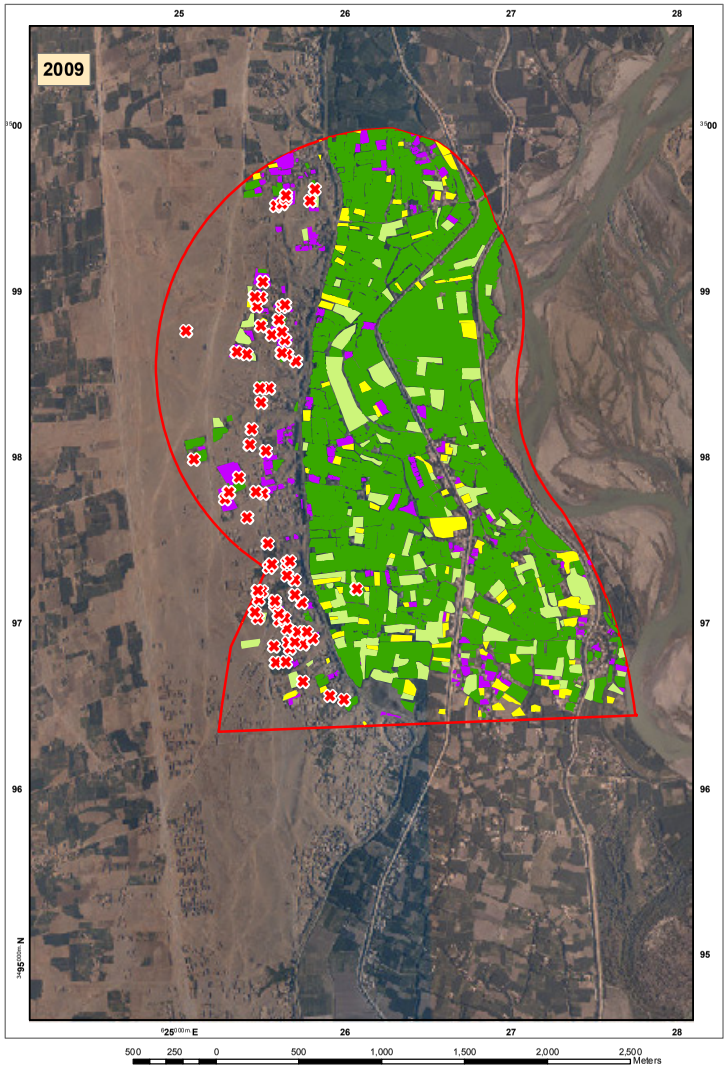


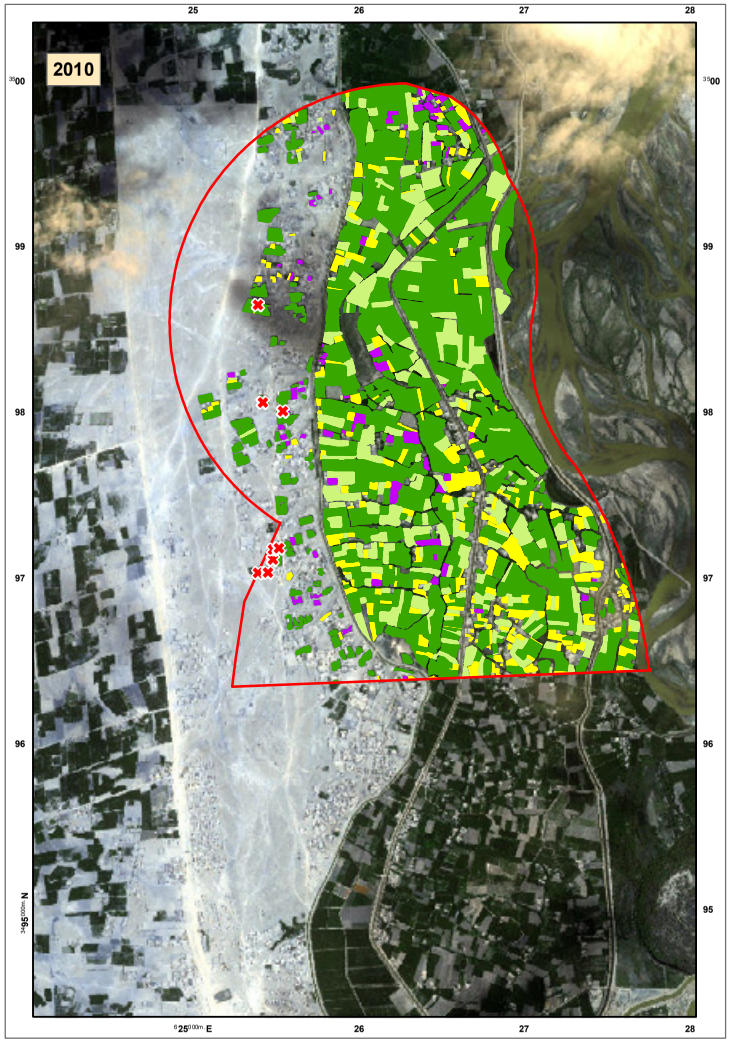
Research Site 6: Dashte Basharan
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:20,000







500 250 0 500 1,000 1,500 2,000 2,500 Meters

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

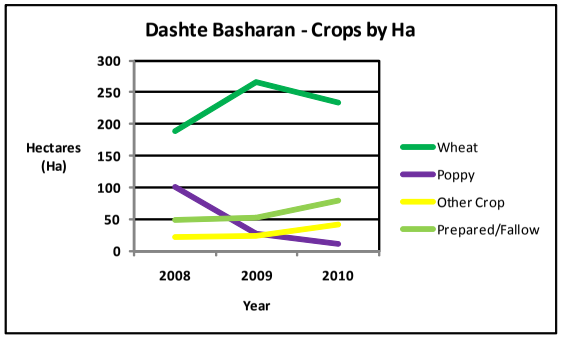
Produced by Alcis Ltd
6th May 2011

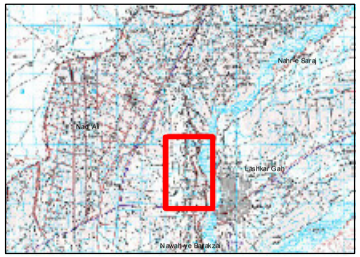
Legend

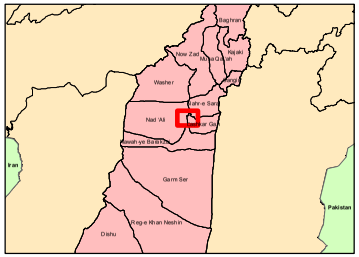
- Eradication Locations
- Research Locations

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



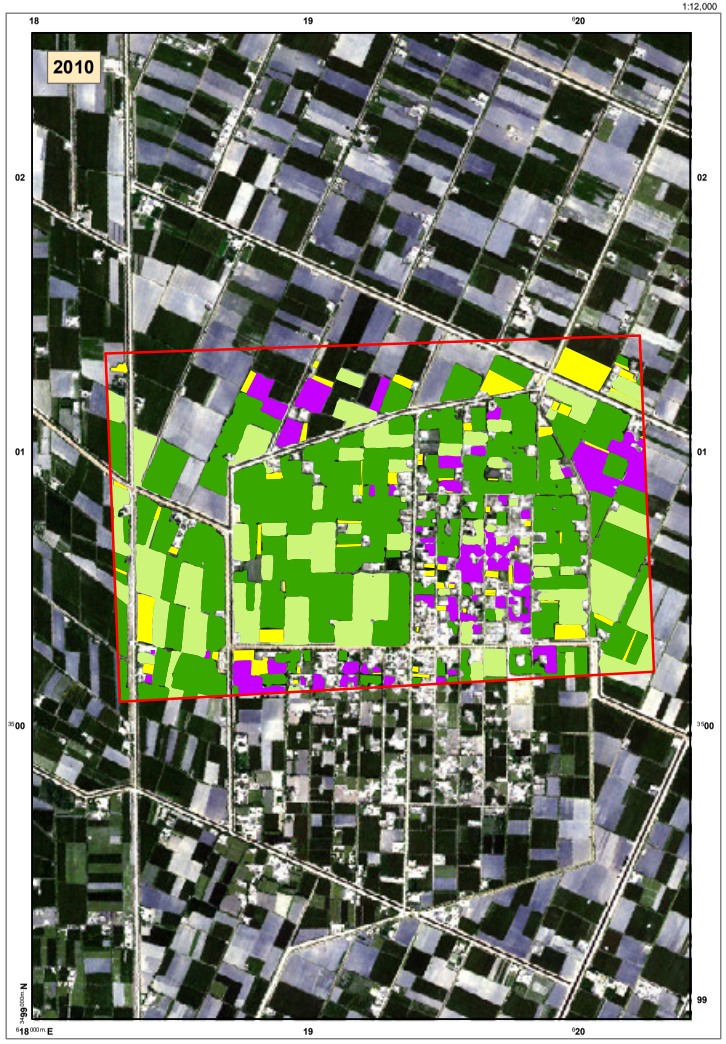




Research Site 7: Luy Bagh
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:12,000



1 0.5 0 1 Kilometers

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

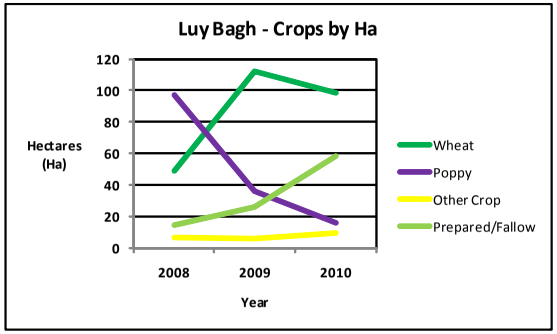
Produced by Alcis Ltd
6th May 2011

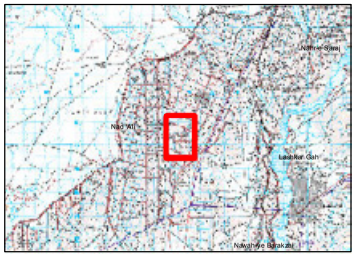
Legend

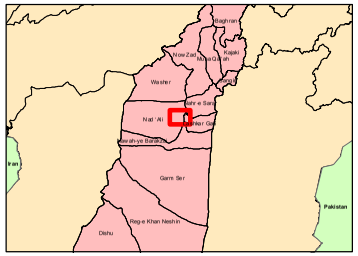
- Eradication Locations
- Research Sites

Crop Type

- Poppy
- Wheat
- Other Crop
- Prepared/Fallow



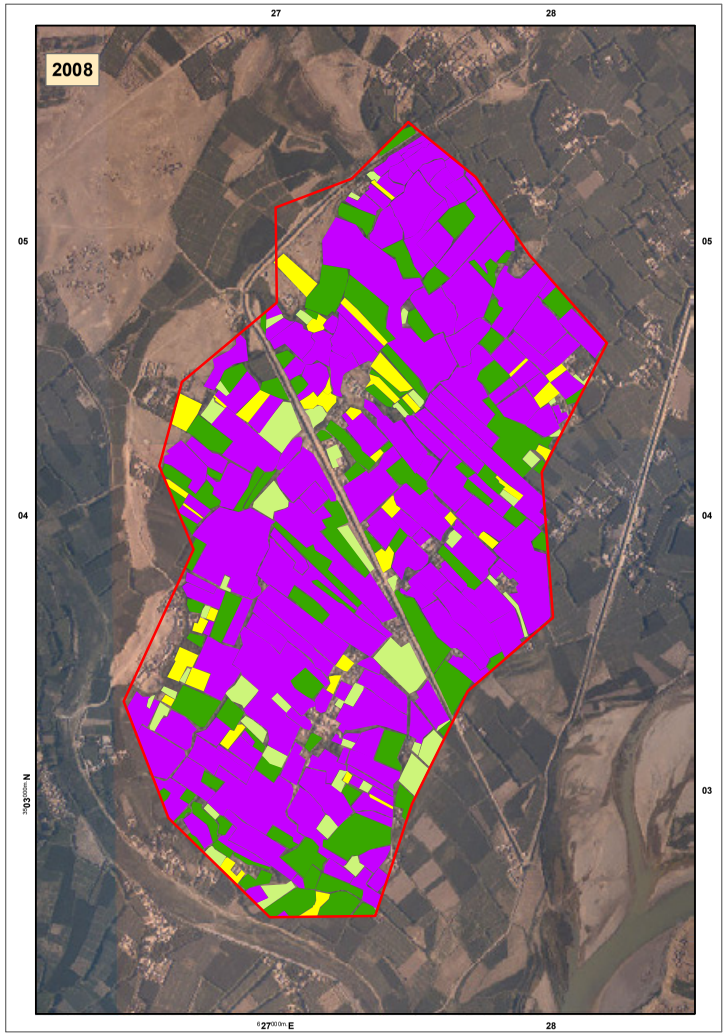


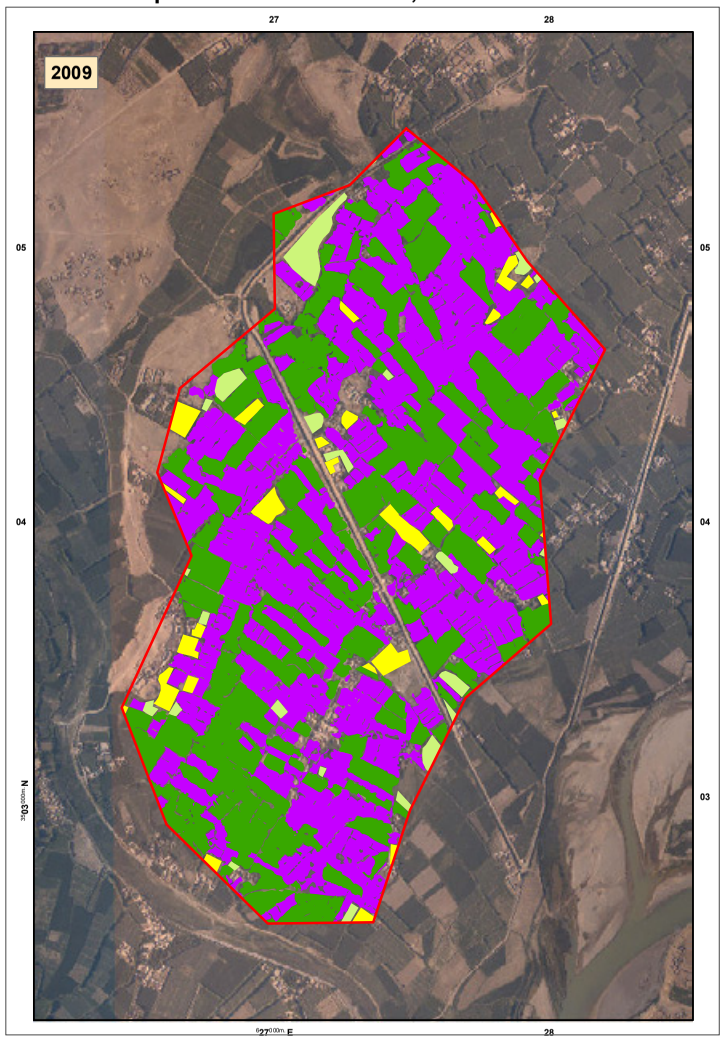


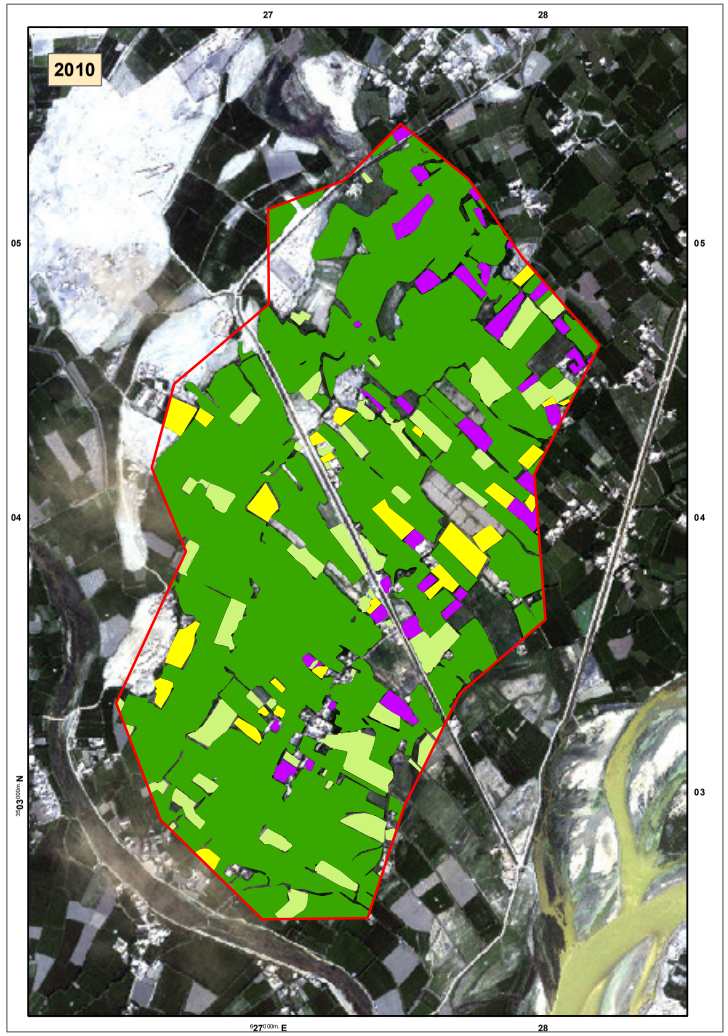
Research Site 8: Khwaja Baidar
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:12,000







500 250 0 500 1,000 1,500 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

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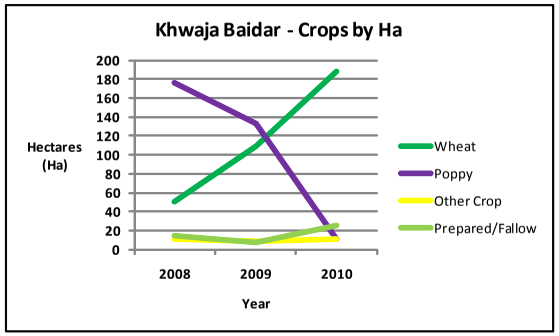
6th May 2011

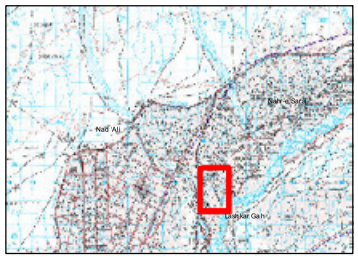
Legend

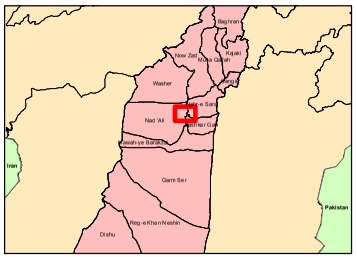
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



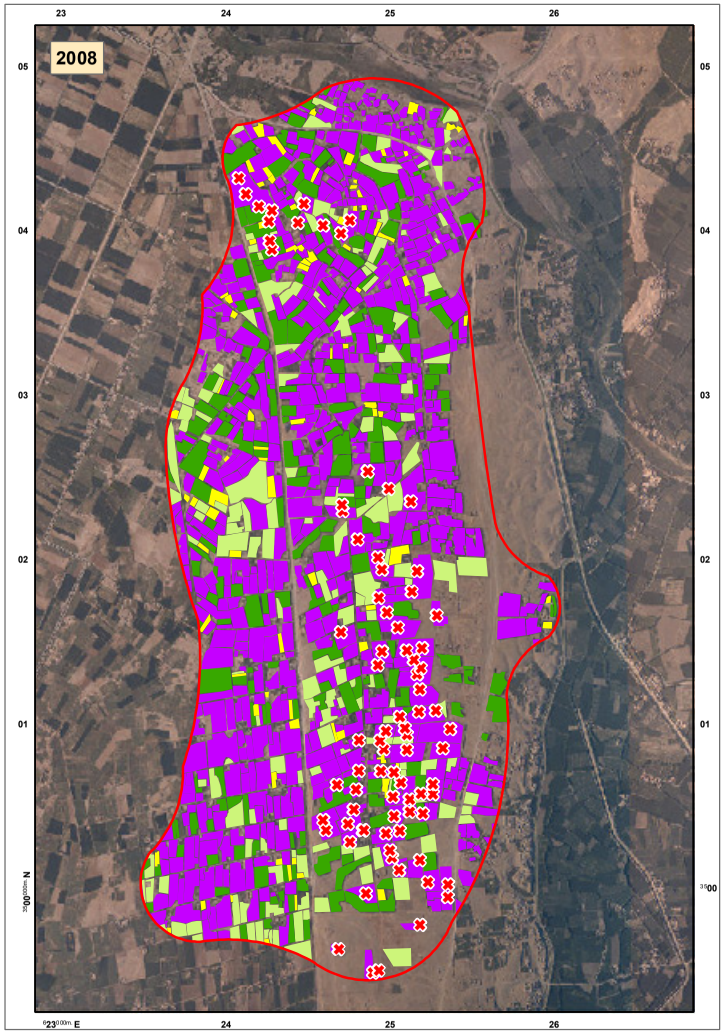


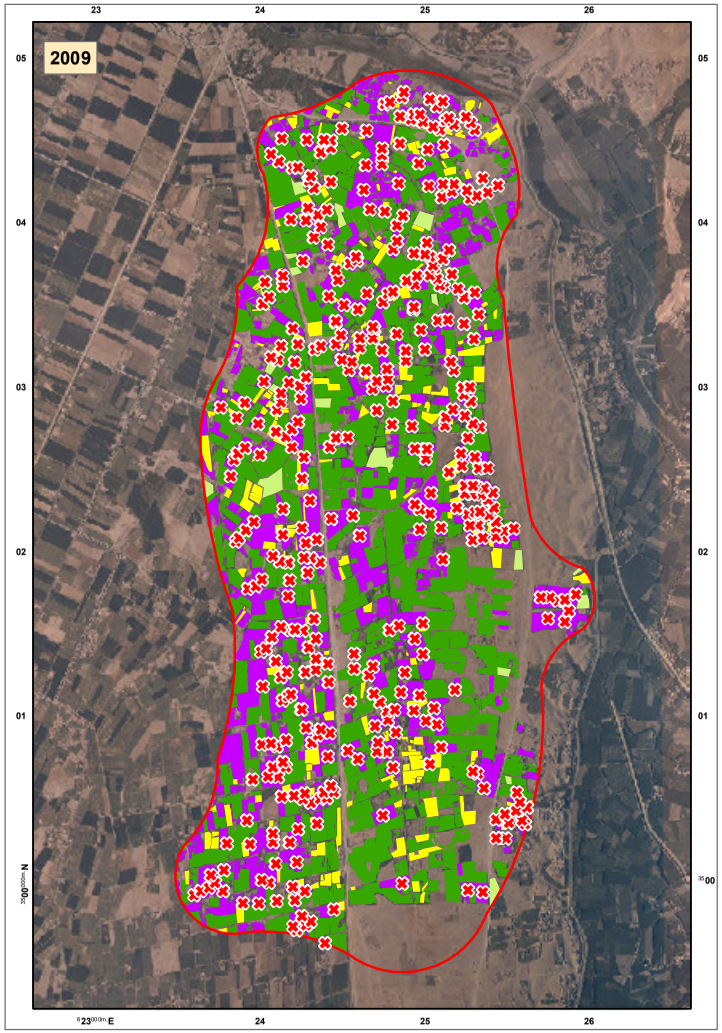


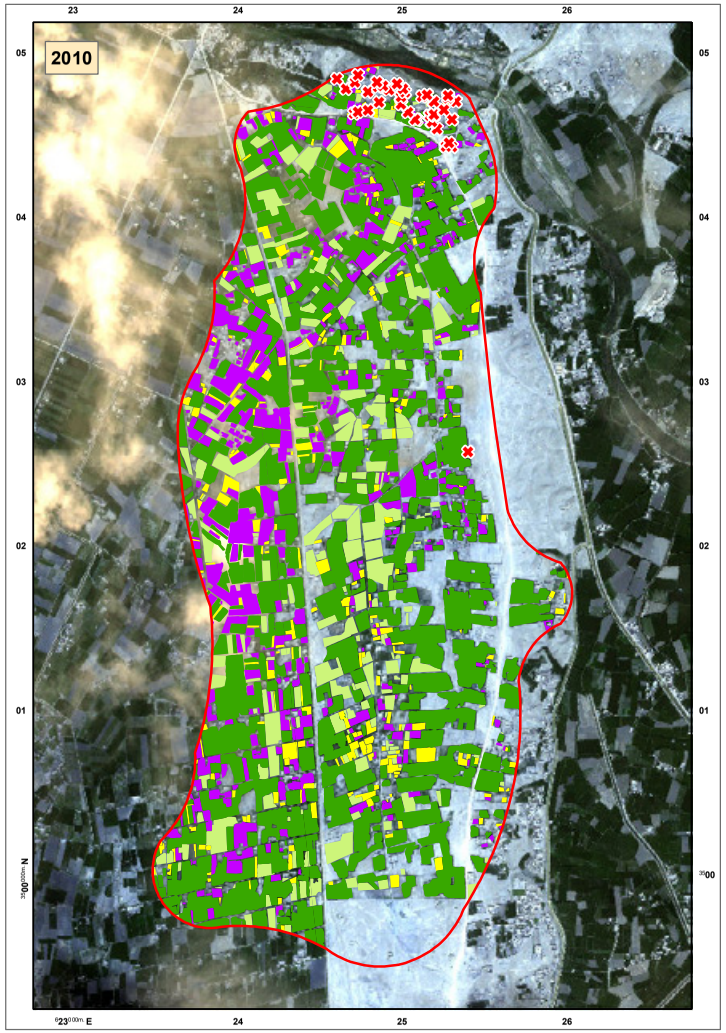
Research Site 9: Chanjir Dashte
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:20,000







Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

1 0.5 0 1 2 3 Kilometres

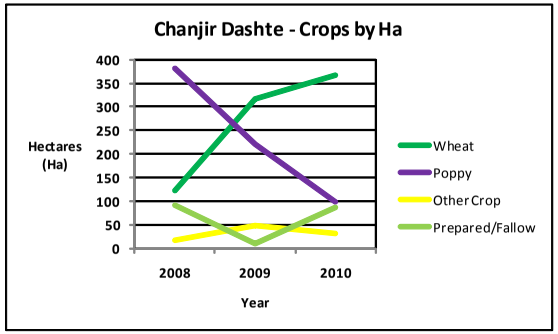
Produced by Alcis Ltd
6th May 2011

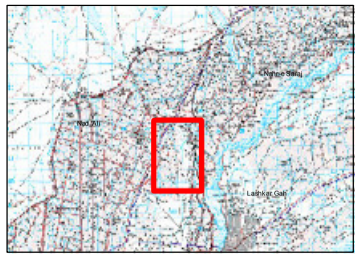
Legend

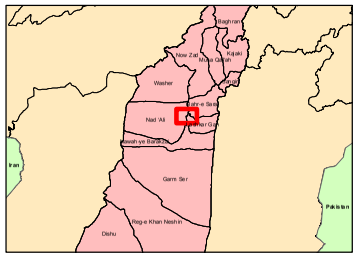
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



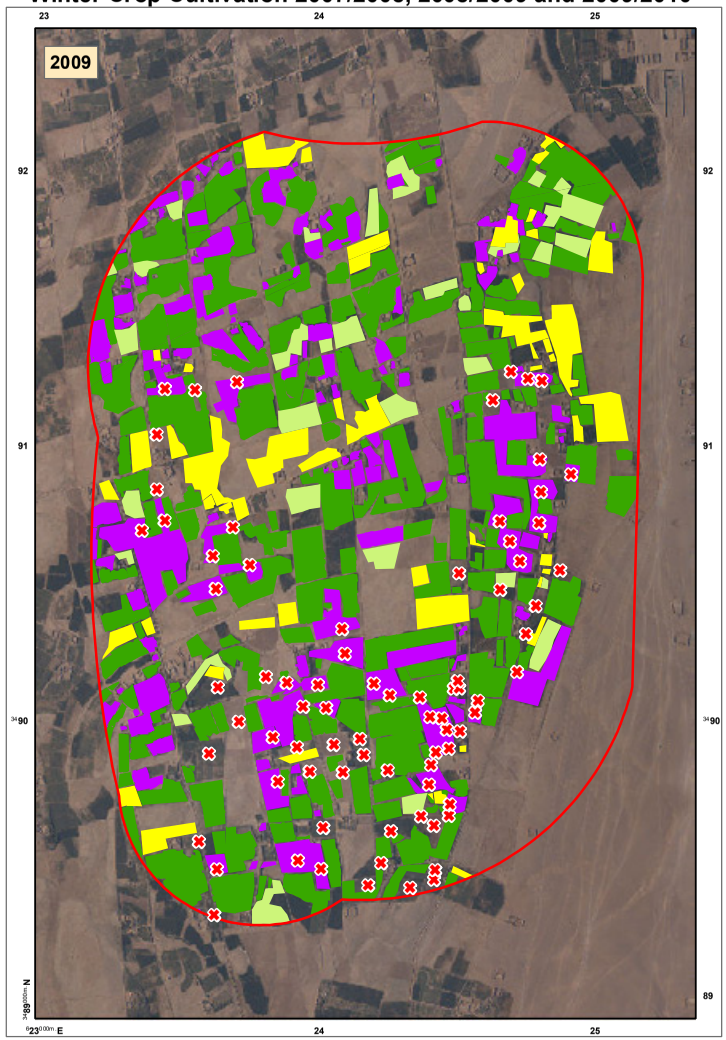


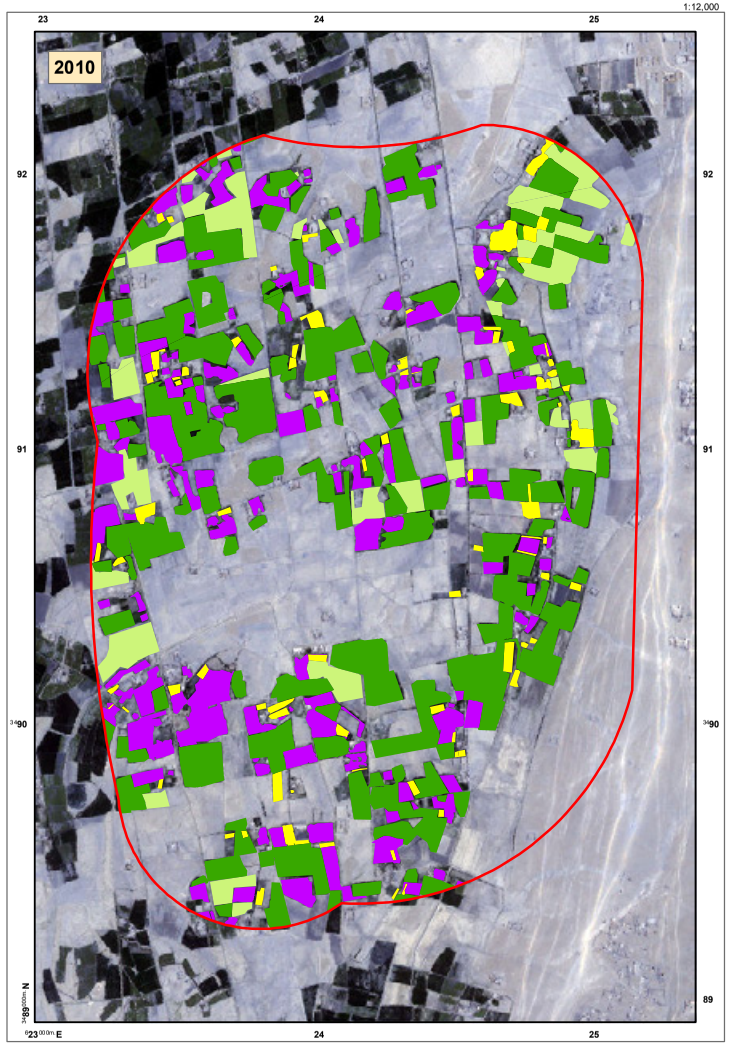


Research Site 10: Dashte Aynak
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:12,000





500 250 0 500 1,000 1,500 Meters

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

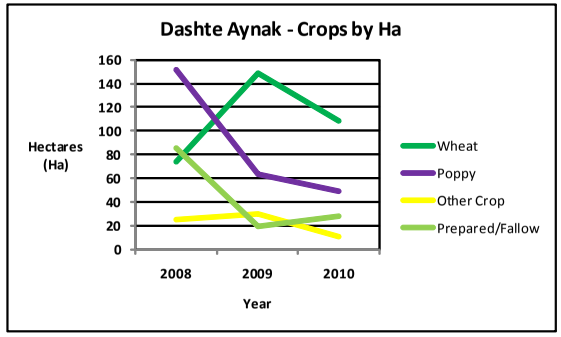
Produced by Alcis Ltd
6th May 2011

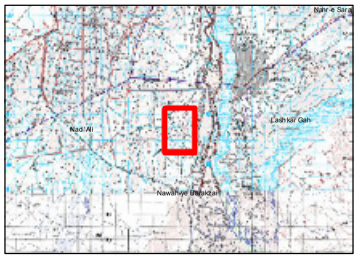
Legend

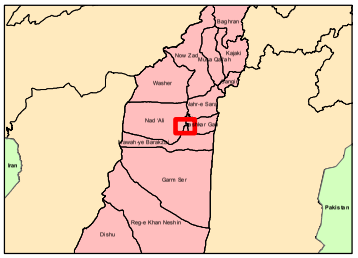
- Eradication Locations
- Research Sites

Crop Type

- Poppy
- Wheat
- Other Crop
- Prepared/Fallow



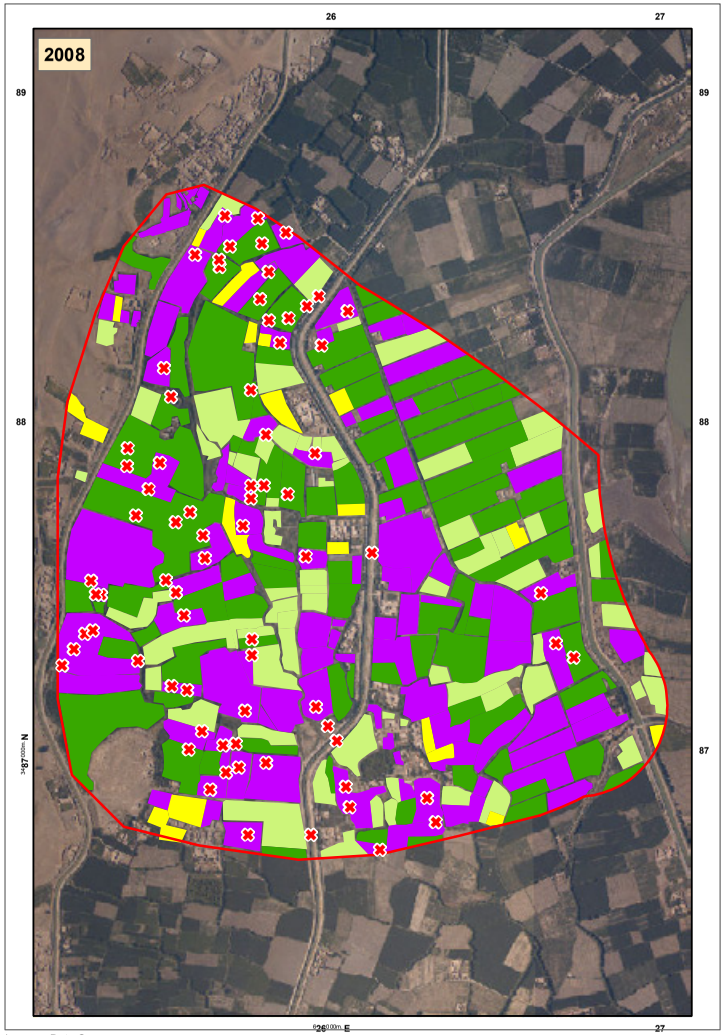


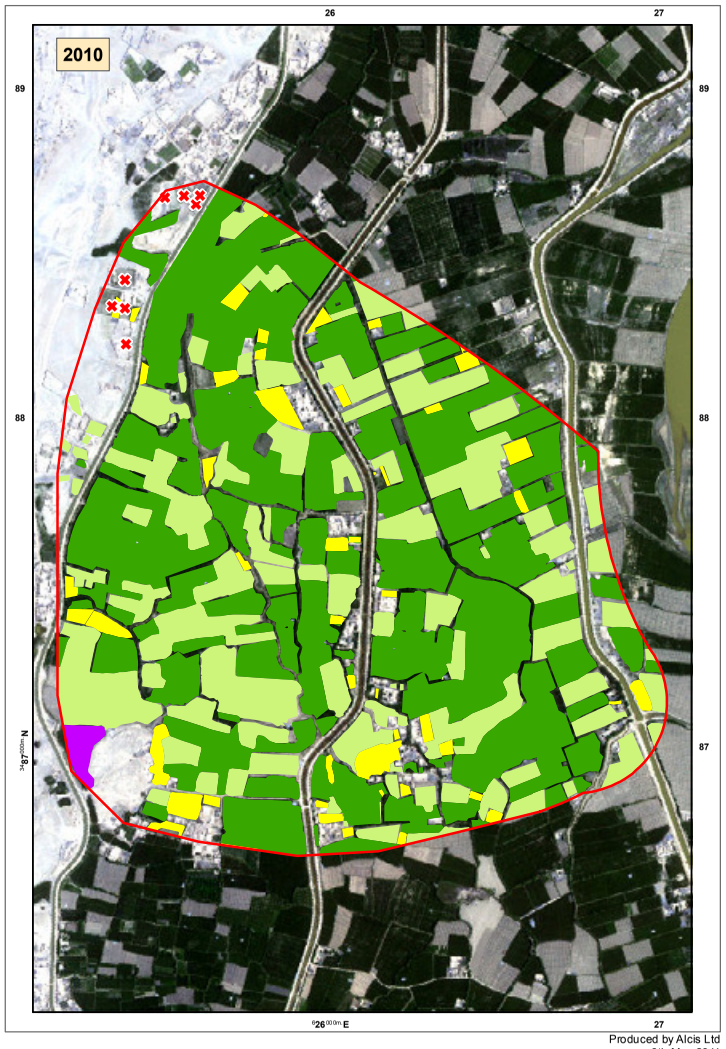


Research Site 11: Aynak
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:10,000





Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

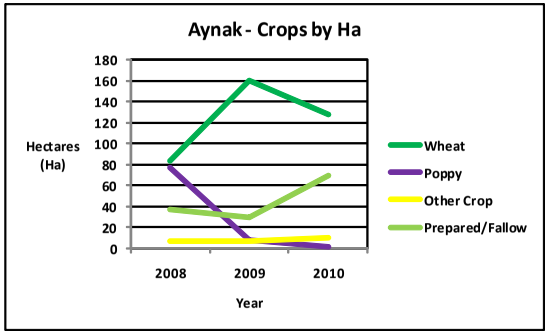
Produced by Alcis Ltd
6th May 2011

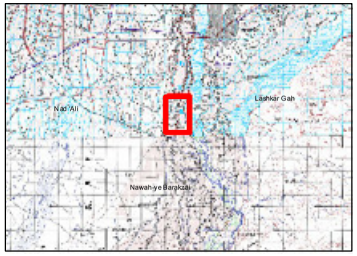
Legend

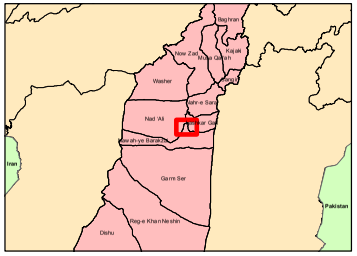
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



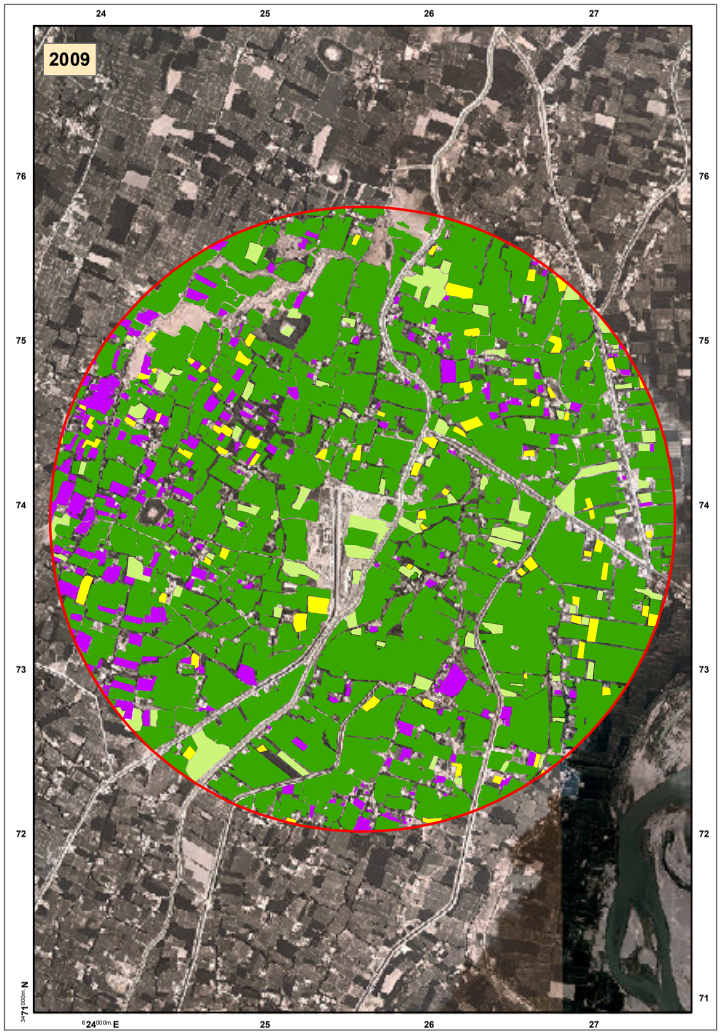


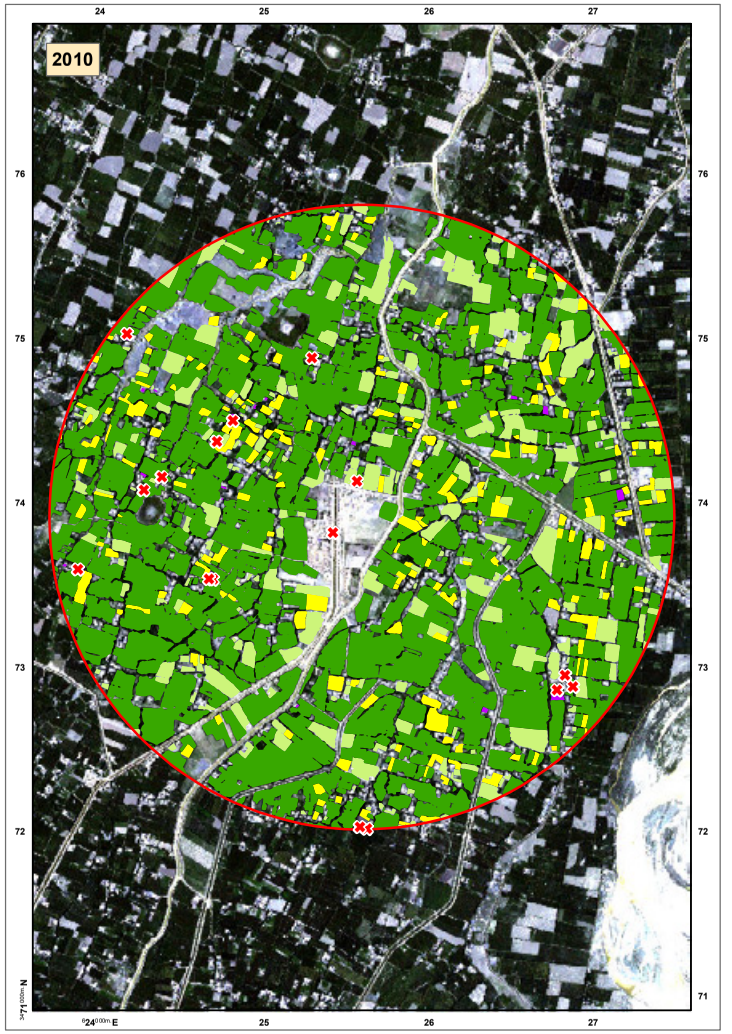


Research Site 12: Kalaj
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:20,426





Imagery Date Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

500 250 0 500 1,000 1,500 2,000 Metres

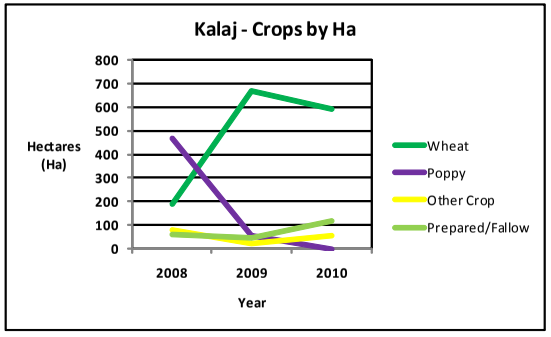
Produced by Alcis Ltd
6th May 2011

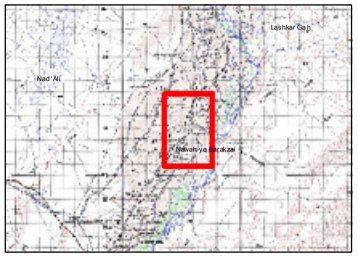
Legend

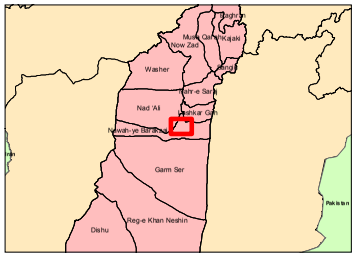
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



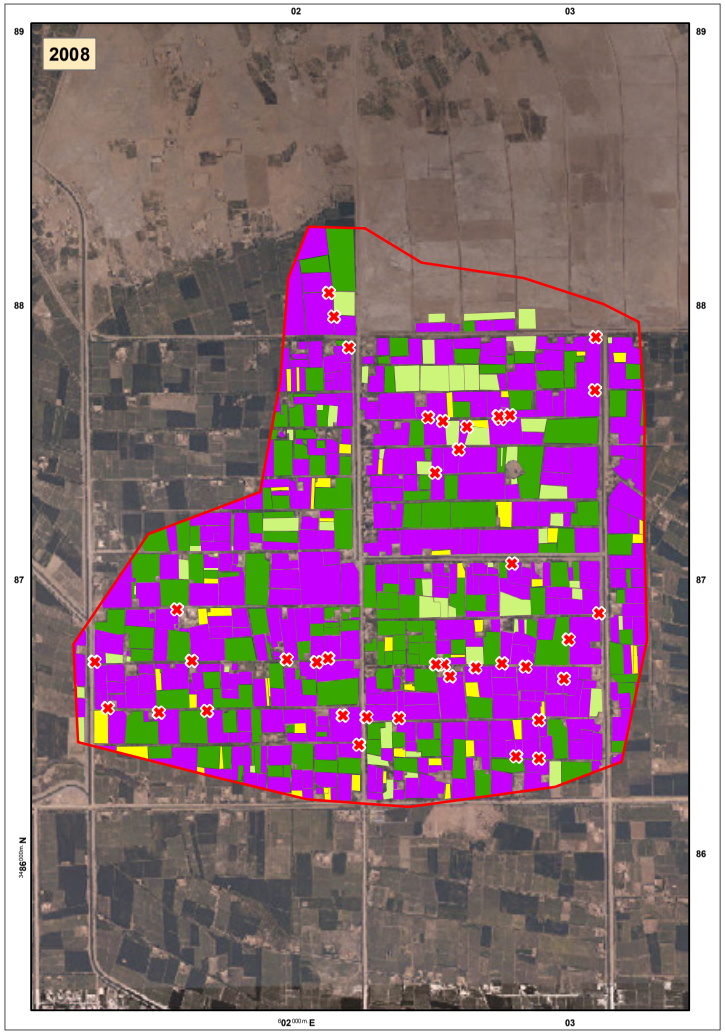


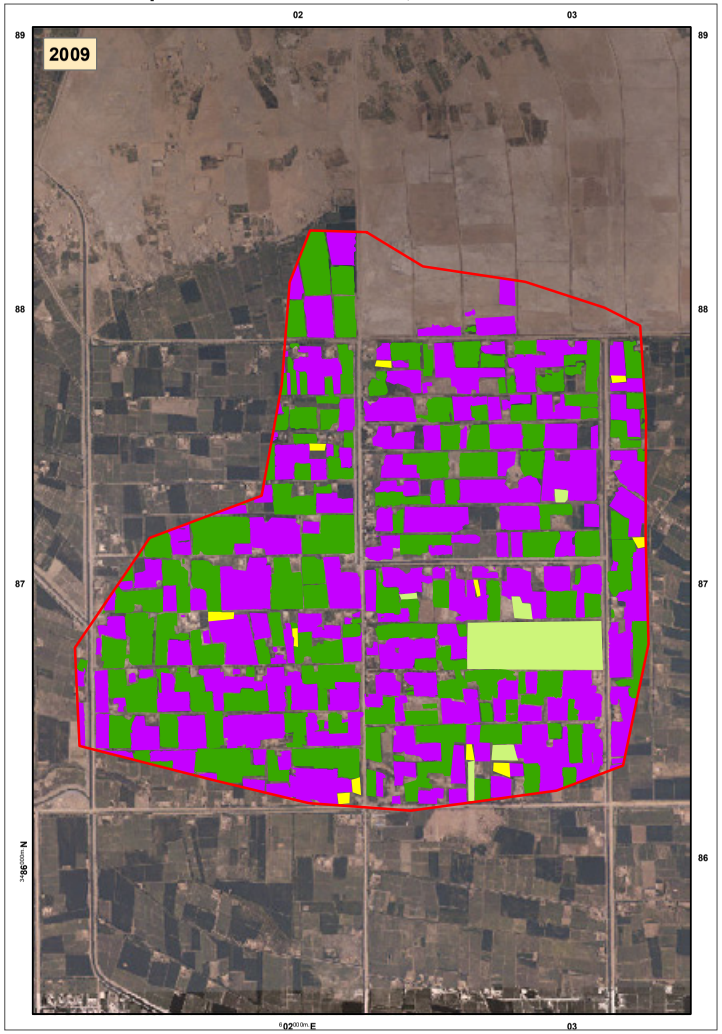


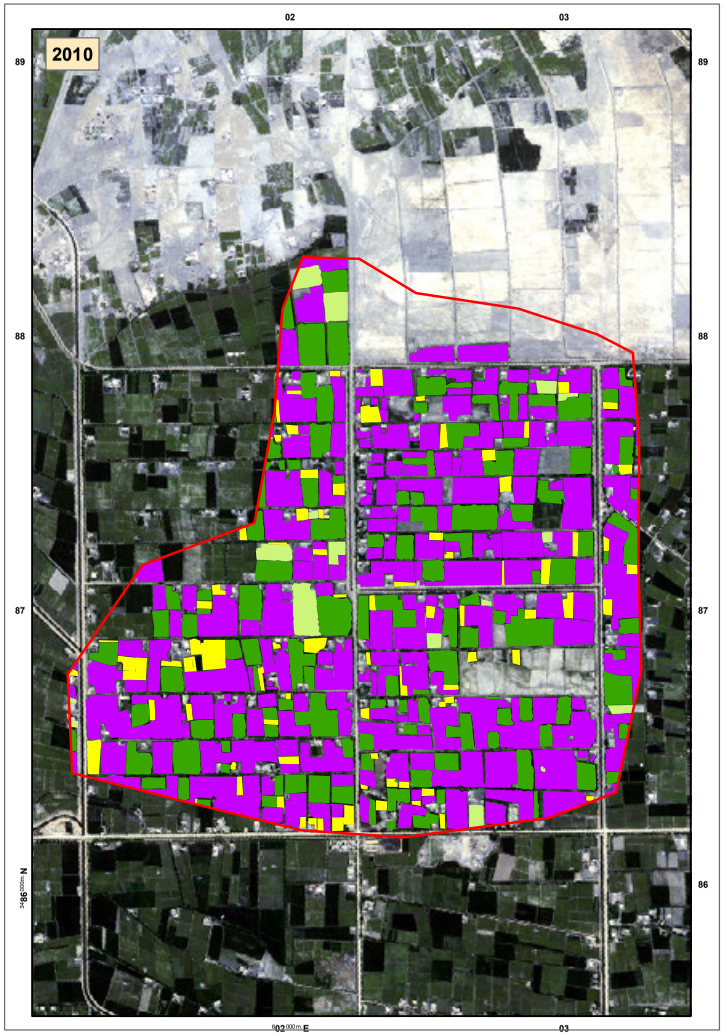
Research Site: 13 Marjeh F4 D5
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:12,000







Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

500 250 0 500 1,000 1,500 2,000 Metres

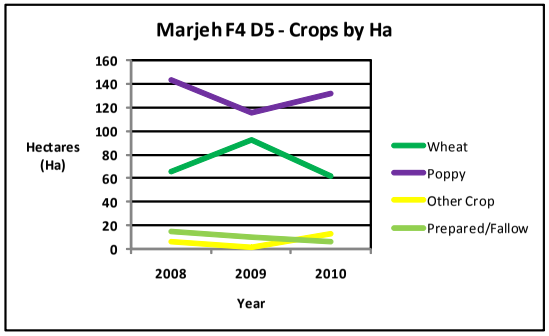
Produced by Alcis Ltd
6th May 2011

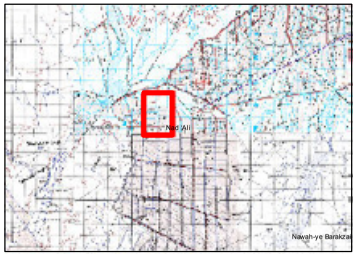
Legend

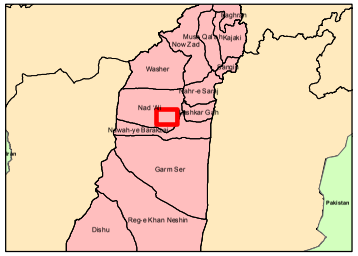
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



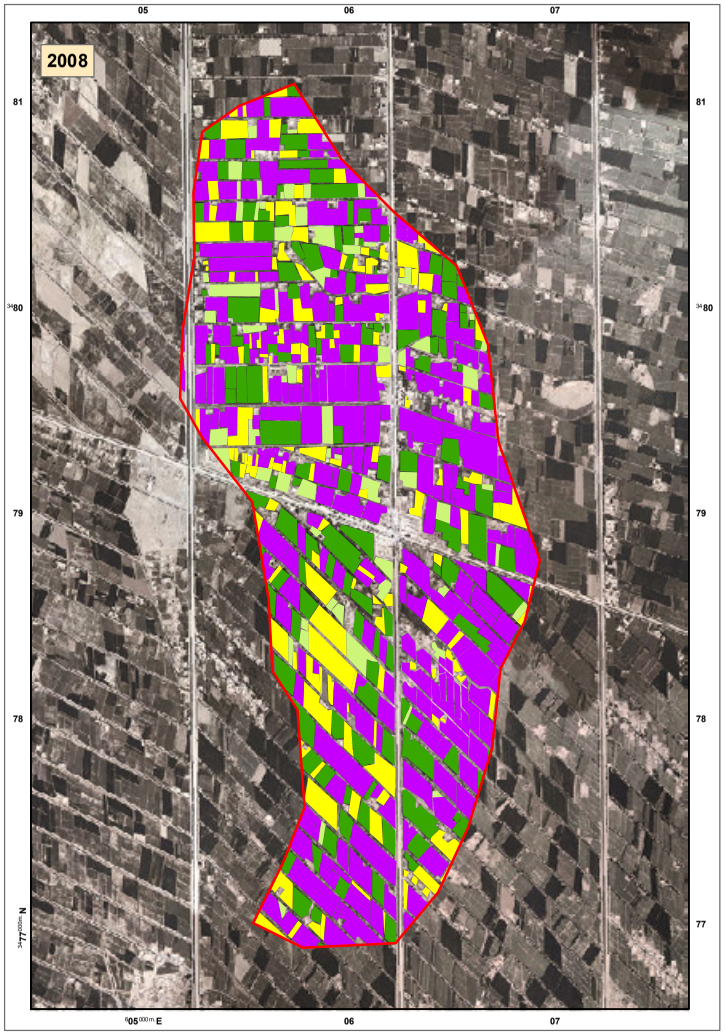


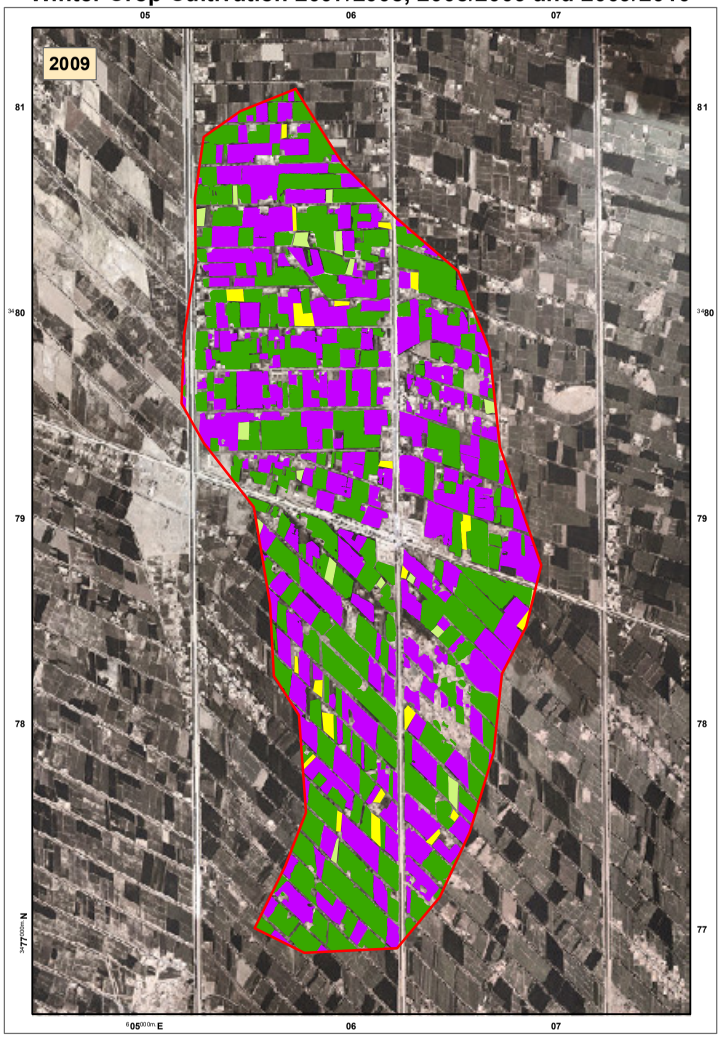


Research Site 14: Marjeh Block 2A
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:16,000





500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

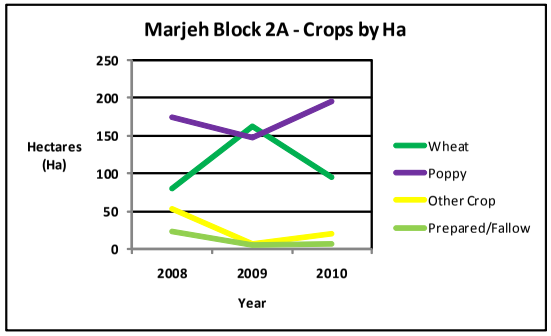
Produced by Alcis Ltd
6th May 2011

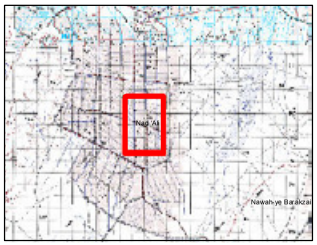
Legend

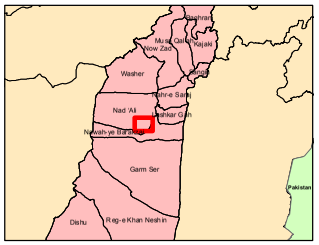
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



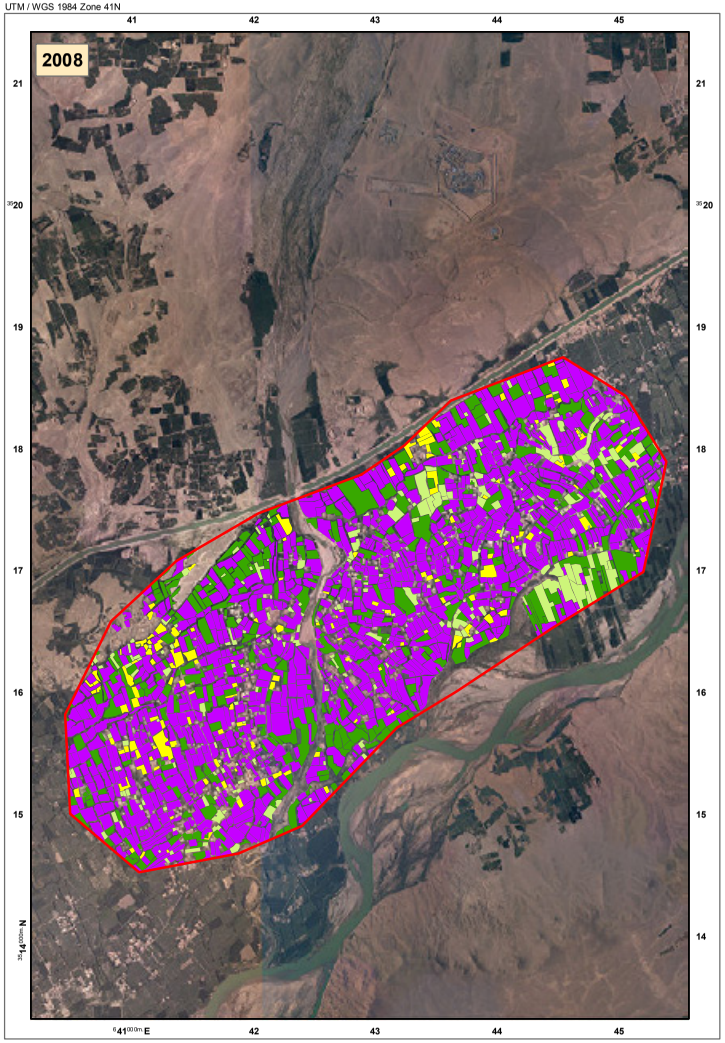


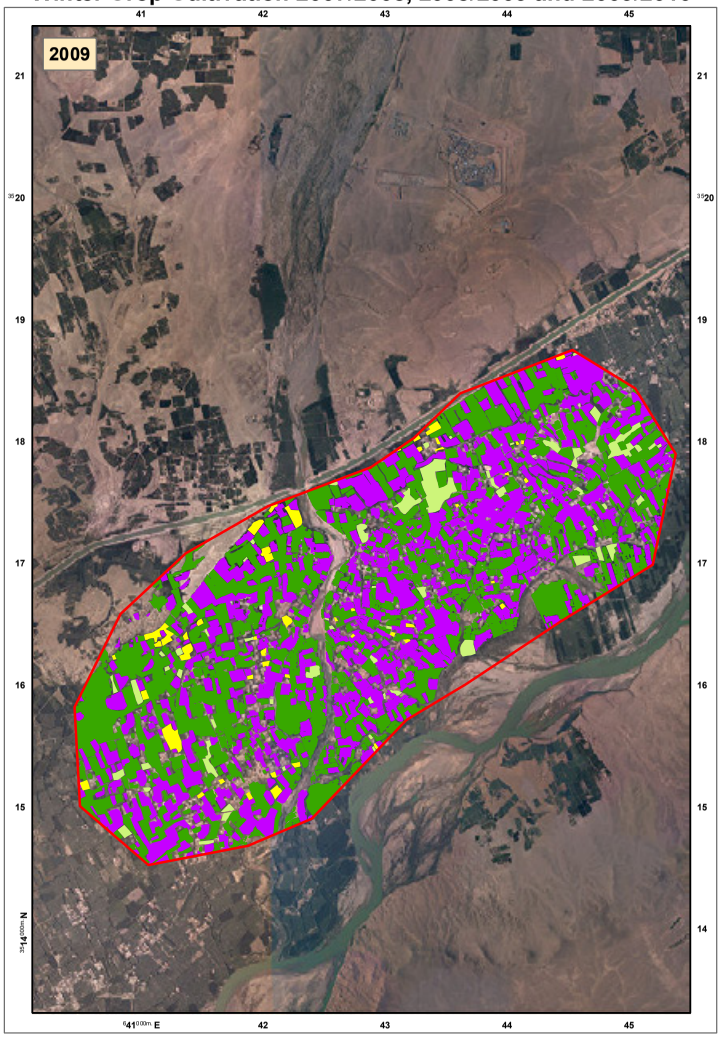


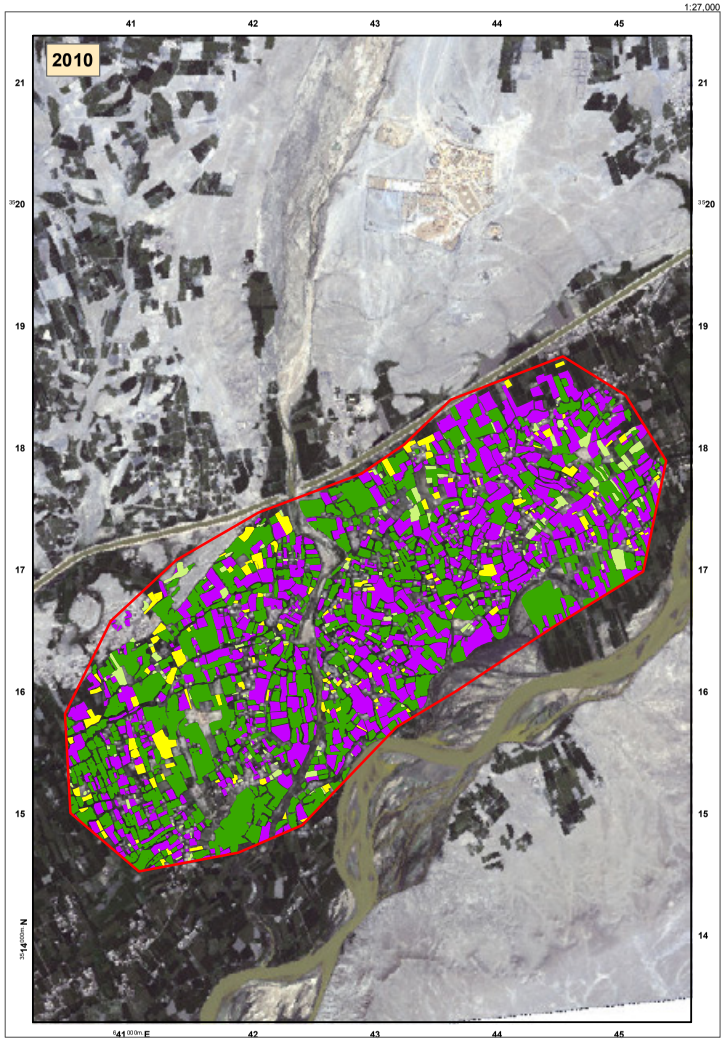
Research Site 15: Malgir
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:27,000







500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

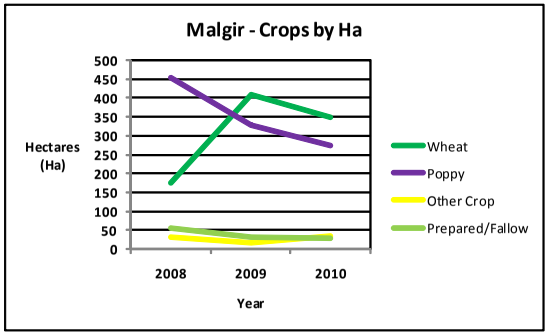
Produced by Alcis Ltd
6th May 2011

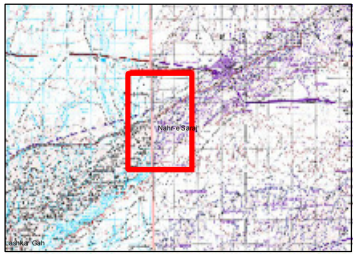
Legend

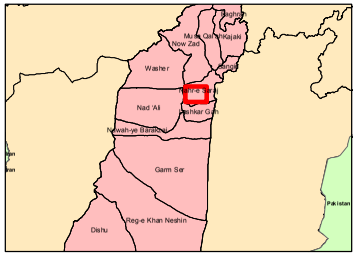
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



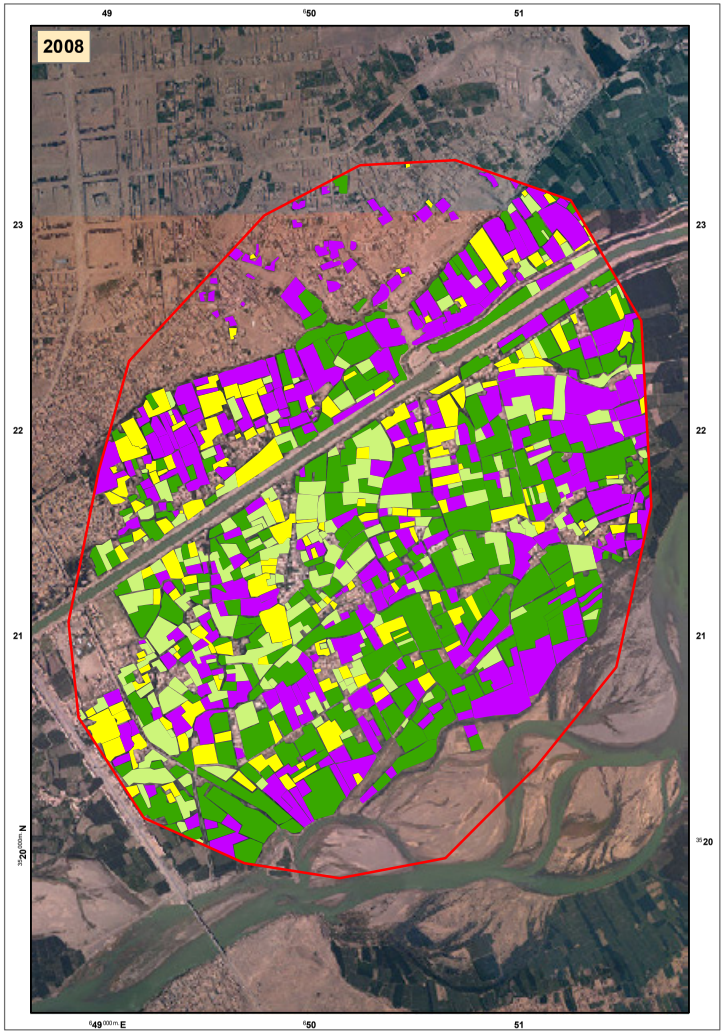


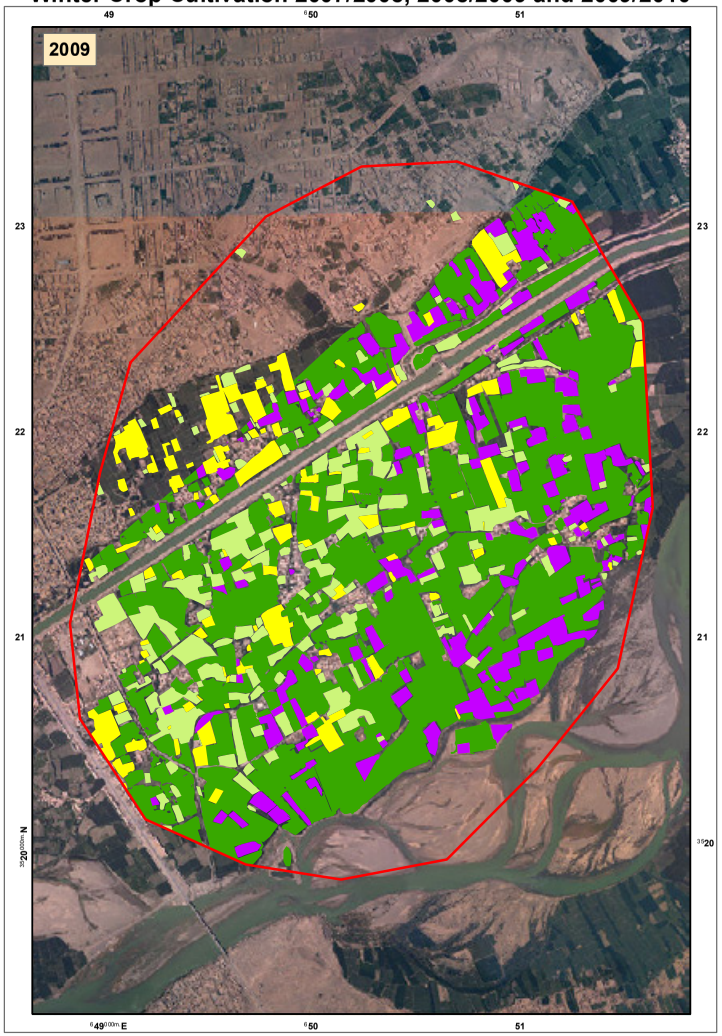


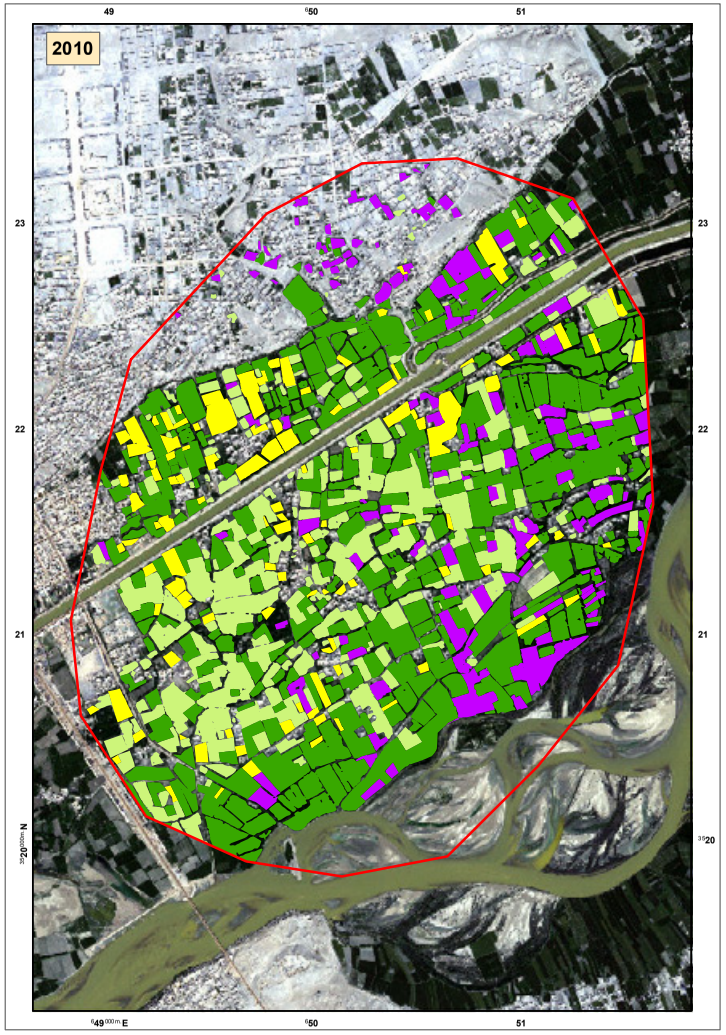
Research Site 16: Sra Kala
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:16,000







Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
210 - World View 2 Dated April 2010

500 250 0 500 1,000 1,500 2,000 Metres

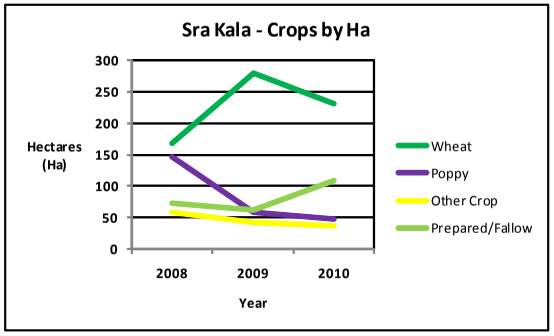
Produced by Alcis Ltd
6th May 2011

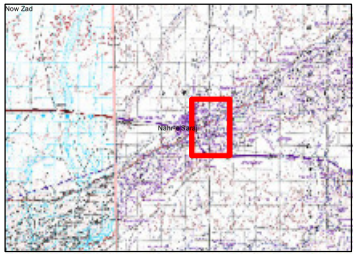
Legend

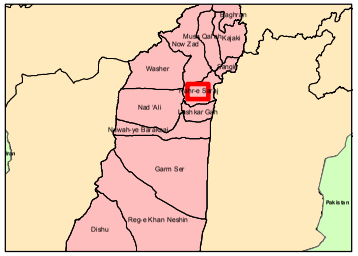
- Eradication Locations
- Reseach Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



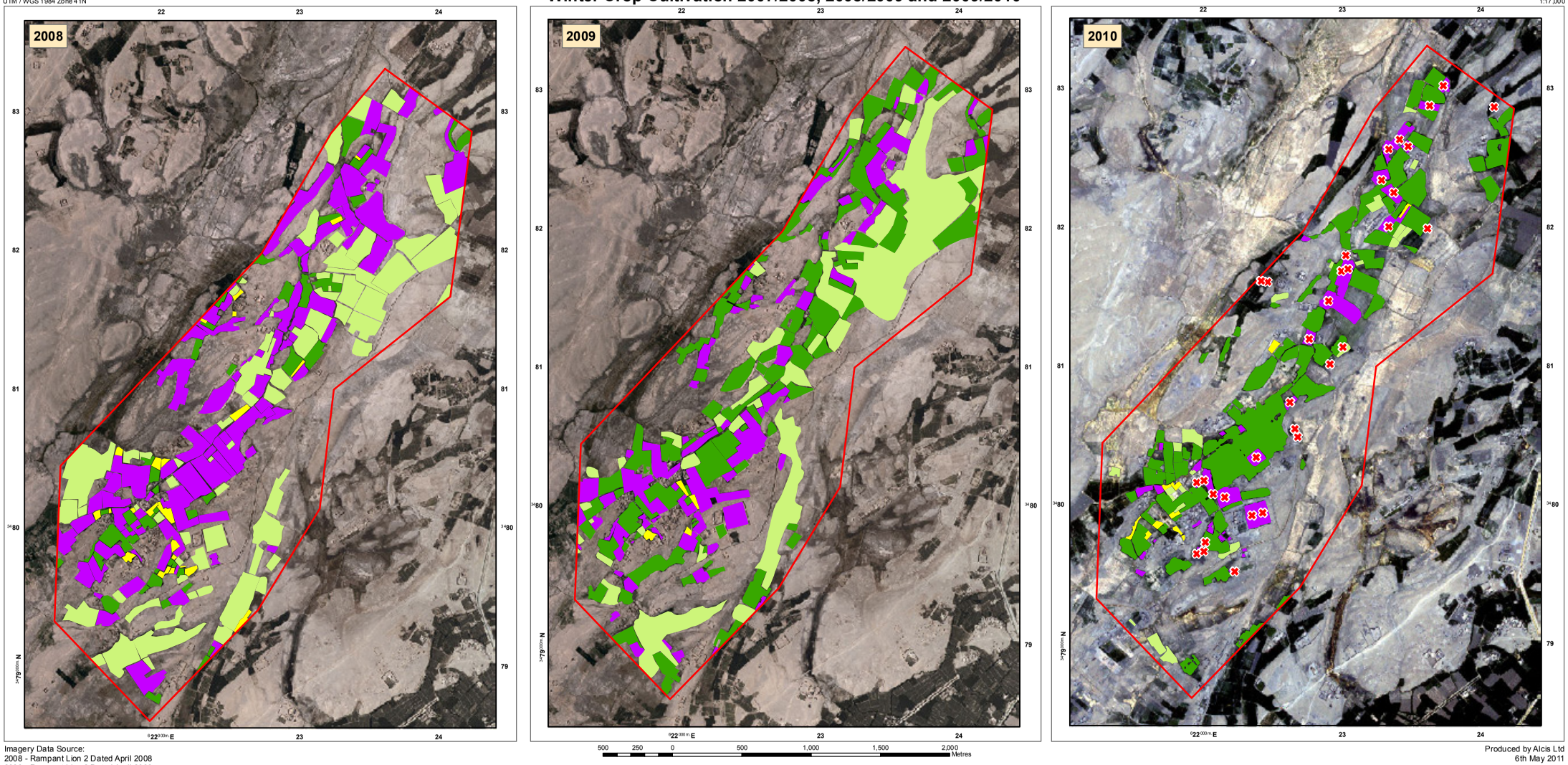




Research Site 17: Shersharak
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:17,000



Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

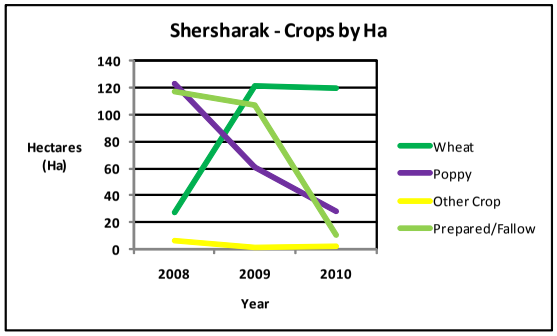
Produced by Alcis Ltd
6th May 2011

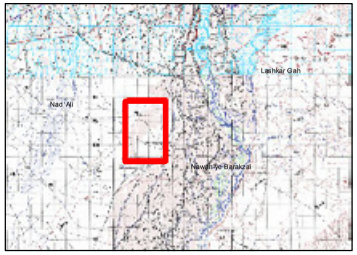
Legend

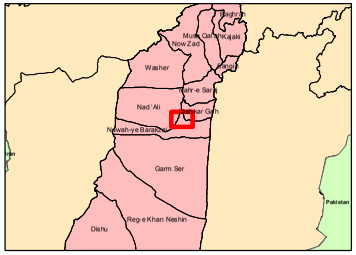
- Eradication Locations
- Research Sites

CropType

- Wheat
- Poppy
- Other
- Prepared/Fallow



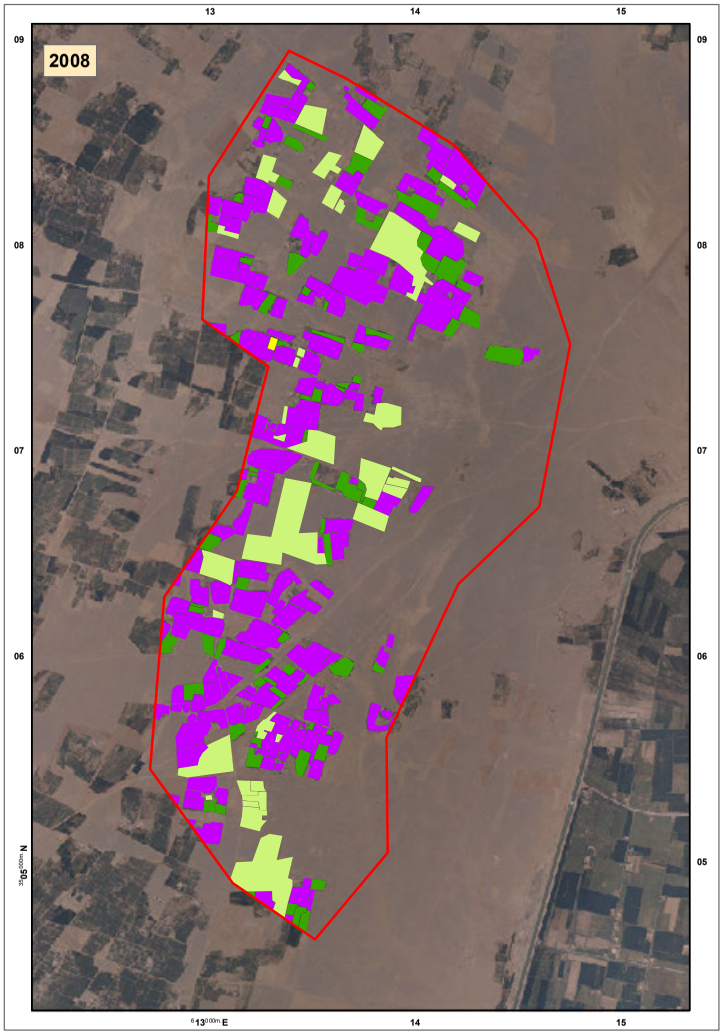


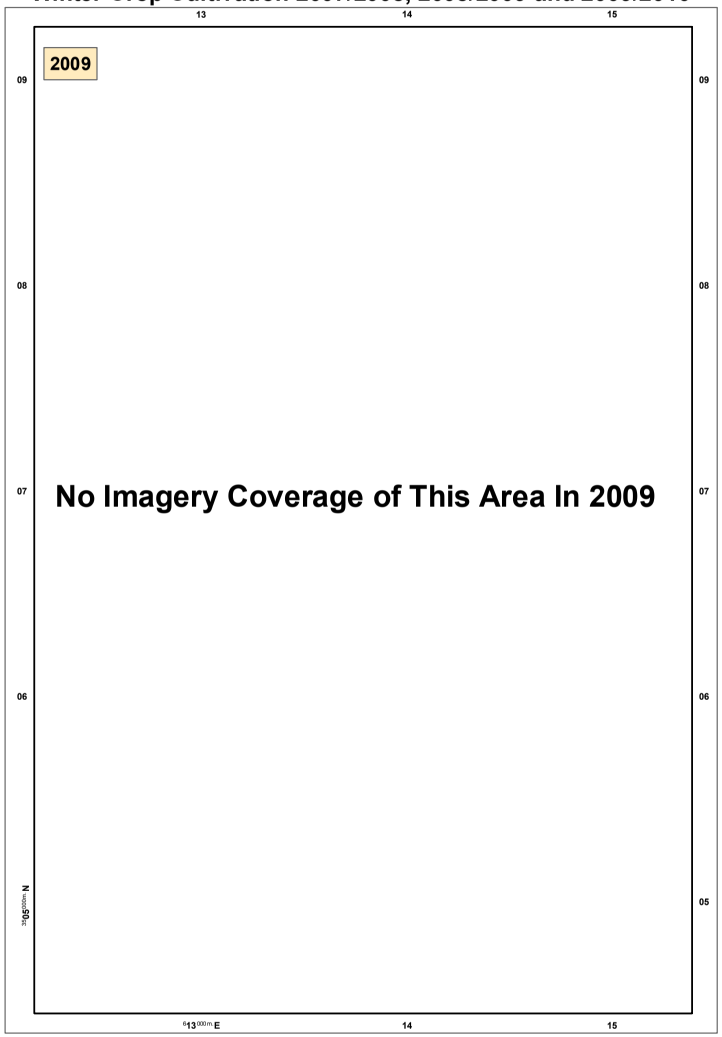


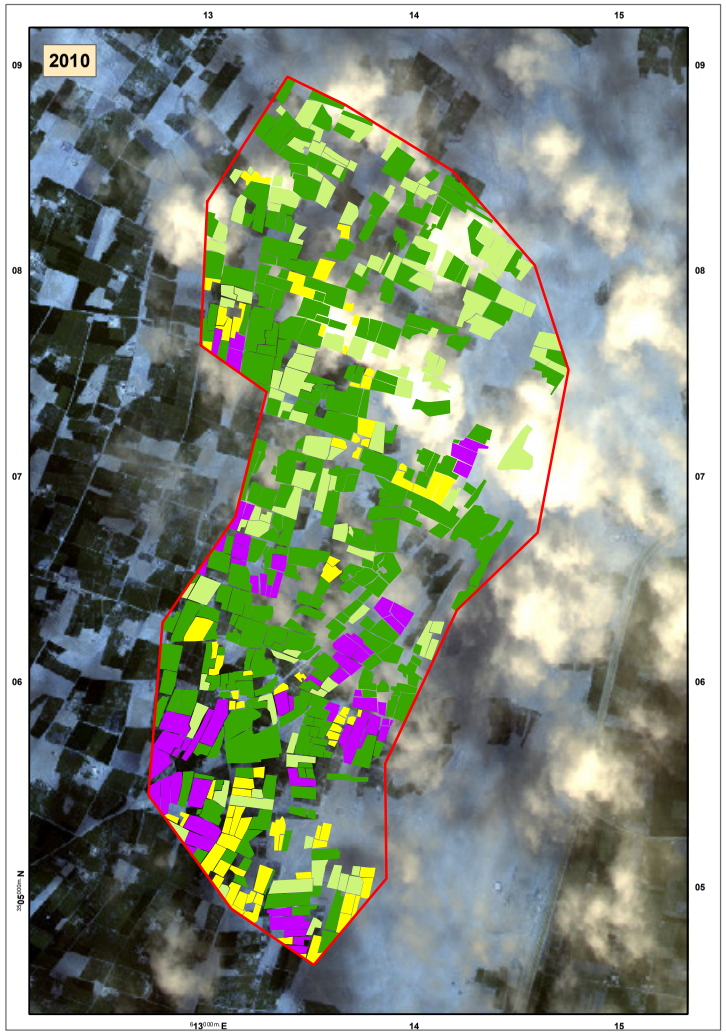
UTM / WGS 1984 Zone 41N

Research Site 18: Dashte Shin Kalay
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

1:16,000







500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2010 - Rampant Lion 2 Dated April 2008

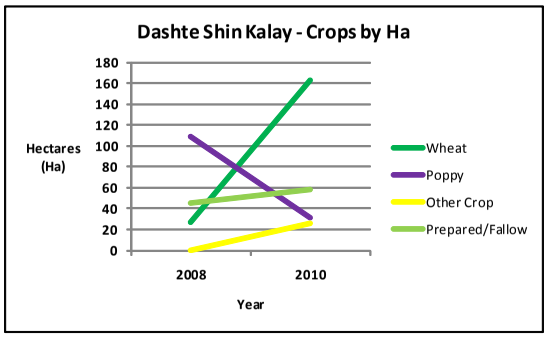
Produced by Alcis Ltd
6th May 2011

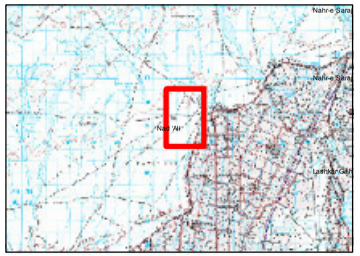
Legend

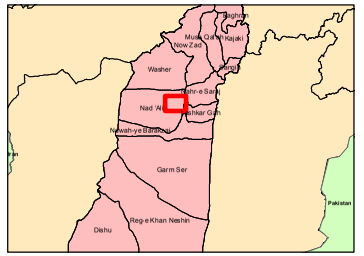
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



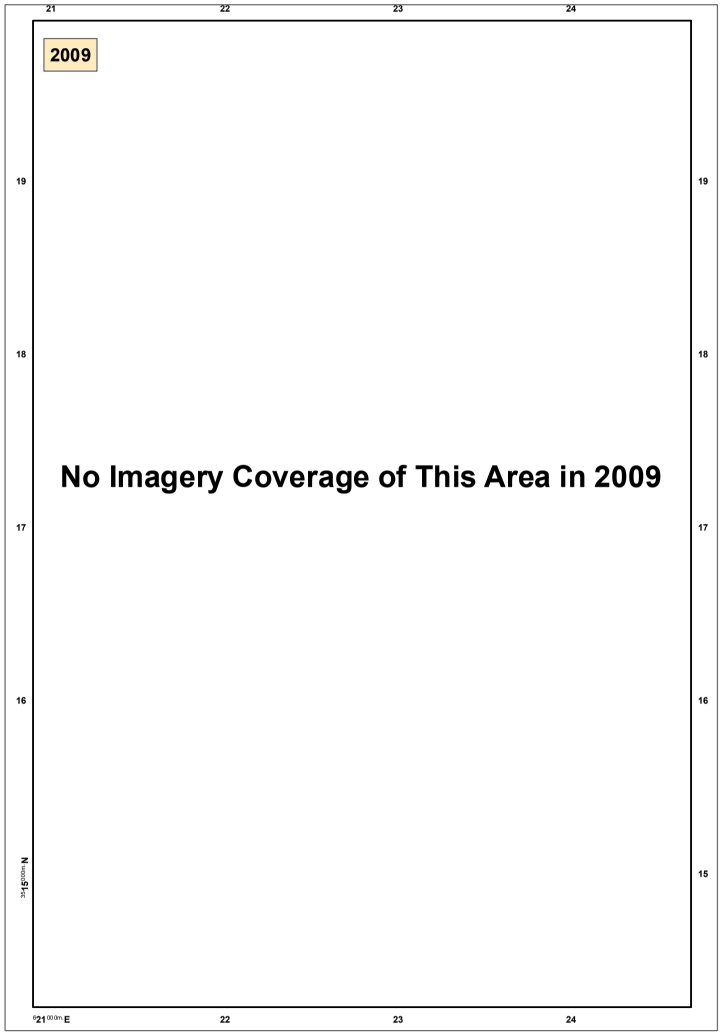


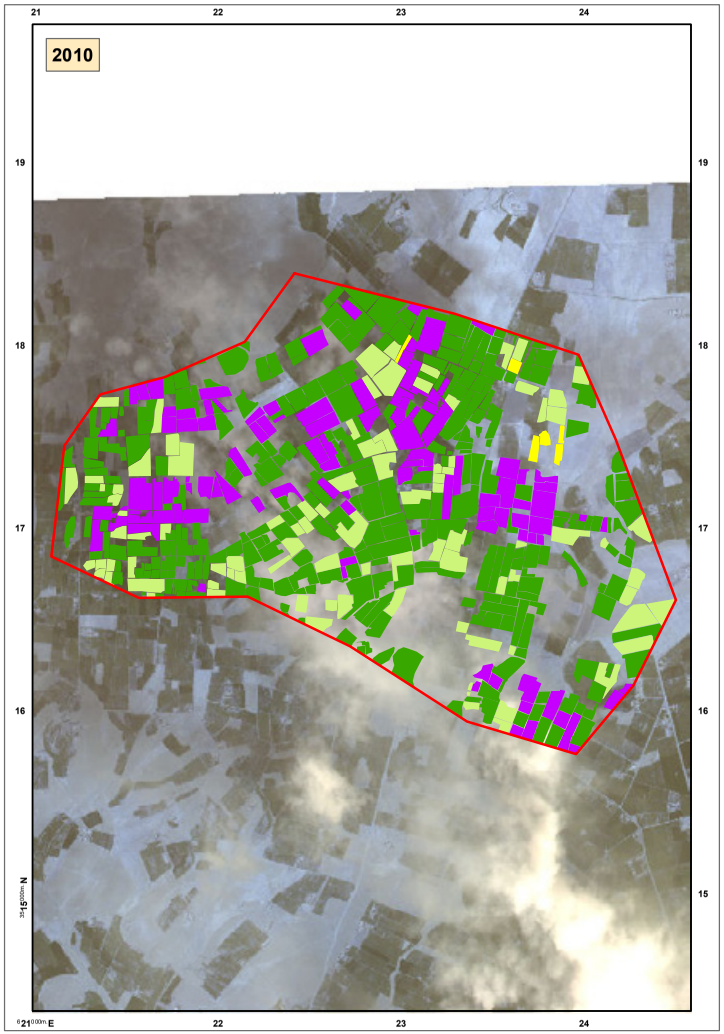


Research Site 19: Sna Jama
Winter Crop Cultivation 2007/2008, 2008/2009, 2009/2010

UTM / WGS 1984 Zone 41N

1:18,000





500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2010 - Rampant Lion 2 Dated April 2008

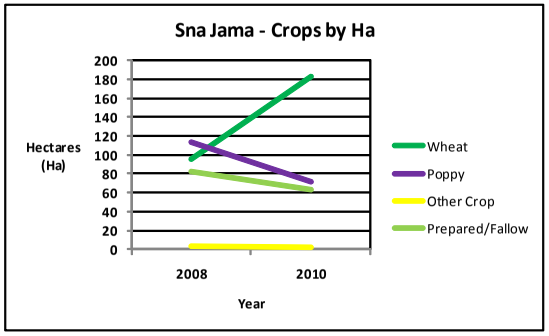
Produced by Alcis Ltd
6th May 2011

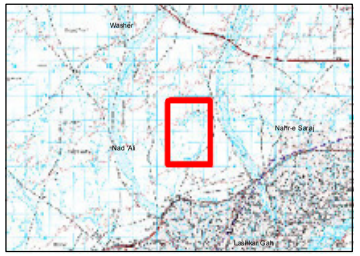
Legend

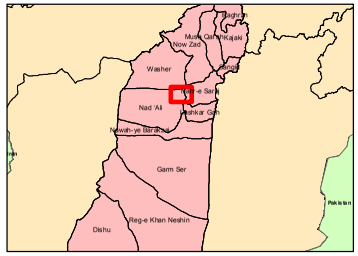
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



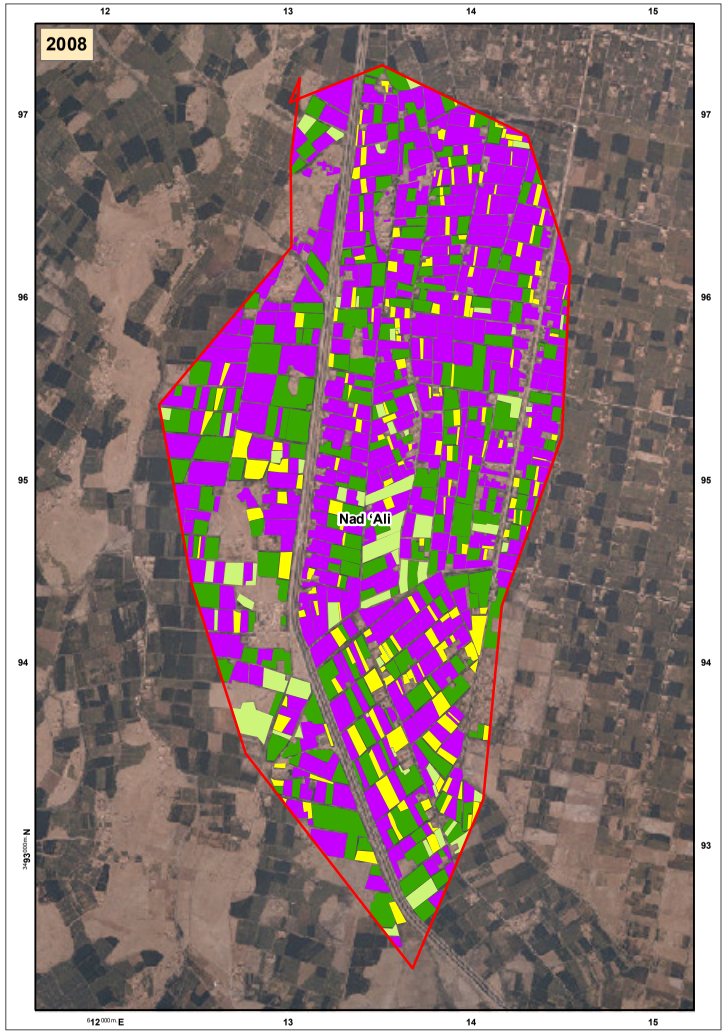


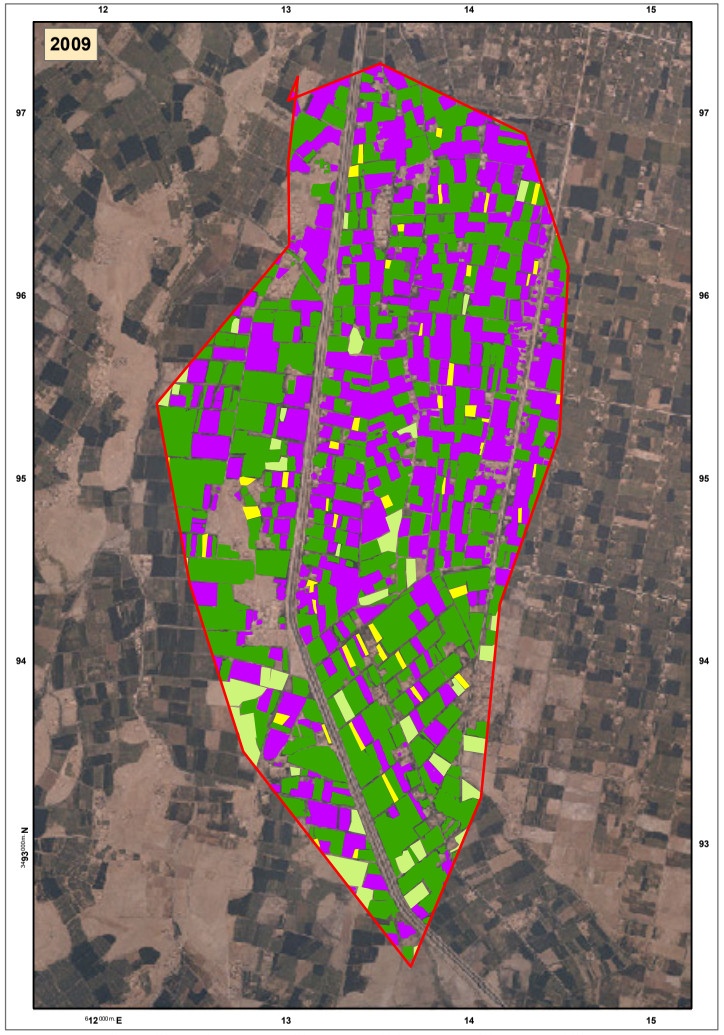


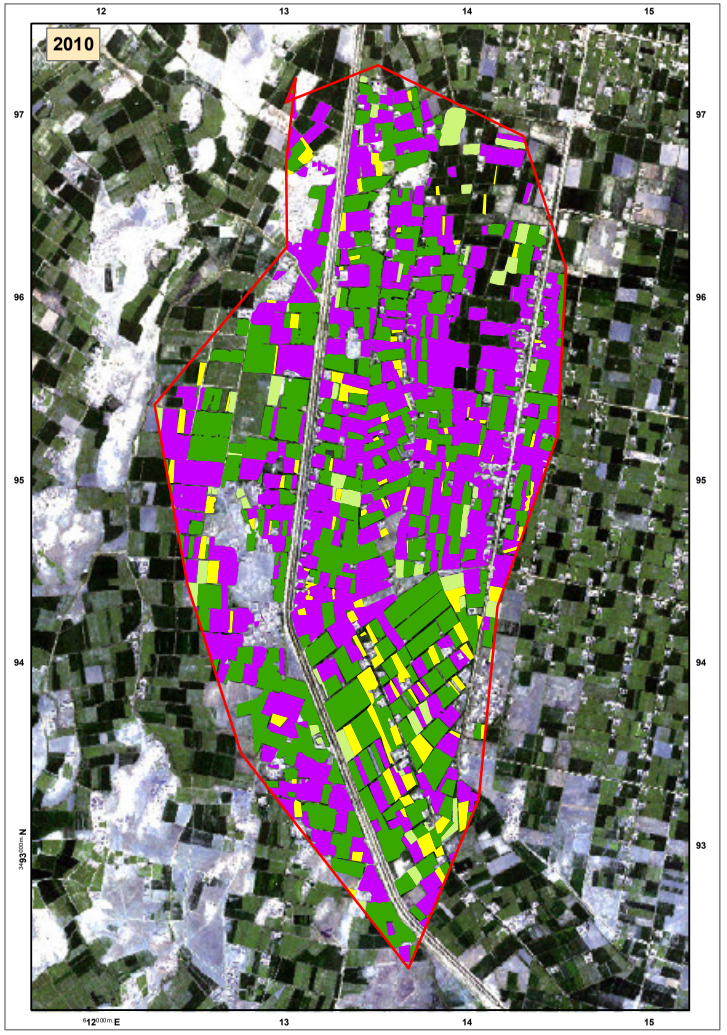
Research Site 20: Keshal Kalay
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:18,000







500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Souce:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

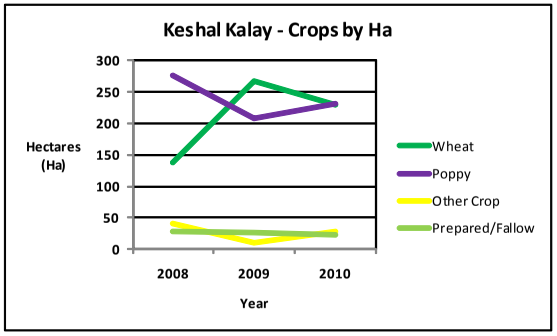
Produced by Alcis Ltd
6th May 2011

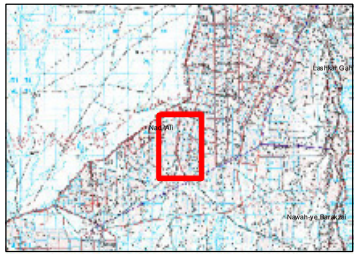
Legend

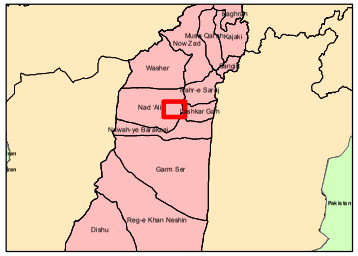
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other Crop
- Prepared/Fallow



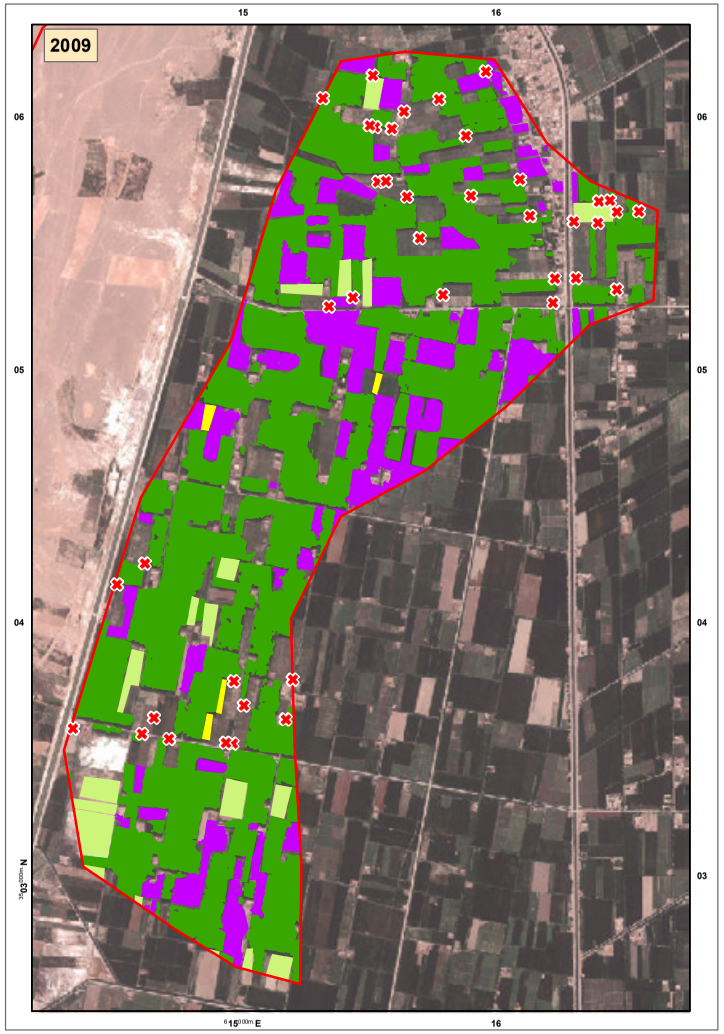




Research Site 21: Shin Kalay
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:13,000



500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Geoeye Dated April 2009
2010 - World View 2 Dated April 2010

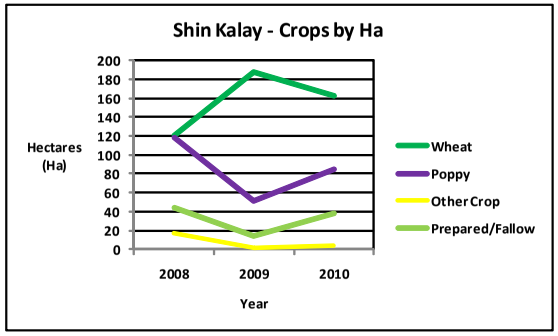
Produced by Alcis Ltd
6th May 2011

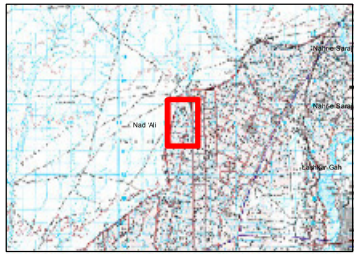
Legend

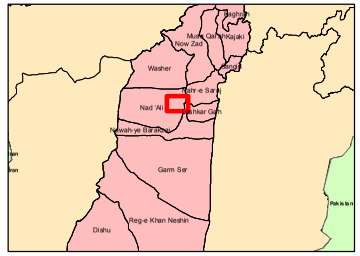
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other
- Prepared/Fallow



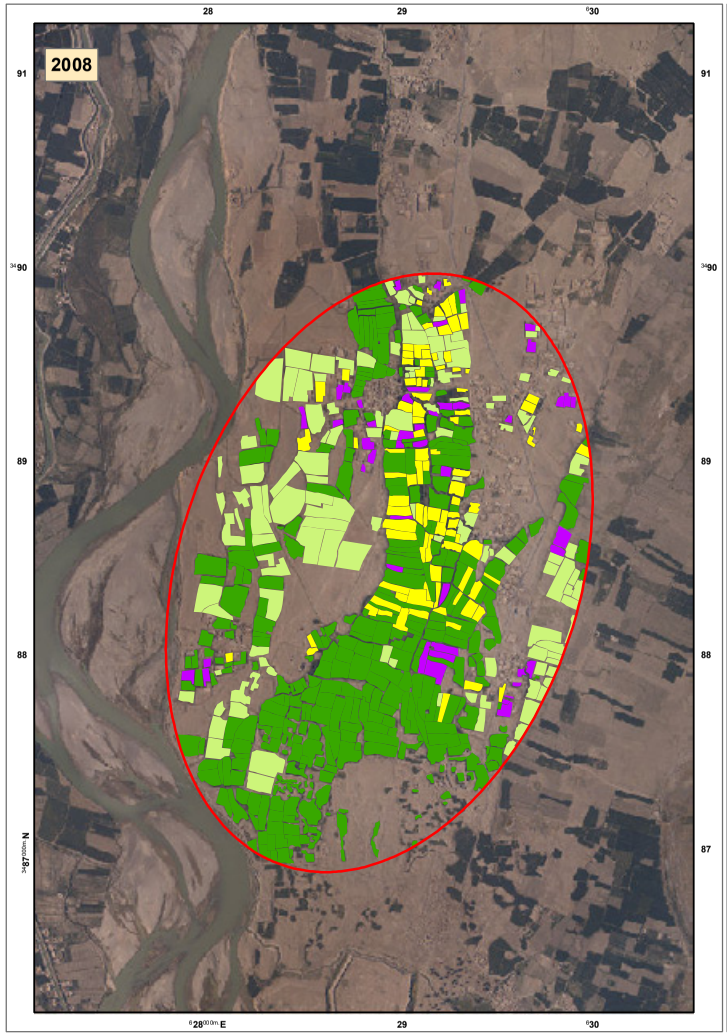


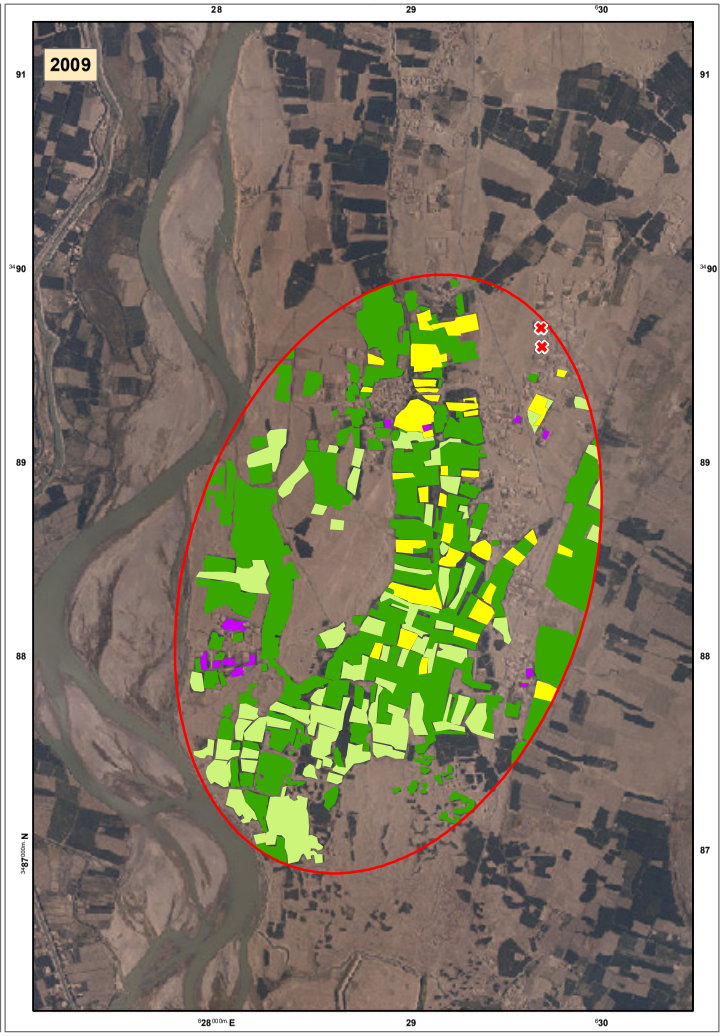


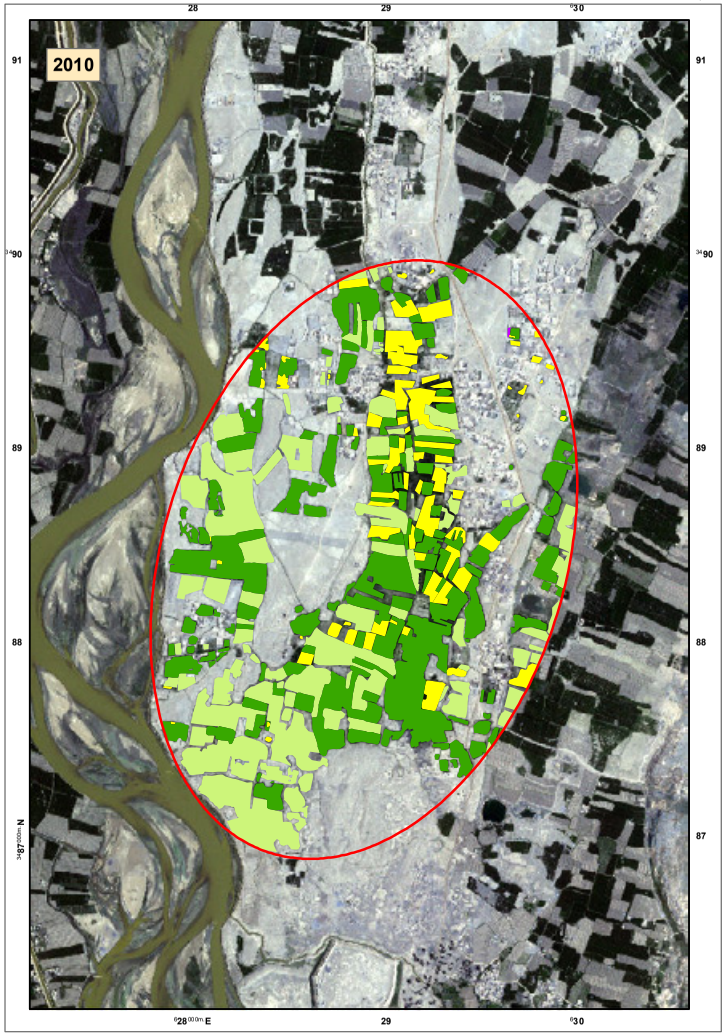
Research Site 22: Qala Bost
Winter Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:17,000







500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

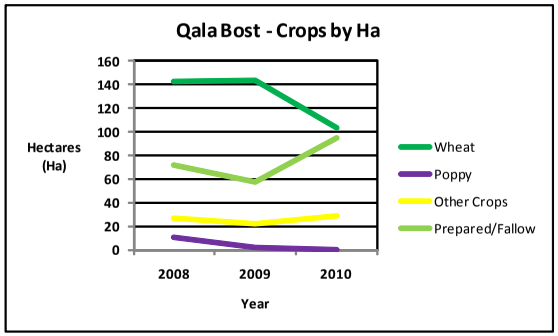
Produced by Alcis Ltd
6th May 2011

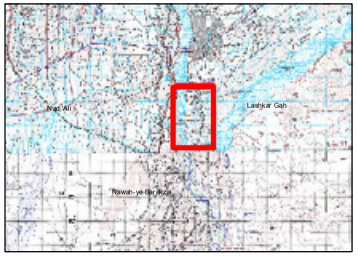
Legend

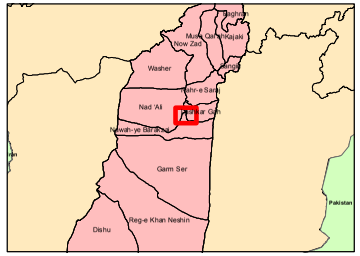
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other Crop
- Prepared/Fallow



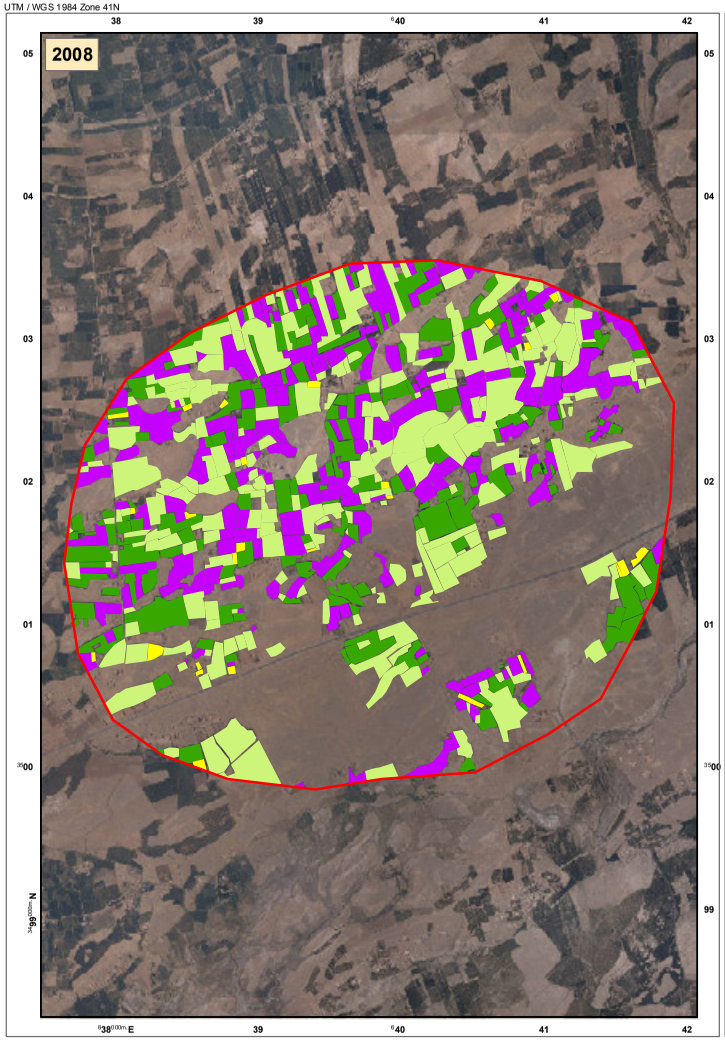


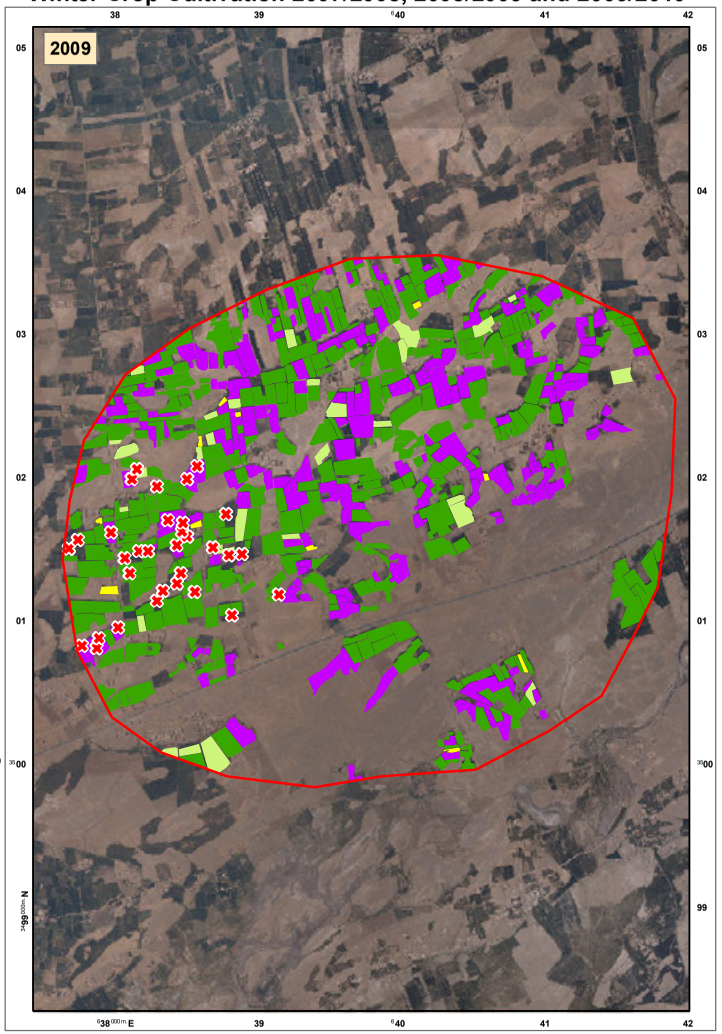


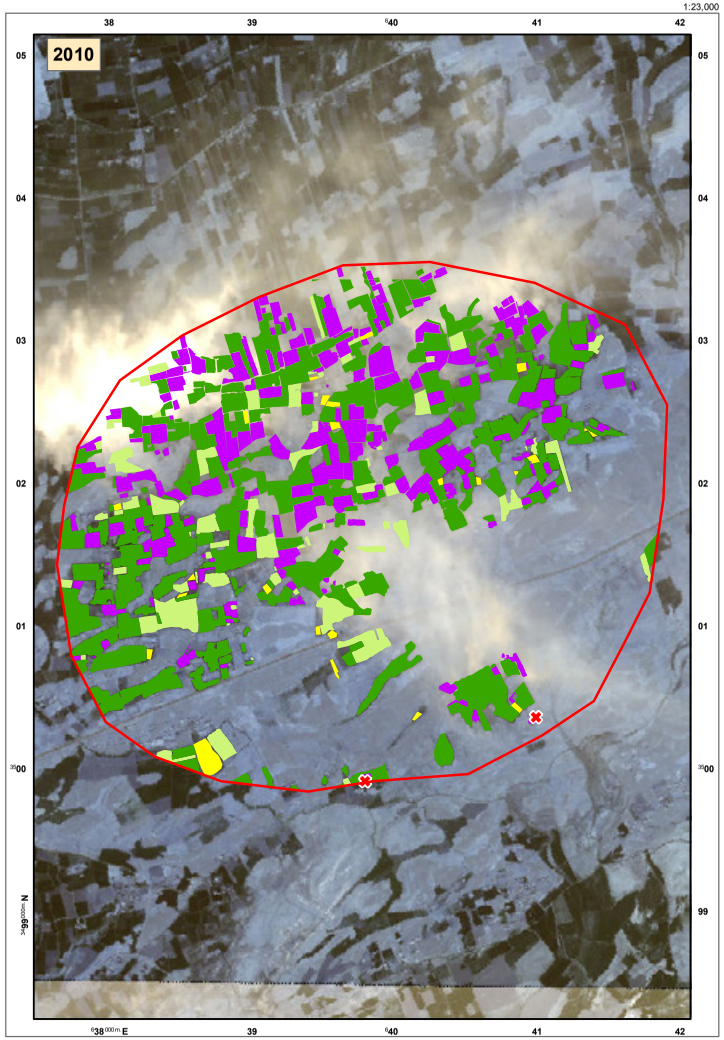
Research Site 23: Mohajerin
Winter Crop Cultivation 2007/2008, 2008/2009 and 2009/2010

UTM / WGS 1984 Zone 41N

1:23,000







500 250 0 500 1,000 1,500 2,000 Metres

Imagery Data Source:
2008 - Rampant Lion 2 Dated April 2008
2009 - Rampant Lion 2 Dated April 2008
2010 - World View 2 Dated April 2010

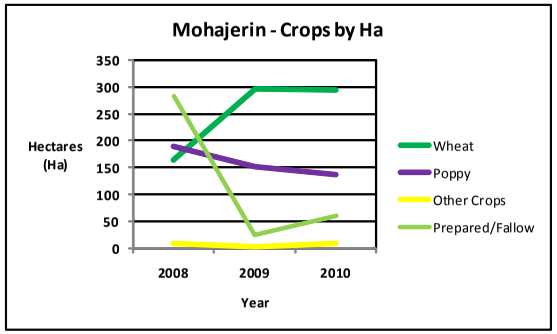
Produced by Alcis Ltd
6th May 2011

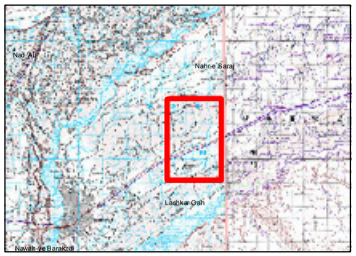
Legend

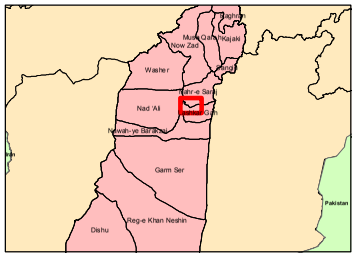
- Eradication Locations
- Research Sites

Crop Type

- Wheat
- Poppy
- Other Crop
- Prepared/Fallow







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