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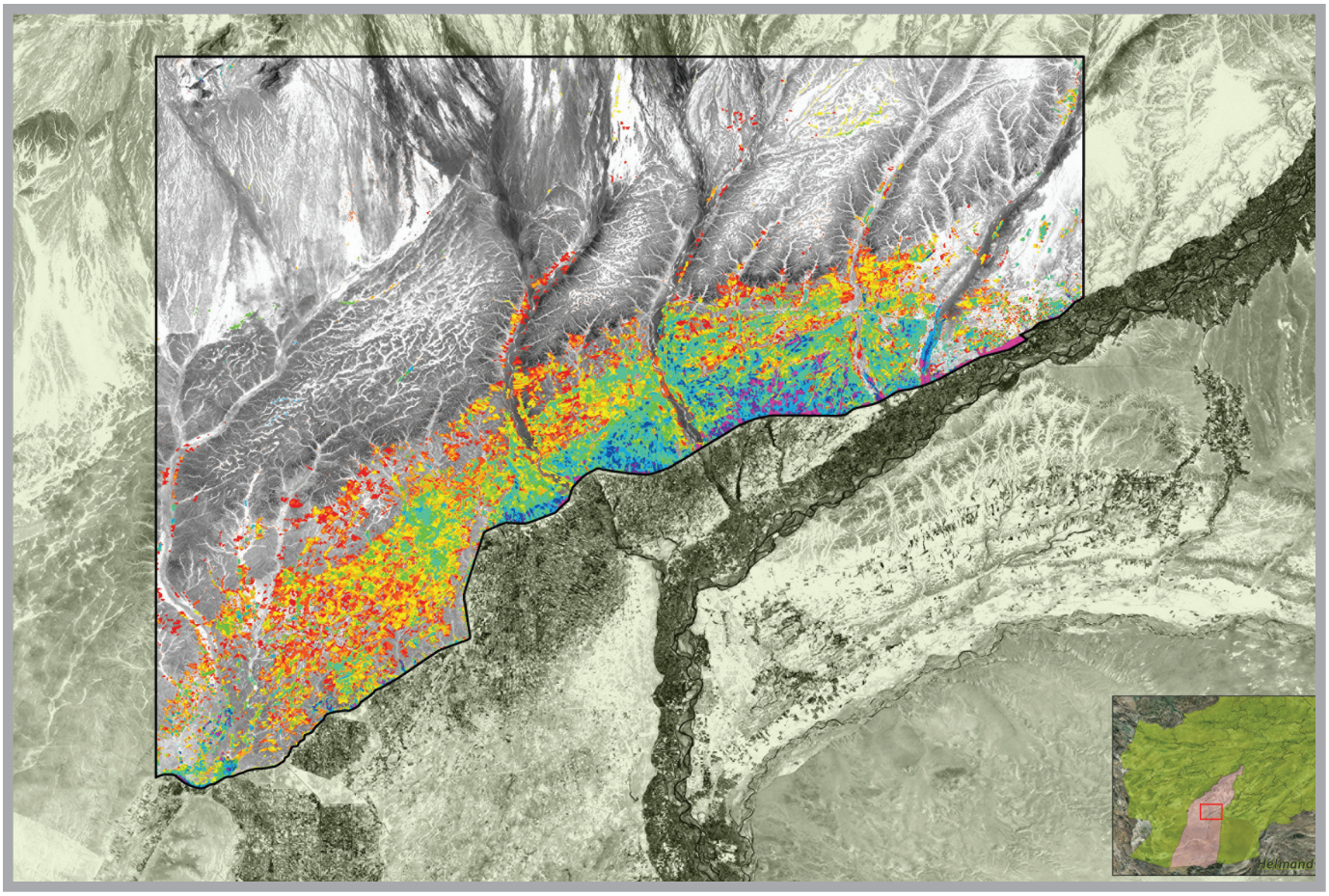

EFFECTIVE MONITORING AND EVALUATION IN CONFLICT-AFFECTED ENVIRONMENTS

AFGHANISTAN POST-2014

David Mansfield

United States Institute of Peace

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About the Report

This report addresses the oversight of reconstruction efforts in conflict-affected environments. Following on from a symposium discussion, this report explains how existing data collection techniques might be supplemented by high-resolution geospatial imagery and analysis and well-focused fieldwork to improve oversight, particularly where state fragility is most extreme. The symposium—"Monitoring and Management in Insecure Environments: Applying Best Practices to Afghanistan"—was sponsored by the United States Institute of Peace (USIP) and the Special Inspector General for Afghanistan Reconstruction.

About the Author

David Mansfield is an independent researcher who has conducted in-depth fieldwork in rural Afghanistan for eighteen consecutive years. His research has evolved with the worsening security situation in rural areas and increasingly combines fieldwork in some of the most insecure parts of rural Afghanistan with detailed geospatial analysis and mapping. Currently a visiting scholar at Columbia University, Mansfield has a doctorate from the School of Oriental and African Studies, London.

Cover photo: Geospatial analysis showing the rapid expansion in land under agriculture in the former desert areas north of the Boghra canal in Helmand province, 2002–2012.

United States Institute of Peace
2301 Constitution Ave., NW
Washington, DC 20037

Phone: 202.457.1700
Fax: 202.429.6063
E-mail: usip_requests@usip.org
Web: www.usip.org

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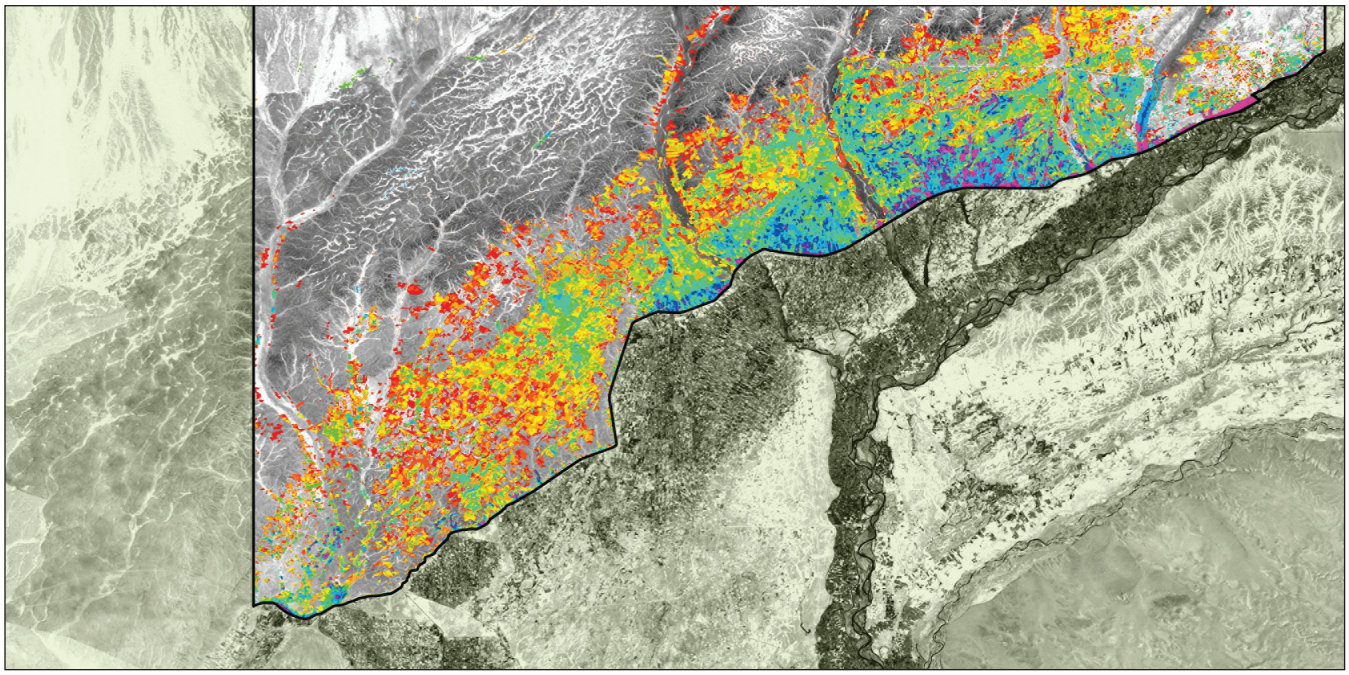

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Summary

- Current methods of monitoring and evaluation in conflict-affected environments such as Afghanistan have typically focused on achievements in more secure and accessible areas where international investment is higher and the population has historically been more attuned to the interests of the state.
- The institutional interests of donors and an overreliance on quantitative data collection techniques, such as polling, has led to this bias in assessing the impact of programs.
- Thus, international organizations often find themselves blind to the outcomes of their investments and to the experience of the population in more contested areas, where state fragility is highest.
- As the conflict has worsened in Afghanistan, oversight of foreign assistance has become even more circumspect. Concerns are growing as to whether current methods offer anything but the most cursory review of program expenditures and outputs.
- To better understand the outcomes of foreign assistance in conflict-affected environments, we need to supplement existing data collection techniques with geospatial analysis and mapping, combined with well-focused fieldwork.
- Although not a panacea, the advent of lower cost and more accessible high-resolution imagery combined with a growing inventory of investments with corresponding global positioning system (GPS) coordinates can support more in-depth analysis of the delivery of infrastructure and agricultural inputs, as well as their subsequent effects, even in the most insecure space.

Introduction

The Afghanistan reconstruction effort—like interventions in many other conflict and post-conflict environments, notably Iraq—has been costly in terms of both "blood and treasure." Officials argue that much has been achieved and that human development indicators would be much worse were it not for the international effort. Others, however, point to increasing levels of violence, instability, and the deteriorating economy to question both the sustainability of results to date and the efficacy of the overall mission.[1] Each side in this debate offers evidence to support its claims, drawing on various sources of data, including official statistics, opinion polls, and program evaluations and audits. That they do makes it increasingly difficult to determine what has been achieved in Afghanistan and how it is distributed geographically, whether it could have been realized more judiciously, and whether we know enough about what worked and what did not to ensure that the next foreign venture will be more effective.

The difficulties of delivering foreign assistance in conflict environments are understandable given the hazardous and often unpredictable environments in which reconstruction and development missions are taking place. The imperative to deliver development assistance to achieve political objectives such as stabilization and counterinsurgency, or to shore up support for the Afghan administration in the run-up to the 2004 presidential elections in the initial years of the reconstruction effort, led to interventions based on limited engagement with local communities and incomplete knowledge of the complex and dynamic political environment. Furthermore, security constraints on the movement of foreign nationals have led to dependence on local implementing partners and large-scale surveys for information on both program performance and the effects of the wider statebuilding project on the local population.

Also referred to as performance and impact (or outcome) measurement, monitoring and evaluation are critical to working in these highly complex and evolving environments. The imperative to act and the challenges of designing and implementing programs in a rapidly changing and fragile environment entail a need to develop a deep understanding of how interventions are playing out on the ground. This requires looking beyond the delivery of program output and the efficacy of financial systems to assess whether the assumptions and theory of change that underpin a given intervention are correct, to identify whether intended outcomes will be achieved, and to identify which groups are benefiting from programs, which are losing out, and how this distribution will affect the local political economy. Mistakes are inevitable—it is part of the development process, particularly in a conflict-affected environment—but it is essential that interventions built on false assumptions and leading to greater instability and deteriorating living standards are not repeated. The need for reliable and impartial evidence on which to base decisions about future and ongoing interventions is essential if good money is not to be thrown after bad and lives are not to be lost in support of failed development programs.

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Current Methods of Assessment

Focus on Outputs

Good development practice requires that programs, whether implemented by specialist organizations or international military forces, be accountable for what they deliver—the activities and outputs within management and budgetary control. How these deliverables translate into outcomes, which if "the population is the prize" might constitute improvements in their lives and livelihoods of the population in a given area, is a function of changes that lie beyond the capacity of a single intervention to deliver. Although development outcomes may be ambitious,

The goal is not only to reduce the risk of wasting finite development monies but also to mitigate the effect of poor performing interventions on the population's perception of the government and the international statebuilding effort.

and sometimes realized only years after a program has finished, managers of development programs need to be aware of the impact their interventions are having on the target population if they are to remain on track and not make matters worse. The goal is not only to reduce the risk of wasting finite development monies but also to mitigate the effect of poor performing interventions on the population's perception of the government and the international statebuilding effort, which development assistance programs are assumed to support.

In a conflict-affected state such as Afghanistan, this kind of performance measurement is particularly important given the rapidly changing environment, the multiple and often competing actors involved, and the paucity of information on primary stakeholders, particularly in rural areas. The pressure to act, and often to act quickly, has been instrumental to western military ambitions to win the rural population's support for the reconstruction effort and the Afghan state. Concepts such as "clear, hold, and build" and the pressure from the military to use "money as a weapon system" increasingly led both to development assistance focused on overtly political and military objectives and to donor compromise on many of the principles that guided program design and implementation before the so-called war on terror.[2]

In Afghanistan, many development programs were designed despite the paucity of basic demographic data, let alone more detailed information on the diverse political economy of rural communities. As a result, programs have often made assumptions about how groups within the population might respond to interventions, drawing on experience in other countries and data that is not representative of Afghanistan and therefore not representative of the full range of possible outcomes. The high turnover of international staff, growing insecurity, and constraints on the ability of international staff to travel left many professionals in the development community uneasy about their ignorance regarding what was happening on the ground.

Measuring program performance and the impact of the wider reconstruction effort has been particularly problematic in rural Afghanistan. It has led to an increasing dependence on implementing organizations—including the national government, nongovernmental organizations, and private contractors—for accurate information.[3] Concerns over the veracity of the data provided and the need for greater accountability to elected bodies in western capitals have led to a demand for third-party monitoring, such as with the Afghanistan Reconstruction Trust Fund established by the World Bank and the Comprehensive Agriculture and Rural Development–Facility (CARD-F) funded by United Kingdom's Department for International Development (DFID) and the Danish International Development Agency. In the United States, oversight of the bilateral reconstruction program has been provided by the Special Inspector General for Afghanistan Reconstruction (SIGAR), the inspectors general from the respective implementing agencies, and the U.S. Government Accountability Office. Although important arbiters of value for money, many of these independent monitoring agents have concentrated on financial reporting and on value-for-money criteria. Data on the impact of interventions on the Afghan population have largely remained beyond their brief, despite its importance in understanding the efficacy of current and future programming.

At the program level, reporting has typically focused on delivery of activities and outputs. Efforts to generate a deeper understanding of program outcomes remain inadequate. For example, rather than actually measure achievements at the objective and goal level, performance management plans (PMP), such as those developed by the U.S. Agency for International Developement (USAID), often convert activities and outputs into outcomes based on what may prove to be inaccurate assumptions. The PMP for the Commercial Horticulture and Agricultural Marketing Program, for instance, assumed that all those that received agricultural inputs

would establish the crops and then, through a series of equations, translated this assumed planted hectarage into increases in private sector employment, hectares under improved irrigation, and area under alternative development.[4] The original Helmand Road Map applied the same logic, resulting in the provincial reconstruction team (PRT) report that it was achieving its stabilization objectives on the grounds that activities were implemented.[5] Similar assumptions have emerged in other UK-supported development programs, resulting in overgenerous reporting on the number of jobs created and growing levels of income.[6]

Even independent evaluations conducted toward the end of a program have found it difficult to generate meaningful impact data. Funding and travel constraints have led to reliance on information from implementing partners and other institutions with a vested interest in the success of the program. In many cases, local staff from the implementing organization are tasked with data collection in the field, violating one of the principles of monitoring and evaluation.[7] When fieldwork is conducted by independent evaluators, it often takes place in the more accessible, secure areas. Even the celebrated randomized impact evaluation of Afghanistan's National Solidarity Program limited its inquiry to safer districts, even though at the time the program had been implemented in some of the more troubled parts of the country, including the southern province of Helmand.[8]

The result is evaluations that are often partial and speculative, riddled with conflict of interest, and scant on the likely sustainability of results. Faced with limited impact data and only provincial estimates of changes in agricultural production, the tendency is often to generalize results from locations where outcomes are a function of more favorable circumstances.[9] Finally, questions arise over the impartiality of independent assessments given the growing dominance of a few large consultancy companies. After all, it is one thing to mark your own work, but it is equally problematic to mark that of your main commercial rivals.[10] In the absence of meaningful impact data, programs have often been found wanting. In its 2014 review of DFID's Growth and Livelihoods Program, the Independent Commission for Aid Impact—an independent body set up to scrutinize UK aid—questioned the credibility of the results reported by DFID and called for it to "enhance its approach and commitment to independent monitoring in order to assess current and future project performance and allow it to assess the impact of its program."[11]

Limits of Surveys

Without program-level data and a methodology to measure the impact of intervention on the welfare of the Afghan population, reliance on national and provincial surveys designed to measure attitudinal change among the Afghan population is growing. From the Asia Foundation's (TAF) Annual Survey of the Afghan People to more provincial-based polling exercises, such as the Helmand Monitoring and Evaluation Program (HMEP), polling has often been used to measure the Afghan population's changing perceptions and thereby infer the success of the international reconstruction effort.[12] Questions are often attitudinal and ask how the population views the Afghan government, the work of international donors, and the military, or in some cases the specific program being delivered. Changes in responses to these questions are monitored and are often used as a measure of the performance of the wider statebuilding and reconstruction effort at both national and provincial levels.

Concerns about the efficacy of large-scale attitudinal surveys in the context of a conflict-affected environment like Afghanistan are long-standing.[13] In large part, this is a function of the certainty often attributed to the results of these methods. David Edwards, an anthropologist

with almost forty years of experience in Afghanistan, argues this way: "In the realms of 'social sciences,' survey research tries to approximate [data that conveys a degree of certainty], but particularly in places like Afghanistan, such research—especially when coached in the statistical language of percentages and coefficients—conveys a spurious sort of precision that is likely to mislead those who take it seriously."[14]

However, genuine concerns about the way survey data is collected and the tendency of respondents to answer questions in such a way that others will view them favorably, a phenomenon known as social desirability bias, are significant. Indeed, a 2010 DFID-funded statistical review of the Asia Foundation survey pointed out that "while social desirability bias can be present in any opinion poll, anywhere in the world, in societies such as Afghanistan, where individual rights can be constrained by culture and tradition, and dominated by social hierarchies, social desirability bias is more likely to color opinions on contentious political social and security issues."[15] The analysis showed that social desirability was even more pronounced in insecure areas, particularly in the southwest, where "an abnormally high number of respondents believed it was inappropriate to criticize the government publicly." The degree of social desirability was such that the review expressed "significant concerns about the use of statistics emanating from these contentious questions" and recommended that a caveat should be offered as a footnote to TAF data highlighting the problems of bias.[16]

The impact of social desirability bias on survey results is most obvious in the representation of sensitive or illegal behavior, such as household data for opium poppy cultivation in Afghanistan. For example, HMEP reported that only 3–5 percent of households in Helmand earned a revenue from opium in 2013 despite the scale of cultivation in the province, which had risen from 75,176 hectares to 100,693 hectares between 2012 and 2013, and some areas reaching as much as 62.5 percent of agricultural land.[17] Other surveys show the same systematic underreporting of opium poppy levels, including the large-scale ones such as the National Risk and Vulnerability Assessment (NRVA) and more limited ones such as those by Incentives Driving Economic Alternatives–North, East,West (IDEA-NEW) and most recently Measuring Impact of Stabilization Initiatives (MISTI).[18] Many of these surveys warn of the potential for a "high degree of social desirability bias" with regard to opium poppy—a crop that can be seen and measured using remote sensing.[19] They are much less candid, however, about the impact of social desirability on data on phenomena that are equally sensitive but almost impossible to verify—such as attitudes to government institutions, international military forces, corruption, the Taliban—but just as vulnerable to bias, especially when respondents are interviewed when others are present (a common occurrence in Afghanistan).

In large areas of Afghanistan, those who work for nongovernmental organizations or institutions connected with the government find it almost impossible to travel. In these areas, anyone asking questions is viewed with suspicion.

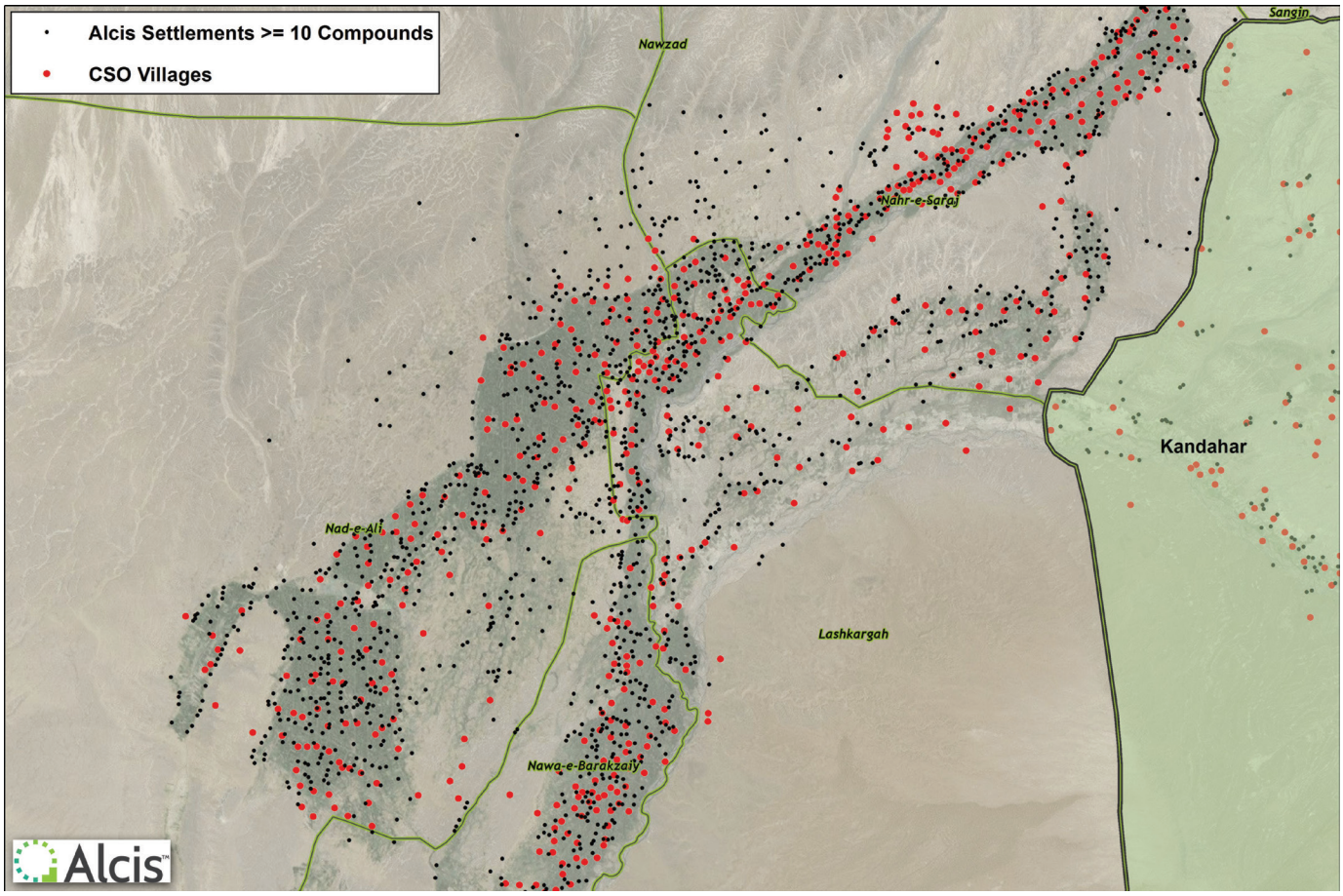
The problems related to conducting formal surveys in more remote and insecure areas with scant history of state presence have also led to favorable reporting. In large areas of Afghanistan, those who work for nongovernmental organizations or institutions connected with the government find it almost impossible to travel. In these areas, anyone asking questions is viewed with suspicion and may be stopped, searched, and have their phone checked for links to international organizations or the government. Given this situation, it is understandable that enumerators asking questions on sensitive subjects are reluctant to venture into insecure areas and interview households at random.

TAF and other surveys have sought to address this problem by interviewing people from insecure areas when they travel to district markets, but this has been no substitute for fieldwork in situ. On the whole, polling has emphasized increasing sample size in more accessible areas where the government writ prevails and development assistance has been more generous, rather

than capturing data on the divergent socioeconomic, political, and environmental conditions more broadly within provincial and district boundaries. The result has often been more positive data—more pro-government, anti-insurgent, and optimistic about security and economic growth—than that from surveys across a wider geographic area that includes places where the state does not have a history of control and is typically seen with some antipathy.[20] For example, a survey of 509 respondents in the Kandahar district of Maiwand claimed that 72 percent of the population reported "a lot" of the Afghan National Army (ANA) in their area, 77 percent had confidence in the ANA, and 53 percent said that no armed opposition groups were in the area.[21] Given the district's historical links with the Taliban, the prevailing levels of insecurity, and the widespread opium poppy cultivation that the government has been unable to eradicate, it is hard to believe that this data is representative of the district's population as a whole.

In fact, as figure 1 shows, the Central Statistics Office (CSO) database of villages, from which most surveys base their sampling, does not include swathes of the population who have settled in what was formerly desert in south and southwest Afghanistan. Over the last decade, this has become a sizeable population, in the hundreds of thousands, people who relocated to

Figure 1. Locations of Alcis Settlements versus CSO Villages, Helmand



Locations of CSO village settlements as reported by its enumerators on the ground in red and those mapped by Alcis using high-resolution remote sensing imagery in central Helmand, including those in the former desert area north of the Boghra canal.

Source: Image source data was supplied by ESRI.

these desert areas precisely because they are remote from government and who typically have rather negative views of the Afghan state.[22] Yet their views are not reflected in the vast majority of surveys and polls because officially they do not exist. Even when they are recognized and included, they live in areas that are too insecure for conventional polling and survey techniques.[23] The result is even greater bias toward more positive perceptions of the state and the reconstruction effort, as well as to relatively wealthier members of the Afghan population.

In sum, large-scale surveys and polling have presented not only an analytical gap in terms of the causal link between program interventions and either political change or population welfare, but also a knowledge gap about what is happening in parts of the country that current data collection techniques ignore. The challenge is how to develop a deeper understanding of the impact of reconstruction efforts across a wider geographic area than current surveys offer, particularly as access for internationals diminishes and what SIGAR calls the oversight bubble contracts. The reason for a broader assessment is not simply accountability and the ability to report on the effect of previous and ongoing development and stabilization programs. This work has an important diagnostic value as well in developing a deeper knowledge of the evolving and diverse political and economic topography of conflict-affected areas. Such efforts provide a much stronger sense of the welfare of large sections of the rural population historically beyond the reach of the Afghan state and often engaged in resistance and rebellion.

Understanding Conflict-Affected Environments

Physical Space in Monitoring and Evaluation

Two major deficiencies in the current performance measurement system in Afghanistan shape the requirement for more effective monitoring and evaluation in conflict-affected states.

The first is the tendency to claim representative samples: collecting data in more secure spaces and presenting it as typical of a population or area as a whole. Ultimately, working in conflict-affected states entails a requirement to better understand the diverse political topography. Understanding how reconstruction affects areas where the population is concentrated is also important. However, it may be even more important to understand the impact that international assistance and the statebuilding effort have in areas where state penetration is weak and access is negotiated because they are also often the source of state fragility.

The second deficiency is that many international staff cannot travel even to some of the more accessible parts of a country. This constraint hampers the capacity of international staff to act as discerning consumers of the data produced by implementing programs, factions within a conflict, and host governments. This environment is unlikely to change in the foreseeable future, given the legal obligations of donor nations as well as the political ramifications of staff being injured or killed overseas. At the same time, increasing levels of assistance are funneled to countries where international staff operate from within heavily fortified offices, such as Somalia, Syria, Libya, Yemen, Afghanistan, and Iraq. This leaves international professional staff blind to what is happening across large swathes of the countries and dependent on other observers for information, many of whom have different institutional and commercial interests. Both policy and operational staff need data that reflect the diverse political topography, are both independent and verifiable, and can be further investigated and used effectively.

Many programs under evaluation aim to bring a change in the physical environment, primarily by providing infrastructure, such as roads, schools, and health centers; irrigation works, such as protection walls and check dams; or even agricultural inputs. These project activities

subsequently seek to bring about wider socioeconomic, political, and environmental change, which can in turn manifest in changes to physical space in target areas and beyond. For example, many rural development programs provide seeds, fertilizer, improved irrigation systems, and market support that lead to improved yields and take-up of new and more remunerative cropping systems, which might include orchards, vineyards, and vegetable production rather than cereals. Road building is intended to catalyze economic growth and might be accompanied by an increase in market infrastructure, roadside shops, and market opportunities for farmers, such as greater diversification into high-value, annual, and perennial crops. Finally, unintended consequences of the reconstruction effort may also have physical manifestations (see figure 2).

Both the deficiencies in the current system and the physical change that reconstruction and development can entail suggest the advisability of much greater use of geospatial data and analysis in monitoring and evaluation. Although not a panacea, geospatial data can support more effective monitoring of outputs and outcomes and help build a more nuanced understanding of the economic and political terrain in the given country.

Figure 2. Land Under Agriculture, Camp Bastion, Helmand

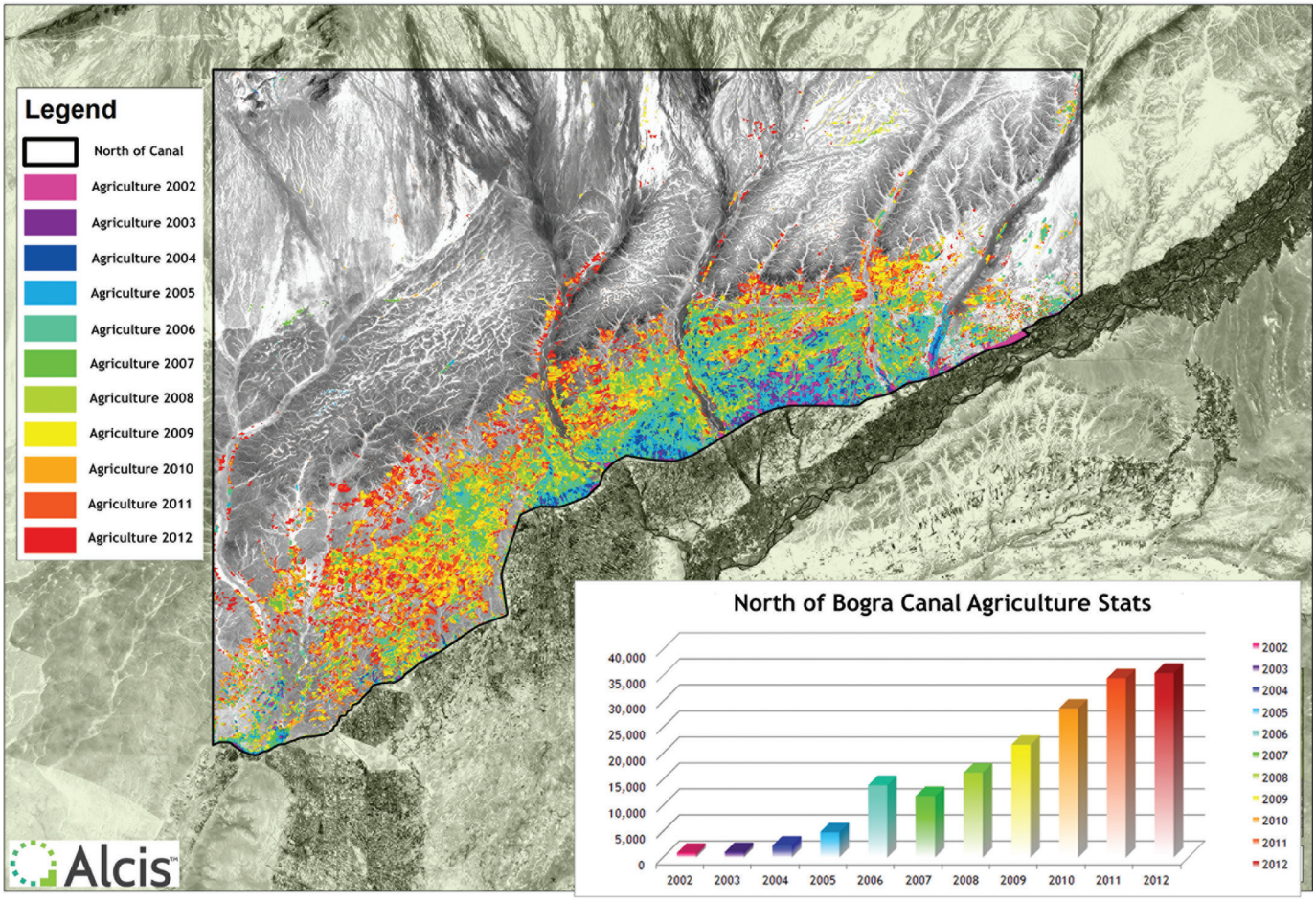
Changes in the amount of land under agriculture (and poppy cultivation) following the close of Camp Bastion/Leatherneck. The February 2014 image shows water stored inside the base as well as the run-off subsequently used to irrigate poppy along the perimeter wall of the base. The March 2015 image shows the lack of storage water and run-off and a substantial drop in land under agriculture, including poppy cultivation.

Moreover, for some time, USAID's implementing partners have collected data on the location of project activities using GPS, and since 2009 this has been input into Afghan Info, the USAID mission's knowledge management database.[24] The U.S. military has also collected GPS data in its development projects, particularly those established through the Commander's Emergency Response Program.[25] Calls to integrate new technologies into program assessment are increasing.

Using smart phones and GPS-enabled cameras to collect data does not go far enough, however. Emphasis remains on verifying activities and monitoring outputs. Even projects such as USAID's proposed Monitoring Support Project demonstrate the lack of ambition when it comes to integrating high-resolution remote sensing data into evaluating program outcomes. At a cost of $170 million, the project's primary objective is to "provide USAID/Afghanistan with an additional layer of data on project implementation." It calls for GPS tracking, photography, and crowd sourcing to assess the delivery of outputs and solicit the views of beneficiaries, but imagery analysis for measuring program outcomes is limited.[26]

This seems to be a missed opportunity. In Afghanistan, geospatial imagery and analysis has already shown its utility as a tool for developing a deep understanding of changes to the physical environment (see figures 3a and 3b). What is now needed is a much closer integration of geo-

Figure 3a. Agriculture Expansion North of Bogra Canal, Helmand



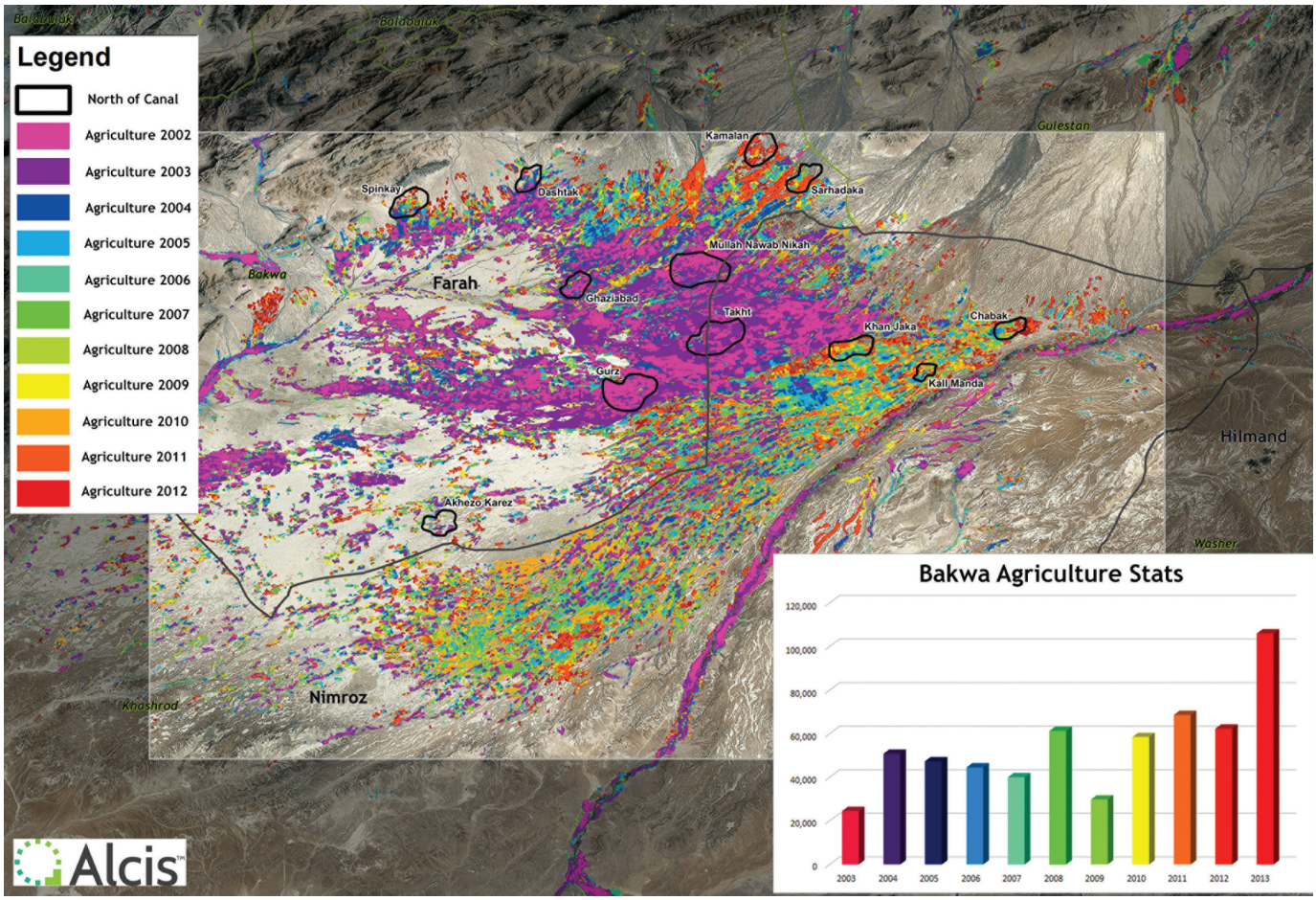
spatial imagery and analysis into ongoing monitoring and evaluation. The next section describes how such analysis can help develop a deeper understanding of the local environment for program managers, provide verification of program outputs, and inform operational decisions so that corrective action can be taken where necessary. Most important, when combined with sharply focused primary data collection, geospatial imagery and analysis provide a mechanism to examine why some populations experience improvements in their lives and livelihoods but others do not—a critical, but all too often missing, component of much current evaluative work in Afghanistan.

Integrating GIS with Primary Data Collection

Geospatial imagery and analysis, when integrated with primary data collection in rural areas, can be a dynamic tool in program management in conflict-affected areas, including in the assessment of program outputs and outcomes.

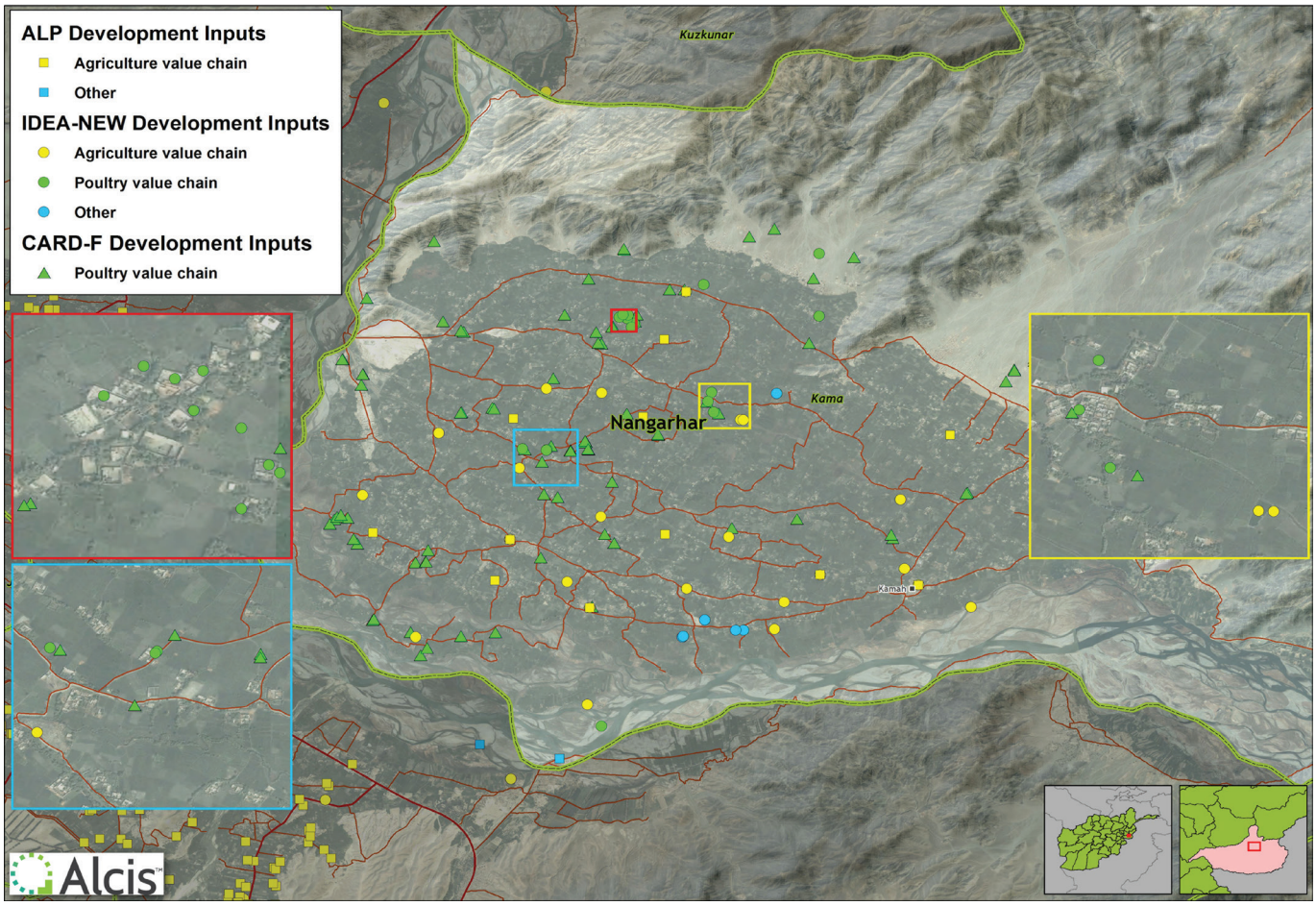
At the most basic level, geospatial imagery analysis allows program activities and outputs to be mapped, which in turn supports examination of the geographic distribution of investments. Programs can also be mapped alongside others to investigate possible duplication of effort,

Figure 3b. Agriculture Expansion in Bakwa



Imagery confirmed the extent of the expansion of agricultural land into the former desert areas of Helmand and Farah; fieldwork revealed the socio-economic and political processes that had led to the settlement.

Figure 4. Project Activities in Kama District, Nangarhar by ADP East, IDEA-NEW, and CARD-F



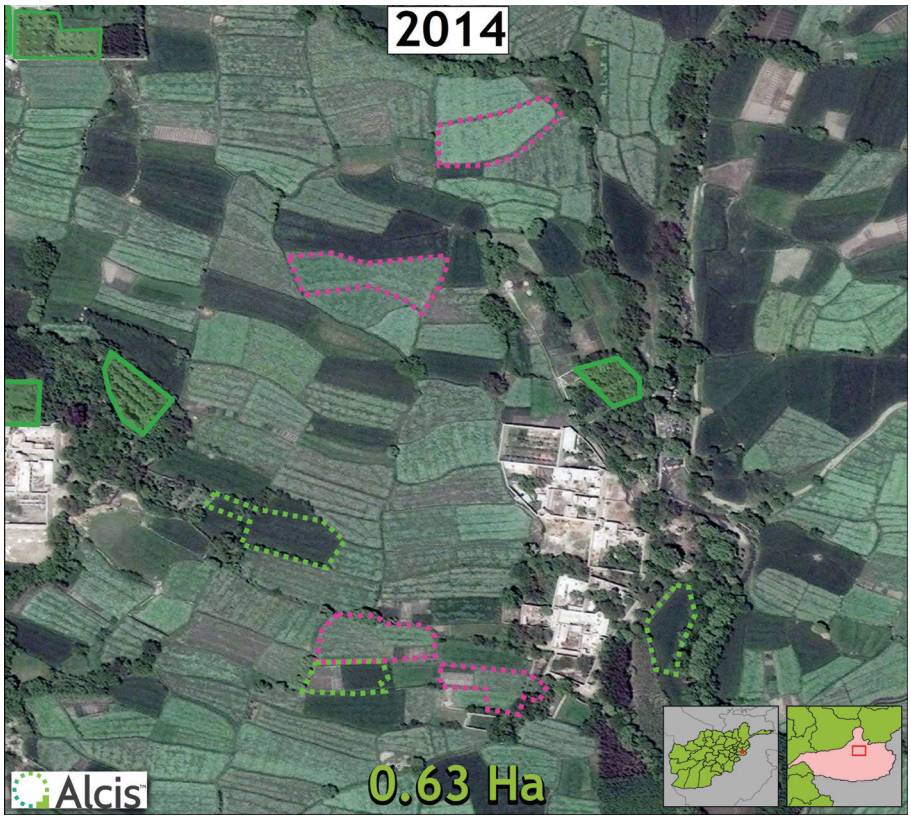
Multiple poultry programs in operation in Kama district, Nangarhar.

compare results, and assess the efficacy of continuing specific interventions using discrete and well-focused fieldwork. Figure 4, for example, shows the location of project activities for three development programs in the district of Kama in Nangarhar: DFID's CARD-F (EDP 3), USAID's IDEA-NEW, and Alternative Livelihoods Program–Eastern Region. Both the volume of delivery and those areas where poultry projects delivered by CARD-F in the districts of Kama (EDP 3) are in some places very near similar ones implemented by IDEA-NEW are noteworthy.

Use of historical high-resolution imagery supports a more detailed examination of program outputs and outcomes. In particular, it is possible to examine whether program inputs are used at all and, if they are, whether they are sustained for the duration of a program and beyond. For example, inputs such as greenhouses, polytunnels, and saplings are clearly visible and can be mapped over time and location. Saplings can be seen to be abandoned and replaced with other crops (see figure 5), and in some cases polytunnels and greenhouses may not be erected in the first place (see figure 6).

Figure 5. Evaluation of IDEA-NEW—Monitoring the Change in the Coverage of Orchards

Figure 5. Evaluation of IDEA-NEW—Monitoring the Change in the Coverage of Orchards, cont.



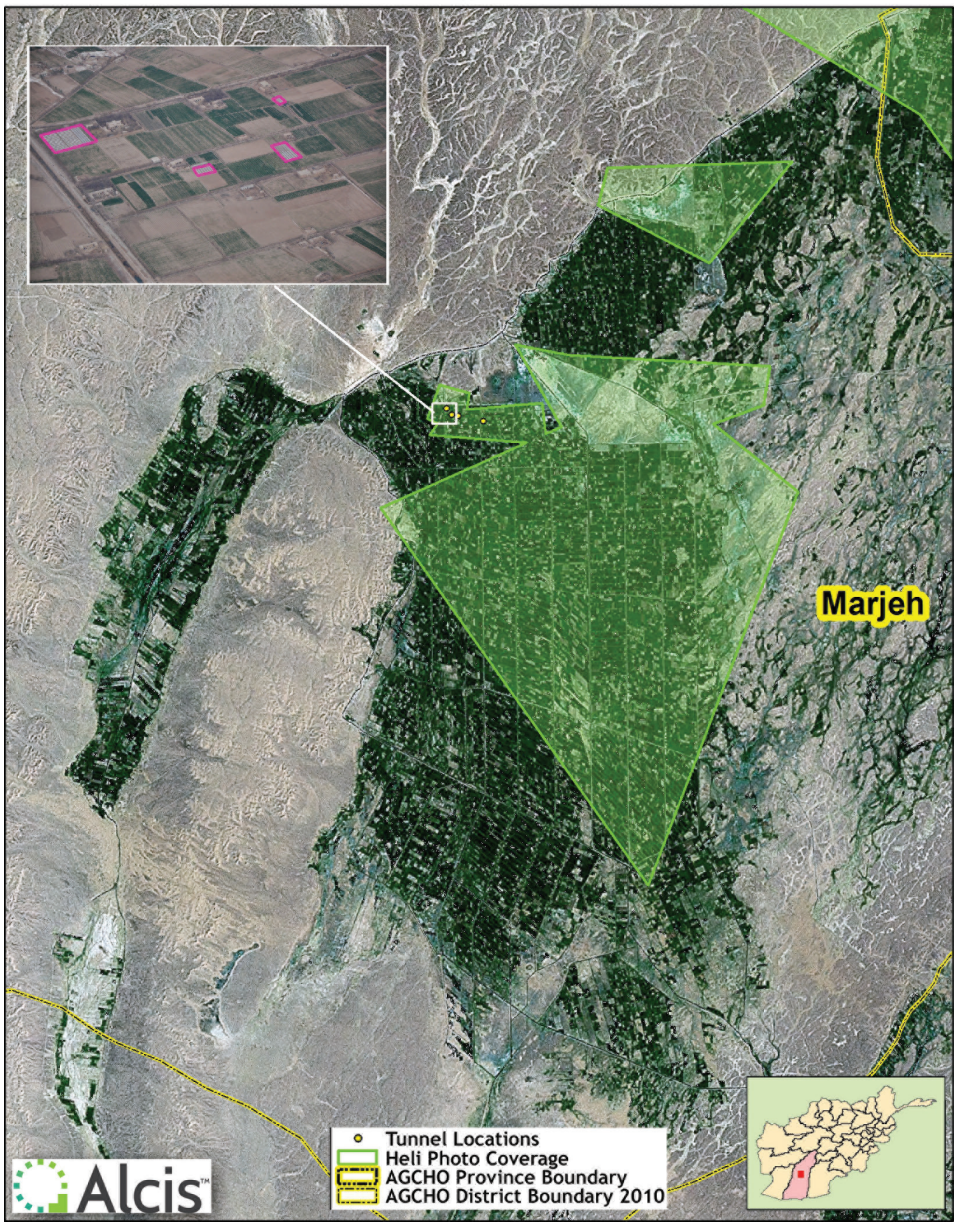
Uptake and replacement of orchards in Khogiani, Nangarhar, between 2007 and 2014.

The effect of investments in infrastructure can also be investigated using high-resolution imagery. Figure 7, for example, shows the location of an irrigation project, and the subsequent repairs in 2009 and 2014, in Pachir wa Agam in Nangarhar before and after work was completed. Figure 8 provides a measure of the land irrigated by the improved irrigation system in 2014 once the project was complete. Figure 9 identifies the crops cultivated under that irrigation system—of which almost 95 percent is opium poppy. This use of historical imagery thus allows program outputs to be assessed for quality, sustainability, and subsequent use. The use of other sensors and measures, such as those that look at vegetative quality, can also assess agricultural yields, offering—when combined with other market data—a sense of the economic effect of the intervention.

Even more detailed imagery and analysis will allow cropping patterns to be identified and tracked over time (see figures 10 and 11). Although resource intensive, crop identification and mapping is particularly useful, given that the uptake of high-value perennial and annual horticultural production is a measure of utilization rates, a desired outcome of many rural development programs, and an indicator of both livelihood resilience and evidence of a sustained reduction in opium poppy cultivation.

From the physical presentation of data and this initial analysis of imagery, it is possible to move onto more diagnostic work and begin to explore why different patterns of outputs

Figure 6. Location of Polytunnels, Marjeh, Helmand



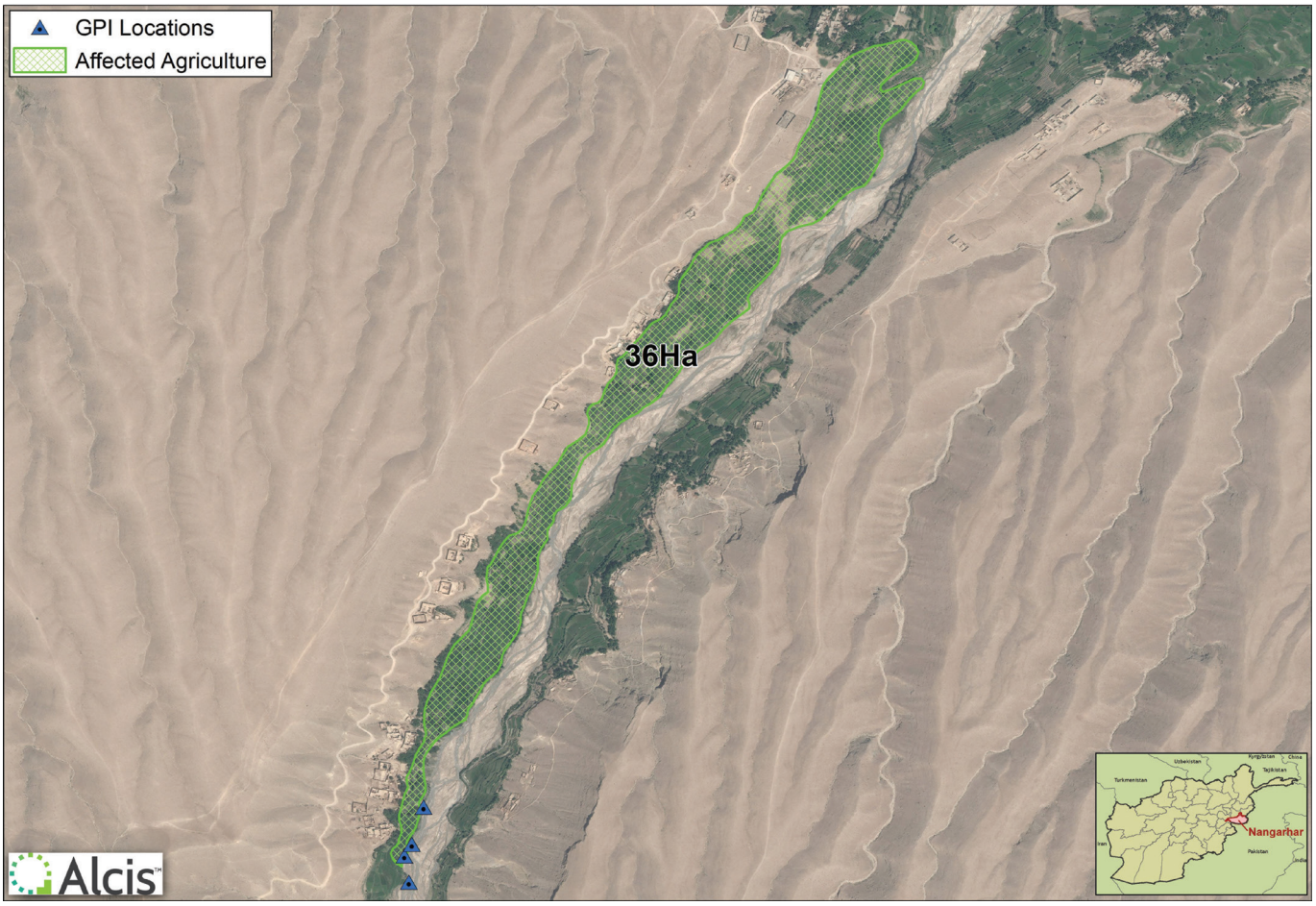
Fieldwork found that farmers were not using the approximate fourteen thousand polytunnels that had been distributed in Marjeh during the AVIPA Plus program due to elite capture, concerns over Taliban intimidation, and limited market opportunities for high-value horticulture in the area. Imagery revealed a concentration of polytunnels on the land of only a few farmers around Fort Hanson, an International Security Assistance Force base and an area with good road access to Lashkar Gah.

and outcomes occur as a way of informing program design and implementation.[27] This step requires identifying a number of locations for primary data collection that offer contrasting experiences, such as levels and types of development investment, rates of adoption of program inputs, incidents of violence and insecurity, proximity to major markets and roads, and perhaps even histories of land settlement, opium poppy cultivation, or drought.

Figure 7. Location of Good Performance Initiative (GPI) Irrigation Projects in Pachir wa Agam, Nangarhar

Location of the irrigation system in 2009 and identification of the status of the repairs in 2014, Pachir wa Agam, Nangarhar.

Figure 8. Area Irrigated Under GPI Projects, Pachir wa Agam, Nangarhar

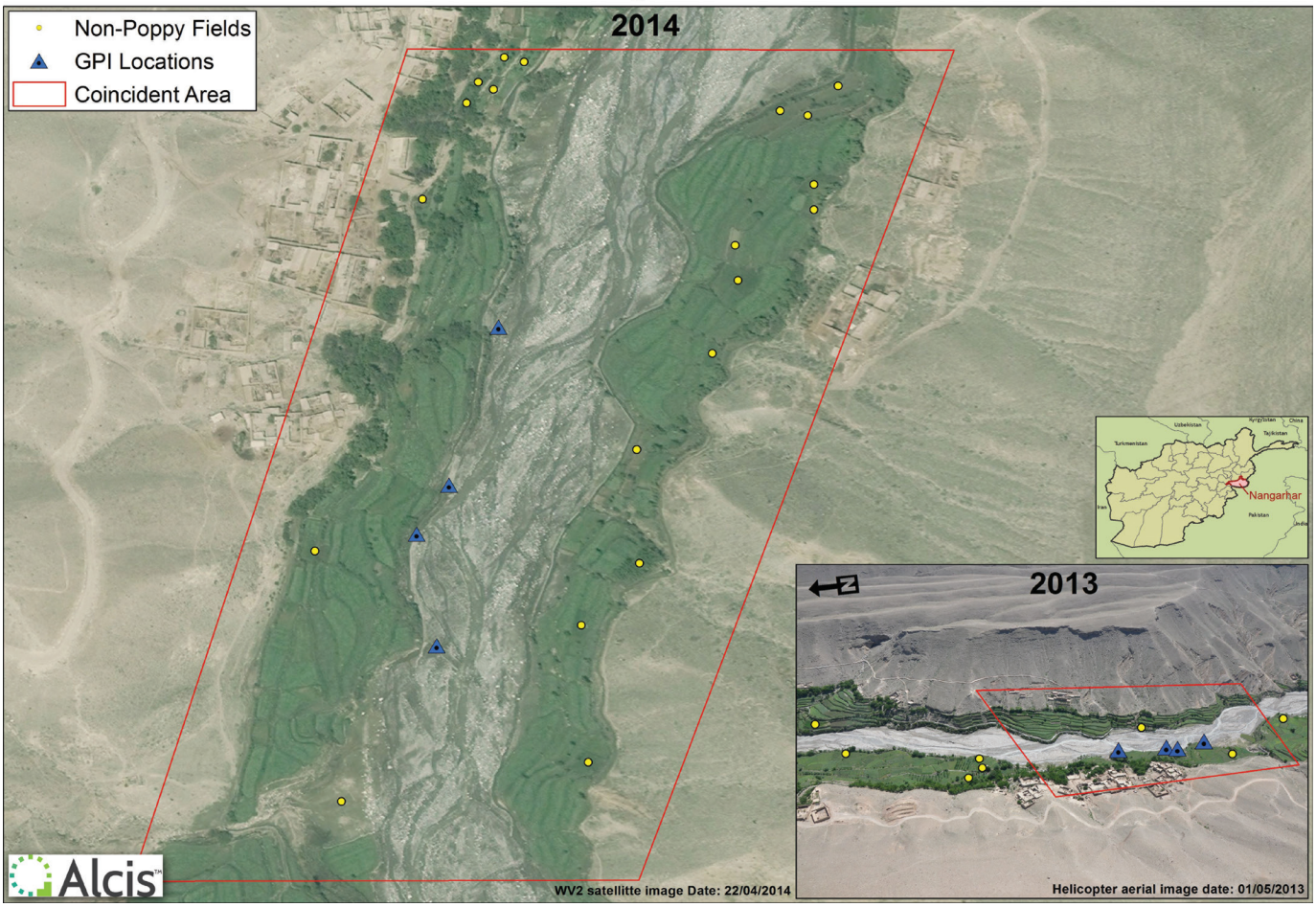


Catchment area of improved irrigation system once the project was complete, Pachir wa Agam, Nangarhar.

The criteria used in selecting locations depend on the nature of the inquiry, the geographic coverage and assumptions that underpin the intervention, and what the initial review of the imagery reveals. For example, in an evaluation of a program that has provided greenhouses and agricultural extension services—to encourage agricultural diversification and increasing agricultural incomes—the initial scope of inquiry might include locations where greenhouses were in place before the intervention, typically provided by other programs or the private sector, those where greenhouses were used for a short time but subsequently removed, those where nonprogram greenhouses expanded after the intervention, and those close to market centers and arterial roads as well as those some distance away.

Geospatial imagery and analysis supports the selection of these locations, and once enough are identified, they can be case studies for detailed primary data collection with rural households and communities. This is not the random sampling that many surveys in Afghanistan attest to but fall short on delivering. Instead, it is maximum variation sampling where "any common patterns that emerge from great variation are of particular interest and value in capturing

Figure 9. Crop Identification for GPI Projects, Pachir wa Agam, Nangarhar

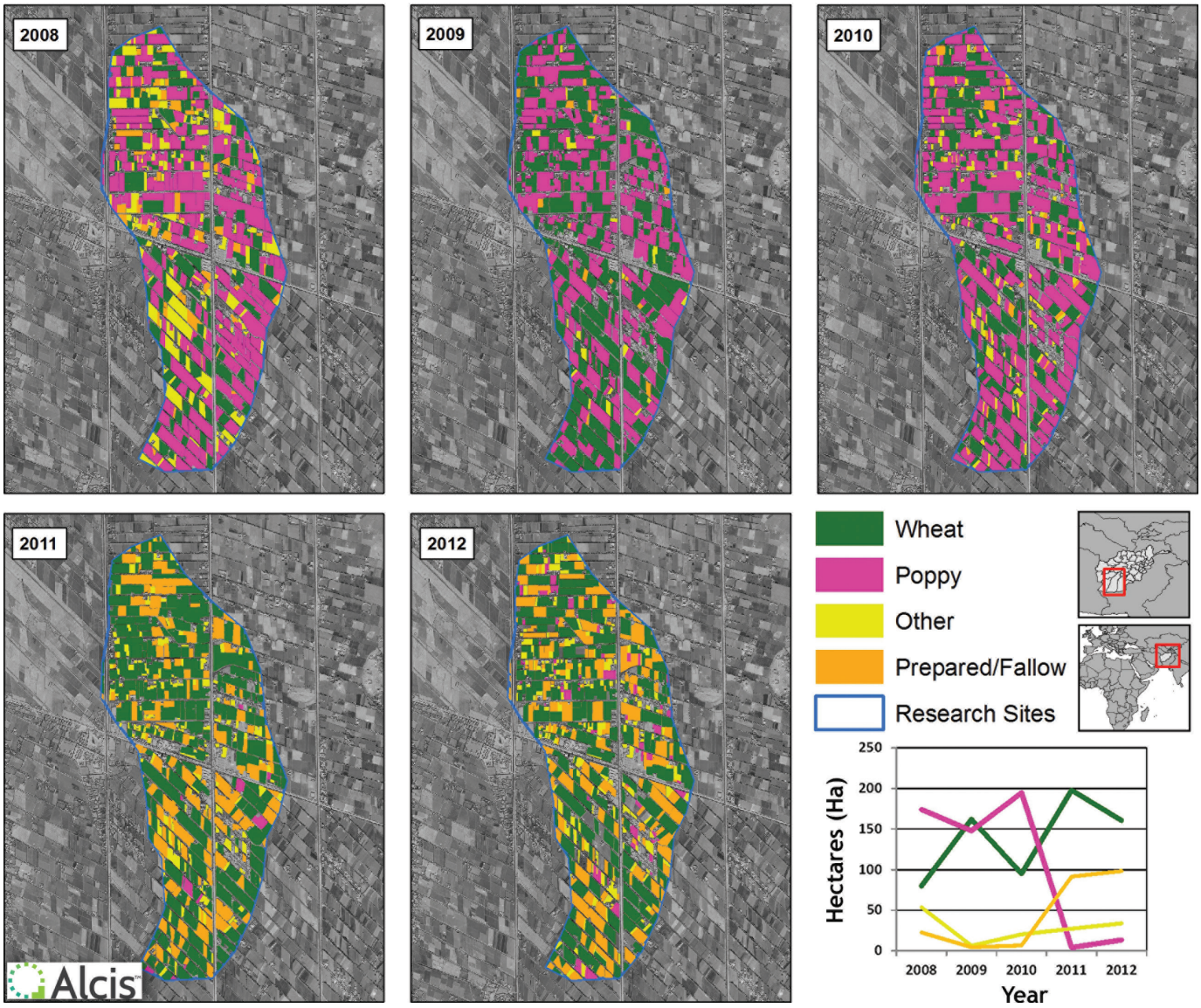


Crops cultivated under the improved irrigation system, Pachir wa Agam, Nangarhar.

the core experiences and central shared aspects."[28] Fieldwork can adopt the same method, looking to contrast the experiences of households with different resource endowments in each research site. This helps explore which groups are more likely to benefit from development assistance and how development activities (as well as external shocks) affect different population groups within and between locations. It also helps build the analytical base for a comparison of "livelihood decisions in different geographical, socio-economic, cultural, and temporal contexts so that patterns can be recognized as pathways that go beyond the specific case," because it is here where the real lessons learned lie.[29]

Structured in such a way, fieldwork should focus on the portfolio of livelihood activities, the development assistance received, and the shocks that households experience. Direct questions on sensitive issues, such as opium production, are best avoided. Experience shows that in drug crop producing areas farmers will typically acknowledge that they cultivate opium poppy when discussing livelihoods and the crops they grow, avoiding some of the most obvious problems of

Figure 10. Helmand Crop Analysis, Marjeh Block 2A

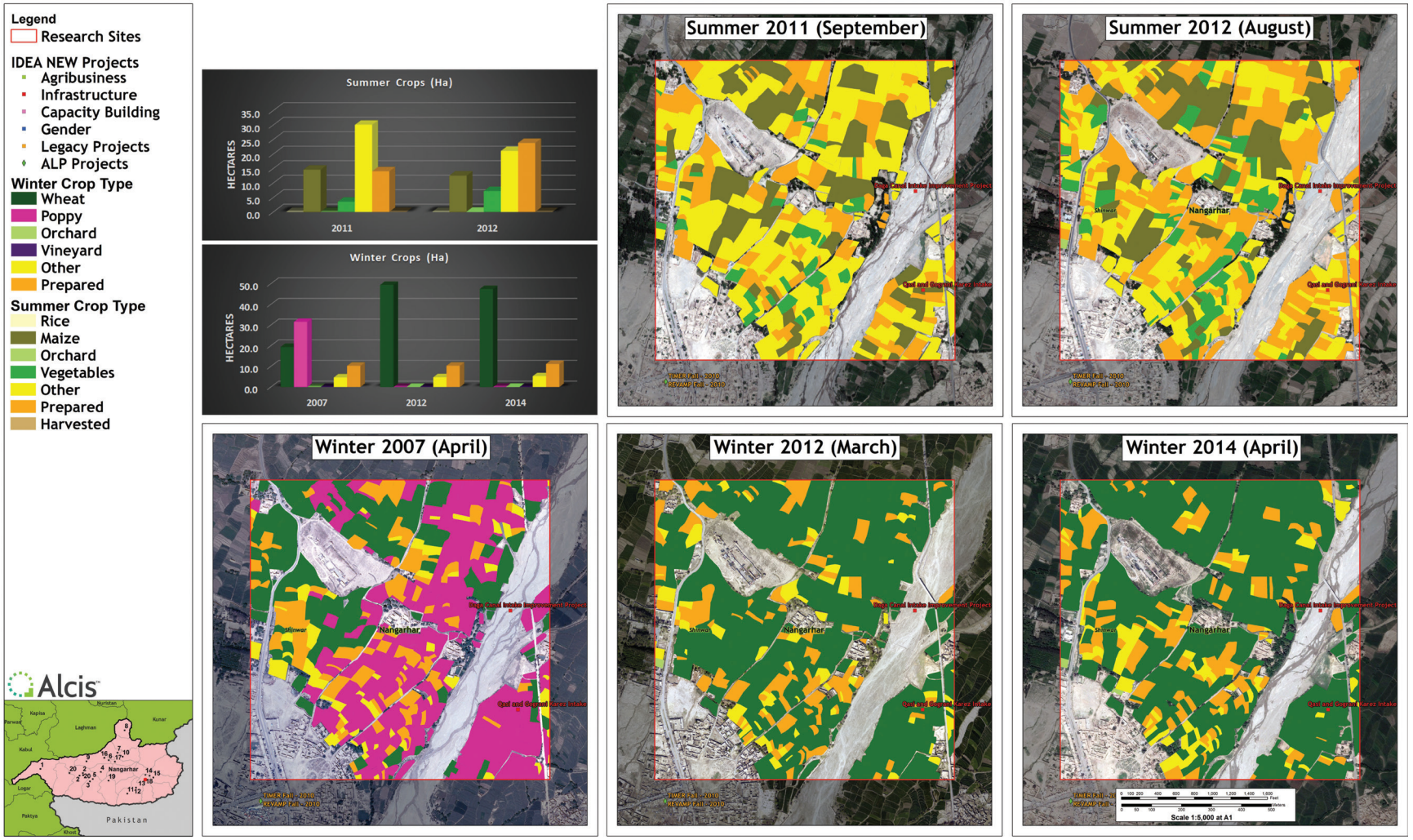


Crop mapping in Marjeh, Helmand, 2008–12.

social desirability bias and "drugs fetishism."[30] Farmers will also offer information on the process and impact of a ban on opium production when discussing the shocks they have been exposed to.

Discussions with farmers themselves should focus on the direct experience of the respondent and their household rather than of a wider geographic area: the experiences of organizations such as the Swedish Committee in its extensive research in the late 1980s and early 1990s shows that answers become increasingly more speculative.[31] Ideally, interviews are conducted in the field during the planting and harvest season, to allow researchers to verify and, where necessary, challenge the veracity of respondent's answers with regard to cropping patterns. When conducted in the household compound, interviews can attract attention from others

Figure 11. IDEA-NEW Poppy Evaluation Research Site 13-Crop Analysis



Crop mapping (winter and summer crops) in Shinwar, Nangarhar, 2007–14.

and become subject to repeated interruption and bias. Group discussions with farmers tend to be dominated by community elites, are inappropriate for discussing sensitive issues, and increasingly represent a security threat.[32] Ideally, interviews should be informal and conducted by local researchers with intimate knowledge of the particular locations being researched, particularly in insecure areas. In the hands of experienced researchers, interviews can be issues-based and notes written up only after the researcher has departed. This approach puts farmers at greater ease, reduces social desirability bias, and offers researchers a degree of anonymity that is critical in a chronically insecure space. To verify information and further develop the results of data collected at the household level, interviews with inputs suppliers, as well as with wholesale and retail traders, should be conducted at markets and bazaars.

Ideally, interviews should be informal and conducted by local researchers with intimate knowledge of the particular locations being researched, particularly in insecure areas.

Conducting fieldwork in this more discrete way does have a few disadvantages, such as recall or memory bias, but such effects can be diminished by the experience of researchers. Questions over coverage and representativeness are much more challenging to counter, particularly when officials and development policymakers believe it still possible to conduct randomized sampling in the kind of chronically insecure space across much of rural Afghanistan today. Instead, maximum variation sampling juxtaposes the results of data collection in multiple locations with both similar and contrasting conditions, as well as across a spectrum of socioeconomic groups. When data converge regardless of location and socioeconomic group, they offer a degree of certainty about particular phenomena. Where they converge instead according to socioeconomic group or locations with similar socioeconomic, political, and environmental conditions, valuable lessons can be learned through a comparative analysis, and further points of inquiry can be identified for subsequent rounds of fieldwork.

Perhaps most importantly, maximum variation sampling can generate in-depth data about the socioeconomic and political conditions in insecure space through more discrete and surgical inquiry. It offers access to insecure space precisely because it does not use long structured questionnaires and large samples and does not task researchers to go door-to-door in their effort to produce a random sample. Moreover, although imagery supports the selection of research sites for fieldwork, it also helps with briefing and debriefing fieldworkers, providing a resource for data verification (critical in conflict-affected environments), and assisting in further exploration of findings from primary data collection. For example, high-resolution imagery and mapping products allow simultaneous viewing of the results of household interviews and examining images of respondents' household compound and agricultural land. Including multiple layers of historical data allows data on security, vegetative index, poppy probability and even eradication to be compared with household responses across the research sites, and also allows reports of new land being brought under cultivation to be examined and subsequently measured.

Historical imagery also ensures that fieldworkers are aware of some of the physical changes occurring in research sites before fieldwork. In turn, primary data collection across a number of locations provides detailed context and explanations for phenomenon found in the initial imagery that can be shared with those undertaking the analysis. Interviews of those upstream or downstream in the value chain can also be examined using geospatial analysis. This review allows findings to be verified and the potential multiplier effects of programs, such as market growth and further crop diversification, to be examined in greater detail. All of which support data verification at each level of the inquiry.

Feedback loops between geospatial imagery and analysis and primary data collection offer significant advantages for performance measurement systems. The related dialogue helps develop a much deeper understanding of a program's impact on an area and the local population

and allows new lines of inquiry to be pursued as part of ongoing data collection and program management. In particular, the loops allow for the unintended consequences—positive and negative—of program activities to be uncovered and corrective action to be taken as needed. Examples are numerous: One is identifying new areas of settlement in the deserts of southwest Afghanistan using GIS (Geographic Information System) and then examining the processes and programs that drove farmers from the irrigated areas using fieldwork in Helmand, Farah, and Kandahar.[33] Another is learning through primary data collection that farmers had stored or sold the polytunnels received as part of a major agricultural program and then verifying through high-resolution imagery that very few of the almost fourteen thousand tunnels distributed in Marjeh had been erected.[34] And another example is identifying the process of deterioration and then abandonment of greenhouses under CARD-F using GIS, and in particular high-resolution imagery, and then using primary data collection to analyze the causes.[35] Each of these has supplemented data gaps that beleaguer current methods of monitoring and evaluation and helped generate invaluable insights.

Conclusion

It is critical in Afghanistan, as in other fragile states, that we better understand what is happening in the areas beyond central government control. Yet throughout the Afghan reconstruction effort, the international community has leaned toward assessing the more optimistic views of a population that is not only more accessible but also has a long history of encapsulation by the Afghan state. Paradoxically, a reliance on large-scale surveys and a tendency to aggregate data across a wide geographic area has meant that policymakers have been blind to the unfolding situation in the very areas that reconstruction and statebuilding efforts seek to have the greatest impact.

The integration of geospatial analysis and imagery into performance measurement supports more comprehensive examination of program results even in especially insecure regions. Geospatial imagery is not a panacea for the problems in current performance measurement systems but is a valuable contribution in the portfolio of monitoring and evaluation strategies for conflict-affected environments. GIS is particularly effective at examining physical change and therefore an effective tool for examining infrastructure, such as roads, irrigation works, schools, and health centers, as well as use of agricultural input. It can also be used to assess some of the social and economic changes that can be attributed to program activities, such as expansion of irrigated land, increased yields, movement into high-value horticulture, and market development.

Geospatial imagery and analysis is an effective way to assess and measure such change across time and space. Moreover, these changes are typically not captured by large-scale surveys focusing on attitudinal change and aggregating data at such a level that it is unhelpful for program-level assessments. Clearly, GIS alone cannot measure some of the more intractable development issues, such as shifts in political participation, attitudes to the state, and conflict resolution.[36] When combined with well-focused fieldwork, geospatial imagery and analysis can be used to explore not only why programs have been effective in delivering changes in some locations rather than others, but also the positive and negative unintended consequences of programs, supporting corrective action during implementation.

When combined with well-focused fieldwork, geospatial imagery and analysis can be used to explore not only why programs have been effective in delivering changes in some locations rather than others, but also the positive and negative unintended consequences of programs.

Despite these advantages, use of geospatial imagery and analysis remains limited. The demand for GIS data is largely confined to monitoring program activities and outputs using GPS-embedded cameras and smart phones. Given the calls for much greater accountability in the use of scarce development funds, it is unclear why much greater investments have not been made. The cost of unclassified high-resolution remote sensing imagery has fallen dramatically over the years and the

number of providers has risen in parallel. The greatest constraint is the donor community. Some question whether donors have a genuine interest in the degree of accountability that these technologies have to offer.[37] What is apparent is that donor performance measurement systems remain behind the technological learning curve, which is perhaps surprising given the challenges that they face in verifying the information they are provided by implementing programs. Moreover, implementing partners have not made the investments they could have in remote sensing technology. They continue instead to be responsive to donor reporting requirements rather than more proactive in developing more effective methods for data collection for program management.

The initiative now lies with the major development donors, such as USAID and DFID. It is they who report against value-for-money criteria to Congress, Parliament, and oversight agencies for foreign assistance to conflict-affected countries. It is they who are interested in learning lessons from past ventures in Afghanistan and Iraq and in ensuring that future interventions in conflict-affected environments are more cost effective. Such donors also have the necessary reputation and funds to drive innovative methods of monitoring and evaluation, such as GIS, and to establish new standards in data collection and accountability. Were some of the larger donors to begin to demand this kind of analysis of their implementing partners in the private sector, it would only be a matter of time before geospatial imagery became a conventional data collection tool. However, the biggest motivation must be that relying on existing data collection techniques and remaining partially sighted in an ever increasing number of conflict-affected countries is clearly not a viable option.

Notes

1. See, for example, Frank Ledwidge, *Investment in Blood: The True Cost of Britain's Afghan War* (London: Yale University Press, 2014).
2. On "clear, hold and build," see U.S. Department of the Army, *Counterinsurgency, Field Manual 324*, Marine Corps Warfighting Publication no. 3-33.5 (Washington, DC: Department of the Army, December 2006). On "money as a weapon system," see *Commander's Guide to Money as a Weapons System*, Handbook No. 09-27 (West Point, NY: Center for Army Lessons Learned, April 2009); *Money as a Weapon System Afghanistan* (MAAWS-A), USFOR-A Pub no. 1-06 (United States Forces—Afghanistan, December 2009).
3. Independent Commission for Aid Impact (ICAI), "DFID's Support to Growth and Livelihoods in Afghanistan," Report no. 31 (London: ICAI, March 2014), http://icai.independent.gov.uk/wp-content/uploads/ICAI-Report-DFIDs-Bilateral-Support-to-Growth-and-Livelihoods-in-Afghanistan.pdf, 3.
4. USAID, *Final Report, USAID Office of Agriculture, Commercial Horticulture and Agricultural Marketing Program* (*CHAMP*) *Mid Term Evaluation* (Washington, DC, USAID: March 31, 2012), 13, 28, http://pdf.usaid.gov/pdf_docs/pdact904.pdf.
5. The initial outcomes and activities that the Helmand provincial reconstruction team was measured by were captured in the UK Government's "Helmand Road Map Measurement of Effect Process Capping Document" (unpublished report, UK Department for International Development, 2009). The design mission for the Helmand Monitoring and Evaluation Program (HMEP) reported "at present a partially problematic approach applied in the PRT limits the effectiveness of M and E; there is variability in the rigor of causal models between strands; there is a lack of historical baseline data against which progress can be determined; and PRT strands are not mapped to the Helmand Plan, thereby limiting HMEP effectiveness" (21). It went onto say that "Strand plans have semi detailed descriptions of inputs, activities and outputs including output results targets. However some are less clear at purpose and goal level; not all have separately defined purposes and goals and indicators at purpose and goal level are in need of some definition or refinement so that outcomes and impact can be monitored" (A16-3). See Coffey International, "Development Program Memorandum DFID Afghanistan, Monitoring Stabilization and Development in Helmand," (unpublished report, UK Department for International Development, January 2010) http://r4d.dfid.gov.uk/Project/61407.
6. For example, an author review of a discrete component of a UK-funded agricultural program found much lower levels of employment created than reported by the implementing organization, the management unit, and thereby the donors. This finding is despite the project completion report assertion of "unambitious" outcome targets.
7. For example, in one case an independent assessment of a 2014 orchard program used program staff to conduct the fieldwork even though program staff had been unable to visit the insecure southern districts since

2010. The report gave no indication of the geographic coverage of the survey. IDEA-NEW, "Orchard Program Report," 2014.

8. The randomized impact evaluation of the National Solidarity Program (NSP) was conducted in 2007 and focused on five hundred villages spread across ten districts in Balkh, Baghlan, Daikundi, Ghor, Herat, and Nangarhar. At the time, NSP had been implemented in "17,200 villages in 279 of Afghanistan's 398 districts" (7), including in parts of the southern region. However, security concerns led to thirty-four districts being eliminated from the sample (10). Andrew Beath, Fotini Christia, and Ruben Enikolopov, *Randomized Impact Evaluation of Afghanistan's National Solidarity Programme* (International Bank for Reconstruction and Development/World Bank, July 1, 2013), www.nsp-ie.org/reports/finalreport.pdf.
9. A good example is USAID, *Evaluation Report for Alternative Development Program Southern Region by USAID in the Islamic Republic of Afghanistan* (Kabul: USAID Southern Region, 2010), http://pdf.usaid.gov/pdf_docs/pdacs236.pdf. This report made a number of statements about program and the relationship between changes in both licit and illicit agricultural production drawing on limited fieldwork and district level maps produced by the United Nations Office of Drugs and Crimes and the Food and Agriculture Organiztion (44–58). Yet high resolution imagery and crop mapping produced at the same time showed dramatic changes in land settlement in the former desert areas of Helmand and significant shifts in cropping patterns within districts. Some of these maps can be seen in David Mansfield, *Managing Concurrent and Repeated Risks: Explaining the Reductions in Opium Production in Central Helmand Between 2008 and 2011* (Kabul: Afghan Research Evaluation Unit, 2011), www.areu.org.af/Uploads/EditionPdfs/1122E%20Managing%20Concurrent%20and%20Repeated%20Risks%202011.pdf.
10. In Afghanistan, for example, DFID has consistently used competitive consultancy firms to review projects as part of its process of annual reviews and project completion reports. This has on occasion led to accusations of conflict of interest and reports being rewritten and marked differently.
11. ICAI, "DFID's Bilateral Support to Growth and Livelihoods in Afghanistan," News, March 7, 2014, http://icai.independent.gov.uk/dfids-bilateral-support-growth-livelihoods-afghanistan.
12. This was particularly the case with HMEP, where senior leadership of the PRT in Helmand would often cite the data collected by monthly polling as evidence of the performance of UK investments. See, for example, Catriona Laing, former head of the PRT, "Helmand—Will it Spiral Back into Violent Extremism?" May 12, 2013, http://blogs.fco.gov.uk/catrionalaing/2013/05/12/helmand-will-it-spiral-back-into-violent-extremism/; see also the critique of HMEP and its results by Paul Davis, "A Bright Shining Narrative: Garmsir, Helmand" (unpublished paper), January 2013, 4–6.
13. For example, following the rather positive results from one of the initial waves of polling in Helmand in 2007, the chief of defense staff at the time is said to have joked that according to the polls, the situation was such that he might consider taking his family there for their annual vacation.
14. David B. Edwards, "Counterinsurgency as a Cultural System," *Small Wars Journal* (December 2010): 12.
15. DFID Afghanistan, "Data Quality Assessment of the Asia Foundation Survey's of the Afghan People 2006–2009" (unpublished report, September 2010), 2.
16. "The TAF survey is quoted widely by the international community and the media. While extremely useful as an indicative estimate of opinions, data from the survey should be viewed as limited in that respondents may be replying in a way which they think will be viewed favorably by others and in that the sample is likely to be richer and better educated than the population as a whole," Ibid., 4.
17. Coffey International, "Helmand Monitoring and Evaluation Program: Counter Narcotics Section" (unpublished report, UK Department for International Development, 2013), 14–22. Earlier rounds of polling by HMEP show the same underreporting of opium poppy as well as problems of consistency over time. For example, the proportion of households who reported growing poppy as their main crop in priority districts fell from 8 percent in the last three months of 2010 to 2 percent in the first three months of 2011 in priority districts. Not only is this figure low given the scale of cultivation but also because the opium poppy season in Helmand is between October and May, it is unclear why there should be a drop in the number of households growing poppy after the season had started. See Coffey International, "Helmand Monitoring and Evaluation Program: Progress Against the Helmand Plan, 2011 Quarter 1" (unpublished report, UK Department for International Development, 2011), 22.
18. The NRVA 2011–12 reports that only 1 percent of households were involved in the "production and sale of opium and opium labour." See CSO, Afghanistan Living Conditions Survey (Kabul: CSO, 2014), 54. The endline survey for IDEA-NEW also reports that only 1 percent of households interviewed reported growing opium poppy despite the dramatic increases in opium poppy cultivation in a number of the provinces it worked in, including Nangarhar and Badakhshan. See IDEA-NEW, "Endline Household Survey Report" (unpublished report, USAID, May 2014), 57. MISTI collected data in the seven districts that the Kandahar Food Zone operated and reported that 28 percent of them cultivated opium poppy. Management Systems International (MSI), *MISTI Stabilization Trends and Impact Evaluation Survey: Analytical Report, Wave 3: Nov 16, 2013 – Jan 30, 2014* (Washington, DC: USAID, July 2014), 90, http://pdf.usaid.gov/pdf_docs/PA00K79N.pdf.
19. MSI, *MISTI Stabilization Trends*, 89.

20. The poll conducted by the Afghan Center for Socio-Economic and Opinion Research for the BBC, ABC, and ARD in December 2009, just after the announcement of the surge, reported against a number of questions that suggested a bias toward more secure space. For example, when asked about a number of different groups and "how much of a presence it has in this area," 41 percent said GIRoA had "a very strong presence" and 38 percent said a "fairly strong presence" compared to 3 percent that said that the Taliban had a very strong presence and 11 percent who said a fairly strong presence. These figures are mirrored in the responses to questions regarding the confidence in GIRoA and Taliban to provide security and local support. Were these figures accurate for the country as a whole it raises questions as to why the surge would have been needed at all.
21. MSI, *MISTI Stabilization Trends*, 81–82.
22. The area under agriculture in southwestern Afghanistan had risen rapidly, from 151,962 hectares in 2003 to 432,896 hectares in 2013. The vast majority of this increase has been in the former desert areas of Helmand, Farah, and Nimroz. Fieldwork suggests that these areas have a population density of between 2.5 and 5 people per hectare. David Mansfield, "Ready to Burst? Examining the Role of the 'Balloon Effect' in the Expansion of Opium Poppy into the Desert Frontiers of Afghanistan" (unpublished paper, LINKSCH project, 2015). Other former desert areas in Zahre and Spin Boldak and Takhtipul in Kandahar, as well as in western Farah, have also seen significant increases in land under agriculture.
23. For example, "HMEP took the 2004 census data and the CSO raw data on settlements as its sampling universe." Samy Ahmar and Christine Kolbe, "Innovative Approach to Evaluating Interventions in Fragile and Conflict-Affected States: The Case of Helmand" (unpublished working paper, Coffey International Development, April 2011), 10, www.ideas-global.org/wp-content/uploads/2015/01/Ahmar-6.6-Evaluation-in-Fragile-and-Conflict-Affected-States.pdf.
24. Afghan Info is a repository for the coordinates of USAID's projects. However, the data stored reflects the village where the project was implemented, not the actual location of the specific project activity. For example, Afghan Info will store the GPS coordinates for the centre of a village even where a project distributes saplings to a number of different households within that village. If the actual locations of the saplings are required for analysis it would be necessary to go to the implementing partner.
25. The data regarding these DoD and USAID projects remain in two distinct databases, creating risks of duplication. Government Accountability Office, "Afghanistan Development: Agencies Could Benefit from a Shared and More Comprehensive Database on U.S. Efforts," GAO 13-34 (Washington, DC: Government Printing Office, November 2012), www.gao.gov/assets/650/649814.pdf.
26. The Request for Proposal contains only one paragraph on "Satellite/Aerial imagery Analysis." It is only one of six elements within the first of two components in the proposed project. USAID in Afghanistan, "Request for Proposals SOL-306-14-000010, Monitoring Support Project (MSP) Indefinite-Quantity Contract," March 15, 2014, 23–27, www.devex.com/projects/tenders/monitoring-support-project-msp-in-afghanistan/146188. There is no request to integrate imagery with other data collection aspects of the project, and reports suggest that now that the project has begun, the GIS component will be downgraded even further.
27. For an example of this kind of evaluative work see David Mansfield, *Examining the Impact of IDEA-NEW on Opium Production*, January 2015, http://pdf.usaid.gov/pdf_docs/PA00KCPT.pdf.
28. Michael Quinn Patton, *Qualitative Evaluation and Research Methods*, 2nd ed. (Newbury Park, CA: Sage Publications, 1990), 172.
29. Leo De Haan and Annelies. Zoomers, "Exploring the Frontier of Livelihoods Research," *Development and Change* 36, no. 1. (2005): 27–47, 44.
30. For more details on methodology for fieldwork in rural Afghanistan with a particular focus on examining rural livelihoods and opium poppy cultivation, see David Mansfield, *A State Built on Sand: How Opium Undermined Afghanistan* (London: Hurst Publishers, November 2015).
31. "[The Agricultural Survey of Afghanistan'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 generalized 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" (Swedish Committee for Afghanistan, "Farming Systems of Nad Ali District, Helmand Province," Afghanistan Agricultural Survey, Fifteenth Report, Part VI, 1992, 1).
32. "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 chief's 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." Ira Moore Stevens and K. Tarzi, "Economics of Agricultural Production in Helmand Valley, Afghanistan" (Washington: U.S. Department of Interior, Bureau of Reclamation, 1965), 1.

33. David Mansfield, "Ready to Burst?"
34. Mansfield, *Managing Concurrent and Repeated Risks,* 63–65.
35. Independent Monitoring Agency, "Impact Monitoring of Economic Development Package 1A: Throwing Stones in Glasshouses" (unpublished report, Department for International Development, May 2015).
36. Some more limited attempts were made to review voting in a small number of polling stations in the Afghanistan presidential elections in 2014 (see Ian Schuler, "Afghanistan Runoff Elections from Space," *Development Seed* blog, August 27, 2015, https://developmentseed.org/blog/2014/07/07/afghanistan-runoff-from-space/). The techniques used show how imagery could be used to assess the use of other facilities including schools and health centers.
37. As a senior staff member of a major development donor put it when questioning why a review had been commissioned of an agricultural input distribution program that many knew had major problems, "If you don't want to know what underwear your mother wears, don't look in her chest of drawers!"

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Geospatial analysis and mapping, as this report explains, have an important role to play in reconstruction efforts in conflict-affected regions. Typically, development projects, when monitoring and evaluating their impact, rely on quantitative data collection techniques. Data are also collected in the most secure areas where the population typically favors the government. The result in environments such as Afghanistan is a certain bias. International organizations find themselves blind to the outcomes of their investments and to the experience of the population, particularly in areas where state fragility is most extreme. Concerns are that current methods often offer little more than a cursory review of expenditures and outputs. This report, following on from a USIP/SIGAR symposium on oversight of reconstruction efforts in conflict-affected areas, discusses how future foreign assistance efforts could supplement existing data collection techniques with geospatial analysis and mapping and well-focused fieldwork.

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- *Managing Conflict in a World Adrift* edited by Chester A. Crocker, Fen Osler Hampson, and Pamela Aall (USIP Press, January 2015)
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