Chapter 14
Sustainability of US Army Agribusiness Development Team Efforts: A Decade in Afghanistan

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Contents

Abstract The World Bank has said that the impact of foreign aid is unknown, with aid delivery in Afghanistan being the most challenging. Innovatively, the US Army developed Agribusiness Development Teams (ADTs) using hand-selected, solider-experts in 2008. These egalitarian, specialized counterinsurgency teams worked directly with and within local communities in Afghanistan to implement Afghan-first, sustainable, development projects. As a case study, the Texas ADT II implemented 50 projects in Ghazni Province during 2009 with 27 detectable projects using satellite imagery. Multitemporal image analysis was used to record project sustainability between 2009 and 2019. Nineteen percent of projects were considered positive; 60%, no change; and 21%, a loss or failed. Only the Ghazni Agriculture Complex and the Ghazni Minarets are positive for the entire decade. The Arbaba Environmental Park showed no progress after 2010 except adjacent construction. Failed projects included the Ghazni Demonstration Farm and the Ghazni Experimental Farm. Even well-thought-out development efforts provided by specialized soldier-expert teams working on Afghan-first projects were not enough to overcome the complex and difficult circumstances in Afghanistan. Nevertheless, exceeding best practices as described in the academic literature, ADTs were what development agencies dream of and should be included in future military-development efforts.

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14.1 Introduction

The World Bank, the international financial institution founded to support the governments of poorer countries with loans and grants for development, stated that they have yet to be able to quantify the impact of aid[1] efforts in a meaningful way (Baker 2000). A consensus among aid organizations at all levels—nongovernmental (NGO; e.g., Oxfam), governmental (e.g., United States Agency for International Development (USAID)), national (e.g., Islamic Republic of Afghanistan), and international (e.g., United Nations Environment Program (UNEP)) organizations—is that successful aid delivery as development, not as a handout, is problematic, especially in contested spaces such as Afghanistan. Aid delivery in insecure locations has been shown to run contrary to the intended purpose due to major gaps between donor-country policies and host-nation realities. This issue is one of primacy of output over outcomes and the militarization of aid, which make development efforts unlikely to achieve large and persistent effects (Oxfam 2014; Iyengar et al. 2017; SIGAR 2020). In Afghanistan, it has been shown that aid efforts developed and employed in contested districts, those under insurgent control, increase violence (Sexton 2016). This creates a paradox where the poorest nations with the most dangerous environments are those most in need of external support and the least likely to have it affect positive change. Providing this support and ensuring its effectiveness and sustainability, however, are key to helping beleaguered nations improve their development pathway to the benefit of their citizens.

The US military took on this challenge of aid delivery, in addition to its traditional warfare activities, as it has become increasingly focused on expeditionary efforts where forces are used. These efforts often simultaneously involve security and development (Shields 2011). They directly entered the development and reconstruction sector, which has historically been driven by other intergovernmental and governmental agencies and NGOs. Being able to transition from conducting traditional military operations, where the US military is well versed, well trained, well led and capable, to having an expeditionary mindset requires specialized and elevated levels of thinking in new operational environments. This, in turn, requires levels of compassion and understanding of the people in the battlespace to be developed in new and mostly untested ways (Shields 2011; Stewart 2015). The US

[1] Universally, aid is the general term for 'Official Development Assistance' with the United States considering all efforts to support foreign nations as Foreign Aid. No matter the delivery mechanism (e.g., military), it is an essential part of US foreign policy and covers national security, commercial interests and humanitarian concerns to provide a secure global environment for US products. In this paper, development falls under aid and was included in the Agribusiness Development Team name to recognize efforts to develop agricultural concerns in Afghanistan.

military has such a broad footprint, with forces in some 70% of the world's nations (Turse 2017), that it has acquired the ability to make developmental changes in these communities where security is a key issue. US soldiers are still being trained for traditional battle but are now also expected to think beyond military skills to provide for communities in ways not part of predeployment training. Although the US military was able to fund projects in Afghanistan (more than $137 billion has been spent thus far on reconstruction and aid; SIGAR 2020), it had yet to devise ways to implement aid and reconstruction once the initial phases of the war subsided. Funding, generally, was leveraged by schemes in which commanders were allowed to provide rapid and relevant development efforts through the Commander's Emergency Relief Program (CERP; Martin 2008). This program, widely used in both Iraq and Afghanistan, was primarily meant for property damage and/or accidental death payouts; funding of less than $25,000 was approved at the battalion level. As these CERP funds were increasingly being used, in 2006 upper echelon commanders began to recognize the need to formally introduce development efforts in support of the coalition forces' acceptance of the counterinsurgency doctrine (COIN) in Afghanistan (Marty 2016). To win "hearts and minds," President George W. Bush, along with US Army leaders, devised a unique tool to support these COIN efforts—Agribusiness Development Teams (ADTs; Stewart 2014). These teams, in addition to the international, civil-military Provincial Reconstruction Teams devised in 2002 to support public services (e.g., security, justice, and healthcare), were the tip of the military's reconstruction spear (Luehrs 2010; Stewart 2014).

These new soldier-expert hybrid teams were developed to provide the optimal combination of traditional military capabilities with individual expertise based on real-world, career-oriented experiences in agribusiness. Their mission was unique and was to work with and within local communities on long-term, sustainable (i.e., more than 5 years), community-devised and -accepted, Afghan-first projects with quality assurance and quality controls (QA/QC). The projects were funded by the US Army but owned fully by the community—all without fanfare, signage, or other conspicuous trappings.

14.1.1 US Army Agribusiness Development Teams

In early 2008, the US Army, in conjunction with various Army National Guard commands (state-based, reserve military forces), developed and deployed ADTs to Afghanistan. These specialized National Guard teams comprised 12 hand-selected soldier-experts within the agribusiness field who worked, when not deployed, as civilian professionals in (by team strength) geoscience, agronomy, veterinary science, engineering, agribusiness marketing, and pest management (Stone 2013). These National Guard soldier-experts were commanded by a National Guard colonel to increase unit maneuverability, support, and access in theater and were supported by a National Guard security force and headquarters elements. In sum, this provided a self-sustaining, unrestricted military unit of approximately 60

soldiers. All trained as a team for months before their deployment to generate the optimal combination of soldier-experts able to think and work on the ground as tacticians with an in-depth, strategic understanding of the insurgents and external, environmental elements contextualized within compassion and understanding of the host nation's culture. This host-nation culture in Ghazni Province in east-central Afghanistan (Fig. 14.1) is primarily Pashtuns in Ghazni City and surrounding areas and Hazaras in the mountainous west. US understanding of their customs, courtesies, and language was supported by interpreters who were either US citizens, US permanent residents, or vetted multilingual Afghans. The Afghan interpreters were from outside the Ghazni region to protect their identities and to minimize local and family connections to projects. Using an egalitarian team structure, these soldier-experts worked directly with both regional and local Afghan government officials and within the communities to support their agribusiness needs. ADTs provided agriculture-related education, training, and sustainable projects, which were US funded but locally operated, maintained, and sustained, with a staunchly held ethic that these projects not be charity. In all, nine states supported the ADT mission providing a total of about 50 teams that operated in 15 provinces. All told, they contributed nearly 700 agriculture-related projects, which generated over $42 million in economic benefits for the people of Afghanistan (NGB 2014).

The mission of the ADTs was to provide basic agribusiness education and services to support the legitimacy and effectiveness of the Afghan government.

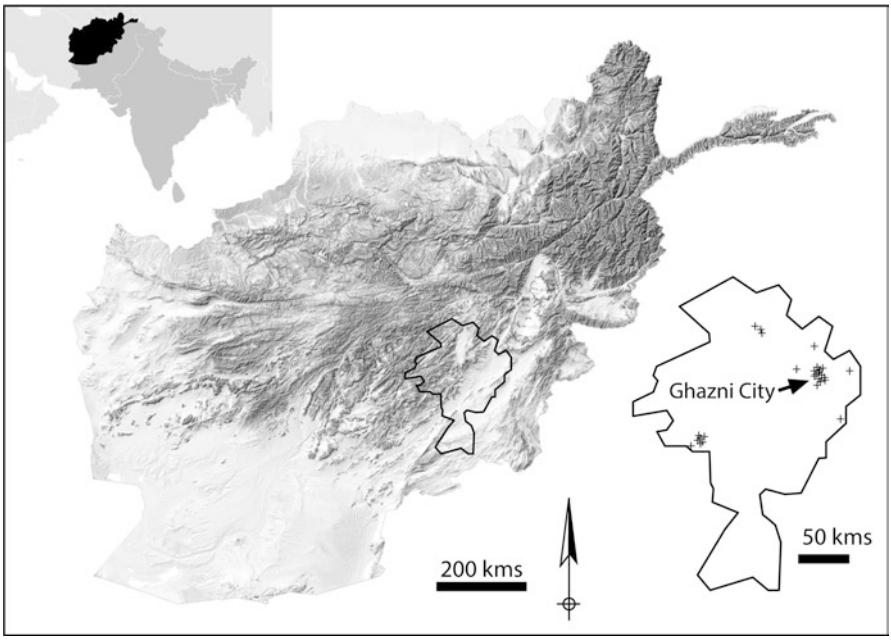

Fig. 14.1 Map of Afghanistan with South Asia (upper left) and Ghazni Province outlined with project locations (lower right). (The hillshade base map is modified from StackExchange (2020))

Working to support the Ministry of Agriculture, Irrigation, and Livestock, ADTs coordinated with the respective Provincial Directors of Agriculture, Irrigation, and Livestock (DAILs); district elders; and the public to develop and implement sustainable projects supporting the government of Afghanistan. Improving agriculture education and services was best achieved when soldier-experts worked in two- or three-member, flexible, problem-specific groups with direct support from the local community. Additional experts and ancillary support were provided by other team members and select academic institutions in the US. When not serving in the military, these professional soldier-experts from the Texas ADT II were a range management specialist with the Texas Parks and Wildlife Department, an aquaculturist with the Dallas World Aquarium, a professional farm manager with Afflerbach Farms, a project engineer with a road construction company, an environmental chemist working with Severn Trent Services, a renewable natural resource manager with Halff Associates, and a geology professor at Angelo State University (author).

14.2 Methods

In 2009, the Texas ADT II inherited, implemented, and planned a total of 52 development projects in Ghazni Province (Fig. 14.1) valued at approximately $5.1 million. Ghazni Province, one of 34 in Afghanistan, covers approximately 23,000 km^2 with a population of approximately 1.3 million centered mostly in the urban areas of Ghazni City, Jaghori, and Malestan districts. Ghazni is a mountainous province with a relief of 2872 m (1933 m at the southern end and 4805 m in the Kharkush Mountain in the west) with a bioclimatic zone of a cool temperate desert scrub biome. Agriculture is centered along the generally flat valley fills of the transpressional plate boundary called the Chaman Fault between the Eurasian and Indian plates (following the Kabul-Kandahar road) and to the east where the terrain is flat to rolling. The mountainous parts of the province support small agricultural concerns located in valley bottoms.

Of the 52 projects, 27 (Table 14.1) could be monitored remotely using visible-spectrum, Earth Observing (EO) satellite data requiring no direct, in-country site visits. Site visits will likely be delayed many more years until hostilities in Afghanistan have subsided, enabling general scientific studies to continue or commence. To remotely evaluate these projects, EO data were thus key. Basic imagery from Google.com and Bing.com, for example, do not have adequate resolution or dense temporal coverage over Afghanistan. As a result, imagery from TerraServer (2020) was used exclusively for the remote-sensing analysis. It is a fee-based, image repository of the Earth's surface that was launched in 1998 and is owned by PrecisionHawk. Image quality and availability via TerraServer are the best available to the general public.

The suite of multitemporal imagery acquired over Ghazni Province extended from 2009 to 2019, although there was no imagery for 2011, 2012 and 2015. Nearly

Table 14.1 The 27 projects developed and implemented by the Texas ADT II, which are resolvable using satellite imagery with general location. Evaluation refers to the status of the project after analysis

Latitude	Longitude	Project	Evaluation
33.5	68.4	Arbaba Environmental Park	No change
33.8	68.4	Band-e Sultan dam	No change
33.6	68.2	Bochakhari dam	No change
33.6	68.4	Ghazni Agricultural Complex	Positive
33.5	68.4	Ghazni Agricultural Extension Training	No change
33.6	68.4	Ghazni Agricultural wind/solar	Loss
33.5	68.4	Ghazni bazaar	No change
33.6	68.4	Ghazni Demonstration Farm (gabions)	No change
33.6	68.4	Ghazni Demonstration Farm (general)	Loss
33.5	68.4	Ghazni Experimental Farm	Loss
33.6	68.4	Ghazni Minarets	Positive
33.6	68.4	Ghazni Wool Facility	No change
33.1	67.4	Jaghori Fish Farm (1)	No change
33.1	67.5	Jaghori Fish Farm (2)	Loss
33.1	67.4	Jaghori Slaughter Facility	No change
33.1	67.4	Jaghori/Sang-e Masha earthen dam	Positive
33.1	67.5	Jaghori Demonstration Farm	Loss
33.1	67.4	Jala village and earthen dam	No change
Assorted		Khwaja Omari River check dams	No change
33.9	67.9	Nawur Demonstration Farm (1)	No change
33.9	67.9	Nawur Demonstration Farm (2)	No change
33.1	67.5	Nawur Fish Farm	No change
33.9	67.9	Okaak earthen/masonry dam 1	Positive
33.9	67.9	Okaak/Nawur primary dam	Positive
33.6	68.4	Sanaee High School Agricultural Education Project	Loss
33.3	68.6	Sardeh Band Demonstration Farm	No change
33.6	68.7	Shetam dam	No change

1000 satellite images, however, were available to evaluate the 27 projects. There may be 10–20 different images in any 1 year at the selected spatial scale over one site. Images used in the analysis were clear and mostly cloud free, with resolutions sufficient to resolve meter-scale objects and were all acquired during summer and at midday to reduce shadows. In sum, 189 clear, midday summer satellite images at required resolutions were used to evaluate the 27 projects from their inception in 2009 until 2019, when the most recent imagery was obtained.

Site images were saved in jpg format and imported as individual "sheets" into Adobe Illustrator, where they were rectified, enabling each image to cleanly overlay the others. Images were then able to be toggled on-off and/or become partially transparent to better enhance changes from year to year (change detection). Structural changes (e.g., size), road and bridge emplacement or removal, and agribusiness activities, such as row planting and plant growth, were tracked for each image.

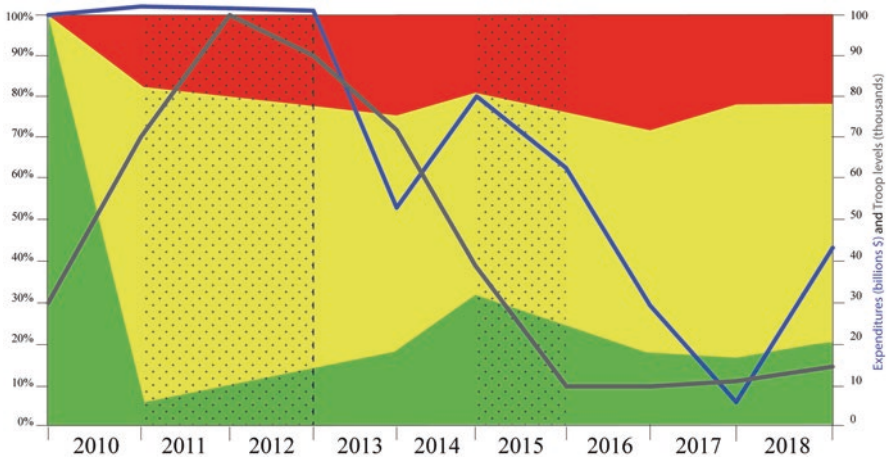

Fig. 14.2 Stacked histogram of the 27 evaluated projects. Green represents "positive" (100% at the end of 2009, assuming all projects were implemented in good faith), yellow are "no change," red are "lost" projects. Stippled areas are years without imagery for evaluation, the vertical-dashed line marks the end of the ADT mission, the blue line is the total US reconstruction expenditures (billions, USD), and the black line is the number of US troops in Afghanistan (thousands)

Three categories based on the original scope of work and the contract developed by the ADT were used to evaluate the projects based on change detection of the imagery: green, yellow, and red (Fig. 14.2). Green projects (positive) continued to operate or appeared to be operating, and development appeared to continue, throughout the period 2009–2019. Yellow projects (no change) followed the scope of work but failed to continue to develop. Red projects (loss or failure) failed to follow the scope of work and/or failed outright. All projects were considered green in the 2009 images because each project was developed and implemented under positive and promising conditions (i.e., each was fully funded, and contracts had been signed).

14.3 Results and Interpretations

Of the 27 projects evaluated (Table 14.1 and Fig. 14.2) over the 2009–2019 decade, 19% ($n = 5$) were considered positive; 60% ($n = 16$), no change; and 21% ($n = 6$), a loss. Only two projects were considered positive for the entire period—the Ghazni Agribusiness Complex (see below) and the Ghazni Minaret Park project. The bulk of the projects were considered no change in that the scope of work or contractual obligations appeared to be completed on the 2010 imagery, with zero growth, changes, development, and/or impacts between 2010 and 2019 (Arbaba National Environmental Park, see below). The Ghazni Demonstration Farm (see below) and the Sanaee High School Agribusiness Education Program projects, for example,

were direct failures with no evidence after 2010 of any contracted efforts being initiated or completed.

14.3.1 Ghazni Agribusiness Complex (Positive)

The Ghazni Agribusiness Complex (GAC) was the first project developed and completed by the Texas ADT I in 2008 to help build a lasting relationship with the Ghazni Provincial DAIL (Stewart 2014). At the time of initial development and implementation, this simple project was a small slaughter facility used by local butchers for goats and chickens. The DAIL was aware that this location, near Shams Village, 3 km northwest of Ghazni City, was the locals' slaughter field (Figs. 14.3 and 14.4). The local practice was slaughtering in a dug trench with blood and offal

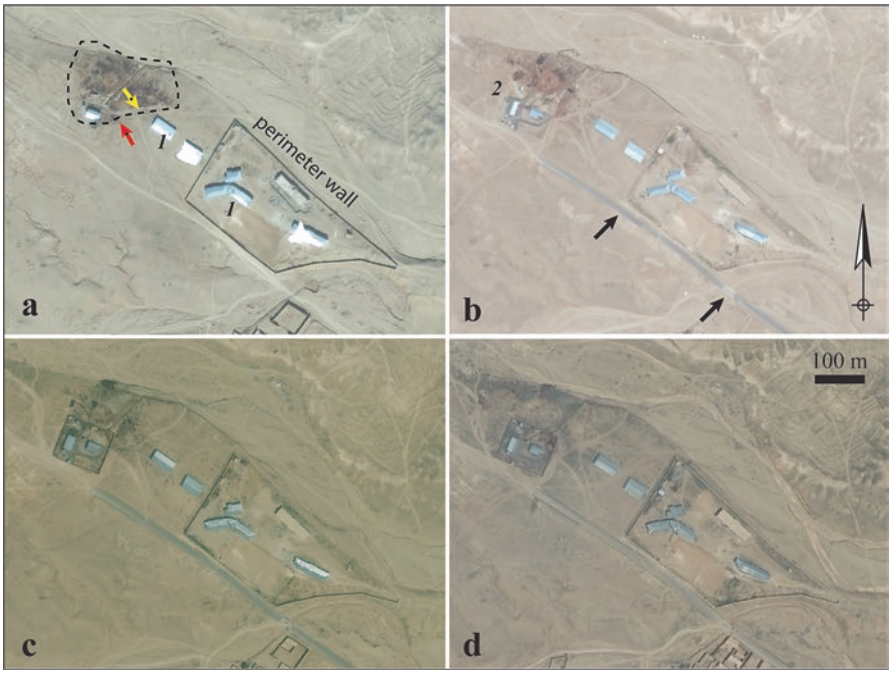

Fig. 14.3 Ghazni Agricultural Complex multitemporal satellite imagery series. (**a**) This 2010 image shows structures built or under construction prior to ADT efforts (1). Additional structures and the perimeter wall were projects supported and implemented by ADT II in 2009. The dashed line represents the slaughter and offal area (blood stains) prior to the 2010 slaughterhouse project. The yellow and red arrows indicate ground photograph locations in Fig. 14.4. (**b**) The 2013 image shows continued building construction (2). The black arrows point to the new road, including a bridge emplacement. The image progression from (**a**) 2010 to (**d**) 2019 shows the changes in the slaughter/offal area. (**d**) By 2019, offal staining is restricted to the walled property of the slaughter facility. (Modified from Terraserver.com; used with permission from PrecisionHawk)

Fig. 14.4 Ground photographs of the Ghazni Agricultural Complex in March 2009. (**a**) This photo looks westerly at the recently built slaughterhouse (red arrow on Fig. 14.3); note the blood-stained ground (especially front left). (**b**) This photo is easterly facing showing the new foundation emplacement for the sales barn (yellow arrow on Fig. 14.3)

left exposed to rot in the sun. This type of slaughter is common in Afghanistan, but the DAIL and the ADT decided to implement a sanitary location for slaughtering small animals. The initial project consisted of a slaughter building and an offal pit for residual collection (Fig. 14.4a). This offal was pumped as needed with waste then transported to an appropriate disposal site. By 2009, ADT II and the DAIL determined that the locals were attracted to this new slaughterhouse, and due to its popularity, demand was greater than capacity with slaughtering continued around the property. A larger facility that could also accommodate cows and camels for sanitary slaughter was warranted.

ADT II, in conjunction with the DAIL and the local Shams Village elders, implemented a new, more expansive project, which included an extension of the current slaughterhouse with an office building, a vehicle barn, a composting barn, a pump truck, and a tractor with trailer. Because the location was becoming a central hub for some agribusiness activities and recognized as such by the community, ADT II proposed a feed mill, a livestock sales facility, and a tanning facility as well. To power

these operations, two 24v, 400w (@26mph) wind turbines and eight 12v, 50w microcrystalline photovoltaic solar panels were installed with power stored in 12 12v, 100 Ah maintenance-free, deep-cycle batteries in a locked storage container. The feed mill was envisioned as a place for the DAIL and his agricultural extension agents and University of Ghazni students to experiment with grain for demonstration and training purposes. It included a dry-storage building, a mill, a generator, and a tractor. In late 2009, the facility was already storing grain. The livestock sales facility comprised a covered sales building with a business office and pens for livestock inspection and treatment. The tanning facility was adopted from an unfinished USAID project and enabled locals to produce products from the tanned hides of livestock slaughtered on-site, as opposed to exporting the hides to Pakistan. The facility also functioned as a hide-and-wool storage facility. By 2010, the feed mill, livestock sales facility, and power systems were completed and in full operation.

Site visits as late as December of 2009 confirmed that the first slaughter facility was operational and also that slaughtering was still occurring and offal was collecting in the ditch, as noted above (see blood stains in Figs. 14.3a and 14.4a). It was recognized that this facility needed a new generator and ancillary items. The livestock sales barn had a poured foundation (Fig. 14.4b) and was about 10% complete with the tanning facility and feed mill operational. Within 1 year, the slaughter facility expansion had been approved and was prepared for commencement in the spring of 2011 (DVIDS 2010). Image analysis shows that this project appeared to be completed by 2013 (Fig. 14.3b) inclusive of an asphalt-access road and bridge, an interior walking pavement, and a controlled migration of slaughtering into the slaughter structure (evidenced by the decreasing bloodstains observed on the imagery between 2010 and 2019 on Fig. 14.3). By 2016, the slaughter facility was enclosed by a perimeter wall (Fig. 14.3c). By 2019, nearly all slaughtering appears to have been moved into the facility (Fig. 14.3d). Overall, this project was both an initial success in helping develop new relationships with the DAIL, the local communities, and the US Army and, later, as an entire Agribusiness Complex. Based on the scope of work documents, it is likely that the bridge and access road improvements were constructed between 2010 and 2013 to meet the increasing use of the complex. These improvements were directly related to the support of the local community and not part of the original scope of work.

14.3.2 Arbaba National Environmental Park (No Change)

The Arbaba National Environmental Park (ANEP) is located 2 km east of the city of Ghazni (Figs. 14.5 and 14.6). It was originally conceived by order of the then President of Afghanistan, Hamid Karzai, in 2005.[2] In conjunction with the newly

[2] Proposal number 685, dated 28 May 2005 of the National Environmental Protection Agency and Order number 1017 of Hamid Karzai dated 30 May 2005.

Fig. 14.5 Arbaba National Environmental Park (ANEP) multitemporal satellite imagery series. (**a**) The dashed line on this 2010 image shows the boundaries of the walled ANEP. This area was disused pasture before 2009. The blue transparent polygon (left) encompasses derelict structures and fields that were later revived/improved. The arrows indicate the locations of the ground photographs in Fig. 14.6. Within the ANEP, the radiating light-colored lines are graveled paths and the center circle is the planned location for a central fountain; it was never begun. The bright spot (1) is a white-balance issue associated with the reflective metal roof for the facility storage/entry/guard building. (**b**) This image from 2013 shows basic row planting (2) and the administration building (3). (**c**) This 2016 image shows the roofed administration building, (4) and (**d**) the 2019 image shows the increase in buildings to the west of the park. (Modified from Terraserver.com; used with permission from PrecisionHawk)

adopted Constitution of Afghanistan, Article 15 stated a formal and direct need for the government to protect the environment, so 20 jeribs of land (four hectares) were transferred to Ghazni Province for the development of the country's first national environmental protection park (Stewart 2014). This land transfer languished in the provincial land office register book until September of 2009 when it was formally transferred for the commencement of the park project. This four-year lag was likely related to the timing of the entrance of US Forces into Ghazni Province in 2008, thereby presenting an opportunity for the US Army to help support the project. The project, along with the Ghazni Minarets Park project, was also spurred on by excitement among the city and province populace and local leaders with their selection as the 2013 Asian Capital of Islamic Culture (UNAMA 2013) during which cultural and heritage conservation and preservation were key attractions for the hoped-for tourism boost.

Fig. 14.6 Ground photographs of the Arbaba National Environmental Park's planned location in June 2009. (**a**) This photo looks westerly across the alluvial pasture (black arrow on Fig. 14.5). (**b**) The cut-bank section from the adjacent wadi where the planned gabion-wall section was intended to be constructed (red arrow on Fig. 14.5)

The original scope of work requested by the Afghanistan Environmental Protection Agency and supported by the ADT required the transformation of an open area of alluvial sands (Fig. 14.6a) into a thriving environmental park meant to provide for the permanent preservation of the area's natural condition (antecedent to human influence) dedicated to public education, enjoyment, and inspiration. Not only was the park to be a site for family visits and recreation but also for high-school and university learning in a lab-type environment (e.g., drip irrigation methods or flora identification). The project was estimated to take about 3–4 months and to be completed by the end of 2009, employing two to three full-time workers. To make this park available to *all* people (i.e., *purdah*[3] for females and families), of utmost importance in this traditional Islamic city, a $1100 \times 2.4 \times 0.6$ m perimeter stone wall was built (Fig. 14.5a). This wall was the first part of the project to be completed and required the joint relations of the governments of Afghanistan, the United States,

[3] *Purdah* is the South Asian practice of veiling women and secluding them from public view.

and Poland (Ghazni was in Polish battlespace) in order to garner enough support for its completion. The success of the park hinged on this *purdah* screen or view-blocking stone wall, and its construction amounted to about 80% of the project's cost. Secondarily, an administration building and a guard shack were requested (Fig. 14.5a, b), as well as a pump room and a generator room, a water well, land leveling, walkways, an irrigation system, and the planting of apple, apricot, and almond trees and ornamental plants. A gabion wall was intended to minimize weathering and erosion from flash floods from the adjacent wadi (Fig. 14.6b).

By the summer of 2010 (Fig. 14.5a), progress on the park included the building of the perimeter security wall, administration-guard building, a central fountain, and graveled walkways. Based on the original contract and scope of work, however, progress was approximately 6 months behind schedule. Reports by the Texas ADT IV in May 2011, when there was no imagery, suggested that the project required another 2–3 months for completion (ADTiv 2011). By 2013, the access road had been paved and the foundation of the administration building is visible with subtle evidence of the orchard in the southwestern section of the park (Fig. 14.5b). No foliage is detectable park-wide on any image between 2013 and 2019. By about 2016 (Fig. 14.5c), the administration building appeared complete, but the access road is becoming increasingly covered by lateral transport of wind-blown or washed regolith, and by 2019 (Fig. 14.5d), it is completely buried and disused.

Based on image analysis, the Arbaba National Environmental Park was never fully completed or implemented as planned. Ghazni was the center for Islam in 2013; however, in this security-poor sector of Afghanistan, it is unlikely the park was dedicated. Although the image analysis indicates that the ANEP per se was not completed, some 60,000 m^2 of adjacent structure development commenced around 2011/12 with continual growth up to 2019. It is likely that this development coincides with the park's inception and was based on hopes that it would be the attraction promised by the government. It is probable, too, that security personnel intended to be provided by the park would lend an added layer of protection in this insecure area and thus enhance the likelihood of local development. If this were to happen, it is anticipated that the ANEP may yet become the reality originally envisioned.

14.3.3 Ghazni Demonstration Farm (Loss)

The Ghazni Demonstration Farm (GDF; Figs. 14.7 and 14.8), like the GAC, was an early ADT I project devised in direct consultation with the DAIL and the local communities. It was paramount, as a newly devised unit with a specialized and unique agribusiness mission novel in the Afghanistan battlespace, that ADT I develop good and lasting relationships with the local communities. The aspiration to develop ideas to enable the Afghan people to become agricultural exporters and not just subsistence farmers was directly related to agribusiness concerns. This had been the case before the Soviet invasion in 1979 when Afghan exports included

Fig. 14.7 Ghazni Demonstration Farm multitemporal satellite imagery series with dashed lines enclosing the farm property. (**a**) In this 2010 image, the circle indicates the ADT-supported and implemented access bridge (2008) and gabion wall (2009). The arrows indicate the locations of the ground photographs in Fig. 14.8. (**b**) This 2013 image shows what appears to be a failed effort to plant trees (2) (see the arranged plot in (**c**)), which returned to derelict rectangular plots, and the greenhouses and other support structures (3). (**c**) This 2016 image shows the continued deterioration of the demonstration farm with the white box surrounding the arranged plot where trees were planted. (**d**) The poorly developed cover crops, fields, and plots in 2019 are evidenced by the mottled appearance (4). (Modified from Terraserver.com; used with permission from PrecisionHawk)

sugarcane, sugar beets, fruit, nuts, and wool. In order to meet this goal, a demonstration farm was proposed in the agricultural corridor of flat, alluvial fills of the Khwaja Omari River near Ghazni City. This demonstration farm was meant to train locals in advanced agribusiness techniques and methods, to serve as a center for the DAIL's agricultural extension agents, and to become a place for potential future agriculture fairs. The initial project devised and implemented included an access bridge (Fig. 14.7a), two greenhouses (Fig. 14.7b), a livestock shed and animal pens, a cool-storage facility, a classroom (Fig. 14.8a), a cistern, and wind turbine and solar panel array to power the operation. By early 2009, this project was completed, and the DAIL and local communities (and the new ADT II) were eager to continue relationships and build upon this foundation. After a QA/QC follow-up in March 2009 conducted by ADT II personnel, it was realized that the new gravel-paved access roads needed to be extended to support the weight of heavy truck

Fig. 14.8 Ground photographs of the Ghazni Demonstration Farm in December 2009. (**a**) View looking northeast across plotted conifer saplings with the classroom and cold storage in the distance (yellow arrow on Fig 14.7a). Note the raveled drip-irrigation lines in the middle ground/right and the failure of approximately 50% of the saplings to take root. (**b**) An IED-resistant irrigation culvert. (**c**) A perspective view from the access bridge looking westerly at the recently emplaced gabion wall (white arrow on Fig. 14.7a). (**d**) Westerly view of the recently emplaced and graveled access road with four culvert abutments

traffic. A second-order consequence was that these roads had become an impediment to irrigation-ditch emplacement and the access bridge's wing-wall was being sapped by lateral bank incision by the perennial Khwaja Omari River that it crosses. To address these issues, the ADT II personnel, in conjunction with the DAIL and community elders, decided to emplace five improvised-explosive-device-resistant (IED) culverts (Fig. 14.8b) to allow for unimpeded irrigation flow and to emplace a series of gabion baskets (Fig. 14.8c) as an extension to the bridge's wing wall (Stewart 2014, 2016a, b).

By the summer of 2009, the access-road network had been expanded and graveled (Fig. 14.8d) and the culverts had been installed. The culverts were reinspected in December 2009 and signed off as functional, along with the gabion basket extension to the bridge wing wall. The culverts were engineered to be IED resistant by welding crossed rebar at the openings to prevent bomb emplacement (Fig. 14.8b). This was necessary because the Ghazni area was undergoing significant insurgency-related security issues at the time due to the constructive relationship between the US Army and the local populace. The gabions were primarily meant to prevent additional sapping of the bridge's wing wall and provided an opportunity for a community-wide learning event. The project centered around a qualified engineer

teaching local farmers how to emplace the gabion baskets. After being taught, farmers were given empty gabion baskets to use on their properties as a form of payment for the help they provided by emplacing them while undergoing instruction. The entire learning event was promoted and run by Afghans and was publicized on a Ghazni radio station to attract participants and, later, to promote the results.

Based on on-site QA/QC visits throughout 2009, the GDF was assessed to be a relatively active and promotional project requested by the DAIL and the local communities. All projects, up to December 2009, were considered complete with payments submitted to the Afghanistan contractors. Inspections throughout the summer of 2009 revealed failed nursery plantings and kinked and improperly placed and managed drip irrigation lines (Fig. 14.8a). The batteries for the wind turbine and solar panel systems had been stolen. Despite these setbacks, every effort was made to continue operations at the GDF. An examination of imagery from 2010 to 2019 indicates that the entire demonstration farm appears to be increasingly derelict. The access roads, culverts, and irrigation accesses all became worn, covered, and disused, and the attempts at cultivating crops or trees appear to have never taken hold. Multitemporal imagery of local farms around the GDF show crop growth as increased greening as the growing season continued, but, unfortunately, this is not the case for fields within the project boundaries. It is likely that the roads are used by local farmers as shortcuts to other destinations, and the buildings have become either derelict or repurposed (such as happened at a nearby USAID-funded grape-drying facility, which was used as a shed to house goats). In all, this community-partnership project likely failed for the lack of timely access to this centrally located demonstration farm where farmers still live and work in their small communities without much interest or need to head to the city of Ghazni (Groninger et al. 2013).

14.4 Discussion

Overall, the sustainability of the 27 projects evaluated results in a normal distribution with 19% positive, 60% no change, and 21% failed or lost (see Fig. 14.2), which is an improvement compared to results presented in development-aid literature globally and for Afghanistan specifically (Qian 2015; Egel et al. 2016; Kapstein 2017; Radelet 2017; SIGAR 2020). Unexpectedly, there is no connection between project success and external defense and security metrics, which would likely have direct effects, such as troop levels and expenditures (Fig. 14.2). Exclusive of the direct loss due to the myriad problems associated with the full success of all projects (e.g., security or contractor issues) and the slow rise (green area in Fig. 14.2) as projects were developed between 2011 and 2013, there is nearly no variability in project status with time. The slight increase in positive effects in 2014 is due to the unexpected continued development, both road paving, at two already positive projects, the GAC and the Ghazni Minarets.

The projects that failed or were lost were all demonstration-oriented projects (e.g., the Ghazni Demonstration Farm; Table 14.1), which mostly never got off the

ground. Despite direct work with and within the communities to develop these projects, it may be that these projects, all of which were presented to the local populace as starter projects to build new community relationships, were seen as ways to open lines of communication and the flow of US aid money into these communities. Initial contact with communities was centered on *shuras*,[4] discussions with the DAIL and local elders, who proposed ideas that would benefit the community as a whole while promising full community acceptance and involvement. Once these projects were started, more specific projects that were more likely to be successful, such as a wool-processing facility, were often requested by the community even though they may not have benefited all equally. In general, these failed projects just never got off the ground—good intentions that were funded but either were never completed or became derelict. The driver was Afghan led, and therefore it was never the intent to have US personnel work on these projects, even if that meant some would never be finished or would fail.

The bulk of the projects developed by the Texas ADT II were considered no change; this is *not* a negative result because these projects were devised and implemented on time (more or less), to budget and remained in basic, planned operations for the following 10 years. Fifty percent (8 of 16; Table 14.1) of the projects that showed no change were either earthen or masonry dams that needed nonstructural repairs, so funds were offered to help maintain their functions (Stewart 2016c). In all, these 16 projects appeared to continue to function as planned yet were not able to spur additional or ancillary development efforts required to be considered positive.

The five positive projects (Table 14.1), such as the Ghazni Agricultural Complex, essentially, are not that much different in their scopes, implementation, locations, or the energies put into their development than the projects that failed or were lost. It is likely the positive outcomes of these projects are attributable to being developed at the right time and in the right place to suit the particular needs of a community that ultimately found real, useful, and promotional value to their intended usage.

The US Army will continue to deploy its forces around the globe (Turse 2017) in support of US interests, and delivering reconstruction aid will continue to be a priority where it supports the military mission (Iyengar et al. 2017). The overall success of development project efforts will be criticized by traditional aid providers, such as Oxfam (2014), as militarized aid that is paradoxical and untenable as a way of providing development efforts globally. Despite this criticism, the ADT mission's efforts were in direct response to needs for humanitarian assistance that could not be met by traditional aid or development agencies because the Taliban and Al Qaeda militants did not recognize the Geneva Conventions or international humanitarian law (Bellal et al. 2011) and the concepts of humanity, impartiality, and neutrality. ADTs were relatively low cost but large in impact. This is in direct contrast to the

[4] *Shura* is an Arabic word for consultation. The Quran and the Prophet Muhammad encourage Muslims to decide their affairs in consultation with those who will be affected by that decision.

many large projects that formal, trained aid agencies (e.g., USAID) have tried to implement and that are often failures from the start (Kapstein 2017).

14.5 Conclusion

Despite spending only 0.03% of the US current total budget on reconstruction efforts in Afghanistan, the ADT mission's overall impact on the communities they served was positive. Some 80% of the 27 remotely sensed projects either have been maintained within the original scope of work or the concept originally proposed or have stimulated ancillary and unplanned, but hoped for, positive results. The ADT mantra to providing agribusiness development in Afghanistan was "small is better," provide to stable communities, and keep it simple, all the while working with and within the local communities through direct, daily conversations. As a result of these efforts, local needs became apparent, as did the ways local people could be supported by Afghan-first projects. This was a natural extension of good people and good planning working for the betterment of Afghanistan. The ADT mission worked this way, years *before* the academic literature appeared to understand that these attitudes and operational needs were a requirement for successful aid efforts (Oxfam 2010, 2014; Egel et al. 2016; Sexton 2016; Iyengar et al. 2017; Kapstein 2017; SIGAR 2018). The effectiveness of these specialized US Army teams has been recognized by the development community and used as a model to develop new and better ways to provide aid. A prime example is the proposed USAID (2018) Rapid Expeditionary Development Teams meant to operate as two-person, civilian-military teams executing a mix of offensive, defensive, and stability operations—all to push USAID efforts into insecure areas and improve their chances of success. The remote-sensing analysis of projects presented here shows that the ADT model was effective and provides evidence to support this model being formally adopted by the US military. The US military should respond to future needs using these unique soldier-expert teams that are able to think beyond military training and provide development assistance in the most dangerous locations on the planet.

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