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The Surprisingly Constant Cost of Landmine Impact Surveys

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The Surprisingly Constant Cost of Landmine Impact Surveys

Landmine Impact Surveys involve survey teams that work with the local people to evaluate how landmines and unexploded ordnance affect daily lives. The Survey Action Center, United Nations and the affected countries closely regulate this process to ensure the preservation of high standards.¹

by Russell Gasser | Humanitarian Technology Consulting Ltd.]



Locals from landmine-affected communities draw community maps in Sudan.
All graphics courtesy of the author.

There is no obvious reason that a Landmine Impact Survey should cost the same in a small European country like Bosnia and Herzegovina as it does in Chad or Thailand, but analysis of the 13 surveys with published costs shows that most surveys do cost about the same amount.¹ The two largest surveys (Afghanistan and Angola) show more variation. This analysis provides a way to deduce which of the past surveys were most cost-effective and could lead to ways of

reducing LIS costs, while providing estimates for future survey costs. Several surveys have been stopped and restarted due to funding shortfalls; therefore, a better cost estimate would help in planning. It is important to remember this is not a rigorously predictive method but an observation on worldwide experience.

Surveys are conducted as defined by international protocols.² This method probably accounts for the fairly constant fixed costs, which are more than US\$900,000

Country	Year Finished	Cost US\$	Suspected Positives Before Visits	Post-LIS Actually Impacted	Notes
Afghanistan	2005	3,004,494	4,655	2,365	
Angola	2007	6,778,163	4,384	1,988	
Armenia	2005	669,800	99	60	
Azerbaijan	2003	1,236,000	610	480	
Bosnia and Herzegovina	2003	2,006,730	2,939	1,366	
Cambodia	2002	1,360,000	13,908	2,776	No sampling
Chad	2001	1,842,000	1,361	249	
Eritrea	2004	2,291,992	352	132	
Ethiopia	2004	4,029,672	3,281	1,492	
Iraq	2006	No Data	12,010	2,117	No sampling
Kosovo	2000	111,000	No Data	No Data	
Lebanon	2003	1,500,000	1,065	306	
Mauritania	2006	No Data	No Data	No Data	
Mozambique	2001	2,272,000	2,057	791	
Senegal	No Data	No Data	No Data	No Data	
Somalia (all three phases)	2007	1,906,900	496	482	
Sudan	2009	No Data	Not aggregated	296	
Thailand	2001	1,656,000	1,491	530	
Yemen	2000	1,645,000	1,294	592	

Table 1: Landmine Impact Survey data available from reports found on <http://www.sac-na.org>.

per country (See Figure 1 next page). In addition to these fixed costs, a variable component averages about \$800 for each community suspected of being affected by landmines and/or unexploded ordnance from the start of the main data collection.

Before the main survey starts, an LIS undertakes a **Recollection of the Opinion of Experts** in the affected country that results in a list of each community in which people are considered mine- and/or UXO-affected. These communities are known as **suspected positives**. At this point in the process, identifying potentially affected communities may eliminate areas within the country where there has been no conflict. In Senegal, only the southern province of Casamance has mined areas. In Thailand, mines only exist in certain border areas. Thus far, every survey has found that a significant proportion—roughly one-half—of the suspected positives are not

mine- and/or UXO-affected, and they then become **false positives** in the survey data. (See Table 1.)

The correlation of total cost against parameters—such as the number of communities suspected, the number visited, the number impacted, the number with mines, UXO or victims, plus several different combinations of this data—was analyzed for all available published surveys. This assessment showed that the best correlation is between the overall cost and the number of suspected positives after the initial data gathering and gazetteer preparation. This result may be expected, as a survey team usually must visit each suspected positive community.

The correlation strength between costs and suspected positives was unexpected at the beginning of the analysis. After eliminating the countries with missing data—including Cambodia, which did not use a sampling methodology—a strong correlation of 0.8 for all surveys was found

to exist between the costs and suspected positives. (See Figure 1) The fixed costs are surprisingly high, meaning that the larger the survey, the lower the cost per affected community. Although this varies from one country to another, Afghanistan and Bosnia and Herzegovina were less costly than average, whereas Angola, Eritrea, and Somalia were more expensive.³ These increased costs may be explained because the Angola LIS had to be stopped and restarted, and Somalia's survey was undertaken in three phases.¹

Future Outcomes

I suggest the mine-action community can draw some useful conclusions from this analysis:

1. The set of protocols closely regulating the LIS probably contributes to the relatively constant cost. To improve efficiency and cut costs, either the protocols will need revision or future surveys will need to reduce the implementation of only the most essential protocol elements. This situation poses a dilemma: Reworking the protocols is likely to be slow and expensive, but surveys not in compliance are less likely to receive funding.
2. First estimates of the overall cost of any future surveys can be made. The number of surveys that have run out of money suggest this exercise could be useful. A better measurement of the likely cost-benefit before investing millions of dollars in a survey will result.
3. As cost is related to the number of suspected positives and about half of these are found to be false positives, it seems that

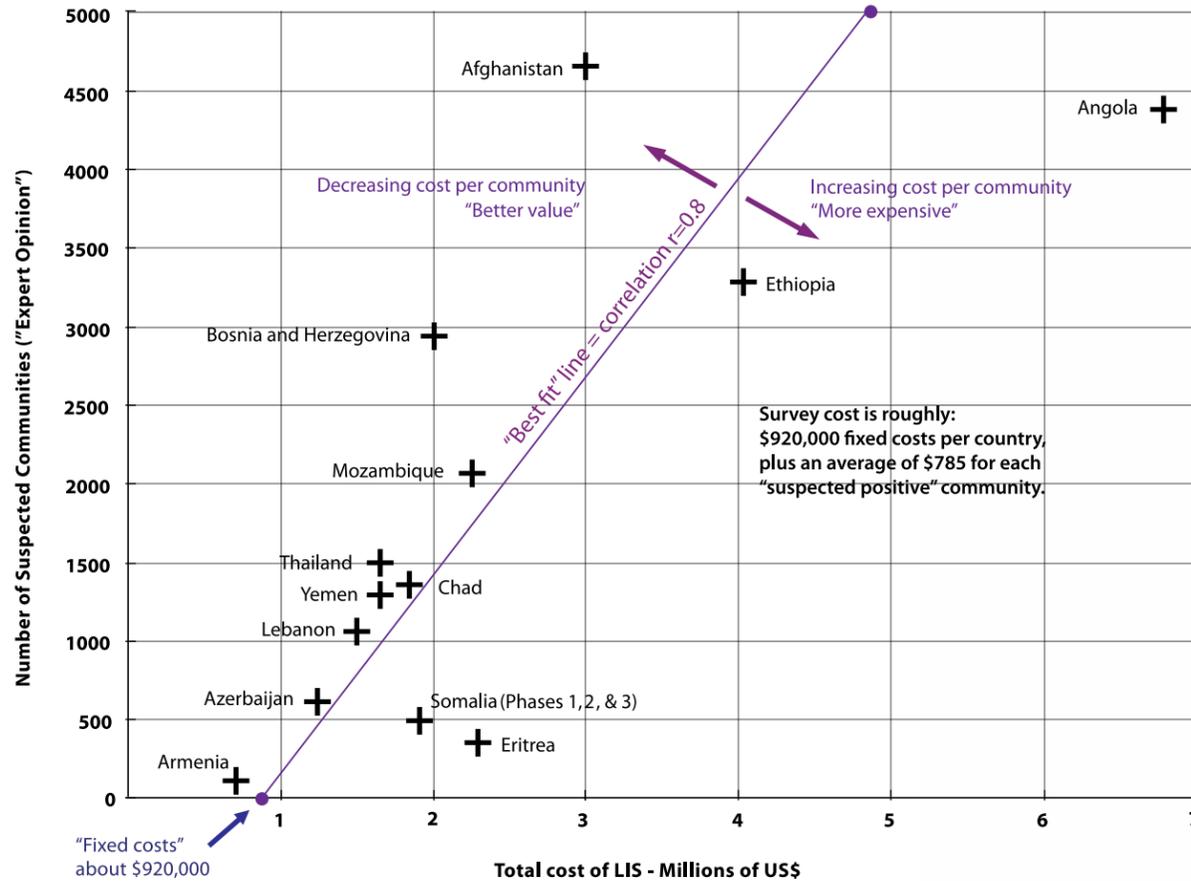


Figure 1: Landmine Impact Survey costs available from reports found on <http://www.sac-na.org>.

spending more time and effort on the initial data collection could be useful. If the number of false positives can be reduced, it is reasonable to assume that overall costs will also decrease. *The Expert Opinion Collection* is usually a relatively small part of the overall survey cost, so investing more resources on accurately collecting data early in the process may be a useful approach to improving the LIS cost-benefit ratio.

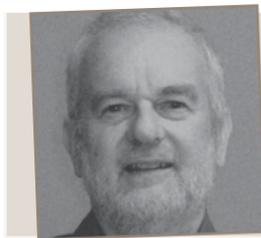
Conclusion

The initial data collection in an LIS designates communities as potentially impacted by mines and UXO. Distinguishing between suspected positives and false positives

early in the process can reduce the costs of the LIS. Based on analysis of the correlation between costs and suspected positives, evidence supports that efficient planning can reduce future survey expenses.

Given the small number of countries that still require an LIS, the outcome of this analysis can give better cost estimates to potential donors and identify the survey parts where savings are most probable in the future. At this stage, with so many Landmine Impact Surveys completed worldwide, rewriting the protocols is likely not useful. Focusing on more efficient implementation and collecting core data in different countries is a better route to cost savings overall. ♦

see endnotes page 83



Russell Gasser is an engineer who became interested in mine action while helping start a wheelchair repair workshop in Nicaragua in the late 1980s. He returned to Warwick University Development Technology Unit in the U.K. in 1996, to write a Ph.D. thesis about advanced technology research failing to deliver new demining tools and equipment. He received his Ph.D. in 2000. After working for the European Commission for three years, he formed a consultancy, Humanitarian Technology Consulting Ltd., to provide mine-action program evaluation.

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The Rise in Terrorist Attacks in the Western Sahara

The Mauritanian government is taking steps to prevent Al-Qaeda's terrorist acts, including suicide bombings and kidnappings in the region. Added to this threat are the explosives Al-Qaeda is able to obtain from landmines and unexploded ordnance scattered throughout the region after years of conflict in Western Sahara. The United Nations Development Programme and various countries work to remove these landmines and items of UXO, which is complicated by the lack of a Landmine Impact Survey.

by Lt. Colonel Mohamed Taghioullah Ould Nema [Cabinet of the Mauritanian National Army]

In 2009, while driving toward the French embassy in Nouakchott, Mauritania, I suddenly encountered a large blast. As I approached the scene, I saw the worst sight I have ever seen—the results of a suicide bombing explosion. A 20-year-old man had blown himself up trying to kill two innocent embassy staff members while they were exercising. The explosion split the man's corpse into three parts: His head to stomach was dismembered and lying in the center of the path; his lower part was thrown about 12 meters (13 yards) away; and pieces of his legs and other small bits were strewn about on the pavement. He committed this action during the daytime, in front of everyone, and I saw it myself.

Immediately following the attack, fear paralyzed the people nearby. No one wanted to move because they were shocked and revolted by the explosion, and they were worried about additional attacks.

Al-Qaeda's Terrorism in Mauritania

This was the first suicide bombing in the country and the beginning of many *Al-Qaeda el Maghreb Islami* (Al-Qaeda of the Islamic Maghreb) attacks in Mauritania. For example,

the Israeli embassy in Nouakchott was blown up by a grenade and assaulted by terrorist fighters, wounding three people. Three French tourists were killed at Aleg (in the deep country). Finally, AQIM killed French captive Michel Germaneau in retaliation for a French raid that killed six AQIM militants.¹ AQIM had kidnapped Michel Germaneau in Niger on the border with Mali and Algeria, but where he was killed remains unknown.^{1,2}

The Mauritanian government is determined to fight terrorists. Many specialized units in counterterrorism are stationed on the borders between Algeria, Mauritania and Mali. The soldiers comprising these units were highly trained in counterterrorism techniques by American and French experts. In addition, the Mauritanian government essentially provided all the needed equipment to the units (e.g., helicopters, vehicles, radar, an armored personnel carrier, night-vision goggles, etc.).

Using technology and satellite data, Mauritania's counterterrorism team is gathering accurate intelligence extending beyond the country's borders to stop the extremists before they can launch new at-



A sentry guards the approach road to a lightly guarded Mauritanian Army munitions supply point. All photos courtesy of John Stevens, PM/WRA, U.S. Department of State.

tacks. A joint tactical-operational center was created in Algeria. This center provides updated intelligence information, assesses the security situation and coordinates shared actions against AQIM.

Other bandits, arms traffickers and drug dealers are located in the same region as the AQIM fighters and can collaborate with them in terms of resupply or equipment support, although AQIM mem-