

Joint Analysis of Landmine Impact and Human Development Surveys in Armenia

In Armenia, the UNDP implemented a Landmine Impact Survey as well as a Human Development Survey, although separately from each other. The authors, by linking the two data bodies, demonstrate new findings about mine-affected communities in a poverty-alleviation perspective.

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An association between landmine/unexploded ordnance contamination and poverty is generally assumed and is often conspicuous and straightforward in anecdotal evidence such as victim case studies or community livelihood vignettes. Its strength and causal direction are more difficult to establish. With data from previous Landmine Impact Surveys,¹ it has been demonstrated that poverty, in terms of lack of livelihood alternatives to using polluted land, renders community adaptation more difficult; in contrast, externally created new alternatives may reduce contact with the explosive devices and thus the number of new incidents and victims. For example, affected communities in Thailand with more diversified financial services stood better chances of remaining entirely incident free than communities with no or such scant services.² While greater income growth and diversity plausibly help to reduce incidents, there is little knowledge of how local economic development ultimately contributes to the definitive resolution of the problem by accelerating the removal of explosive remnants of war.

Moreover, there may also be an indirect link between pre-war poverty levels and contamination. Terrain and accessibility may be the intervening variables. For example, communities in high-altitude, difficult-to-reach mountain areas may have been structurally poor for some time prior to the events causing the contamination. Later, during the conflict, their strategic location may have predisposed some of these communities for military uses, defended with minefields and littered with unexploded ordnance. After the conflict, the contamination makes them less amenable to reconstruction and poverty-alleviation programs than other post-conflict communities that are not contaminated and thus do not present the same kind of access and resource blockage problems.

The standard LIS methodology does little to shed light on the relationships between poverty and contamination, let alone on the question in which direction causal effects are stronger—from poverty to contamination or from contamination to poverty. The survey

covers all suspected and confirmed affected communities, but collects no substantive information on non-suspected ones. As such, the LIS fails to support strict case-control analytic approaches. However, variation in impact severity can to a degree be used in studying the association with poverty. From a strategic perspective, the lack of comparison with unaffected communities makes it harder to mainstream mine action into broader development programming. Such mainstreaming is one of the recommendations that a recent LIS evaluation made.³

The poverty data itself has to be acquired from outside sources and only a small number of country Landmine Impact Surveys have been able to obtain useful data bodies in time to be considered in their analyses and reporting. Lebanon provides a first example. By fusing agricultural census data with LIS data, we were able to demonstrate that affected communities in the south, generally poorer and freed from hostilities later than other regions, tended to have higher active-land-use ratios while controlling for the agro-climatic ecology and landmine impact severity.⁴ A plausible interpretation was that poverty and lack of alternatives obliged local residents to use land more extensively regardless of contamination.

In Vietnam, the LIS conducted in three central provinces obtained data from a poverty-mapping project of the International Food Policy Research Institute. Contrary to common wisdom, however, poverty was not found to be associated with higher victim numbers, except in certain mountainous areas.⁴ A possible interpretation of this finding is that while collectively, at the commune level, the association between poverty and ERW victimization has weakened over time, individually it remains high, with poorer residents taking higher risks, particularly with the collection of scrap metal and explosives.

A further opportunity to relate LIS data to poverty information has presented itself in Armenia. It arose because the LIS implementing organization, the United Nations Development Programme was also conducting several interlinked surveys as part of efforts to help formulate national poverty-alleviation strategies. The particular attraction of this information within the LIS analysis is that it lets

survey users compare the positions that affected and non-affected communities took on a number of development issues. Thus communities are not only seen as a problem to be fixed, but as a collection of human beings voicing their own priorities in the wider poverty-alleviation context.

The Armenia LIS

The European Union and the United States Department of State's Office of

resources and contaminating munitions, the survey classified four communities as high-impact, 31 as medium-impact and 25 as low-impact.

Affected Communities and the Human Development Survey

Officially, the last known emplacement of landmines on Armenian soil took place in 1994. UXO from the conflict with the Soviet Union still dot the landscape. In a small number of communities surveyed, key informants related instances of local people planting mines as recently as 2003. The impacted population has long been aware of the dangers of UXO and landmines, giving the people time to adapt. Proof of this adaptation is found in the reduced number of mine and UXO victims.

In LIS countries with several hundred affected communities, it is feasible to relate the degree of community adaptation, indexed by the ability to avoid incidents, to various social and contamination factors. In Armenia, with only 60 surveyed communities found to be affected, such effects cannot be reliably estimated.

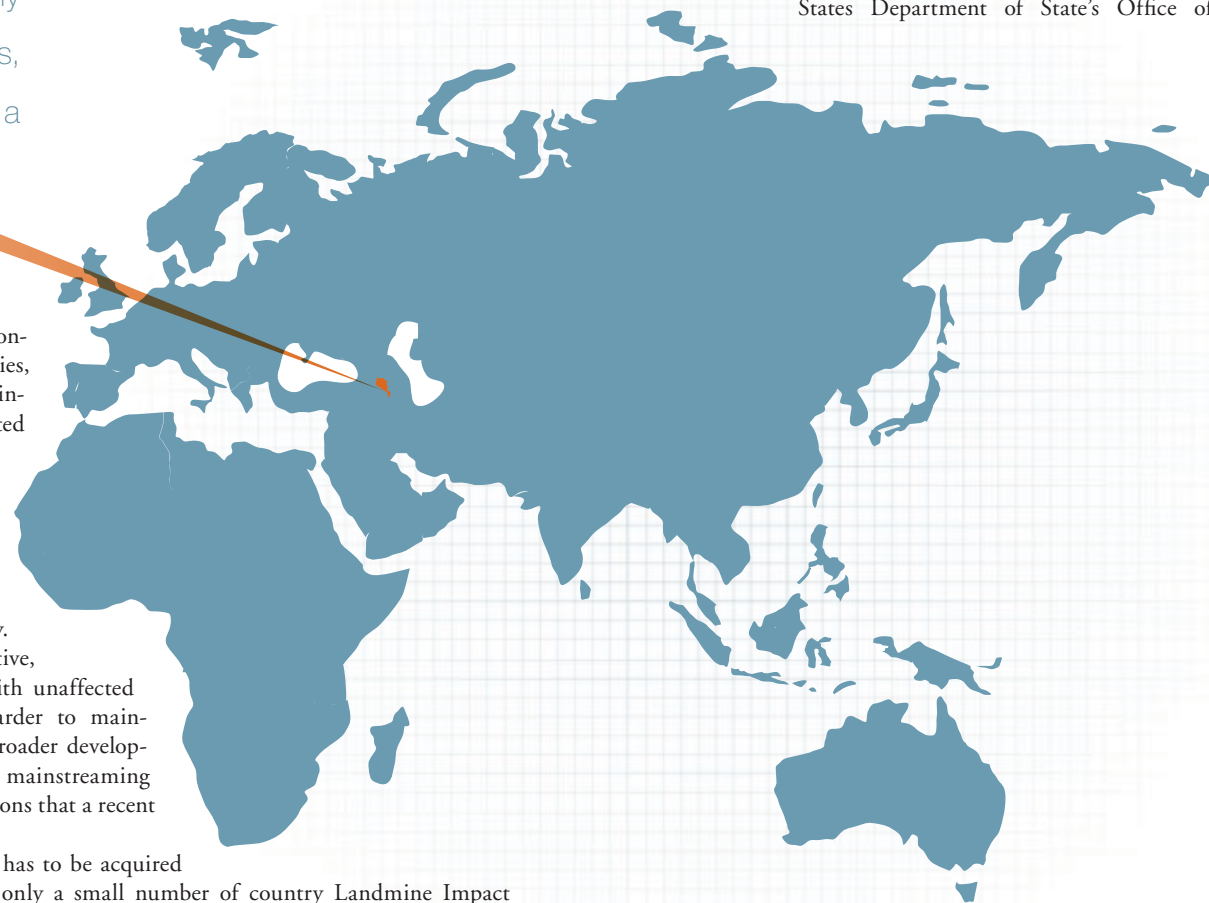
However, almost half of the 60 affected communities were sampled during the surveys that the government of Armenia and UNDP conducted in 2002 and 2003, under the designation of the National Human Development Survey. The NHDS comprised interrelated community, family and family-member surveys, with the ultimate goal of estimating national and regional poverty

levels. Included in the questionnaires were a considerable number of items concerning facilities and service provision, importance rankings for development issues, as well as demographic changes.

Ironically, although both the Armenia National Human Development Survey and the LIS were executed by the UNDP, the two survey staffs, headquartered in different towns, were not aware of each other's existence and purposes. By serendipity, Vietnam Veterans of America Foundation became aware of the NHDS rather late in the LIS data collection phase and asked the LIS staff to obtain copies of the NHDS data. Neither survey had been designed in conjunction with the other. In particular, the NHDS community and household samples were not stratified on landmine/UXO presence. The community gazetteers used by the two surveys were not identical and the overlap between the two sets of surveyed communities could only be established approximately. Moreover, the NHDS was designed in the tradition of World Bank/UNDP-sponsored Living Standards Measurement Surveys⁶ with a focus on sample surveys of household behavior rather than community surveys. It was therefore rather fortunate that the two survey data bodies could be linked.

Poverty Differences

The overlap between LIS and NHDS community samples permits comparisons between mine-affected communities and non-affected ones on a small number of pov-



Weapons Removal and Abatement funded the 2004–2005 LIS in Armenia, and the UNDP Armenia Humanitarian Demining Project was responsible for implementing it. The funds were channeled through RONCO and covered the cost of technical support activities. The Vietnam Veterans of America Foundation (now Veterans for America) provided technical expertise. The U.N. Mine Action Service has since certified the survey.⁵

The Landmine Impact Survey identified 60 impacted communities within the internationally recognized borders of Armenia. These areas were located in five of the 11 provinces and in areas where Armenia borders Azerbaijan. In the 60 communities, 14 persons were killed or injured in the two years prior to the survey. Based on the configuration of recent victims, impacted



Figure 1: Political map of Armenia showing impact areas near borders.

INDICATOR	LANDMINE-AFFECTED	NOT AFFECTED	IS THE DIFFERENCE STATISTICALLY SIGNIFICANT?
Communities compared	26	17	
Population (mean)	1,006	1,1557	n.s.
Distance from border (mean)	3.0 km	3.9 km	[n.a.; cut-off distance]
[Population-weighted means:]			
Very poor households (as fraction of all households, estimated by community leaders)	25%	18%	Affected communities have more very poor households, p = 0.07
Landless households (as fraction of all households)	21%	13%	n.s.
Out-migration (during 2002, as percent of population)	5%	1%	n.s.
Services and facilities score	0.66	0.88	n.s.
Industrial enterprises per 1,000 residents	0.42	1.10	Affected communities have fewer enterprises, p = 0.07
Industrial employees per 1,000 residents	10.52	14.69	Affected communities have fewer employees, p = 0.08

Table 1: Shows indicators and affected and non-affected communities and impacts of those indicators and whether it is statistically significant.

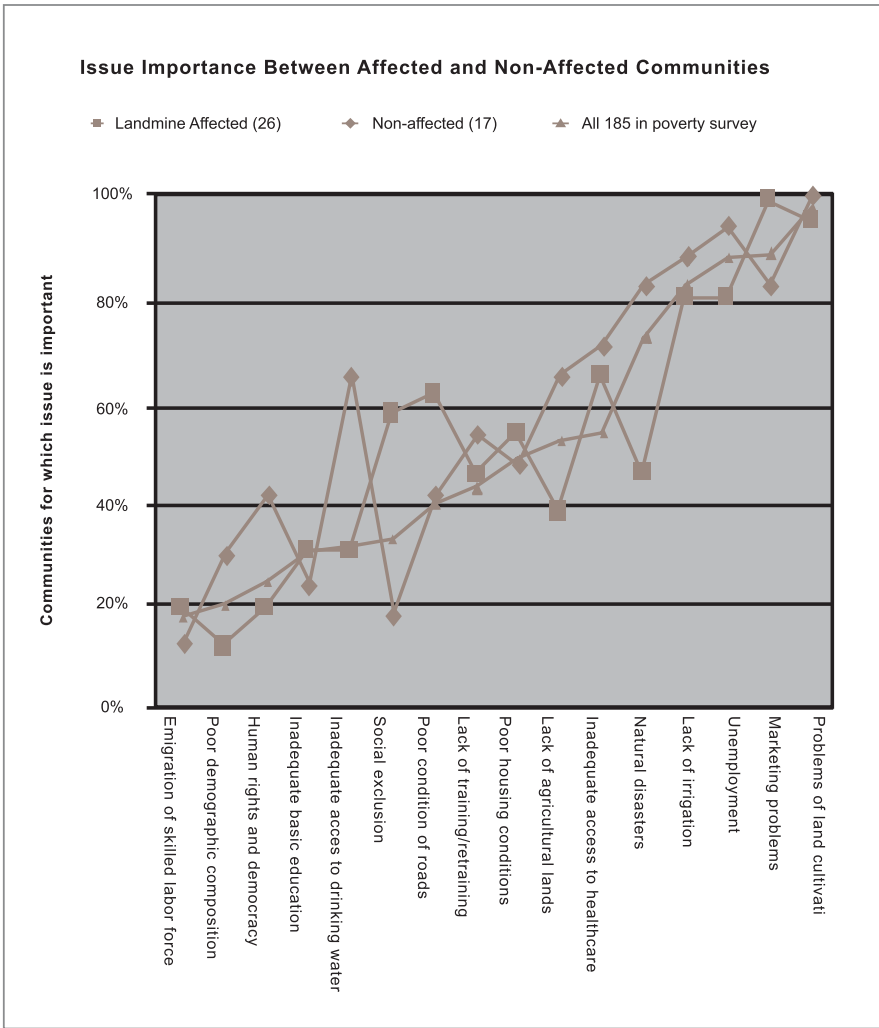


Figure 2: Line graph of affected and non-affected communities and proximity to the border. ALL GRAPHICS COURTESY OF THE AUTHORS.

erty indicators. These comparisons have to be taken with caution. Statistical tests for differences are valid to a degree only because the affected communities with poverty data were supplied by two NHDS samples—a probability sample of 170 rural communities (nine affected communities) and a sample of the 100 communities that national experts had designated as the poorest communities. This latter survey supplied poverty information on 18 landmine-affected communities; the fact that the surveyors aimed the sampling design at the poorest communities may induce upward bias for the poverty estimates of the 27 affected communities as a whole.

For better comparability, Table 1 contrasts affected and non-affected communities from similar environments—from the five provinces with landmine/UXO contamination and within these, only communities close to international borders. “Close to borders” is defined as being no farther away from the nearest border than 6,470 meters (four miles), the maximum distance for the affected communities also found in the NHDS samples.

At first sight, non-affected communities fare better on poverty and institutional indicators; however, tests suited for small samples reveal they are significantly different from their affected neighbors only in the levels of extreme poverty and industrial employment.⁷ The service and facilities score is based on the presence or absence of 10 different institutional features that set communities apart from one another. These features include industries, paved access roads, post

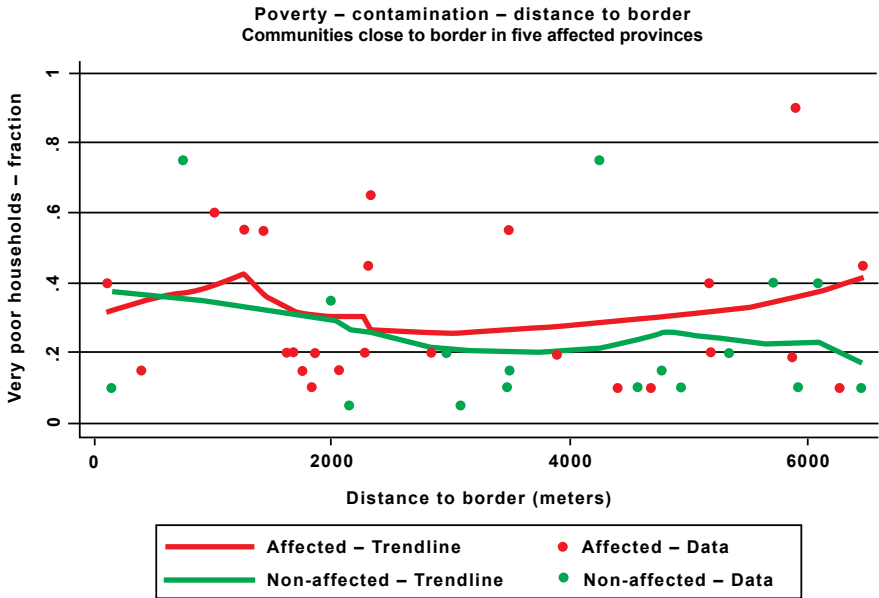


Figure 3: Graph of poverty rates and how connected to land-mine affected regions.

ISSUE	LANDMINE-AFFECTED (26)	NON-AFFECTED (17)	ALL 185 IN POVERTY SURVEY
Social exclusion	58%	18%	33%
Condition of roads	62%	41%	40%
Marketing	100%	82%	89%
Agricultural lands	38%	65%	52%
Natural disasters	46%	82%	72%
Drinking water	31%	65%	32%

Table 2: Percentages of importance / concern affected and non-affected individuals placed upon certain issues. Shows the percentages of people interviewed and what percentage viewed a topic of interest.

offices, kindergartens, secondary schools, outpatient health care facilities, pharmacies, cultural centers, telephone services and a centralized drinking water supply.

As the following graph makes clear, the claim of affected communities suffering more severe poverty is due essentially to the high density of communities relatively close to the border (three kilometers [about two miles] or less) that reported 20 percent or more of their families as “very poor.”⁸

Whether these communities faced poverty prior to the war (because they were at higher altitudes, closer to the mountain ridges that demarcate Armenia from surrounding countries) or whether their exposure to hostilities in addition to the landmine and UXO contamination exacerbated poverty in the area is impossible to establish with the extant survey data. But the association between contamination and poverty is strong enough to suggest that appropriate mine-ac-

tion strategies should be closely integrated with wider poverty-alleviation plans.

Importance of Development Issues

Some of these wider concerns stem from the importance that landmine-affected and non-affected communities attach to a variety of development issues rated in the NHDS. In Figure 3 the percentage of communities that considered an issue important is shown for landmine-affected and non-affected communities close to the border in the contaminated provinces. Issues are arranged by the importance they registered within the entire 185-community samples accessible to this analysis.

Overall, the importance profile among mine-affected communities and non-affected communities was similar. Some exceptions, however, are significant:

- Mine-affected communities are more isolated. They emphasize social exclu-

sion, poor roads and marketing problems as important issues more often than other communities. It is noteworthy that the greater importance given to social exclusion and road access persists even when surveyors control for population size (larger communities are less isolated), distance from the border (no effect) and extreme poverty (no effect).

- Mine-affected communities complain significantly less about lack of agricultural land than their mine-free neighbors do in affected provinces and areas close to the border. This may seem paradoxical. In many cases, however, agricultural land to which landmines and UXO are hampering access forms part of restricted military zones. The local community may not think of these areas as accessible and therefore may not formulate the problem as lack of a particular type of land.
- Fewer mine-affected communities than was expected identified natural disasters as an important issue. Drinking water is far less important an issue than among the 17 non-affected communities in the same zone but has the same importance as in the large sample. These differences cannot be explained with the available data, as shown in Table 2.

The greater emphasis on isolation and the somewhat surprising de-emphasis of agricultural land may suggest that, given limited development budgets, for many of the landmine-affected communities, clearance may not be as productive as other rehabilitation and development investments. Their relative lag in industrial employment appears to reinforce this conclusion.

Conclusion

The findings of the Armenia LIS, as far as they resulted from the analysis conjointly with human development survey data, warrant a substantive as well as a methodological conclusion. Substantively, poverty-alleviation policies and humanitarian mine-action strategies should be seen as mutually dependent. This dependency, however, is nuanced and cannot be thought of as a simple linear association between contamination and poverty or poverty alleviation and ERW mitigation. While both aim to inform national strategies, the suitability of particular project types for local community development has to be assessed by looking at several information bodies and by actively involving the affected populations. The LIS alone cannot establish the priority of mine-action

activities within the total reconstruction and development effort; living standards and human development surveys are not capable of rating the severity of the local landmine and UXO impacts. It is their combination with participatory methods that leads to better insights and policies.

This last remark hints at methodological practices desirable on both the LIS and poverty-research sides. The LIS has benefited from the discipline of using standardized community gazetteers and managing its data in a global information system framework that links up with other spatially denominated data bodies—a practice yet to be widely adopted in the sample-survey-based tradition of poverty research. Conversely, in order to release the constraints of “selecting on the dependent variable” (i.e., collecting data on affected communities only), LIS implementers need to reach out to institutions holding data on both affected and non-affected communities more aggressively and earlier, starting in the survey setup phase. And both survey traditions can benefit enormously from participatory assessments that elicit the voice of local communities.⁹

The Armenia LIS and human-development surveys, while planned and conducted separately, offer a glimpse of the potentials of mainstreamed mine action when affected communities are looked at through both prisms simultaneously. ♦

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