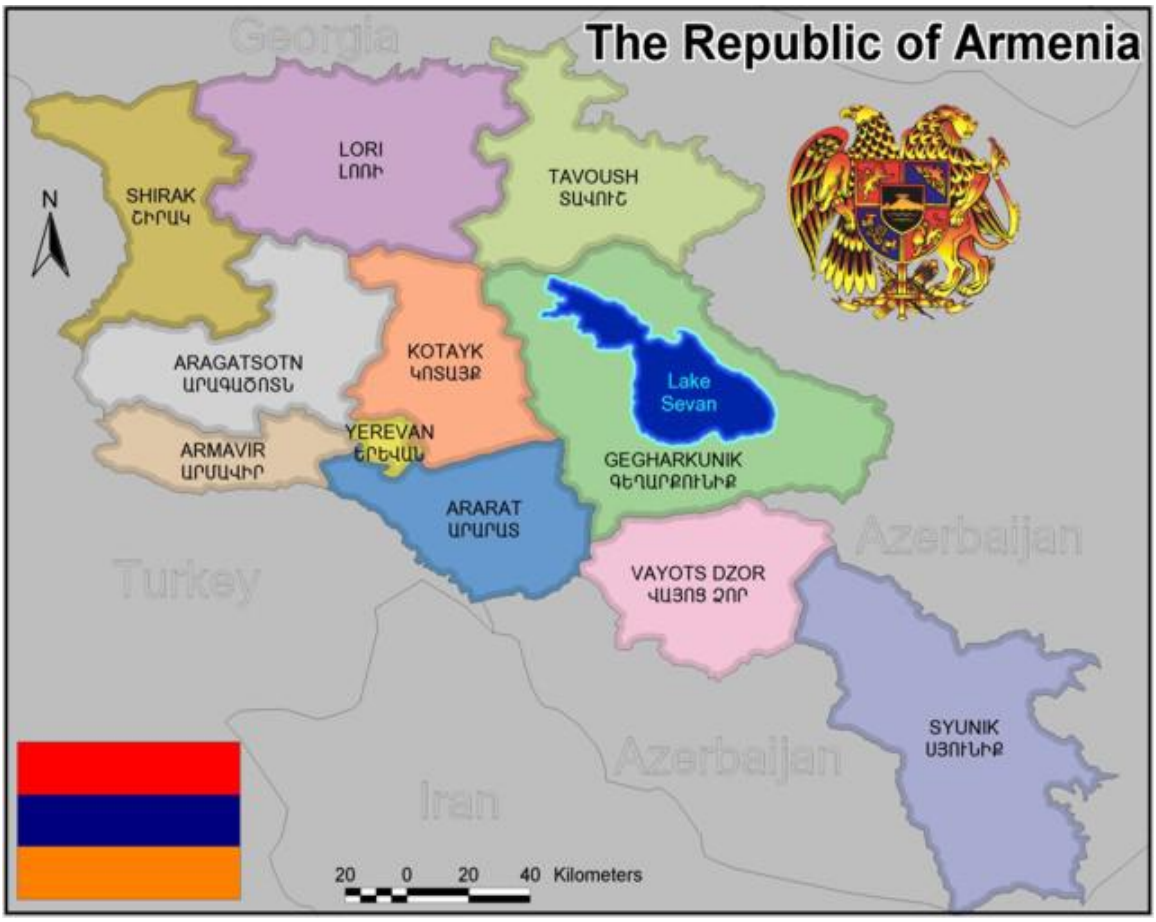
# LANDMINE IMPACT SURVEY

REPUBLIC OF ARMENIA

2005

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Approved by the Government of the Republic of Armenia

Implemented by the UNDP Armenia Humanitarian Demining Project

PROJECT ABSTRACT

The Landmine Impact Survey in Armenia summarizes the results of a nationwide socio-economic survey of the affects of landmines and UXO on communities in Armenia. This survey was conducted over a 7-month period, ending in August 2005.

This document is only one in a series of reports, which collectively constitute the Global Landmine Survey Initiative. This initiative aims to catalog the socio-economic impacts caused by landmines and UXO and to store this data in a manner that supports strategic national planning and resource allocation decisions.

The report on Armenia is designed to be read in conjunction with a document entitled, The Global Landmine Survey Initiative, which describes the global project as well as the general methodologies used to conduct impact surveys.

The following governments and organizations provided contributions to the survey:

European Union

Government of Armenia


United Nations Development Programme

Funding for the implementation of this Survey was provided by the European Union.

Cost-sharing contributions were allocated by the UNDP and the Government of Armenia.

Technical expertise was provided by the Vietnam Veterans of America Foundation.

Quality assurance monitoring has been independently provided by UNMAS.

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## LIST OF ACRONYMS USED IN THIS REPORT

| | |
|---|---|
| AHDC | Armenian Humanitarian De-Mining Centre |
| ALIS | Armenia Landmine Impact Survey |
| AP | Anti-personnel |
| AS | Area Supervisor |
| ASM | Advance Survey Mission |
| AT | Anti-tank |
| BCPR | Bureau for Crisis Prevention and Recovery (UNDP) |
| CA | Cleared Area |
| CM | Community Meeting |
| DA | Dangerous Area |
| DC | Data Collector |
| EC | European Commission |
| EOC | Expert Opinion Collection |
| EOD | Explosive Ordnance Disposal |
| EU | European Union |
| FE | Field Editor |
| FN | False Negative |
| FNS | False Negative Sampling |
| FP | False Positive |
| GICHD | Geneva International Centre for Humanitarian De-Mining |
| GIS | Geographic Information System |
| GL | Group Leader |
| GPS | Global Positioning System |
| HMA | Humanitarian Mine Action |
| HQ | Headquarters |
| ICRC | International Committee of Red Cross |
| iMMAP | Information Management and Mine Action Programs |
| IMSMA | Information Management System for Mine Action |
| LEOC | Local Expert Opinion Collection |
| LIS | Landmine Impact Survey |
| MA | Mine Action |
| MoD | Ministry of Defence |
| MoU | Memorandum of Understanding |
| MRE | Mine Risk Education |
| NGO | Non-Governmental Organisation |
| NRC | Norwegian Refugee Council |
| PIU | Project Implementation Unit |
| QA | Quality Assurance |
| QC | Quality Control |
| QAM | Quality Assurance Monitor |
| SFN | Search for False Negatives |
| SGL | Survey Group leader |
| SHA | Suspected Hazardous Area |
| SOP | Standard Operating Procedure |
| SWG | Survey Working Group |
| TL | Team Leader |
| UNDP | United Nations Development Programme |
| UNICEF | United Nations Children's Fund |
| UNMAS | United Nations Mine Action Service |
| UXO | Unexploded Ordnance |
| VVAF | Vietnam Veteran of America foundation |

# INTRODUCTION

Growing out of the world wide collaborative efforts of the International Campaign to Ban Landmines and its Ottawa Treaty, Landmine Impact Surveys (LIS) are executed to meet the overlapping needs of international donors, national authorities in landmine-and unexploded ordnance (UXO)-impacted countries and humanitarian mine action planners.

The overall vision of Landmine Impact Surveys as articulated by the Survey Working Group (SWG), is to "*facilitate the prioritizing of human, material and financial resources supporting humanitarian mine action at the national, regional and global levels*". To fulfill this vision, LIS projects are executed to the same high standard. Their implementation provides for improved collaboration between the three main stakeholders of the process: national authorities, donors and implementing agencies, and provides for the utilization of the same dataset. The data collected during the LIS process provides clear improvements on past efforts in that it:

- Defines the entire problem in terms of scale, type of location, hazards, and socio-economic impacts on communities;
- Improves national planning efforts by allowing for better prioritization of resources;
- Fosters development of national plans with well-defined immediate, intermediate and long–term objectives;
- Establishes baseline data from which performance can be measured.

Impact surveys are considered to be the first and most vital step in the transformation of overall humanitarian mine action. Impact surveys dramatically improve the quality of information available for decision makers at all levels.

Subsequent meetings of the SWG further refined this vision into a number of subordinate objectives focused upon these three key constituencies:

- Allow *donors* to rationalize their allocation of funds to the areas of greatest human need as defined by the impact of landmines and UXO upon communities;
- Permit *national authorities* to develop national plans focusing on regions and areas of greatest impact;
- Give *implementers* baseline impact data that will provide success indicators for mine action programs.

The findings and information presented in this report are available in the Information Management System for Mine Action (IMSMA) database maintained by the government of Armenia. This information is descriptive in nature, and provides the best and most comprehensive picture of the nature of the landmine and UXO threat impacting communities in Armenia.

It should be clearly mentioned at this early stage that although this report is the most useful tool for subsequent planning at the national level, it is not a substitute for a national plan. This report should encourage Armenian national authorities, decision-makers and planners to become familiar with the current state of landmine/UXO contamination in their country, and to use the report in support of future activities related to allocation of funding, prioritization of efforts and identification of areas for intervention. This survey has transformed the vague or unknown into functional knowledge. The challenge now is to ensure that others will use this knowledge to bring about positive, constructive action.

As a global initiative to standardize available information regarding the landmine problem around the globe, the LIS effort represents a successful, concerted effort to ensure conformity of methods, procedures and processes. These surveys are based upon the best practices in the fields of social science research and humanitarian mine action. To ensure quality of results, internal and external quality assurance mechanisms are imbedded into the methodology of the LIS. Landmine Impact Surveys are executed to internationally recognized standards and measure and score impacts upon affected communities in a generally uniform manner.

# EXECUTIVE SUMMARY

## SUMMARY OF CONCLUSIONS

The Landmine Impact Survey in Armenia was conducted in Armenia by the UNDP Armenia De-Mining Project with Technical Assistance provided by the Vietnam Veterans of America Foundation (VVAF) during the period of February – August 2005. The LIS identified 60 impacted communities in five regions of Armenia, 102 Suspected Hazardous Areas and 14 recent victims.[1] The total area of suspected contamination in Armenia was identified at a size of 321,677,110 sq. m., while 68,737 people were identified as impacted by the landmines and / or UXOs. There were 20 UXO spots found and 78 communities were sampled, no false negatives were identified.

The collected data provides extensive opportunities for research, analyses and further planning. These findings shaped several key conclusions:

- Five out of eleven regions of Armenia have landmine and / or UXO contamination, and contamination occurs only in the regions where Armenia borders Azerbaijan;
- Contamination occurs in the border areas, particularly in areas where military actions were conducted or in the areas which are located in close proximity to battle fields;
- The Syunik and Tavoush regions appear to be the most contaminated compared to the other regions of Armenia;
- 50 SHAs in the restricted military zone represent almost half of the total number of the SHAs, while size wise they total 217.965 sq.km, which represents 67.76% of the total size of the all SHAs, which is 321.677 sq.km. This leads to the assumption that SHAs in the restricted military zone are usually bigger, or it is more difficult to estimate their size from the civilian perspective;
- The UNDP Armenia De-Mining Program conducted the survey only within the internationally recognized boundaries of Armenia. No activities were conducted in the disputed (occupied) territories or on Azeri soil, nor were they conducted in Nagorno Karabagh;
- The community of Artsvashen was not surveyed (although it appeared in the suspected and / or contaminated lists of EOC) as currently this particular area is controlled by the Azeri military and the community is inaccessible;

[1] The number of recent victims is relatively low provided that the last landmine was emplaced on the Armenian soil in 1994 (11 before the survey), so the local residents by the time of the survey had a fairly good knowledge base on the dangerous areas and locations of the minefields. Also, a considerable number of SHAs are located within the restricted military border zone (buffer zone), where civilians have no access.

- The community of Berkaber was not surveyed because the security situation in the area is unstable. The road to this community is under regular shelling from the Azeri side of the border and it was confirmed by the regional authorities, Ministry of Defense and the UN Field Security Officer for Armenia that it is a common practice that snipers shoot any strangers coming to the village;

- The most common activities being conducted by the victims at the time of accident were: farming 21.4% (3 victims), herding activities 21.4% (3 victims), other activities 21.4% (3 victims), collecting food and water 7% (1 person), doing household work 7% (1 person), playing 7% (1 person), and 14.3% were engaged in military activities (2 persons);

- Victim profiles are as follows: all victims were male; 36% (5 victims) were between 30-44 years old; 30% (4 victims) were between 15-29 years old; 21% (3 victims) were between 45-59 years old; and 13% (2 victims) were above 60 years old.

## BACKGROUND AND PROJECT OVERVIEW

Since the collapse of the Soviet Union, the Southern Caucasus has become a scene of ethnic conflicts in which the civilian population has suffered the most. Among the major problems that those conflicts resulted in are the presence of a large number of refugees and Internally Displaced People (IDP) and landmines affecting agricultural lands and roads. According to the Landmine Monitor Report, about 17 percent of landmine victims in countries of the Former Soviet Union are in the Caucasus.

After the 1994 cease-fire following the conflict between Armenia and Azerbaijan, according to the Landmine Monitor, army engineers surveyed approximately 1,000 square kilometres of border territories in Armenia, where warfare was waged, to identify minefields and dangerous sites. The military used all of the available documentation at that time and information provided by local residents. Most of the minefields are located in the regions of Tavoush, Syunik, Vayots Dzor and Gegharkunik, along the border with Azerbaijan. The Government of Armenia has estimated 50,000 to 80,000 emplaced landmines.[2]

Armenia has not signed either of the two International Conventions on Land Mines. Although supporting the Ottawa Convention (on use, production and transfer of Anti-personnel Landmines), Armenian authorities believe that its adoption would put the country in a disadvantaged position for as long as the Government of Azerbaijan refuses to sign the Convention. For similar reasons the Protocol II on Prohibition or Restrictions on the Use of Mines, Booby-Traps and other devices has not been signed by Armenia. Despite that, Armenian authorities decided to submit to the UN Secretary General, on a voluntary basis, the annual report required under Articles 11 and 13 contributing to global mine action.

The goal of the project is to strengthen the national capacity for coordination and implementation of a Mine Action Program in Armenia. In order to achieve this goal, the following was envisaged for the project:

[2] This estimation was made based on the numbers of landmines at Soviet Military storages on the territory of Armenia available before the collapse of the Soviet Union, and the intensity of their usage.

- A countrywide Landmine Impact Survey [LIS], conducted to improve available data and update the existing database; (completed)

- A pilot technical survey in Syunik region conducted with special attention given to the lands, which could potentially be used for agricultural or other income generation purposes once cleared; (2006)

- increase public awareness in mine affected regions; (on-going) and

- develop an assistance scheme for land-mine victims. (2007)

One of the comparative advantages the UNDP has in implementing this project is its global network of UN Agencies with respective capacity and expertise in humanitarian de-mining and related fields. Those goals and activities are in line with the UNDP's mandate worldwide to help people prevent and effectively address the challenges caused by disasters and complex emergencies through national capacity building, policy dialogue and knowledge networking. This effort will be closely coordinated with the Ministry of Territorial Administration and Coordination of Infrastructure of Armenia, Ministry of Defense of Armenia, and the Humanitarian De-Mining Centre of the Ministry of Defense of Armenia.

SCOPE OF THE PROBLEM

The survey identified that contamination with landmines and / or UXO exists in five out of eleven regions of Armenia. The contaminated regions are as follows: Tavoush, Gegharkunik, Ararat, Vayots Dzor, and Syunik. A total number of 60 impacted communities were identified with 102 Suspected Hazardous Areas and 68,737 people being impacted. The breakdown among the regions is provided below:

| | |
|---|---|
| Tavoush | - 20 impacted communities (2 low impacted, 16 medium impacted and 2 highly impacted), 29 SHAs, 39,003 impacted people; |
| Gegharkunik | - 11 impacted communities (7 low impacted and 4 medium impact), 13 SHAs, 14,852 impacted people; |
| Ararat | - 4 impacted communities (3 medium and 1 low impacted), 9 SHAs, 2,890 impacted people; |
| Vayots Dzor | - 7 impacted communities (5 low impacted and 2 medium impact), 8 SHAs, 3,785 impacted people; |
| Syunik | - 18 impacted communities (10 low impacted, 6 medium impacted and 2 high impacted), 43 SHAs, 8, 207 impacted people. |

## IMPACT ON COMMUNITIES

The standard LIS scoring system was used to identify the level of impact on communities. Use of this system allowed the identification of 25 low impact communities, 31 medium impact communities and 4 high impact communities. The indicators used to determine this ranking include the number of landmine victims within the last 24 months (recent victims), blocked access to facilities and livelihood areas, and the nature of contaminated munitions. The number of people living in high impact communities in Armenia is 4,052; 48,349 people live in medium impact communities, and 16,336 people live in low impact communities.

Table 1: The Number of Suspected, Visited, Affected, and Unaffected Communities by Region

| Province | Total number of communities | Included in the combined EOC list | Visited | Affected | Unaffected |
|---|---|---|---|---|---|
| Aragatsotn | 115 | 0 | 0 | 0 | 0 |
| Ararat | 97 | 7 | 7 | 4 | 3 |
| Armavir | 97 | 0 | 0 | 0 | 0 |
| Gegarkounik | 92 | 28 | 27 | 11 | 16 |
| Kotayq | 67 | 0 | 0 | 0 | 0 |
| Lori | 113 | 0 | 0 | 0 | 0 |
| Shirak | 119 | 0 | 0 | 0 | 0 |
| Syunik | 109 | 29 | 29 | 18 | 12 |
| Tavoush | 62 | 28 | 27 | 20 | 6 |
| Vayots Dzor | 44 | 7 | 7 | 7 | 0 |
| Total | 915 | 99 | 97 | 60 | 37 |

All impacted communities represent border regions of Armenia with Azerbaijan. In all of these contaminated areas military hostility was conducted or war was waged within close proximity. No visual verification was conducted in the areas, which are located within the restricted military buffer zone on the border.

## MINE INCIDENTS

The total number of recent victims (incidents registered within the last 24 months back from the date when the survey was conducted) of landmine incidents is 14, out of which one was a killed and thirteen were injured. All recent victims were males. Recent victims appear in 7 communities in 2 regions of Armenia (Tavoush and Syunik). The number of recent victims is relatively small due to the fact that the last hostilities in these areas were conducted in 1994 and the last landmines or UXOs were emplaced in 1994 (11 years ago), therefore the local population has come to know the contaminated areas very well.

The most common activities being conducted by the victims at the time of accident are presented in the table 2:

Table 2: Activity at the Time of Accident

| Activity | Percent of victims | Number of victims |
|---|---|---|
| farming | 21.4% | 3 |
| herding | 21.4% | 3 |
| other activities | 21.4% | 3 |
| military activities | 14.3% | 2 |
| collecting food and water | 7% | 1 |
| household work | 7% | 1 |
| playing | 7% | 1 |

Victim profiles are as follows: all 14 recent victims were male; 5 victims (36%) were between 30-44 years old; 4 victims (30%) were between 15-29 years old; 3 (21%) victims were between 45-59 years old; 2 victims (13%) were over 60 years old. Ten recent victims come from high impact communities, while four recent victims come from medium impact communities . There are a total of five recent victims in the Syunik region of Armenia and nine recent victims in Tavoush region of Armenia. The other regions of Armenia do not have any recent victims.

There are in total 380 non-recent victims identified in the Armenia LIS. 37 non-recent victims appear in high impact communities, 275 non-recent victims appear in medium impact communities, and 68 non-recent victims appear in low impact communities. Ararat region has 31 non-recent victims; Gegharkunik region has 46 non-recent victims, 109 non-recent victims in the Syunik region, 193 non-recent victims in the Tavoush region, and 1 non-recent victim in the Vayots Dzor region.

## CASUALTIES

Statistical analysis of the survey data, particularly that relating to community attributes, allows one to see relationships between a variety of factors and the risks that mines pose to specific communities. In Armenia, the survey found that there is a strong correlation between the mean number of victims and certain impact combinations. More people tend to suffer incidents when not only pasture and non-agricultural land, but also more intensively managed cropland is blocked.

The correlation between SHA surface and munition types is evident. Adding UXO or AP to the situation tends to boost SHA size whereas AT does not significantly contribute. Any addition of AP boosts estimated magnitudes of SHAs by almost two.

Based upon the period between the time when residents were first affected by the contamination and the data collection in July 2005, the victim incidence rate was calculated. The incidence rate for the period ending mid-2003 (the period bracketing the “old victims”) works out as 51.7 per 100,000 persons per year compared to 10.18 incident rate for the last two years. The incidence rate dropped between the two periods by a factor of 5:1, which is the testimony to a very significant learning process among the population at risk.

## CONCLUSION

The results of the Landmine Impact Survey in the Republic of Armenia clearly indicate that the country still suffers many adverse consequences from landmine and UXO contamination, even though the last military activities were conducted and last landmines and UXOs were emplaced 11 years ago (1994). The collected data and produced information, as a result of data analyses, will allow for the creation of a well-planned and targeted set of mine action initiatives. The results can also contribute to

the development and refinement of planning for Mine Risk Education and Victim Assistance in a manner that will produce positive and immediate results.

Provided that sustainable funding is available to address the landmine problem in Armenia, and considering the relatively manageable size of the problem, the initiatives based on the results of this LIS will allow Armenia to become a high impact free country in a relatively short period of time. By using the information provided in this Landmine Impact Survey it is possible to concentrate resources in a strategic manor where they will be the most beneficial. By doing this the greatest negative impacts can be removed and Armenia can become a high impact free country in a relatively short period of time. The LIS will also provide the knowledge base necessary to continue using resources in an efficient way during the longer-term efforts of mine action in Armenia.

SPECIAL NOTE

This document has been produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union.

# CHAPTER 1. SURVEY RESULTS AND FINDINGS

## SCOPE OF THE PROBLEM

### NUMBER OF COMMUNITIES AFFECTED

The survey identified contamination with landmines and / or UXO in five out of eleven regions of Armenia. In Tavoush, Gegharkunik, Ararat, Vayots Dzor as well as Syunik, a total of 60 affected communities were surveyed together with 102 Suspected Hazardous Areas (SHAs). An estimated 68,737 people are living in the affected communities. These figures do not include two communities known to be contaminated, which, at the time of the survey, were not accessible for security reasons.

Table 3: Affected Communities and Populations by Regions

| Province | Communities | Population |
|---|---|---|
| Ararat | 4 | 2,890 |
| Gegharkunik | 11 | 14,852 |
| Syunik | 18 | 8,207 |
| Tavoush | 20 | 39,003 |
| Vayots Dzor | 7 | 3,785 |
| Total | 60 | 68,737 |

The breakdown among the regions is presented in table 3. The region of Tavoush claims almost two thirds of the people impacted by landmines, while the region of Syunik has the highest number of SHAs (43 out of 102 countrywide), but affecting a relatively small population. Among the affected regions, Ararat reported the smallest number of people impacted.

### SETTLEMENT TYPE AND POPULATION SIZE

Most of the contaminated areas are on the Armenian – Azeri border or within close proximity to it. The typical distance from the community center to the border is 2.4 kilometers, and none of the communities are any farther than 12 km inland. All but two affected communities are villages[3], with a typical (median) population of 800 residents. The two exceptions are the town of Chambarak, in Gegharkunik Region (population 7,500) and the town of Noyemberyan in Tavoush (5,186).

Table 4: Affected Communities and Population by Settlement Type

| Settlement type | Affected communities | Population affected | Mean population |
|---|---|---|---|
| Urban | 2 | 12,686 | 6343 |
| Compact village | 56 | 54,056 | 965 |
| Dispersed village | 2 | 1,995 | 998 |
| Total | 60 | 68,737 | 8306 |

[3] The type of settlement (town-village) of a community is provided in the total list of localities/communities of Armenia provided by the State Department of Statistics.

Table 5: Affected vs. All Communities by Population Size Brackets

| Population | Affected communities | | All communities | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| 1 - 1,000 | 36 | 60.0% | 443 | 48.5% |
| 1,001 - 2,000 | 14 | 23.3% | 216 | 23.6% |
| 2,001 - 3,000 | 5 | 8.3% | 107 | 11.7% |
| 3,001 - 4,000 | 3 | 5.0% | 49 | 5.4% |
| 4,000 - 5,000 | 0 | 0.0% | 21 | 2.3% |
| 5,000 + | 2 | 3.3% | 78 | 8.5% |
| Total | 60 | 100.0% | 914 | 100.0% |

Compared to the national community size distribution, affected communities tend to be smaller, as table 5 demonstrates.

In terms of affected communities, those in Tavoush Region are larger on average than those of the other contaminated regions.

## GEOGRAPHIC DISTRIBUTION OF IMPACTED COMMUNITIES

Map 1 shows the location of the impacted communities. As noted before, all are located within a narrow band (< 12 km) along the borders with Azerbaijan.

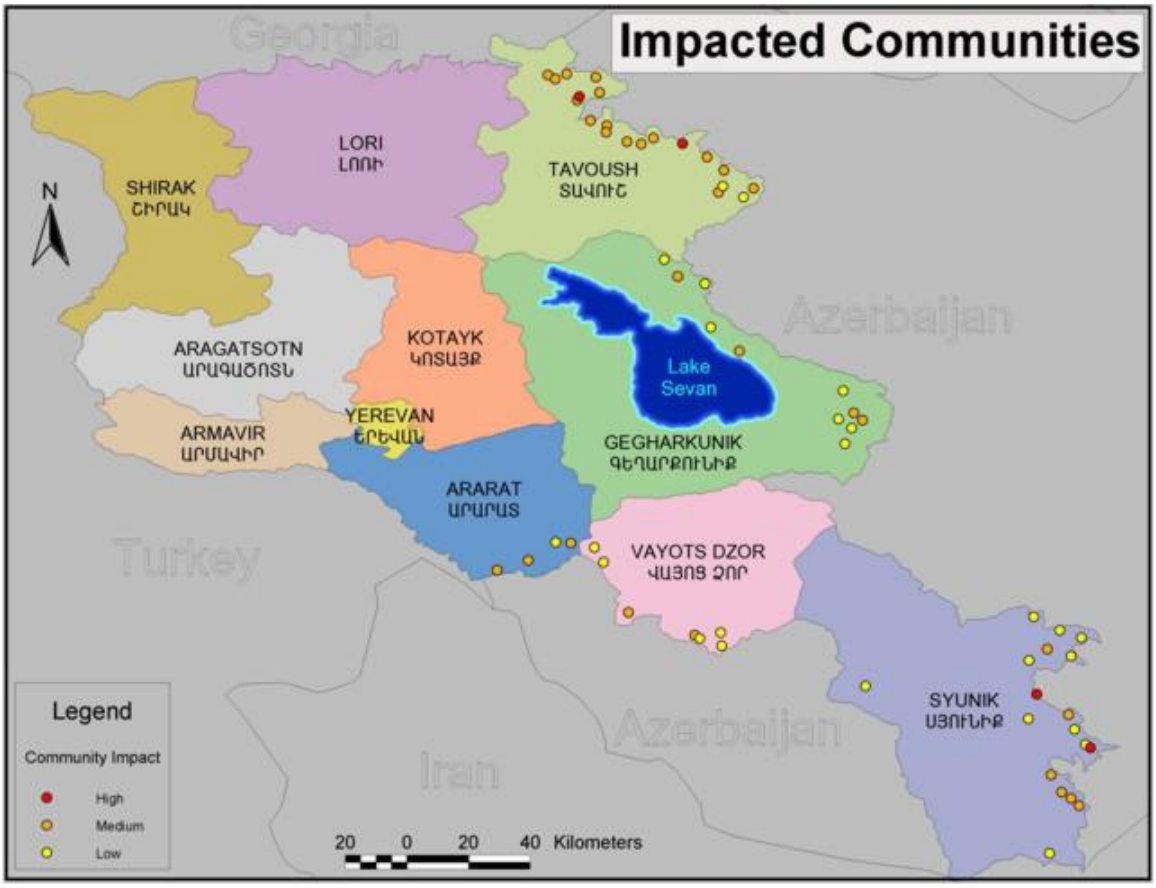
Table 6: Affected Communities by Region and in Total by Population Size Bracket

| Population | Ararat | Gegharkunik | Syunik | Tavoush | Vayots Dzor | Total |
|---|---|---|---|---|---|---|
| 1 - 1,000 | 3 | 7 | 15 | 5 | 6 | 36 |
| 1,001 - 2,000 | 1 | 3 | 2 | 7 | 1 | 14 |
| 2,001 - 3,000 | 0 | 0 | 1 | 4 | 0 | 5 |
| 3,001 - 4,000 | 0 | 0 | 0 | 3 | 0 | 3 |
| 4,001 - 5,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5,000 + | 0 | 1 | 0 | 1 | 0 | 2 |
| Total | 4 | 11 | 18 | 20 | 7 | 60 |

One third of the 60 impacted communities are in Tavoush Region; two are classified low-impact, 16 medium-impact, and two high-impact[4]. Gegharkunik Region reported 11 impacted communities (7 low, 4 medium); Ararat has four (3 medium and 1 low); Vayots Dzor has seven (5 low, 2 medium), and Syunik has 18 (10 low, 6 medium, and 2 high).

[4] These categories are defined on page 19.

Map 1: Impacted Communities




HISTORY OF CONTAMINATION BY MINES AND UXO

The survey elicited the year mines and UXO were last laid or left behind. Figure 1 gives a graphic representation of this information.

Officially, the mines and UXO were emplaced until 1994. Communities with later years of last emplacement are rare; these events were mainly due to cross-border shelling.

Figure 1: Communities by Year Mines and UXO Last Emplaced

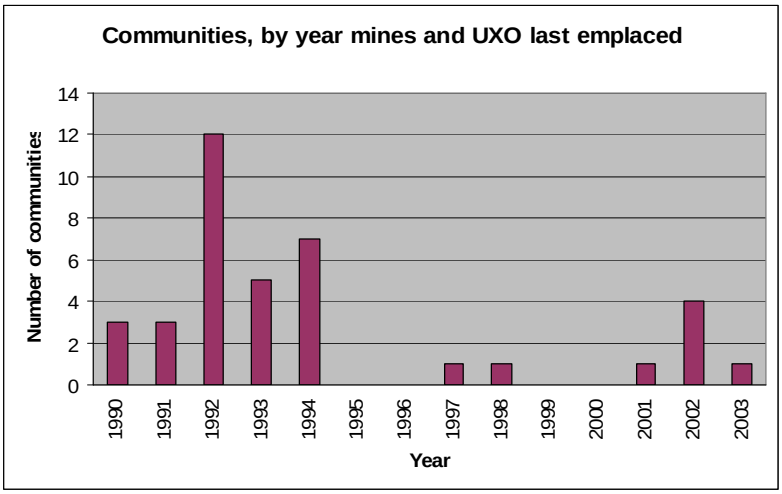
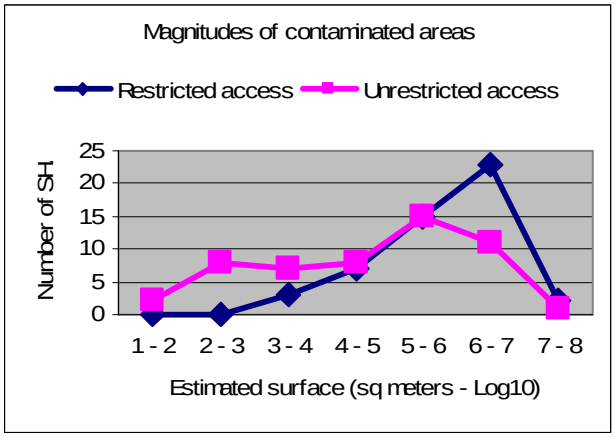


Figure 2: Magnitudes of Contaminated Areas




The survey identified 102 distinct areas of suspected landmine and/or UXO contamination. Local informants estimated that these contaminated areas cover a total land surface of up to 322 square kilometers. The reported size of the individual contaminated areas varies greatly. The typical (median) size estimated for SHAs is 256,000 square meters, or, in other words, a square with sides just over 500 meters long. Also, a considerable percentage of all SHAs were not available for visual verification[5]. Size estimates for unverified SHAs are a full magnitude larger on average than those of visually verified ones. Similarly, SHAs differ as to whether or not they fall inside restricted military zones, which are not accessible to civilians. Size estimates between restricted and accessible (up to safe viewing points) SHAs are stark. The typical (median) size of the 52 accessible SHAs is 0.13 sq km; for the 52 restricted ones, this estimate soars to 1.05 sq km.

*Unexploded Ordnance*

The estimated size does not follow a "normal" distribution pattern[6], neither for the entire set of 102 SHAs, nor for those with unrestricted access. As the following graph makes clear, there were many more large SHAs reported than small ones. The reasons for this deviation from the expected pattern are not understood. As one would expect for remote mountainous regions, SHAs that block access to forests are typically larger than those for which this blockage type was not reported. At the same time, this type of SHA is relatively rare and cannot account for the preponderance of very large areas.

*Stockpile Unexploded Ordnance*

The number of SHAs reported by communities also differs significantly. Over 90 percent of the impacted communities reported three or fewer distinct areas. Syunik Region contained a disproportionately large number of multiple-SHA communities, including the two that claimed the maximum number of six distinct areas each. Countrywide, however, 60 percent of all affected communities reported only one SHA.

[5] All impacted communities represent border regions of Armenia with Azerbaijan. In all areas of contamination military hostility was conducted or war was waged in close proximity to these areas. No visual verification was conducted in the areas, which are located within the restricted military buffer zone on the border.

[6] Normal (bell-shaped) in the logarithm of SHA size, as seen in other countries.

VICTIMS OF MINE AND/OR UXO INCIDENTS

Among the 60 communities surveyed and found affected, 39 had a history of mine or UXO incidents that harmed one or more persons. Among these communities, seven recorded recent victims. For the purposes of this survey, "recent" means that an "incident took place within the past 24 months". The number of communities where incidents occurred more than two years previously was also 39, implying that all of the recent victims came to harm in communities with previous victims.

Table 7: Communities by Number of SHAs

| Distinct contaminated areas in the community | Number of Communities | Percent |
|---|---|---|
| 1 | 36 | 60.0% |
| 2 | 15 | 25.0% |
| 3 | 4 | 6.7% |
| 4 | 3 | 5.0% |
| 5 | 0 | 0.0% |
| 6 | 2 | 3.3% |
| *Total* | *60* | 100.0% |

Table 8: Mine And UXO Victim Survey

| Period | Communities involved | Victims | | |
|---|---|---|---|---|
| | | Killed | Injured | All |
| Recent victims | 7 | 1 | 13 | 14 |
| Victims of less recent date | 39 | 109 | 271 | 380 |
| All victims | 39 | 110 | 284 | 394 |
| Had no victims | 21 | - | - | - |

The total number of mine and/or UXO victims in Armenia is 394. There are only 14 recent victims, compared to 380 victims of less recent date. Based on the recent victim total, the survey calculated an estimated incidence of landmine and UXO victims per 100,000 people per year. These rates are estimated using population estimates that key informants offered for their own communities as well as on provincial and national figures taken from census reports. The rates work out as 10.18 within the populations of affected communities; 2.57 within the population of affected regions and 0.22 within the entire nation.

*Victim of Mine Accident. Amputation of upper limb*

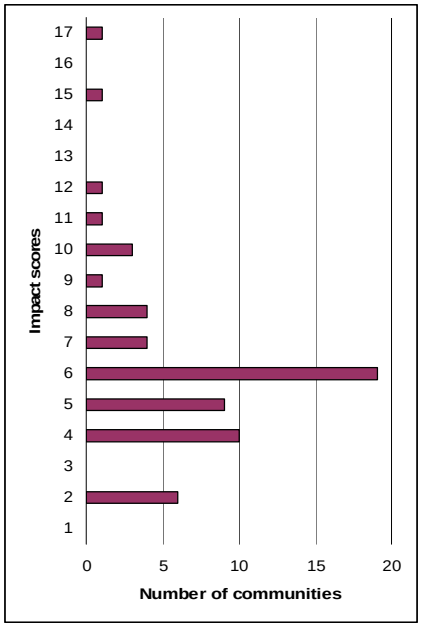
For all but three of the 60 affected communities, for the period between the time when residents were first affected by contamination and the time of data collection, which ended in August 2005, figures are known with enough precision to calculate the victim incidence rate for the last 2 years (recent victims) and also for the previous period.

On average, communities had been exposed to the mine/UXO hazard for 12.7 years. Allowing for the variable exposure time among affected communities, the incidence rate for the period ending mid-2003 (the period bracketing the "old victims") works out as 51.7 per 100,000 persons per year. This estimate is approximate; it is based on the *current* population, not the period average. However, it is good enough to put a figure on the hazard reduction. The incidence rate dropped between the two periods by a factor of 5:1, testimony to a very significant learning process within the population at risk.

# IMPACT ON COMMUNITIES

## SEVERITY OF IMPACTS

Figure 3: Distribution of Impact Scores




For each affected community, the survey calculated a point score expressing the severity of the various mine impacts. The score takes three major factors into account:

- Number of recent victims
- Livelihood and institutional areas to which and UXO mines block access
- Class of munitions

The score is then used to classify communities as low, medium, or high impact. Scores ranged from 2 to 17.

A score of two indicates that a community reported only the presence of mines and no serious blockages or recent victims. As reflected in Figure 3, the survey found six communities with this very mild signature[7]. At the other end of the scale, a score of 17 was assigned to the community of Shurnukh in Syunik Region due to the presence of three recent victims and numerous blockage types.

However, most communities had a score of six or less. The modal score, the score most often assigned, was six. The median score was also six, meaning that half of the communities scored six or less. The arithmetic mean was 6.1. Score ranges that qualify an affected community as low, medium or high impact are shown in table 9.

Table 9: Impact Score Classification

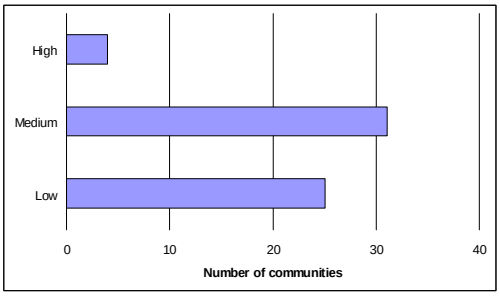
| Score range | Classification |
|---|---|
| 1–5 | Low |
| 6–10 | Medium |
| 11 and higher | High |

Using this classification, 25 communities or 42 percent of the total are considered to be in the low-impact category; 31 communities or 52 percent are medium-impact; and four or seven percent are high-impact communities. Figure 4 portrays this distribution.

Atypical of Landmine Impact Surveys, the number of medium-impact communities exceeds that of low-impact communities.

[7] One of these communities did report that some of its local roads or trails were blocked.

Figure 4: Impact Classification




## POPULATIONS BY IMPACT CATEGORY

It is estimated that 68,737 people live in landmine and UXO-affected communities in Armenia. Of these, approximately 4,052 people live in high-impact communities, and an estimated 48,349 live in medium-impact communities.

Thus, the majority of people whose lives are affected by mines and UXO live in communities that the survey rated as high or medium impact. This information is summarized in table 10, which also breaks down the affected communities by region.

Table 10: Communities And Populations by Impact Categories

| | Ararat | Gegharkunik | Syunik | Tavoush | Vayots Dzor | Total communities | Total affected population |
|---|---|---|---|---|---|---|---|
| High | 0 | 0 | 2 | 2 | 0 | 4 | 4,052 |
| Medium | 3 | 4 | 6 | 16 | 2 | 31 | 48,349 |
| Low | 1 | 7 | 10 | 2 | 5 | 25 | 16,336 |
| Total | 4 | 11 | 18 | 20 | 7 | 60 | 68,737 |

Tavoush Region stands out for its high share of medium and high-impact communities. Note that the impact score and hence the category do not depend on population size; thus, the fact that the high and medium-impact communities have a larger mean population than low-impact ones is due to *indirect* population effects – more recent victims, and the more diversified economy of the larger villages leads to more numerous blockage types.

## DEMOGRAPHY OF RECENT VICTIMS

The survey identified 14 recent victims in Armenia. Victims were claimed in 39 of the 60 affected communities, with seven still reporting recent victims. Five of these communities are in the Tavoush Region, and two are in Syunik.

Map 2: Recent Victims

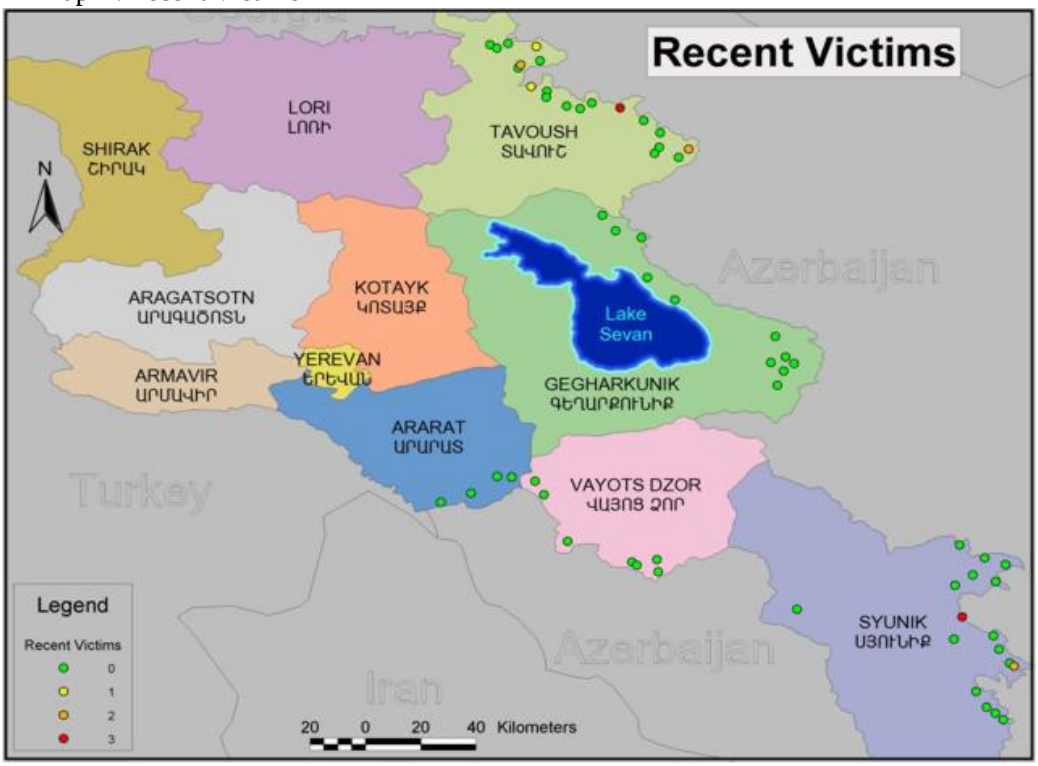



Table 11: Recent Victims By Age And Gender

| Age ranges | Male | Female | Total |
|---|---|---|---|
| 0-4 | 0 | 0 | 0 |
| 5-14 | 0 | 0 | 0 |
| 15-29 | 4 | 0 | 4 |
| 30-44 | 5 | 0 | 5 |
| 45-59 | 3 | 0 | 3 |
| 60 and above | 2 | 0 | 2 |
| Total | 14 | 0 | 14 |

A noticeable fact concerning recent victims in Armenia is the total absence of female and child victims. Among males of adolescent and adult age, there is rather equal distribution of recent victims within the age groups: 15 – 29 years old – four victims, 30 – 44 years old – five victims, 45 – 59 years old – three victims. Only two of the recent victims were in the age group 60 of years and above.

In terms of military/civilian status and civilian occupations, the recent victims represent a diverse picture, but with an expected predominance of agricultural occupations. The occupations of the recent victims before the incident are represented in table 12. Two of the recent victims were in military service[8].

Table 12: Recent Victims By Military/Civilian Status, and Civilian Occupation

| | |
|---|---|
| Military | 2 |
| Civilian | 12 |
| Herding | 4 |
| Farming | 3 |
| Tractor driver | 1 |
| Household work | 1 |
| Musician | 1 |
| Student | 2 |
| Total | 14 |

[8] It should be noted that the community interview provides information on recent military victims only in the cases, when they are known to the community. One could assume that there might be cases, when the community is not aware of recent military victims, especially when incidents occurred in the restricted military zone, which is not accessible for civilians.

INCIDENTS AND SURVIVOR CARE

Table 13: Activity at Time of Incident

| | |
|---|---|
| Military | 2 |
| Civilian | 12 |
| Farming | 3 |
| Herding | 3 |
| Household work | 1 |
| Collecting food or water | 1 |
| Playing | 1 |
| Other | 3 |
| Total | 14 |

Activities at the time of the incident are dominated by agricultural activities. Most notable is the absence of tampering with munitions. Given that there are no children among recent victims, it is not surprising that playing occurred only once.

One of the 14 recent victims was killed immediately in the incident. The type of care received by the 13 survivors is detailed in table 14.

All but one of the survivors received emergency care. Two survivors had access to rehabilitative care. No cases were noted of a survivor receiving vocational training.

Table 14: Type of Care Received by Victims Not Killed Immediately

| | |
|---|---|
| Emergency care | 12 |
| Rehabilitative care | 2 |
| Vocational training | 0 |
| Other care | 1 |
| Total | 13 |

Map 3: Past Victims[9]


[9] Past victims are victims, who were injured or killed earlier than 24 months prior to the survey date.

# ANALYSIS OF BLOCKAGE IMPACTS

## TYPES OF BLOCKAGE

Key informants in the impacted communities point to four major land use types in which landmines and UXO block access:

- Pasture
- Cropland
- Non-agricultural land, most of which is forest
- Roads and trails

Table 15: Percentage of Communities Reporting Blocked Access

| Areas of blocked access | Communities affected |
|---|---|
| Pasture | 75% |
| Rain-fed cropland | 42% |
| Irrigated cropland | 38% |
| Non-agricultural land | 20% |
| Water bodies | 8% |
| Roads and trails | 52% |
| Housing | 2% |
| Other infrastructure | 5% |

Pasture: With 45 or 75% of 60 impacted communities suffering blockages of pasture; this is the dominant blockage type. In Armenia, pasturelands are usually located within the distance of 10 km from the community center depending on landscape and vegetation. This also gives us an indication that the majority of impacted communities are in fact involved in herding.

Rain-fed cropland: 42 percent of all impacted communities in Armenia reported that the SHAs were impeding access to some of their rain-fed cropland. Cropland, especially rain-fed land, is usually located closer to the community center, compared to the pasture areas.

Irrigated cropland: A similar percentage (38%) of the affected communities reported blocked access to some of their irrigated perimeters. However, one and the same SHA does not affect both irrigated and rain-fed farmland, and even communities with multiple SHAs rarely report both types impacted. Also, there are regional differences. Blocked irrigated land is relatively more common in Tavoush Region (17 out of its 29 SHAs) whereas a significant proportion (8 of 13) of the SHAs in Gegharkunik are impacting rain fed farming.

Non-agricultural land: One in five affected communities reported blockages to non-agricultural lands. In most cases, this means forested areas. In rare cases key informants described grassy roadside areas in the mountains in which the community used to harvest medicinal plants in pre-war days. These SHAs were classified as non-agricultural land.

Residential areas and infrastructure other than roads: Remarkably, communities reported that blockages of these types were rare. The three cases of other infrastructure are a cattle shed, a temporary dwelling, and a water supply system that plausibly could be grouped with other blockage categories. The insignificant number of such impacts does not primarily come from the fact that affected communities are equipped with fewer facilities and services than non-affected ones. Simply, the built-up core areas of the communities are rarely contaminated.

Roads and trails: 52 percent of all impacted communities in Armenia reported blockages of roads or trails. However, only two communities - Vazashen in Tavoush, Shurnukh in Syunik - reported that the mines were impeding their communications with major administrative centers. In 41 out of 43 SHAs blocking roads and trails, the nuisances are local. "Blocked trails" are sometimes coterminous with blockages reported for the land to which they lead. For example, for 24 out of the 63 SHAs blocking cropland, blockages of local roads and trails were also reported. Alternative roads, usually involving a detour, were reported only for nine blocked roads and trails.

In most cases, alternatives to blocked roads do not exist. This implies that the areas to which the blocked roads used to lead are for the most part not currently being used. The absence of alternatives may be related to terrain, particularly in mountainous areas. A similar situation applies to the roads that were built in the Soviet times for the purpose of transportation between Armenia and Azerbaijan (and Nakhichevan). However, after the collapse of the Soviet Union and the establishment of the new international boundaries between Armenia and Azerbaijan, all the roads between Armenia and Azerbaijan were discontinued.

Table 16 presents the scope and type of blocked access. It should be kept in mind that a given contaminated area might be blocking several resource types. Thus, the overlap between these categories is considerable. The estimated area represents the SHAs that are blocking some resource of the concerned types. This does not necessarily mean that the entire extent of the SHAs was actively used in pre-war times. As well, the population totals are those of the population resident in communities that reported the particular blockage type. With the privatization of land, this figure may be higher than the number of persons actually affected.

Table 16: Magnitude of Blocked Access

| | Communities affected | Population of those communities | Mined areas involved | Estimated area (sq km) |
|---|---|---|---|---|
| Pasture | 45 | 60,397 | 59 | 295.31 |
| Irrigated cropland | 23 | 31,541 | 32 | 147.91 |
| Rain fed cropland | 25 | 33,375 | 31 | 42.91 |
| Water bodies | 5 | 7,460 | 5 | 25.00 |
| Non-agricultural land | 12 | 7,449 | 15 | 30.08 |
| Housing | 1 | 197 | 1 | 0.27 |
| Roads and trails | 31 | 34,327 | 43 | 119.94 |
| Infrastructure | 3 | 2,880 | 3 | 24.00 |
| All impacts combined | 55 | 66,719 | 93 | 319.85 |

Note that 9 SHAs covering 1.83 sq km were recorded as not having any serious blockage effect. These SHAs are part of five communities with a total population of 2,018.

## TYPICAL COMBINATIONS OF IMPACTS

A Landmine Impact Survey tries to understand the socio-economic impact on communities in which mines or UXO block access to various resources. The survey revealed four basic groupings reflecting the types of resources made unavailable to communities. These are essentially defined by the presence or absence of blocked pasture, rain-fed cropland and irrigated cropland and furthermore are associated with the variable degrees to which the resources are blocked.

These groupings are called “clusters” of impacts and are displayed in table 17. The categories are as follows:

- Type A : 13 communities that reported pastures blocked, but did not report any cropland blocked. This type is significantly often associated with blocked non-agricultural land, mostly forest.

- Type B refers to contamination on pasture and rain-fed cropland. This holds for 14 affected communities.

- Type C refers to contamination of pasture and irrigated agricultural land. This type is significantly associated with blockages of non-agricultural land and water bodies. This cluster includes 18 communities.

- Type D is a residual type defined by the absence of pastureland blocked. 15 communities are in this group. Some complained of various combinations of cropland and forest blocked.

Table 17: Typical Impact Combinations

| Blockage type | Frequency | A | B | C | D |
|---|---|---|---|---|---|
| Pasture | 75% | | | | |
| Rain fed cropland | 42% | | | | |
| Irrigated cropland | 38% | | | | |
| Non-agricultural land | 20% | | | | |
| Water | 8% | | | | |
| Affected communities | 60 | 13 | 14 | 18 | 15 |
| Mean number victims | | 2.8 | 7.2 | 10.7 | 4.2 |

Blockage type present in all cases
Blockage type significantly more frequent than mean

A strong correlation exists between the mean number of victims and certain impact combinations. Apparently, more people tend to suffer incidents when not only pasture and non-agricultural land, but also more intensively managed croplands are blocked. This is not surprising; with increasing unit value from pasture to rain fed to irrigated land, incentives to exploit it are higher. This is reflected in the mean victim per community figures for types B, and C. Maybe: This is reflected in the mean victims per community figures for types B and C as opposed to type A.

These differences become stronger when controlling for the population size of the communities. Communities which “only” reported pasture and forest blocked are smaller (typically with 300 residents) and are closer to the border; blocked cropland tends to occur in larger communities (typically around 1,100), which tend to be located somewhat farther from the border.

# SUMMARY OF PAST MINE ACTION

## THE MINE ACTION COMMUNITY

The Armenian Humanitarian De-Mining Centre was established in March 2002 with the help of the US State Department and the US Department of Defense[10]. The Centre took the lead in training of de-miners, resulting in nearly 200 de-miners, dog handlers and staff personnel trained and equipped to date.

Within the framework of the US State Department-funded and RONCO-implemented initiative, the center conducted a pilot survey in the region of Tavoush in 2002. As well, mine clearance activities were conducted in 2003, 2004 and 2005[11] in the Syunik Region. During this time the US Marshall Legacy Institute, in cooperation with the US Humanitarian De-mining Program established the Mine Detecting Dog Partnership program in Armenia.

ICBL Armenia carried out a landmine victim survey aimed at compiling and verifying a database on landmine victims in Armenia. As of April 2002, the database contained records of 343 survivors, including both soldiers and civilians injured in landmine incidents in all 11 provinces. The results of this survey have not been made public and have not been made accessible to this LIS. Another survey, completed in January 2002, tested the level of public awareness of landmine risks in Yerevan and in affected regions. Results indicate that while there is an overall understanding of the hazard among the population, the capacity to deal with the problem is very low.

Landmine victim assistance*:* Armenia has a wide network of health care facilities and qualified personnel for specialized medical assistance, for production of prosthetic appliances, and for rehabilitation and reintegration of landmine survivors. However, their ability to address the needs of landmine survivors is limited because of a lack of adequate resources. Landmine survivors do not receive any psychological or social rehabilitation. Although legislation exists to protect the rights of persons with disabilities, it does not mandate special measures for landmine survivors.

It is worth mentioning that different schemes for landmine victim assistance apply to civilian and military victims. It is a common understanding that the victim assistance scheme for military personnel is better developed and better financially supported.

[10] Between 1993 and 2003 the US contribution amounted to about US$10 million. Additional $1.8 million was provided by the US Embassy in 2002 from its Freedom Support Act funds to augment the de-mining program and to establish the de-mining centre.

[11] Mine Clearance in 2005 was conducted in the village of Shurnukh in the Syunik region of Armenia, which was identified by the LIS as one of four high impact communities. Decision to conduct mine clearance in this village was based on the preliminary results of the LIS.

Table 18: Intensity of Mine Action Penetration by Activity

| | Communities | Percent |
|---|---|---|
| Mine clearance | 4 | 7.84 |
| Marking | 5 | 9.62 |
| Mine awareness education | 9 | 15.00 |
| Victim assistance | 2 | 4.88 |
| Local mine clearance | 13 | 21.67 |
| Total | 33 | 59.00 |

Table 18 shows that the degree of mine action penetration is relatively low across the affected communities. However, these figures have to be taken with caution. For example, the fact that only two of the 60 affected communities reported any victim assistance does not mean that victim assistance was extended in five percent of all communities *with* landmine / UXO survivors (not all communities had incidents), nor does it mean that five percent of *all* survivors received any organized assistance. Remarkably, the portion of affected communities, which engaged in any local clearance efforts, is relatively low. This agrees well with the fact that none of the recent civilian victims came to harm while tampering with munitions.

# FACTORS INFLUENCING MINE AND UXO CLEARANCE

## SIZE AND DEFINITION OF CONTAMINATED AREAS

There are many factors to be considered when planning for mine clearance or UXO demolition in a given country. The physical characteristics and the types of the explosive ordnance are among the most influential ones. The size of the SHAs, the type of the terrain and vegetation in this area are also of crucial importance.

The size and the definition of the boundaries of the SHA are fundamental issues when reviewing approaches to mine clearance. However, at this stage the LIS does not provide for a precise size of the SHA, unlike the Technical Survey, which would more precisely define the boundaries of the SHA and reduce its size in many cases[12]. The results of the LIS are meant to be a starting point for future activities. For example, even results for the region of Syunik (surveyed in May 2005), albeit preliminary, have led the Armenian Defense Ministry, in June 2005, to start clearance in the most contaminated community.

With 60 impacted communities and 102 SHAs, there is an average of 1.7 SHA per impacted community. The total area believed to be contaminated measures 321.68 sq. km. This is tantamount to 1.08% of the national territory of Armenia.

*The Mountainous terrain of Armenia makes the Clearance a real Challenge.*

## CONTAMINATED LAND BY VEGETATION AND TERRAIN

The 102 hazardous areas identified in Armenia have different ground profiles and are covered by different types of vegetation, which are critical factors to be considered when planning clearance operations. While the size and definition of a suspected area can suggest particular clearance techniques, the physical characteristics of the vegetation and topography, especially at larger sites, have the most influence on the final approach selected.

Table 19: Contaminated Surface Area by Vegetation and Ground Profile Types

| | Flat land | Contains gullies, hillside, or ridge | Other | Unknown | Total | Percent |
|---|---|---|---|---|---|---|
| None | 0.00 | 0.02 | 0.01 | 0.00 | 0.03 | 0.01% |
| Short grass only | 0.43 | 74.31 | 7.76 | 0.00 | 82.50 | 25.65% |
| Tall grass | 3.07 | 196.67 | 0.00 | 0.00 | 199.72 | 62.09% |
| Bushes or trees | 0.28 | 31.35 | 4.25 | 2.34 | 38.22 | 11.88% |
| Other | 1.20 | 0.00 | 0.00 | 0.00 | 1.20 | 0.37% |
| Total | 4.97 | 302.35 | 12.02 | 2.34 | 321.68 | 100.00% |
| Percentage | 1.54% | 93.99% | 3.74% | 0.73% | 100.00% | -- |

[12] Technical Survey is scheduled for 2006.

Tall grass on hillsides and ridges account for more than 60% percent of all contaminated land. This element of information agrees with the finding that blocked pasture is the most prevalent blockage type. In terms of clearance difficulty, gullies, ridges and hillsides are more arduous than flat land. The degree of difficulty that vegetation presents increases from "None" to "Bushes and trees". It can be seen that more than half of the suspected surface is in difficult terrain, but is not covered with bushes or trees.

## CONTAMINATED LAND BY ORDNANCE CLASS

Table 20, located below, represents different types of contamination (anti tank, anti personnel, UXO) for communities and surfaces at the country level, and for communities by region. It is striking that 49 out of 60 affected communities reported the presence of AP as well as AT, some together with UXO, and others without. Across the regions, the combinations are similar, with the exception of four communities in Gegharkunik and Syunik that reported the presence of AT only. Between them, these communities contain 23 of the 25 SHAs with AT only, or almost a quarter of all SHAs. Since SHAs with only AT are by far the smallest (the typical estimated size is only 3,500 square meters), this regional particularity is relevant for clearance planning.

Approaching this diversity from the UXO side, one notes that only 13 of the affected communities reported the presence of any, and most of them did so in combination with AT. Note that the combination of UXO and AT, without AP, occurs neither at the community nor at the SHA levels. Only one community reported solely UXO contamination - the village of Yelpin in Vayots Dzor Region. At the SHA level, three areas are suspected to harbor UXO only.

Table 20: Affected Communities, Contaminated Areas and Surface by Munition Type

| | Communities | | | | | | SHAs | |
|---|---|---|---|---|---|---|---|---|
| | Ararat | Gegharkunik | Syunik | Tavoush | Vayots Dzor | TOTAL | Areas | Total surface |
| UXO only | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 2.78 |
| AT only | 0 | 1 | 3 | 0 | 0 | 4 | 25 | 5.61 |
| AT and UXO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| AP only | 0 | 3 | 2 | 0 | 1 | 6 | 16 | 11.49 |
| AP and UXO | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 36.16 |
| AP and AT | 0 | 6 | 9 | 18 | 4 | 37 | 45 | 236.06 |
| AP, AT and UXO | 4 | 1 | 4 | 2 | 1 | 12 | 10 | 29.57 |
| Total | 4 | 11 | 18 | 20 | 7 | 60 | 102 | 321.68 |

For each of these combinations, the total surface area over all SHAs in point is given. AP and AT is the combination with the largest combined surface, by far.

The average SHA surface area is also of interest. . However, arithmetic means are heavily influenced by the largest SHAs. Working instead with the magnitudes, a statistical model produces surprising results: Adding UXO or AP to the situation tends to boost SHA size whereas AT does not significantly contribute. Dramatically, the addition of AP, when statistically controlling for UXO and AT presence, boosts estimated magnitudes of SHAs by almost two. Adding only UXO to the scenario increases magnitudes by a smaller, but still strongly significant .75. While technical surveys may ultimately determine different relationships, local informants of the LIS firmly tended to enlarge SHA surface estimates when UXO was present, and even more so in the presence of AP.

This correlation between SHA surface and munition types is evident also in the left wing of table 21, which displays size brackets by munition types and, separately, by vegetation types.

Table 21: Size of Contaminated Areas by Munition Type and Vegetation Coverage

| | Type of munitions | | | | | Vegetation | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Size (Sq. M.) | AP only | AT only | Mixed mines | UXO only | Mines and UXO | None | Short Grass | Tall Grass | Bushes/ Trees | Other/ Unknown |
| < 10000 | 2 | 17 | 0 | 0 | 1 | 4 | 6 | 6 | 6 | 1 |
| 10001-100000 | 5 | 4 | 5 | 1 | 0 | 1 | 5 | 3 | 12 | 0 |
| 100001-500000 | 4 | 3 | 13 | 1 | 3 | 0 | 7 | 7 | 24 | 0 |
| 500001-1000000 | 1 | 0 | 5 | 0 | 0 | 0 | 3 | 0 | 5 | 0 |
| 1000001-5000000 | 4 | 1 | 16 | 1 | 5 | 0 | 7 | 8 | 21 | 1 |
| > 5000000 | 0 | 0 | 6 | 0 | 4 | 0 | 5 | 4 | 2 | 0 |
| Total | 16 | 25 | 45 | 3 | 13 | 5 | 33 | 28 | 70 | 2 |

Regarding vegetation, there are 5 SHAs without vegetation, and most of them are less than 10,000 sq.m. Short grass vegetation is identified in 33 SHAs, the size of those SHAs is equally distributed among different size categories: from under 10,000 sq.m. to more than 5,000,000 sq.m. Tall grass is present in 28 SHAs. Their sizes fall between under 10,000 – 500,000 sq.m., and then the much larger size – between 1,000,001 and more than 5,000,000 sq.m. Bushes and trees account for the greatest number of SHAs, there are 70 SHAs with this type of vegetation. In most of the cases, bushes and trees are also combined with difficult landscape (mountains and rocks), which renders mine clearance difficult. Most of the SHAs with bushes and trees fall under two categories of sizes: 100,001 – 500,000 sq.m. and 1,000,001 – 5,000,000 sq.m.

# COMMUNITY BACKGROUND AND MINE EFFECTS

The background of the conflict, as a result of which contamination appeared in Armenia, was not the subject of this survey and is not the subject of this report. However, the history of the affected communities since contamination is important to the LIS. Currently, almost nothing is known of the coping mechanisms or responses, which were developed by the communities to adapt to the new "contaminated" reality . Officially, the last known emplacement of landmines and / UXO on Armenian soil took place in 1994. In a small number of communities surveyed, key informants related instances of local people planting mines as recently as 2003. By and large, the problem has been known for a long time, giving the impacted population time to adapt. The most obvious proof of this adaptation is found in the greatly reduced rates of mine and UXO strike victims.

In a Landmine Impact Survey in a country with several hundreds of 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 affected, such effects cannot be reliably estimated.

However, almost half of the 60 affected communities were the object also of surveys that the Government of Armenia and the United Nations Development Program conducted in 2002 and 2003, under the designation of the "National Human Development Survey (NHDS)". The NHDS was comprised of 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.

## POVERTY DIFFERENCES

The overlap between the LIS and the NHDS community samples permits comparisons between mine-affected communities and non-affected ones on a small number of poverty 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 (9 affected communities) and a sample of the 100 communities that national experts had designated as the poorest communities[13]. This latter survey supplied poverty information on 18 landmine-affected communities; the fact that their sampling design aimed at the poorest communities may induce upward bias for the poverty estimates of the 27 affected communities as a whole.

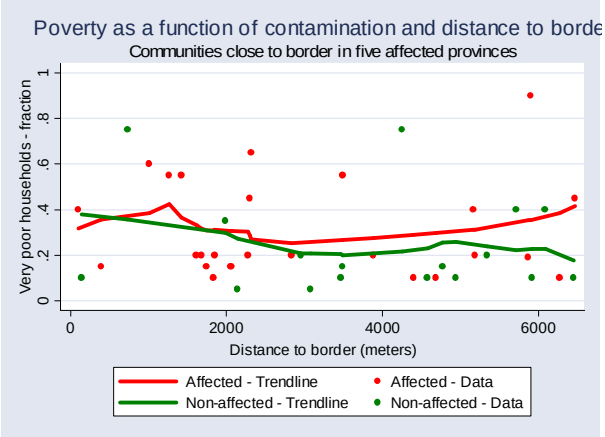
For better comparability, table 22 contrasts affected to non-affected communities from similar environments – from the five provinces with landmine / UXO contamination, and, within these, only communities close to international borders. "Close to borders" is defined as being no farther away from the nearest border than 6,470 meters, the maximum distance for the affected communities found also in the NHDS samples.

[13] To be accurate, this sample was constructed by taking the ten communities deemed the poorest in each of ten regions, excluding Yerevan.

Table 22: Affected vs. Non-Affected Communities on Poverty Indicators

| Indicator | Landmine-affected | Not affected | Is the difference statistically significant? |
|---|---|---|---|
| Communities compared | 26 | 17 | |
| Population (mean) | 1,006 | 1,557 | No |
| 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% | No |
| Outmigration (during 2002, as percent of population) | 5% | 1% | No |
| Services and facilities score | 0.66 | 0.88 | No |
| 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 |

Figure 5: Poverty, Contamination and Distance to Border




At first sight, non-affected communities fare better on all poverty and institutional indicators. However, tests suited for small samples reveal that they are significantly different from their affected neighbors only in the levels of extreme poverty and industrial employment.[14] The service and facilities score is based on the presence or absence of 10 different institutional features that discriminate well between communities. They include industries, paved access roads, post office, kindergartens, secondary schools, outpatient health care facility, pharmacy, cultural center, telephone service and centralized drinking water supply.

As the following graph makes clear, the claim to more severe poverty among affected communities is due essentially to the massing of communities relatively close to the border (3 km or less) that reported 20 percent or more of their families as “very poor”.

Whether these communities were poorer already prior to the war (because they were at higher altitudes, closer to the mountain ridges that demarcate Armenia from surrounding countries), or whether they were more exposed to hostilities in addition to the landmine and UXO contamination is

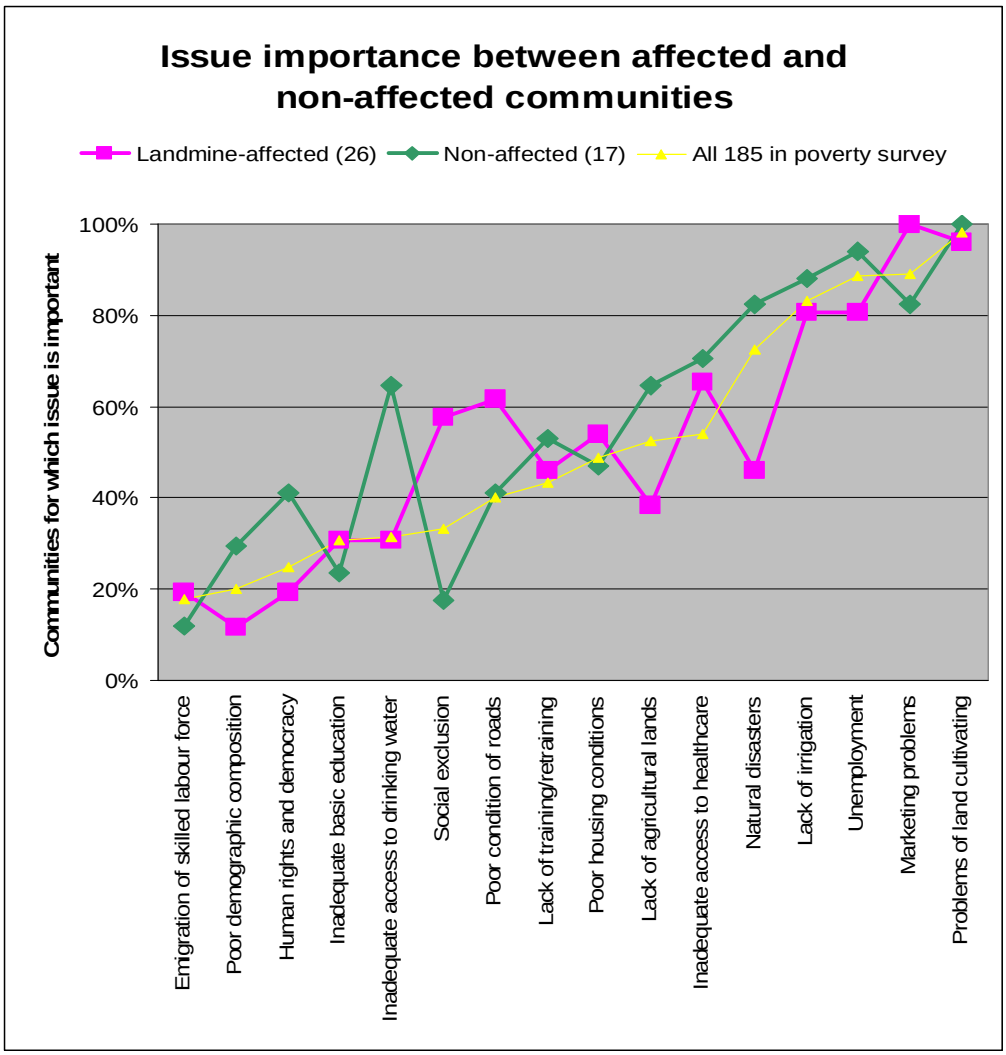
[14] This selection ensures good comparability, but restricts the number of non-affected communities to 17. Means and (non-parametric) difference tests were calculated also using a larger number of controls. The cut-off was set to 11.17 km from the border, which is the maximum distance for any affected communities. This definition results in 15 more, i.e. a total of 32 non-affected communities used for comparison. Tests essentially yield the same results, except the differences in population size and in the fraction of landless households too become statistically significant.

impossible to establish with the survey data extant. But the association between contamination and poverty is strong enough to suggest that appropriate mine action strategies should be closely integrated with wider poverty alleviation plans.

## IMPORTANCE OF DEVELOPMENT ISSUES

Some of these wider concerns transpire also from the importance that landmine-affected and non-affected communities are attached to a variety of development issues rated in the NHDS surveys. In the following graph, the fraction 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 with the entire 185-community sample accessible to this analysis.

Figure 6: Issue Importance for Affected and Non-Affected Communities



Overall, the importance profile for the mine-affected communities follows those of the non-affected communities and of the larger sample fairly closely. Some exceptions, however, are significant:

- Mine-affected communities are more isolated. They emphasize social exclusion, poor roads and less access to markets as important issues more often than other communities. It is noteworthy that the greater importance placed on social exclusion and road access persist even when population size, distance from the border and extreme poverty are controlled for.

- Mine-affected communities complain significantly less about the 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 the restricted military zones. The local communities may not normally think of these areas as accessible to their economic pursuits and, therefore, may not formulate the problem as lack of a particular type of land.

- Fewer mine-affected communities than expected nominated natural disasters as an important issue. Drinking water is far less salient than among the 17 non-affected communities in the same zone, but has the same salience as in the large sample. These differences cannot be explained with the available data.

These differences are summarized in table 23.

Table 23: Significant Differences in Issues of Importance

| 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% |

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 would seem to reinforce this conclusion.

# CONSEQUENCES FOR MINE ACTION

## GENERAL PLANNING CONSIDERATIONS

*The Tavoush and Syunik regions of Armenia merit the highest priority for mine action programs.* The Tavoush communities have the largest share in the number of affected communities in the country with the highest number of affected population and impact. Tavoush contains one-third of the impacted communities, 51.6% of the communities with medium impact and 50% of communities with high impact. It also reported 64.28% percent of all recent victims. Syunik reported 18 impacted communities, 2 of which (50%) are rated as highly impacted, and 6 communities as having medium impact (19.35%). Syunik province reported 35.71% of recent victims.

Table 24: Impact Categories by Province

| | Ararat | Gegharkunik | Syunik | Tavoush | Vayots Dzor | Total | Current population |
|---|---|---|---|---|---|---|---|
| Low | 1 | 7 | 10 | 2 | 5 | 25 | 16336 |
| Medium | 3 | 4 | 6 | 16 | 2 | 31 | 48349 |
| High | 0 | 0 | 2 | 2 | 0 | 4 | 4052 |
| Total | 4 | 11 | 18 | 20 | 7 | 60 | 68737 |

A number of consequences for practical action flow from the survey findings. First, the results of the survey shows that only two clusters of the same impact level can be distinguished in Tavoush and Syunik provinces where some medium risk communities tend to be clustered near each other (see Map 1 “Impacted communities”).

Second, there may be communities within a heavily mined region and near other communities classified as medium or high risk, which have been assigned a low impact score. This phenomenon may be because there were not many mine victims in the previous two years. Therefore, when technical survey teams move to communities classified as high impact, it may be appropriate for them to visit neighboring affected communities as well, even if they were classified as low or medium priority by the Landmine Impact Survey. The extent of such visits may be determined by a host of factors, but technical survey work plans that look at clusters of communities may not only have advantages for logistical efficiency, but also may be more effective in reducing the risk.

Table 25: Community Institutional Development and Infrastructure

| | Number | Percent |
|---|---|---|
| Telephone connection | 55 | 93.22% |
| Fuel | 23 | 38.33% |
| Electricity | 60 | 100.00% |
| Piped water supply | 54 | 90.00% |
| Health care facility | 55 | 91.67% |
| School | 55 | 91.67% |
| Higher education | 1 | 1.67% |

*Compared to other countries with landmine and UXO problems, Armenia shows a high level of development of local institutional and infrastructural capacities.* Almost all communities have electricity, piped water supply, telephone connection, health care facilities, and secondary schools. This is an important advantage which confirms the assumption in the previous chapter about a very significant learning process among the population at

risk as communities with schools, markets, and local community organizations are better equipped to successfully adapt to the presence of mines and UXO than communities that lack these items.

*The mine action conducted in contaminated areas and communities of Armenia is comparatively low*. In 87.5% of cases no mine action has been conducted in communities and only in 12.5% cases has any mine action took place. Also, if local mine clearance efforts are excluded, in 90.2% of cases no surveying/marking, MRE, victim assistance, or clearance was conducted in contaminated communities.

Table 26: Intensity of Mine Action Penetration by Activity and by Province

| Province | Mine awareness education | Victim assistance | Marking and Survey | Mine clearance | Local mine clearance |
|---|---|---|---|---|---|
| Ararat | 0 | 0 | 0 | 0 | 0 |
| Gegharkunik | 0 | 1 | 0 | 0 | 0 |
| Syunik | 2 | 0 | 1 | 2 | 9 |
| Tavoush | 7 | 1 | 4 | 2 | 3 |
| Vayots Dzor | 0 | 0 | 0 | 0 | 1 |

The mine action planning shall consider the factor of restricted military zones: the areas that fall into this category shall be distinguished from those without restricted status. The SHAs that fall within the military restricted zones along the border with Azerbaijan are currently not accessible for mine clearance largely due to security issues. There are 36 impacted communities with 50 suspected areas recorded in all five contaminated regions, which fall under the category of having SHA's in military restricted zones (Map 4). Only 103.71 out of 321.68 square kilometers of suspected area is in a non-restricted zone while the rest of the area, constituting 67.76%, of the suspected area, is formally inaccessible for civilians.

Map 4. Restricted and Non-Restricted SHAs

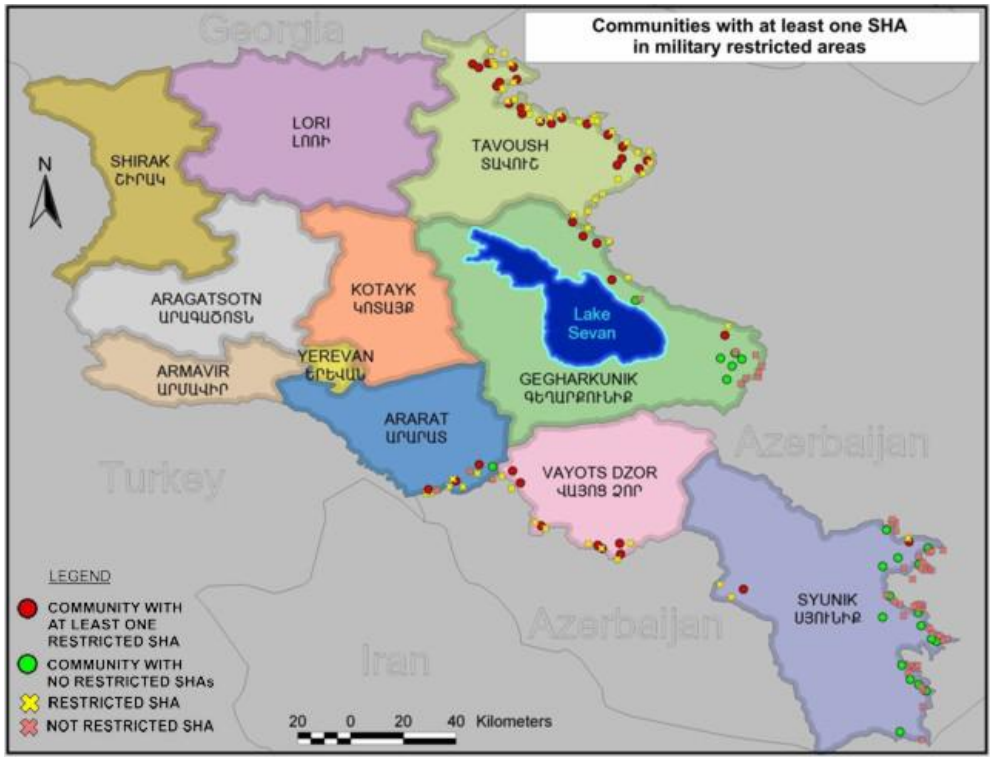


Table 27: Number and Size of Dangerous Areas (Sq Km), by Province and Restricted/Non-Restricted Status

| | Restricted area | | Not restricted area | |
|---|---|---|---|---|
| Province | Number of SHA | Total Size of SHAs | Number of SHA | Total Size of SHAs |
| Ararat | 6 | 47.47 | 3 | 1.66 |
| Gegharkunik | 5 | 12.25 | 8 | 76.31 |
| Syunik | 2 | 0.14 | 41 | 25.75 |
| Tavoush | 29 | 141.26 | 0 | 0.00 |
| Vayots Dzor | 8 | 16.86 | 0.00 | 0.00 |
| Total | 50 | 217.97 | 52 | 103.71 |

*The population of communities with SHAs in restricted areas is more vulnerable than those with SHAs in non-restricted areas.* Communities that lack agricultural land and are in close proximity to restricted zones are often forced to use the restricted land illegally. Therefore landmine blockages in restricted area SHAs will have an impact on communities. The tables below show that despite the restricted status of those areas, they still have considerable impact on communities in terms of victims and social-economic blockages.

Table 28: Victims by Province and by Restricted/Non-Restricted Status of Communities

| | Not Restricted | | Restricted | |
|---|---|---|---|---|
| | Recent Victims | Old Victims | Recent Victims | Old Victims |
| Ararat | 0 | 0 | 0 | 31 |
| Gegharkunik | 0 | 16 | 0 | 30 |
| Syunik | 5 | 109 | 0 | 0 |
| Tavoush | 0 | 0 | 9 | 193 |
| Vayots Dzor | 0 | 0 | 0 | 1 |
| Total | 5 | 125 | 9 | 255 |

Almost twice as many recent and non recent victims had their incident in restricted SHAs rather than in non-restricted SHAs. Restricted communities contain twice the amount of communities with medium impact scores and an equal number of high impacted communities compared to communities with non-restricted SHAs.

Table 29: Impact by Province and by Restricted/Non-Restricted Status of Communities

| Status | Impact | Ararat | Gegharkunik | Syunik | Tavoush | Vayots Dzor | Total |
|---|---|---|---|---|---|---|---|
| Not Restricted | Low | 0 | 3 | 9 | 0 | 0 | 12 |
| | Medium | 1 | 3 | 6 | 0 | 0 | 9 |
| | High | 0 | 0 | 2 | 0 | 0 | 2 |
| | Total | 1 | 6 | 17 | 0 | 0 | 24 |
| Restricted | Low | 1 | 4 | 1 | 2 | 5 | 13 |
| | Medium | 2 | 1 | 0 | 16 | 2 | 22 |
| | High | 0 | 0 | 0 | 2 | 0 | 2 |
| | Total | 3 | 5 | 1 | 20 | 7 | 36 |

Though the number of SHAs in restricted and non-restricted areas is the same, the restricted and non-restricted areas cause a different number of blockages. The distribution of social-economic blockages among restricted and non-restricted areas show that restricted areas have more impact on communities than non-restricted ones. The average number of blockages caused by non-restricted areas is 1.27 while for restricted areas it is 1.58. In particular, SHAs in restricted areas cause more blockages of agricultural lands than those in non-restricted areas (respectively 55 and 38).

Table 30: Blockages by Restricted/Non-Restricted Status of Communities

| | Not Restricted | | Restricted | |
|---|---|---|---|---|
| | Number of responses | Percent of cases | Number of responses | Percent of cases |
| Pasture | 20 | 44.44 | 25 | 55.56 |
| Field Irrigated | 6 | 26.09 | 17 | 73.91 |
| Field Rain-fed | 12 | 48.00 | 13 | 52.00 |
| Water | 2 | 40.00 | 3 | 60.00 |
| Non-agricultural land | 5 | 41.67 | 7 | 58.33 |
| Housing Area | 1 | 100.00 | 0 | 0.00 |
| Road | 18 | 58.06 | 13 | 41.94 |
| Infrastructure | 2 | 66.67 | 1 | 33.33 |
| Total | 66 | -- | 79 | -- |

Several important conclusions for subsequent mine action in affected communities of Armenia may be drawn out. Communities with SHAs in restricted areas may form a specific cluster of impacted communities that have their own conditions for mine action in the future.

All communities in two out of five affected provinces have SHAs in military restricted zones. In the three remaining provinces there are mixed types of communities that may have SHAs either only in restricted zones, or only outside restricted zones, or both types. Subsequently, different mine action strategies for each type of province and community can be developed and implemented.

MINE CLEARANCE

Currently, 52 SHAs are located outside of the restricted military zone and are accessible for mine clearance. However, all 60 impacted communities, including communities with SHAs within the restricted military zone need to have other components of mine action beyond mine clearance.

Taking into consideration: the population affected, the number of recent and old victims, and the level of social-economic impacts, the non-restricted areas of the Syunik province offer the best opportunity for efficient mine action. Relatively small areas in Syunik have higher impacts than large areas in Gegharkunik, therefore more benefit can be obtained from the clearance of these smaller areas (tables 27, 28, and 29).

*Class of munitions*

Munitions type is an important factor in determining appropriate clearance methods as well as what types of equipment are both safe and effective in a given suspected area. Table 31 illustrates contaminated areas in restricted and non-restricted suspected areas by munitions type.

Table 31: Contaminated SHAs and Surface Area (Sq Km) by Type of Munition and by Restricted/Non-Restricted Status of SHAs

| Type of Munitions | Not restricted | | Restricted | | Total | |
|---|---|---|---|---|---|---|
| | SHAs | Size | SHAs | Size | SHAs | Size |
| UXO only | 2 | 0.38 | 1 | 2.40 | 3 | 2.78 |
| AT only | 23 | 5.60 | 2 | 0.01 | 25 | 5.61 |
| AT and UXO | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| AP only | 12 | 9.30 | 4 | 2.19 | 16 | 11.49 |
| AP and UXO | 1 | 0.16 | 2 | 36.00 | 3 | 36.16 |
| AP and AT | 11 | 82.27 | 31 | 147.51 | 42 | 229.78 |
| AP, AT and UXO | 3 | 6.00 | 7 | 23.57 | 10 | 29.57 |
| Unknown Mine | 0 | 0.00 | 3 | 6.29 | 3 | 6.29 |
| Total | 52 | 103.71 | 50 | 217.97 | 102 | 321.68 |

The results show that the largest categories of suspected areas in Armenia (71.43%) result from contamination by a mix of AP and AT (229.78 square kilometers). This type of munitions has the biggest share in the size of both restricted and non-restricted suspected areas. However, a significant proportion of the areas are contaminated by a mix of AP, AT and UXO, totaling 29.57 square kilometers (only 6.00 sq km in not restricted and 23.57 in restricted areas). The size of area contaminated only by UXO is 2.78, for restricted and non-restricted areas is respectively 0.38 and 2.40.

The size of areas with UXO in combination with other munitions is 6.54 sq km for non-restricted areas and 61.97 sq km for restricted areas (only UXO and AP). Only in 5.60 square kilometers of suspected areas are there exclusively AT mine fields, and 9.30 sq km contaminated by AP mines only. For clearance purposes, the presence of AT mines is significant when deploying most clearance machinery: AT is present in 264.96 square kilometers of suspected area, 93.87 in not restricted suspected areas and 171.09 in restricted ones. AP in combination with other types of munitions are present in 306.99 sq km of suspected area out of which only 97.73 sq km is in non-restricted areas.

*Vegetation and Ground Profile*

Table 32 shows in detail the distribution of vegetative cover in relation to the terrain and contaminated surface area and the number of suspected areas for impacted communities. The most common terrain in these communities is composed of ravines, hillsides and ridges covered by bushes or trees. This will limit the use of mechanical clearance methods and force a reliance on slower, more expensive manual clearance techniques. Clearance teams working in the field support this finding and also report the added difficulties of the high rock content of the soil in Armenia, high temperatures in summer and, in a number of areas, snow and ice in winter. All of these factors further slow and, at times, completely halt clearance activities.

Table 32: Contaminated SHAs and Surface Area (Sq Km), by Vegetation and Ground Profile Types and by Restricted/Non-Restricted Status of Communities

| Vegetation | | Not restricted | | | Restricted | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | Flat land | Contains gullies, hillside, or ridge | Other | Flat land | Contains gullies, hillside, or ridge | Other | Unknown | |
| None | Size | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| | SHAs | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 5 |
| Short grass | Size | 0.20 | 19.74 | 1.76 | 0.23 | 54.57 | 6.00 | 0.00 | 82.50 |
| | SHAs | 3 | 10 | 5 | 3 | 11 | 1 | 0 | 33 |
| Tall grass | Size | 0.01 | 64.40 | 0.00 | 3.05 | 132.26 | 0.00 | 0.00 | 199.72 |
| | SHAs | 2 | 8 | 0 | 2 | 13 | 0 | 0 | 25 |
| Bushes/trees | Size | 0.08 | 15.03 | 2.30 | 0.20 | 16.33 | 1.94 | 2.34 | 38.22 |
| | SHAs | 3 | 11 | 4 | 1 | 13 | 4 | 1 | 37 |
| Other | Size | 0.00 | 0.00 | 0.00 | 1.20 | 0.00 | 0.00 | 0.00 | 1.20 |
| | SHAs | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| Total | Size | 0.29 | 99.19 | 4.08 | 4.68 | 203.15 | 7.94 | 2.34 | 321.67 |
| | SHAs | 8 | 31 | 13 | 7 | 37 | 5 | 1 | 102 |

Only 10 SHAs out of 102 and only 3.49 square km out of 321.67 sq km of suspected land contains short or tall grass and flat land that will allow for relatively easy mine clearance.

MARKING

The marking of suitable low-impact contaminated areas with warning signs, constituting 41.67% of the total number of impacted communities, may prove to be a cost-effective way to reduce the overall risk that mines pose to populations while other tasks with higher priority are accomplished.

The marking of dangerous areas can be addressed at various levels. At one extreme, full technical surveys can be undertaken that involve area reduction techniques and perimeter fencing and are supported by mine warning signs.

Table 33: Number of SHAs and Recent Victims by Marking and by Restricted/Non-Restricted Status of SHAs

| Marking | Number of Recent victims and SHAs | Not Restricted | Restricted | Total |
|---|---|---|---|---|
| None | SHAs | 50 | 26 | 76 |
| | Recent Victims | 3 | 7 | 10 |
| Local Signs | SHAs | 1 | 0 | 1 |
| | Recent Victims | 0 | 0 | 0 |
| Official Signs | SHAs | 1 | 13 | 14 |
| | Recent Victims | 2 | 2 | 4 |
| Several | SHAs | 0 | 1 | 1 |
| | Recent Victims | 0 | 0 | 0 |
| Unknown | SHAs | 0 | 10 | 10 |
| | Recent Victims | 0 | 0 | 0 |
| Total | SHAs | 52 | 50 | 102 |
| | Recent Victims | 5 | 9 | 14 |

At the other extreme, individual mine signs can be placed at highly localized areas or run along one edge of a suspected mined area, such as along a road verge. Close liaison with communities during the process of marking and fencing has proven to be an effective way of maintaining fences and signs in many countries—communities can then take responsibility and ownership for the ongoing upkeep of marking until clearance activities can take place. Communities reported 76 suspected areas (74.50%) as being completely unfenced or marked. With the number of unknown marking in restricted areas this

constitutes 86 SHAs (84.31%). Fencing and marking these areas to international standards could significantly reduce the danger to the population.

*The marking of SHAs in restricted areas, at least along the edge of suspected mined area, separating the restricted area from the accessible one, may be a good alternative to actual de-mining.* Table 33 shows that 14 SHAs in restricted areas already have either local or official signs. Though no statistical association between recent-victims and marking of SHAs in suspected areas can be revealed due to small number of recent victims, the table shows that 77.78% of recent victims had an accident in restricted areas without any marking.

*Marking*

MINE AWARENESS

- *Seasonal constraints must be considered when scheduling the delivery of mine awareness education*. In almost all regions, the local population is not available during periods of harvest and sowing (March-October).

- *Mine Awareness and MRE are needed in all impacted communities in spite of location of the SHAs affecting these communities.* The data shows that explosive ordnances equally affect the populations of communities with SHAs in restricted and non-restricted areas.

- *Age and sex of victims affect both the message and method of delivery*. According to yje data collected, all recent victims are adult male. And there are no recent-victims among children. This means that community awareness programs need to focus predominantly on adult men.

- *All recent incidents occurred in Tavoush and Syunik provinces, making these regions strong candidates for future mine awareness activities.*

VICTIM ASSISTANCE

The survey identified 394 victims of landmine and UXO incidents; of these victims, 110 killed and the rest remain living. In the last two years, there have been 14 incidents. In these recent incidents, 1 victim died as a result of his injuries.

Table 34: Old and Recent Victims by Province and Restricted/Non-Restricted Status of Communities

| | Not-restricted | | Restricted | | Total |
|---|---|---|---|---|---|
| | Recent Victims | Old Victims | Recent Victims | Old Victims | |
| Ararat | 0 | 0 | 0 | 31 | 31 |
| Gegharkunik | 0 | 16 | 0 | 30 | 46 |
| Syunik | 5 | 109 | 0 | 0 | 114 |
| Tavoush | 0 | 0 | 9 | 193 | 202 |
| Vayots Dzor | 0 | 0 | 0 | 1 | 1 |
| Total | 5 | 125 | 9 | 255 | 394 |

Based on the data received, 12 recent survivors are confirmed to have received emergency care shortly after their injury. None of the victims remained without care. The emergency medical facilities in Armenia are good by most standards with a well-structured health system administered down to

district and community level. For rehabilitation and vocational training of survivors, the findings of the survey are disappointing due to the low number (3) of other types of victim assistance.

Table 35: Type of Wounds and Care Received

| Province | Wounds Received by Mine Victims | | | | Care Received by Mine Victims* | | | |
|---|---|---|---|---|---|---|---|---|
| | Fatal | Amputation | Loss Of Sight | Other | No care | Emergency | Rehabilitation | Other |
| Syunik | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 |
| Tavoush | 1 | 5 | 1 | 3 | 0 | 7 | 2 | 1 |
| Total | 1 | 5 | 1 | 8 | 0 | 12 | 2 | 1 |

* NOTE: One victim received fatal wounds and died immediately.

The following conclusions for future victim assistance can be derived from the survey.

- *The restricted and non-restricted status of communities, important for mine clearance activities, is not relevant for Victim Assistance.* The data shows that explosive ordnances equally affect the populations of communities with SHAs in restricted and not-restricted areas.

- *The low number of victim assistance projects is disappointing.* Only in two out of 60 affected communities a victim assistance program was implemented during the last two years. There was no special program for victims of mine and UXO accidents.

- *The survey shows that it is necessary to broaden the range of rehabilitation services and expand access to these services.* This capacity needs to be reinforced and reorganized to provide an accessible network of services nationwide. Only 2 out of 12 recent victims (16.67%) had access to rehabilitation services for victims.

Table 36: Summary: Communities, Contaminated Surface, and Population Affected, by Region

| Region | Communities Affected | Population Affected | SHAs | Contaminated Surface (sq km) | Victims | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Recently Killed | Recently Injured | Killed earlier | Injured earlier | All Victims |
| Ararat | 4 | 2,890 | 9 | 49.13 | 0 | 0 | 6 | 25 | 31 |
| Gegharkunik | 11 | 14,852 | 12 | 88.55 | 0 | 0 | 15 | 31 | 46 |
| Vayots Dzor | 7 | 3,785 | 8 | 16.86 | 0 | 0 | 0 | 1 | 1 |
| Syunik | 18 | 8,207 | 43 | 25.88 | 0 | 5 | 32 | 77 | 114 |
| Tavoush | 20 | 39,003 | 29 | 141.26 | 1 | 8 | 56 | 137 | 202 |
| Total | 60 | 68,737 | 101 | 321.676 | 1 | 13 | 109 | 271 | 394 |

# CHAPTER 2. BACKGROUND AND METHODOLOGY

## TEAM LEADER'S REPORT

### BACKGROUND ON ARMENIA

Armenia is a country that covers 29,8 thousand sq. km in the Southern Caucuses and has a population of slightly over 3 million. It is divided into ten Marzes (provinces) – administrative territorial divisions, plus the administrative district of the city of Yerevan (the capital)[15]. It is a highly educated and urbanized society. Armenia is bordering Azerbaijan, Turkey, Iran and Georgia; it is landlocked but contains Lake Sevan, which is 1,360 sq km, at an elevation of almost 1,905 meters above the sea level.

Armenia was hit by a devastating earthquake in 1988. The earthquake damaged 40% of the country's industrial capacity and was followed by economic collapse caused by transition period. This led to a considerable migration of the population. Most of the landmines on Armenian soil are the result of military activities conducted in the region from 1988 to 1994 between Azerbaijan and the Armenian enclave within Azerbaijan – Nagorno Karabagh.

### BACKGROUND TO LIS IN ARMENIA

Since 1994, the Government of Armenia, the donor community and civil society have been committed to the successful completion of the following activities in the area of humanitarian de-mining, mine risk education and victim assistance.

Armenian Humanitarian De-Mining Centre was established in March 2002 with the help of the US State Department and the US Department of Defense[16]. The Centre took the lead in training de-miners, resulting in nearly 200 de-miners, dog handlers and staff personnel trained and equipped to date. The centre also conducted a pilot landmine survey in the Tavoush region of Armenia in partnership with the Armenian Red Cross under the funding provided by RONCO in 2002.

The US Marshall Legacy Institute, in cooperation with the US Humanitarian De-mining Program established the Mine Detecting Dog Partnership program in Armenia.

Landmine Victims assistance*:* Armenia has a wide network of health care facilities and qualified personnel for specialized medical assistance, for production of prosthetic appliances, and for rehabilitation and reintegration of landmine survivors. However, their ability to address the needs of landmine survivors is limited because of a lack of adequate resources. Landmine survivors do not

[15] Census 2002. www.armstat.am

[16] The US Government is the main donor for mine action programs in Armenia. Between 1993 and 2003 the US contribution amounted to about US$10 million. Additional $1.8 million was provided by the US Embassy in 2002 from its Freedom Support Act funds to augment the de-mining program and to establish the de-mining centre.

receive any psychological or social rehabilitation and, although legislation exists to protect the rights of persons with disabilities, it does not provide a special approach towards land mine survivors.

It is worth mentioning that different schemes for landmine victim assistance are employed for civilian and military victims. It is a common understanding that the victim assistance scheme for military personnel is better developed and financially supported. At the same time, it shall be mentioned that the information on military victims of landmines is not publicized and rests with the Ministry of Defense.

RONCO Consulting Corporation, under contract to the United States Department of State, has conducted mine action training and activities in Armenia in order to facilitate development of a national mine action capacity. Through this work, RONCO has been able to assess country organization and obtain a general picture of landmine and unexploded ordnance [UXO] contamination, sample existing minefield and geographic information system [GIS] information, examine mine action resources available in-country, and gain a comprehensive understanding of Armenian and international mine action organizations acting there. RONCO has identified the Armenian Ministry of Defense [MoD] as the primary local partner for implementation of all mine action activities, including a potential Landmine Impact Survey.

In February 2002 VVAF's Information Management and Mine Action Programs (iMMAP), under IMAS Contract No. S-LMAQM-99-0144 Task Order Number 01-78), assessed the level of landmine and unexploded ordnance [UXO] contamination in Armenia, basic knowledge assets and capabilities for conduct of survey.

Subsequently, VVAF's iMMAP prepared [in cooperation with RONCO personnel in Armenia] and delivered in March/April 2002 an appropriate training curriculum for national staff members of the Armenian Humanitarian De-Mining Center (AHDC). This training imparted to AHDC survey staff basic knowledge assets and capabilities necessary to conduct a Landmine Impact Survey to support national strategic mine action planning. In addition, VVAF attempted to provide AHDC senior staff with a grasp of the management and analytical methods utilized and challenges likely to be encountered.

VVAF identified that existing AHDC survey staff alone possess limitations relative to implementation of a Landmine Impact Survey. Therefore, it was proposed that to conduct a successful national Landmine Impact Survey local institutions would need to be trained and mobilized to implement a survey. VVAF identified in 2002 that the Armenian Red Cross [ARC] and the American University of Armenia [AUA] had the local capacity (with proper supervision and technical assistance) to carry out a Landmine Impact Survey effectively and efficiently.

Accordingly, a pilot landmine impact survey was conducted in 28 villages of Tavoush mars in late 2002 with field staff provided by ARC. In March 2003 United Nations Mine Action Service (UNMAS) dispatched a Quality Assurance Monitor (QAM) to Armenia to assess the feasibility of certifying the pilot survey as a landmine impact survey in the 28 villages covered. The QAM, based on his assessment concluded that certification could not be granted to the pilot survey because of various shortcomings.

## LIS ARMENIA AS PART OF THE BIGGER INITIATIVE

The Landmine Impact Survey in Armenia is a one-year component of the bigger three-year UNDP initiative, funded by the EC. The second year of the program will be devoted to the pilot Technical Survey in the most contaminated communities as identified by the LIS. The third year of the program will cover the issues related to victim assistance and legislative framework for mine action in Armenia. Throughout the program, development of the national strategy to address the issue of landmines in Armenia will be among the core activities of the program. For this purpose the Government of Armenia has agreed to establish an inter-agency Government committee to oversee Mine Action in Armenia.

Provided that the issue of landmines is a new area of intervention for the UNDP and all other national partners in Armenia, the lack of qualified national personnel was among the challenges, which the program management and UNDP in general faced. The LIS is only one component of the necessary mine action in Armenia. National personnel trained and experienced from the LIS could be used in other capacities within the overall framework of mine action in the future, there by decreasing the before mentioned challenge.

## LIS PERSONNEL

Program management would like to express its thanks and appreciation to the Armenia LIS team, who worked hard to make the LIS in Armenia a success.

| | | |
|---|---|---|
| Project Manager | - | Mr. Armen Grigoryan |
| Operations and Finance Associate | - | Mr. Armen Khojoyan |
| Survey Group Leader | - | Ms. Kristine Barseghyan |
| Data / LAN / Web Manager | - | Mr. Vahe Ayvazyan |
| Field Editor | - | Ms. Tatyana Sargsyan |
| Field Editor | - | Mr. Maxim Poryakov |
| Data Entry Specialist | - | Mr. Victor Yengibaryan |
| Translator / Interpreter | - | Ms. Anna Hakobyan |
| Data Collectors | - | Ms. Nune Grigoryan |
| | - | Mr. Aghasi Meliksetyan |
| | - | Mr. Arthur Isayan |
| | - | Mr. Vahe Tamamyan |
| Drivers | - | Mr. Grigor Mnatsakanyan |
| | - | Mr. Karen Mkrtchyan |
| | - | Mr. Arsen Jaghinyan |
| | - | Mr. Arman Avchyan |

It shall be mentioned that most of the personnel recruited for the purpose of implementation of the LIS in Armenia will continue to work within the scope of the UNDP Armenia De-Mining project, taking into consideration that these people are the only trained and experienced specialists in Armenia in the field of Mine Action in general and in LIS in particular.

# PROGRAM TIMELINE

Following consultations with the Government of Armenia and the Armenian Humanitarian De-Mining Center, as well as, the US counterparts, the UNDP and the EC undertook this project to address the needs and priorities of landmine action identified by key stakeholders.

The goal of the project is to strengthen the national capacity for coordination and implementation of a de-mining program in Armenia.

This goal is in line with UNDP's mandate worldwide to help the country prevent and effectively address the challenges caused by disasters and complex emergencies through national capacity building, policy dialogue and knowledge networking. This effort will be closely coordinated with the Ministry of Defense of Armenia, Humanitarian De-Mining Centre and the Ministry of Territorial Administration and Infrastructure Coordination.

The project strategy draws on three overarching frameworks:

- Untied Nations Development Assistance Framework for 2005-2009: In the area of economic governance, where the main goal is to achieve economic equity, the project outcomes aim to support the Government's employment and recovery strategy, in particular, programs aimed at generating jobs, creating conditions at community level for sustained growth and strengthening the emergency response system.

- UNDP Country Program for 2005-2009: One of the desired outcomes of the Country program Document (CPD) is to accelerate the process of post-conflict recovery in targeted communities.

- Poverty Reduction Strategy Paper: The Paper identifies the process of post conflict recovery in Armenia as a high priority task for the Government of Armenia to achieve in the period of 2004-2007.

In order to achieve its overarching goal, that is to strengthen the national capacity of coordination and implementation of a de-mining program in Armenia, the project has identified six components:

Component One: Conducting full countrywide Landmine Impact Survey and Collecting Data.

Activities will include:

1.1 Training and equipping survey groups
1.2 Conducting a full-scale landmine impact survey
1.3 Processing the collected data and updating the database

Component Two: Preparing and conducting a Technical Survey, Marking and Clearance (one community, as a pilot project.

Activities will include:

2.1 Conducting mapping and technical survey in one of the most contaminated and impacted communities of the Syunik region

2.2 Completing a quality control survey
2.3 Preparing a report on the Technical Survey

Component Three: Conducting a public awareness campaign and mine risk education in mine-affected areas.

Activities will include:

3.1 Developing special MRE programs based on a training needs assessment
3.2 Conducting Mine Risk Education (MRE) programs in communities at risk by providing trainings to youth, schools, local community leadership and community members
3.3 Raising public awareness through TV and radio spots
3.4 Conducting seminars and presentations

Component Four: Conducting targeted victim assistance in mine affected areas.

Activities will include:

4.1 Conducting a full survey of victims and survivors of landmines
4.2 Developing a victim assistance strategy with an action plan
4.3 Developing draft legislative amendments to the existing legislation on targeted victim assistance
4.4 Carrying out targeted victim assistance - medical, orthopedic
4.5 Conducting special training of medical personnel in the mine affected regions.

Component Five: Supporting the Armenian Humanitarian De-mining Centre.

Activities will include:

5.1 Developing and conducting professional training programmes for de-miners.
5.2 Developing and conducting specialized training programs for medical personnel working in minefield areas.

Component Six: Handing over, certifying and publishing the Final Report.

Activities will include:

6.1 Submitting a draft report to the UNMAS Program Secretariat and Government of Armenia (GoA)
6.2 Attaining UN certification and approval of the GoA
6.3 Completing, publishing and disseminating the Final Report

Each of the objectives of the project has immediate and indirect beneficiaries. National authorities, mine affected communities in Armenia, international donors, and international and national mine action and development organizations will receive immediate and long terms benefits from information gained from the impact survey. Border communities will highly benefit from public awareness rising and mine education. The survey results also will be of significant benefit to other agencies providing humanitarian and development assistance to Armenia.

THE TIMELINE OF UNDP ARMENIA DE-MINING PROGRAM

The United Nations Development Program (UNDP) and the Ministry of Defence (MoD), Republic of Armenia (RoA) embarked upon a three year (2004-2007) project, project document signed on July 29, 2004, to address various aspects of humanitarian mine action (HMA) in Armenia. The intended outputs under this project are:

- Year 1: Conduct of a countrywide Landmine Impact Survey (Level 1) and production of an impact based report.

- Year 2: Conduct of Technical (Level 2) survey in Syunik marz (province); marking and clearance in southern part of Syunik.

- Year 3: Development of a victim assistance strategy and legislative framework.

RONCO, accordingly, has requested VVAF's Information Management and Mine Action Programs to provide technical assistance towards the conduct of a national Landmine Impact Survey proposed under the auspices of UNDP. VVAF's iMMAP, in cooperation with RONCO, AHDC, UNDP and other relevant non-governmental organizations (NGOs) and international organizations (IOs) active in Armenia:

- Provided technical training, support and assistance in survey instrument design, survey protocol development, and data analysis for the Armenia Landmine Impact Survey, including technical field visits by VVAF's iMMAP staff;

- Supported activities as required to ensure information collected is fully compatible with protocols for completion of a Landmine Impact Survey;

- Advised and assist survey management techniques and procedures, and quality control; and

- Assisted in completion of a final report.

Between 15 & 27 August 2004, VVAF Information Management & Mine Action Programs (iMMAP) Medical Epidemiologist/Survey Coordinator, conducted a mission to Armenia to increase the understanding of UXO/landmine contamination, and to gauge the existing in-country capacity and resources to conduct and support a national landmine impact survey (LIS), with special emphasis upon operational requirements for conduct of a LIS.

Substantive negotiations were held with UNDP Armenia Project Manager, Mr. Armen Grigoryan in July 2004 during the mission to Armenia of Mr. William J. Reid, Assistant Vice President of RONCO. The principal agreement to unite efforts in preparation and implementation of the LIS in Armenia was reached between UNDP and RONCO at that stage.

CHRONOLOGY OF EVENTS FOR LIS ARMENIA

| | |
|---|---|
| December 2003 | - Action Agreement on Armenia De-Mining Project is signed between EC (donor) and UNDP in Brussels; |
| January 2004 | - UNDP Armenia starts negotiations with in-country stakeholders; |
| February 2004 | - UNDP Armenia makes a first draft of Project Document and shares it with major stakeholders; |
| March 2004 | - First comments obtained from in-country stakeholders on proposed project document; |
| April 2004 | - Expert opinion collection resulted in drafting the first list of contaminated and / or suspected communities; |
| May 2004 | - Second draft of the Project Document is distributed to the stakeholders, including the Armenian Ministry of Defence) for comments; |
| June 2004 | Project Appraisal Committee is convened to finalize the project document; |
| July 2004 | - Preliminary discussions with RONCO on parallel funding -of the LIS Armenia; |
| July 2004 | - UNDP signed the Project Document with its national counterpart – Ministry of Defense; |
| August 2004 | - Advance Survey Mission is conducted by VVAF to Armenia; |
| September 2004 | - Cost-sharing Agreement is signed between UNDP Armenia and the Armenian Ministry of Defense; |
| October 2004 | - Procurement and HR needs of the program identified and processes initiated; |
| November 2004 | - Project needs on human resources and equipment and tools are identified, based on the scope of work and the problem to address; |
| December 2004 | - Project location identified and renovated; |
| January 2005 | - Necessary procurement and recruitment is conducted; |
| February 2005 | - LIS training is conducted by VVAF for UNDP De-Mining project staff; |

| | |
|---|---|
| March 2005 | - IMSMA training is conducted by VVAF for UNDP De-Mining project staff; |
| March 2005 | - Pre-test is conducted in Ararat region of Armenia; |
| April 2005 | - GICHD provides the project with the updated IMSMA; |
| April 2005 | - Pilot test is conducted in Vayots Dzor region of Armenia; |
| May – July 2005 | - Data collection is conducted in five regions of Armenia; |
| June 2005 | - VVAF Operations Technical Advisor visited Armenia; |
| June – July 2005 | - UNMAS QAM visits Armenia; |
| August 2005 | - LIS final report drafted. |

MANAGEMENT ARRANGEMENTS

Direct Execution Modality is used for the implementation of this project. Project is cost-shared between the principal funding institutions: EC, UNDP and Armenian Humanitarian De-Mining Centre of the Ministry of Defense.

For specialized activities (i.e. de-mining), the existing capacity of the AHDC will be used. International experts will be used for LIS, Technical Survey and other specialized components.

Vehicle Requirements

All vehicles necessary for the program are purchased and adequate allocations for with drivers made, operating costs and maintenance are provided from the project budget.

Communications Requirements

The Project Implementation Unit (PIU) uses the best available communication networks (Internet, land and mobile phones and radio communication) based on the location on transparent selection process.

Office Space

Necessary office space is identified in order to accommodate the project personnel and necessary equipment and tools. PIU is located within the premises of the AHDC in the town of Echmiadzin within 26 km from Yerevan.

UNDP Contribution

In addition to the assistance that UNDP CO normally provides to UNDP-executed projects, the UNDP country office provides further support for the execution of the Project:

- Making direct payments,
- Identification and recruitment of Project Unit (PU) personnel,
- Identification of training activities and assistance in carrying them out,
- Procurement of goods and services,
- Access to UNDP-managed global systems, the network of UNDP country offices and specialized systems containing operations information, including rosters of consultants and providers of development services,
- Ensuring that financial and substantive reports are delivered to the EC on time and in good quality.

The PIU manages the implementation of all project activities on a daily basis. UNDP is responsible for financial management and coordination of all project activities, including elaboration of a work-plan, conduction of biddings and tenders, selection of companies, preparation of contracts, supervision of works, quality assurance, issuance of certificates of payments, procurement of goods and equipment, organization and provision of trainings, preparation of progress and financial status reports etc.

# KEY PARTICIPANTS

United Nations Development Program (UNDP) is the executing agency of the Landmine Impact Survey in Armenia. It has responsibility for planning, executing, monitoring and follow up on the activities related to the LIS.

European Commission (EC) is the main donor for the program in general and for its LIS component in particular. EC Delegation in Armenia is also tasked to conduct regular monitoring activities related to the implementation of the project.

US State Department provides parallel funding to the project and channels its resources through RONCO, which subcontracted VVAF to provide Technical Expertise on planning, organization and implementation of the LIS, as well as on data analyses, correlations and drafting the final report.

Geneva International Center for Humanitarian De-Mining (GICHD) provided IMSMA software and respective training for the AHDC and project staff.

United Nations Mine Action Service (UNMAS) has responsibility for ensuring the quality of the survey. UNMAS has provided the Quality Assurance Monitor (QAM). The QAM visited the Armenia LIS once at the end of the field data collection (June – July 2005). His recommendations were all incorporated into the operational and methodological planning and deviations corrected.

Government of Armenia (GoA) is the National Counterpart for the UNDP Armenia De-Mining Project and its LIS component. Government of Armenia has also contributed 15 mln. Armenian Drams (AMD), which equals $29,622 to the implementation of the project.

Ministry of Territorial Administration (MoTA) is the coordinating body within the structure of the Government of Armenia. Its Deputy Minister is also the National Director for the UNDP Democratic Governance Portfolio under which the UNDP De-Mining Project is falling. This Ministry coordinates the activities of other national institutions in relation to the LIS and the UNDP De-Mining programme in general. The MoTA is also coordinating the activities of the Government on establishing the National Inter-Agency Committee on Mine Action.

Emergency Management Administration (EMA) under the MoTA is a long-standing valuable partner of the UNDP in Armenia for a number of joint initiatives, including the implementation of the Landmine Impact Survey. During the LIS EMA's emergency services at a regional level were contacted while the team was in the survey areas. EMA also provided the project with the quality GIS data on earthquake prone regions of Armenia, landslide sites, potentially dangerous areas for flooding and the GIS data on all communities of Armenia.

International Committee to Ban Landmines (ICBL) Armenia is among initial providers of Expert Opinion on potentially suspected and / or contaminated communities.

Armenian Red Cross Society (ARCS) was used by RONCO for pilot survey in Tavoush region in 2002. In this respect, the ARCS possessed valuable information, which was shared with the project. The

ARCS also provided initial expert opinion on potentially contaminated and / or suspected communities in Armenia.

German Technical Cooperation (GTZ) provided the expert opinion at the early stage of the project, based on the survey and field activities conducted or funded by the GTZ and information gathered during their implementation.

American University of Armenia (AUA) was considered as an implementing partner for the pilot survey in 2002, conducted by RONCO (at a later stage, ARCS was subcontracted for this task). AUA was also a provider of initial expert opinion on contaminated and / or suspected communities.

Norwegian Refugee Council (NRC) is a provider of initial expert opinion on contaminated and / or suspected communities. NRC also conducted a household survey in 2001, where one of the questions related to difficulties for using agricultural lands, was related to possible landmine contamination.

The Armenian Ministry of Defense and its Armenian Humanitarian De-Mining Center (AHDC) provided the project with initial expert opinion on contaminated and / or suspected communities, as well as, with the IMSMA data collected during the pilot survey in the Tavoush region of Armenia . The MoD also provided a specialized ambulance and first aid training to the project personnel. The ambulance and three medics were seconded from the AHDC to the UNDP for the duration of field data collection. An ambulance was stationed at the Field Operating Base, wherever data collection was being conducted. Two surveyors from the AHDC were also seconded to the project for the duration of the field data collection, as some of the contaminated communities are located in the border zone and their lands are located within restricted military border zones. The Ministry of Defense and its Humanitarian De-Mining Center also provided office space and covers expenses for the utilities used by the project, which is located in the AHDC premises.

United Nations Children Fund (UNICEF) is a specialized UN Agency for Mine Risk Education. UNICEF's country office in Armenia was contacted by the project for the possibility of having a contribution to the project in the format of MRE specialists, the worldwide network of UNICEF support, and its experience in conducting MRE programs. An assessment mission was conducted by UNICEF in Armenia to assess the feasibility of implementation of MRE in Armenia as a UNICEF contribution to the utilization of the results of the LIS at the country level.

Regional and local authorities in Armenia are the custodians of information in relation to contaminated and / or suspected territories. Local Expert Opinion was collected from the local authorities. Close collaboration with Governors' offices and community leaders is a key to a successful and comprehensive Landmine Impact Survey in any given region of Armenia. Government authorities turned out to be helpful and committed to the sound implementation of the LIS and a very valuable partner in terms of necessary data on potential areas of contamination.

Local NGOs and CBOs turned out to be a helpful provider of indirect information on the landmine problem in Armenia. Because most of them operate at the grassroots level, they possess knowledge of problems related to blockages and inaccessibility of certain areas for development and / or humanitarian initiatives. Most of the information provided by the NGOs and CBOs was valuable and confirmed the originally collected expert opinion on the scale of contamination in Armenia.

# ADMINISTRATIVE STRUCTURES

Staff orientation

The Project Manager (PM) received general training on Mine Action at the UNDP in New York. VVAF experts, principally from the LIS team in Iraq, came to Armenia in February 2005 to conduct the staff-training course for six weeks and trained the IT Manager and the data entry personnel on IMSMA for two weeks.

Set up HQ office

The UNDP De-Mining Project is located within the premises of the Armenian Humanitarian De-Mining Center (AHDC) of the Ministry of Defense (MoD), which greatly facilitates informal exchanges between the partner organizations and resulted in developing a mutual confidence .The military barrack located 26 km away from Yerevan provides a secure and usable office and working communication systems (internet, mobile phones, satellite phones and VHF radios). The GIS system and staff are located next to the AHDC IMSMA cell for greater coordination.

Procure and transport office equipment

Based on the PM requirements, the UNDP procurement unit has efficiently ensured the necessary supply of essential items for the LIS. As per the donor obligation, the LIS had to purchase vehicles of EU origin, which slightly delayed and disrupted the daily operations and were not the most suitable for the local terrain.

Recruitment of personnel

The LIS staff is competent, qualified, dedicated and gender balanced. The recruitment process was strictly based on UNDP Standard Operation Procedures. All positions were advertised on the UNDP website, in the UNDP building and in two local newspapers. Each pre-selected candidate had to pass a UNDP written test enhanced by VVAF to meet the specific LIS requirements for the relevant vacancy. Based on these results, only short-listed candidates were interviewed by a selection board made up of five UNDP senior staff.

As a result, the Field Editors (FE) made a complimentary team made up of a sociologist with Masters degree and a former RONCO staff member. The enumerators all have previous survey experience and two out of four are from the impacted regions. The Data Entry Specialist (DES), with Western MA degree in sociology, had proven experience in database survey. Finally, the Survey Group Leader is young, dynamic and already experienced in conducting surveys with a PhD degree coming up.

Technical Advisory Team

Vietnam Veterans of America Foundation (VVAF) provided technical assistance to the survey team in the fields of social science, survey methodology and design, geographical information systems, information management, statistical analyses and drafting of the final report.

Quality Assurance Monitor

Mr. Damien Vallette d'Osia was assigned by the United Nations Mine Action Service (UNMAS) as a Quality Assurance Monitor (QAM) for the Armenia Landmine Impact Survey (ALIS). Mr. d'Osia spent five weeks in Armenia at the end of the data collection process, during the second part of June and July 2005. Mr. d'Osia witnessed in total three community meetings, as well as twice witnessed the visual verification process.

The basis for activities of Mr. d'Osia was the SAC protocol on certification requirements. It shall be mentioned here that although the certification guidelines require three QAM interventions throughout the LIS, only one visit was conducted by the QAM to observe the LIS in Armenia. One report was produced by the QAM and agreed with the Project Manager in substance, but not in certain terminology used (e.g. PM thinks that a sketch, which, according to the QAM conforms to the protocol requirements can not be called "an artistic drawing", which is the way it is referred to in the QAM report).

The QAM provided recommendations in relation to the scoring system, victims, sampling plan and survey in restricted military buffer zones on the border with Azerbaijan. Although, these comments provided valuable contribution to the quality of the survey, they were made at the end of the data collection and had considerable operational and budgetary implications. It shall be recommended for the future that the first QAM mission to observe LIS shall by no means be conducted as late as the end of the data collection.

Mr. d'Osia also checked the IMSMA and the entries, which occurred as a result of the field data collection. Mr. d'Osia met UNDP Deputy Resident Representative and UNDP Portfolio Coordinator, as well as, the Task Manager from the EC.

Armenia's LIS Structure is introduced in Figure 7. The Structure was developed during the ASM conducted by VVAF to Armenia in August 2004, and it is a joint effort of the UNDP PM and OA with the VVAF ASM expert. The structure was designed in a way to address the existing scope of the problem.

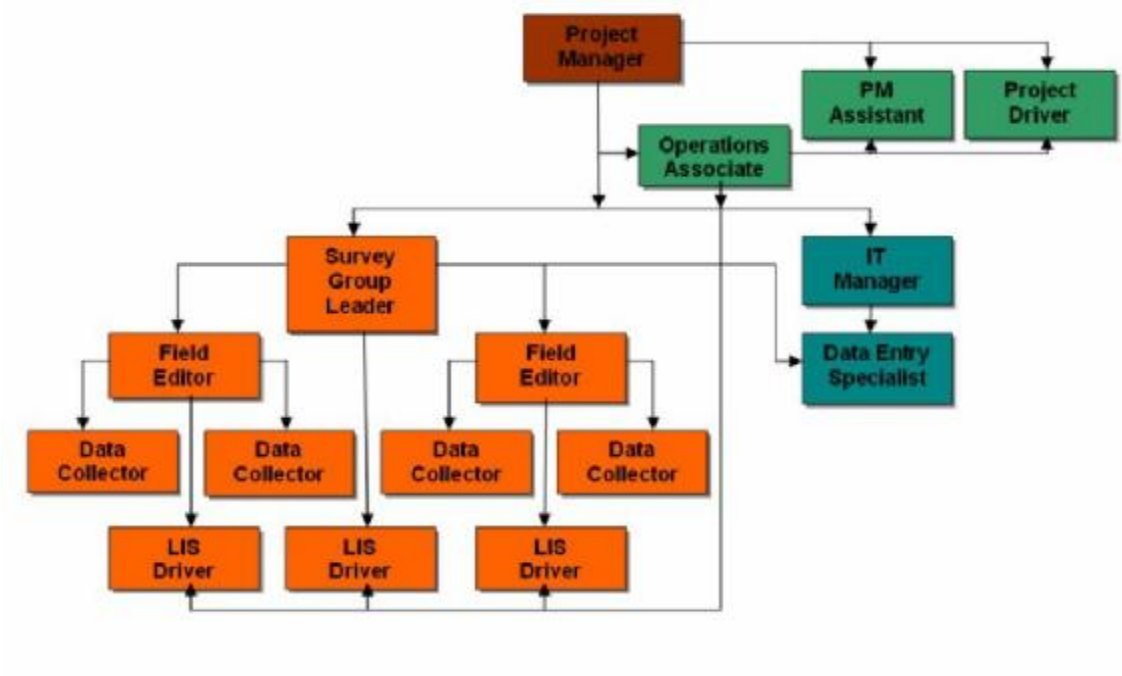
Figure 2 represents the current set up of the De-Mining system in Armenia. To a great extend this system was developed as a united effort between RONCO and the Armenian Ministry of Defense, as a part of the RONCO initiative in Armenia, when the Armenian Humanitarian De-Mining Center (AHDC) was established in Armenia in 2002.

# FINANCES

The overall budget for the UNDP Armenia De-Mining Project is 1,540.000 EURO[17], out of which 1,400.000 is the contribution from the EC. An action agreement between the UNDP and EC was signed in December 2003 in Brussels. The LIS component budget is $669,800.

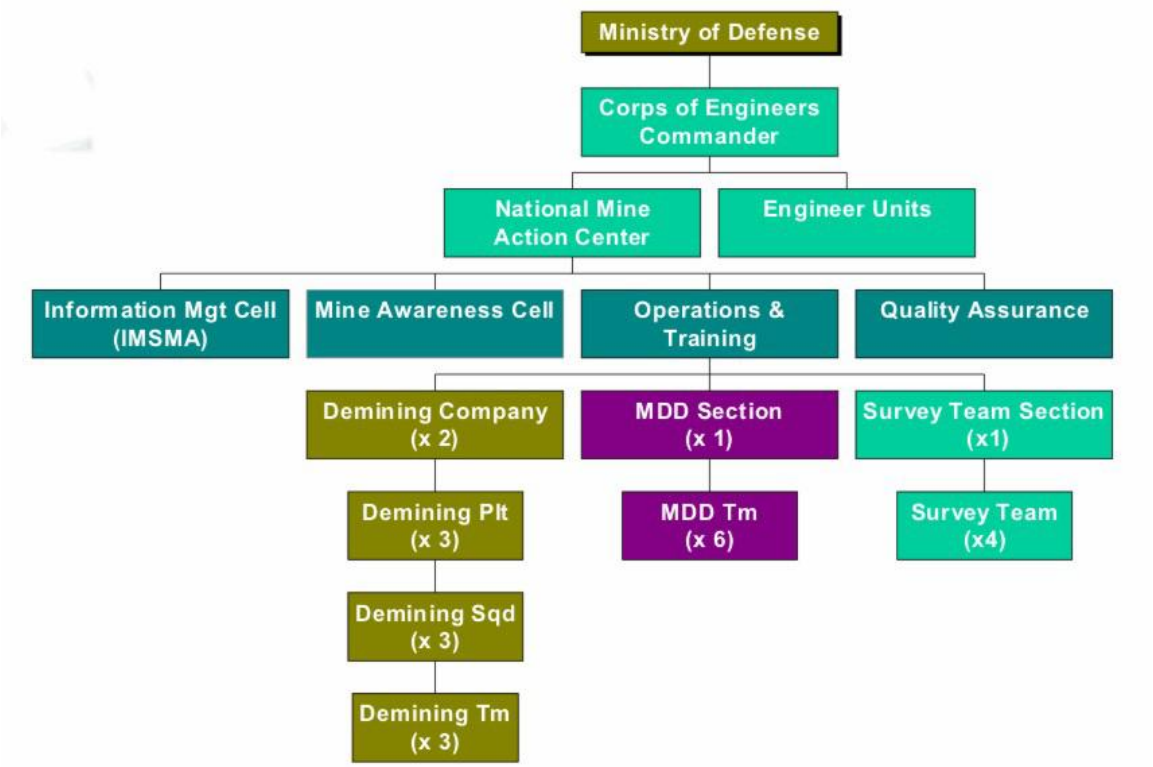
The EC, UNDP and the Government of Armenia are the funding institutions for the Armenia LIS, while the Government of Armenia (Ministry of Defense and its Humanitarian De-Mining Center) contributes office space, local knowledge and expertise on the landmine problem in Armenia, covers utility expenses and provides the necessary personnel to compliment the staff recruited under UNDP contracts for the implementation of the LIS.

Figure 7: Armenia LIS Structure




[17] The total amount in USD would fluctuate depending on the EURO – USD exchange rate as the funding from the EC is allocated in several installments with different exchange rate for each installment.

Figure 8: National De-Mining Structure In Armenia



# SURVEY METHODOLOGY

The Armenia Landmine Impact Survey followed the protocols approved by the Survey Working Group (SWG) for the Global Landmine Impact Survey initiative. These protocols and procedures are part of the standards set by the United Nations Certification Committee. The standard impact survey methodology was also adapted and modified to fit within the Armenian context. The first phase of the survey process was Expert Opinion Collection (EOC). This involved the systematic gathering of information at national level on the location and number of communities suspected of being contaminated by landmines or unexploded ordinance (UXO). The main sources of this information included the Government of Armenia, RONCO (US Consulting Corporation), UNDP Armenia, American University of Armenia, Armenian Red Cross Society, and German Technical Cooperation.

Before the survey in each particular suspected province a local expert opinion collection (LEOC) was conducted, during which the main sources of information were deputy-governors and the heads of territorial administration of provinces. The first step during the LEOC was the meeting of the PM, OA and the SGL with the Deputy Governor of the region, where the preliminary list of suspected and / or contaminated communities was discussed. In some cases, deputy governors added several communities, which they thought could be contaminated.

All suspected and / or contaminated communities were visited by the SGL to determine their status. If they were found to be unaffected a one-page form was completed and signed by five members of the community and sealed by the official stamp to confirm that the community is not contaminated by mines or unexploded ordinance. If the community was found to be a formerly affected community but cleared from mines and UXO by army or local efforts a two-page form was completed and signed by five community members and sealed. All forms were signed by five representatives of each village, including the community leader and/or deputy community-leader, and were sealed with an official community stamp.

If still suspected to be affected, a community interview was arranged to gather data on the impacts of mines and unexploded ordinance. Six to fifteen community members, representing the main sectors of the community, in terms of occupation, gender, and age, participated in the meeting.

The interview was conducted by the trained and equipped survey team, which contained two data collectors, one representative from the Armenian Humanitarian De-Mining Center (AHDC) and the project driver[18]. After an introduction to the survey process, a community mapping exercise was conducted, in which the interview participants were asked to sketch a map of their community and to indicate the suspected area(s). A questionnaire was completed to collect data on the background of the community, the impact of mines and UXO, and any efforts made to address the problem. The questionnaire was written in standard Armenian language, which is widely spoken and understood in all regions of Armenia[19]. After the interview, visual verification of the mined areas was conducted, photographs were taken, as were the GPS readings required by the protocol.

[18] Provided the high level of education among the population in Armenia, it was decided that drivers shall play a role in the post interview process and in decision on the root taken to the safe viewing point to conduct visual verification.

[19] Two out of four data collectors were born in the survey regions, therefore spoke the local dialect, although the formal Armenian language is widely spoken and understood countrywide.

The survey teams did not perform visual verification in the following cases:

- the suspected area is inside a military restricted zone and there is no safe viewing point outside it;
- there is NO SAFE viewing point (especially in borderland areas), for example, because of cross-border shelling;
- there is no accessible safe viewing point.

Once the community interview was completed, the data was checked, translated, and entered into the IMSMA database in the FOB before the teams relocated to the HQ. The close proximity of the FOB to the data collection sites allowed for improved information flow and quicker re-checks if required.

## ADMINISTRATIVE STRUCTURE OF ARMENIA

Armenia has a three level administrative system – national, regional (province = Marz) and community. Administratively, Armenia consists of 10 Marzes (Provinces) and the city Yerevan, the capital of the country, which has a Marz status. There is no intermediate administrative structure between Marz and Community, such as districts, which used to exist in Soviet times. The names of Provinces are as follows: Ararat, Armavir, Aragatsotn, Tavoush, Vayots Dzor, Kotayk, Gegarkounik, Lori, Shirak, Syunik, and the city of Yerevan.

## COMMUNITY SELF-IDENTIFICATION

Armenia has a well-developed territorial-administrative system. There are no nomadic communities in Armenia and no seasonal settlements were included in both the original and updated Gazetteers. All suspected communities had: a fixed location, cadastral area, official and elected self-governing body composed of a village leader and council of elderly, Each village had an official stamp. All communities were indicated on the official maps and even road maps so they could be easily identified and found. All suspected (and sampled) communities were included in the total list of localities/communities of Armenia provided by the State Department of Statistics.

Communities were then visited and the survey teams interviewed the local population, including authorities responsible for each community. A community meeting was held in those communities reported as being affected by mines or UXO. The community members and the leadership were then asked to define their community in spatial and social terms. A spatial definition of the community was especially important for the survey due to the use of geo-referenced data and the geographic information systems used to display this data.

All communities had their administrative cadastral maps and in none of the cases was the community self-definition different from that of the government gazetteer. In a few cases, the community members reported about using the lands administratively belonging to other communities or belonging to the state reserve (central government). In such cases, a separate survey in the community was conducted and suspected area(s) were documented as to document the impact on the community and ascribe it with an impact score. A special comment on the shared status of the area was made in the questionnaire and entered into IMSMA.

In none of the cases was a locality listed on the gazetteer no longer inhabited or abandoned.

The survey teams relied on the community leader and other community members to define the community in a number of other ways. The same method was used for definitions of whether the community was defined as 'rural' or 'urban'. The community leaders, or their deputies with whom the preliminary visit was agreed, defined each community during the preliminary visit in accordance with the community's official records. In some cases, local military units were involved in the process to increase the precision of boundaries of military restricted areas and obtain contributions and opinions of all stakeholders. This was particularly the case in all border communities.

Community leaders usually had the necessary papers with exact figures representing community population. As well, this issue was also raised during the community meeting to obtain the consensus of all community members.

## EXPERT OPINION COLLECTION AND SELECTION OF AREAS FOR STUDY

The process of gathering information concerning affected communities , known as Expert Opinion Collection, started immediately once the Action Agreement between EC and UNDP on Armenia De-Mining Program was signed in December 2003. The UNDP started gathering information on the activities of the Government of Armenia and its national and international partners in the border regions of Armenia with Azerbaijan, where the military activities were or could have been conducted and where contamination was possible.

Phase I of the process took place between January and August 2004, when the first list of suspected affected communities was created. In order to maximize the reliability of the initial list of contaminated and / or suspected communities, the UNDP organized a round table discussion of all stakeholders in June 2004. Once the Project Document was developed, a Project Appraisal Committee (PAC) was convened in July 2004. Members of the PAC provided their comments and in general agreed on the initial list as reliable and accurate. The initial LIS list included the information provided by the Government of Armenia (MoD and AHDC), RONCO, GTZ, NRC, ARCS, AUA and the UNDP itself.

### 1. The Government of Armenia

The Armenian Ministry of Defense and the Armenian Humanitarian De-Mining Center (AHDC) provided maps of contaminated areas and a list of contaminated communities, which were identified by the decision of the Government of Armenia. Based on this list, the Government of Armenia declared tax holidays for the communities, which have contaminated territories and cannot use them due to landmines. The Government list identified 47 communities by its decree # 163 from 21 February 2002.

### 2. RONCO (US Consulting Corporation)

The total number of communities identified by RONCO as potentially contaminated included 52 communities, which to great extend repeats the Government list.

3. UNDP Armenia

The list of suspected communities provided by the UNDP Country Office in Armenia included 46 communities and the list greatly repeats the previous lists.

4. American University of Armenia

AUA provided the list of suspected and / or contaminated communities only for the Tavoush region of Armenia, where the pilot LIS was conducted in 2002. The list is comprised of 24 communities and it repeats the previous lists for this region.

5. Armenian Red Cross Society

The Armenian Red Cross Society was an implementing partner for RONCO during the pilot survey in the Tavoush region of Armenia in 2002. The information obtained from the ARCS contained 41 communities in three regions of Armenia out of five contaminated border regions.

6. German Technical Cooperation

GTZ identified 23 communities in the Tavoush region of Armenia, which cannot use some or all of its agricultural lands because of landmines. The 23 communities, which appear in the GTZ list, repeat the communities for this region, presented in previous lists.

*It shall be concluded at this stage that all the data received by the LIS Management in relation to the scope of contamination and lists of contaminated and / or suspected communities are very similar, which confirms their reliability. At the same time, based on the Survey experience, the LIS Management can state that all the lists were rather inclusive and that all contaminated villages were identified during the Expert Opinion Collection or Local Expert Opinion Collection at the regional level. This is an indication of the reliability of the information received and confirms one of the milestones of the LIS methodology; that no contaminated community is missed by the survey.*

Table 37: The Armenia LIS Original Gazetteer (Without LEOC)

| | MARZ/COMMUNITY | GOVERNMENT | ARC | RONCO | AUA | UNDP | GTZ |
|---|---|---|---|---|---|---|---|
| Syunik marz | | | | | | | |
| 1. | N. Hand | | | | N/A | | N/A |
| 2. | Shikahogh | | | | | | |
| 3. | Srashen | | | | | | |
| 4. | Jakaten | | | | | | |
| 5. | Geghanoush | | | | | | |
| 6. | Syunik | | | | | | |
| 7. | David-Bek | | | | | | |
| 8. | Shurnukh | | | | | | |
| 9. | Korni dzor | | | | | | |
| 10. | Khnatsakh | | | | | | |
| 11. | Khoznavar | | | | | | |
| 12. | Nivadi | | | | | | |
| 13. | Arevis | | | | | | |
| 14. | Agarak | | | | | | |
| 15. | Uzhanis | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16. | Kaxnout (Moghes) | | | | | | |
| 17. | Yeghvard | | | | | | |
| *Total* | | *9* | *13* | *9* | | *10* | |
| Tavoush marz | | | | | | | |
| 18. | N.Karmiraghbyur | | | | | | |
| 19. | Voskevan | | | | | | |
| 20. | Choratan | | | | | | |
| 21. | Koghb | | | | | | |
| 22. | Vazashen | | | | | | |
| 23. | Berkaber | | | | | | |
| 24. | Noyemberyan | | | | | | |
| 25. | Chinari | | | | | | |
| 26. | Voskepar | | | | | | |
| 27. | Artsvaberd | | | | | | |
| 28. | N. Tsaghkavan | | | | | | |
| 29. | Movses | | | | | | |
| 30. | Dovegh | | | | | | |
| 31. | Paravakar | | | | | | |
| 32. | Sevkar | | | | | | |
| 33. | Berdavan | | | | | | |
| 34. | Barekamavan | | | | | | |
| 35. | Koti | | | | | | |
| 36. | Baghanis | | | | | | |
| 37. | Sarigyugh | | | | | | |
| 38. | Aygedzor | | | | | | |
| 39. | Kirants | | | | | | |
| 40. | Aygehovit | | | | | | |
| 41. | Achajur | | | | | | |
| 42. | Azatamut | | | | | | |
| 43. | Ditavan | | | | | | |
| 44. | Djujevan | | | | | | |
| 45. | Aygepar | | | | | | |
| *Total* | | *23* | *23* | *28* | *24* | *23* | *23* |
| Vayots Dzor marz | | | | | | | |
| 46. | Yelpin | | | | | | |
| 47. | Chiva | | | | | | |
| 48. | Khachik | | | | | | |
| 49. | Khndzorut | | | | N/A | | N/A |
| 50. | Sers | | | | | | |
| 51. | Nor Aznaberd | | | | | | |
| 52. | Bardzruni | | | | | | |
| *Total* | | *7* | *4* | *7* | | *6* | |
| Gegharkunik marz | | | | | | | |
| 53. | *Jil* | | | | | | |
| 54. | Ttujur | | | | | | |
| 55. | Vahan | | | | N/A | | N/A |
| 56. | Jambarak | | | | | | |
| 57. | Artsvashen | | | | | | |
| *Total* | | *5* | | *5* | | *3* | |
| Ararat marz | | | | | | | |
| 58. | Yeraskh | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 59. | Zangakatun | | | | | | |
| 60. | Paruyr Sevak & Tigranashen | | | | | | |
| 61. | Vardashat | | | | | | |
| 62. | Urtsalanj | | | | | | |
| *Total* | | *3* | *3* | *3* | | *5* | |
| *Grand Total* | | *62* | | | | | |

OPERATIONAL PLAN AND DEPLOYMENT OF DATA COLLECTOR TEAMS

The Armenia LIS was composed of one survey group with two survey teams, one survey group leader, two field editors, and one data entry specialist. Each of the two LIS Armenia Survey Teams was composed of two data collectors and one military investigator from the AHDC. Each of the two Field Editors was attached to one survey team with limited supervising responsibilities.

The survey was conducted with the following chronology:

- Ararat region (pre-test)
- Vayots Dzor province (pilot test)
- Ararat province
- Syunik province
- Tavoush province
- Gegharkunik province.

Operational plans for the ALIS were development in March 2005. The resulting operational plan for Armenia's LIS was a lively, flexible document, which was updated on a regular basis during three different visits:

- The Project Manager, Operations Associate and Survey Group Leader conducted advance mission visits to each region to be surveyed to meet the regional authorities.

- The second visit of the PM, OA and SGL to the regional center to meet the community leaders of suspected and / or contaminated communities.

- Preliminary visits of the SGL to the contaminated and / or suspected communities, during which their affected or not affected status was recorded.

The operational plan included several key components related to methodology, logistics and security. A Field Operating Base was established in each region where the survey was conducted except Ararat and Gegharkunik regions, which are located in close proximity to the LIS HQ at the AHDC. The FOB location was identified using the criteria for good communication, safety, proximity and other. In two regions (Syunik and Tavoush) the FOB was established in two different locations consecutively as the survey progressed.

PRE-TESTS AND PILOT TEST

*Pre-test*

One pre-test was held to field-test the survey instruments. The pre-test was held in Ararat province on March 9 – 11, 2005. A total of 3 communities were visited and community interviews held. All the communities visited during the pre-test were re-surveyed during the main data collection process.

*Visual verification of Pre-Test*

The pre-test was conducted in accordance with existing international standards for Landmine Impact Surveys and was observed by three experienced international specialists of LIS seconded to the Project by the Vietnam Veterans of America Foundation (VVAF).

Among major international standards for the LIS, the following were observed as priority: Survey Action Centre (SAC) Protocol v3 article 5.2.2 and LIS Advisory 3 "Survey Overview". The main goal of the pre-test was to test and validate the clarity and appropriateness of the questionnaire.
The pre-test was aimed at the following:

- To test the full compatibility of the survey instruments to local conditions, their applicability, feasibility, and ease of operation ;
- To test the clarity of the language and see if it is easy to understand;
- Following this, to modify the questionnaire if necessary, and create a final version;
- To develop Data Collector Protocols with detailed explanations of all questions on the Questionnaire as to provide the data collectors and field editors with guidelines for filling out the Questionnaire and checking it;
- To formulate points of focus to be raised during data collectors training;
- To make recommendations on the further implementation of the LIS.

The main findings and recommendations of the pre-test were the following:

- The pre-test showed that the communities were usually responsive and ready for cooperation. In none of the pre-test interviews were the participants indifferent to the issues discussed.
- Female participants tended to not participate in drawing of the community map and to leave early. This may be connected with the dominant male culture. It was recommended to data collectors to put more efforts in involving female participants in the discussion.

- Since the borderland communities in Armenia have big SHA's with complicated terrain, it was decided to consider the possibility of dividing SHA's into parts for more precise and exact information on SHA's

- Taking into consideration the mountainous terrain of Armenia and based on the recommendations from the VVAF and LIS Management it was decided to avoid drawing topographic community maps. However, it was important to draw precise topographic sketches.

The language, applicability and ease of execution of the questionnaire were checked during the pre-tests.

- Armenia has a three level administrative system – central (national), regional (marz or province) and community levels. The coding system for the LIS Armenia (together with locator codes in various modules of the questionnaire) was changed as to be composed of three codes - country, province, and community. Throughout the whole questionnaire the term "locality" was replaced by "community".

- The pre-test showed that communities always keep an official record of the number of "households". By "household" they mean social-economic entity based on the nuclear family.

- Segment 12 of the questionnaire - verification from a safe point – was also changed to meet the goals and expected outputs of the Armenia LIS. Armenia LIS largely relied on the SAC Protocol Document # 10a (Annotated Questionnaire) and Iraqi LIS Questionnaire. Questions about guides, accompanying the survey team to the safe viewing points, description and GPS reading of safe viewing points, and direction, bearing, and size of suspected mined areas were added. Data collectors were required to draw sketch maps of suspected mined areas. Data collectors were also required to make their own observations of terrain and vegetation of mined areas and to verify, if possible, that the area is mined.

*Pilot Test*

The Armenia LIS pilot test was conducted on April 3-9, 2005 and included seven suspected communities of the Vayots Dzor region of Armenia. The pre-test interviews were conducted by two Survey Teams with the participation of two Field Editors, the Survey Group Leader, and two experienced international specialists of LIS's from the VVAF. The military participated in the project for the duration of LIS by accompanying Survey Teams during their visits to communities and participating in all stages of data collection. A specialized ambulance unit was located at the FOB. The summarised conclusions derived from the pilot-test were the following.

*Methodology*: The LIS Management developed a strategy to record and score suspected areas in military restricted zones.

The chain of gathering, checking, translating and entering the information was tested. The Pilot Survey revealed that the IMSMA program needed more adjustments to meet the local conditions of Armenia's LIS.

*Armenia's LIS Reporting system*: Testing of the system of reporting during the pilot test can be evaluated as positive. The pilot test showed that no additional form of reporting is needed.

*Management and the logistics of the survey*: The management of the Armenia LIS decided to conduct preliminary visits, which were used after the Pilot Survey. It was decided that the SGL would visit the communities in order to check their status (contaminated or not) despite any received information or any other official source information.

*Security plan and monitoring:* The LIS Management ensured that the survey teams have sufficient information about the security situation in contaminated communities before data collectors visited those communities. Survey Teams must in no case approach or enter dangerous areas for visual verification.

*Coordination with local and regional authorities and with the military units located in the survey areas:*The pilot test uncovered the necessity of closer cooperation with local military units during the survey. Due to the fact that many of the suspected areas reported by communities were located in a military restricted (buffer) zone, the knowledge of the local military representatives about the actual status (restricted or not restricted) status of the areas as well as the security situation was important.

*General planning of the survey:* The pilot test showed the necessity of the Survey Group staying at the FOB until all survey operations in the province were complete. The Survey Group should accomplish all activities related to the area, covered from the particular FOB, including, data collection, editing, entry, lessons learned, reporting and summary before it left the FOB.

PRELIMINARY VISITS TO SUSPECTED COMMUNITIES

Before the start of the survey in each province, the first step for the Project Manager, Operations Associate, and the Survey Group leader was to make an advance mission visit and meet the province administration. During the visit a local expert opinion collection on suspected communities was conducted, and the existing gazetteer was verified with the regional administration. The LIS Management also met the community leaders of suspected communities included in the original gazetteer and presented the main aim of the survey, asked the community leaders about the extent of possible contamination, and made preliminary appointments for the survey. Usually community leaders were hesitant to give final answers on the affected or unaffected status of the community and the size and type of contamination and were asking for additional time to discuss the issue with other members of their communities. This is when preliminary visits to the communities by the SGL were discussed and the time frame agreed upon.

The SGL met initially with the head of the community to determine whether or not it was really considered affected by the community, and if so, an appointment was made with the community leader and other representatives for the date of the data collectors' visit to the community. The SGL also explained in detail what was expected from the community leader and community members during the community meeting and the visual verification. Based on lessons learned from the pilot test it was decided to prepare a handout for the community leader and the community representatives, which would introduce the purpose of the survey, the expectations from the community and the possible follow up. Since then the handouts were developed and distributed to the community leaders and community representatives in advance.

Demography of community interviews

The total number of the surveyed communities in Armenia was 97, out of which 60 communities were confirmed to be affected. The total number of sampling visits in five affected regions of Armenia, where the survey was conducted is 78. It shall be mentioned that Unaffected Questionnaire Forms were collected from the six non-affected regions of Armenia, including the capital city of Yerevan. The Unaffected Questionnaire Forms from the regions were signed and sealed by Office of the Governor of each respective region. A total number of 579 key informants were recorded in the group interview attendance sheets.

*Armenia LIS Data Collectors Conducting Community Interview*

The majority of interviewed informants were men: 132 females and 447 males. This stands for 29.5% of key informants being female, which is more than in many other surveys. The age distribution among the key informants in Armenia LIS is as follows: 5-14 years old – 7 people, 15-29 years old – 75 people, 30 – 44 years old – 217 people, 45 – 59 years old – 210 people and 60 years old and above – 70 people.

In most of the cases, there was no disagreement between the community members on the issue of whether the community was affected or not. Since more than eleven years has passed from the time when the last mines had been planted, the community members usually had a common knowledge and opinion on contamination in the area. If during the discussion with the leader and other representatives of the community no doubts remained that the community was not affected by landmines/UXOs, the SGL asked the community leader and four other representatives to fill out, sign, and seal the Unaffected Community Questionnaire Form. However, if still some doubts remained about the possible contamination and impact on the community, an appointment for the data collectors visit to conduct the survey was made.

In cases when the preliminary visit to the community by the SGL confirmed the contaminated and / or impacted status of the community, the SGL would introduce the subject of the LIS during the preliminary visit to the community, explained the purpose of the impact survey and the community interview process. The SGL then asked the community head to arrange a community meeting, stressing the importance of having a community meeting that represents different occupations, ages, and genders.

An important consideration in planning the community meeting was finding a day and time that was convenient for the participants. The time of the year when the survey was conducted was the season of intensive agricultural activity in all of the areas of the survey. A considerable number of community members were usually spending the most part of the day in their private agricultural lands, which are sometimes kilometers away from the community and the community centre. It took certain negotiation skills from the SGL to find a consensus for the identification of the date for the community meeting and the visual verification.

## THE COMMUNITY MEETING

The community meetings were conducted by a data collection team of two. At the beginning of each interview the data collectors gave a standard introduction and completed an attendance sheet. When a representative group was thought to be present, the data collectors started the interview.

*Community map produced during community interview.*

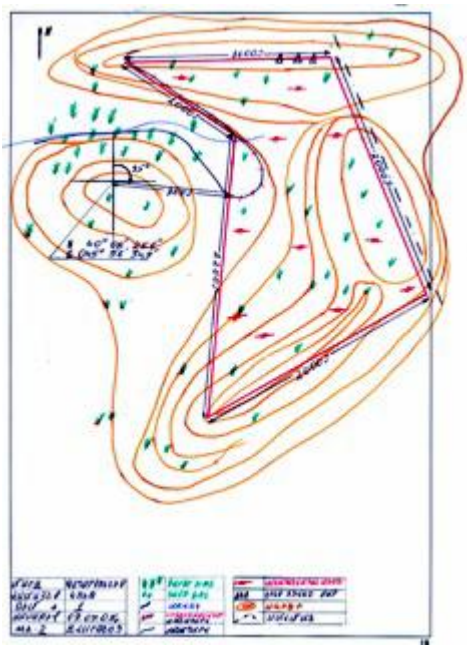
The interview commenced with a community mapping exercise - this was drawn by community members on a large blank piece of paper, using large, colored marker pens. The community map was then displayed in a place that all participants could see and was used during the remainder of the interview to focus the participants on the interview and on the particular mined areas being discussed.

The data collectors then worked through each of the questionnaire modules - each mined area being numbered and having one module filled out. Each recent victim was linked to the mined area where the accident occurred and a victim module was completed for each one (see explanation of the questionnaire modules below).

The length of time taken in each interview depended on the number of mined areas, the number of recent victims and the scope of general discussion generated. A typical interview would last for about two hours.

## VISUAL VERIFICATION OF SUSPECTED AREAS

After the interview the data collectors went with a knowledgeable member of the community to conduct visual verification of the mined areas from a safe viewing point. A sketch map was also drawn, showing the distance and bearing of the mined area from the visual verification point. Photographs of the mined area were taken, and the description of the mined area provided by the community was verified. In cases where the data collectors believed the community interview was not sufficiently representative, they asked the community leader to invite additional members of the community or went themselves to meet other members of the community.



*Sketch map produced during visual verification.*

The survey teams did not perform visual verification in the following cases:

- ð the suspected area is inside a military restricted zone and there is no safe viewing point outside it;
- ð there is NO SAFE viewing point (especially in borderland areas), for example, because of cross-border shelling;
- ð there is no passable safe viewing, for example because of mountainous terrain without any paved or dirt path.

*Armenia landmine Impact Survey Data Collectors Conducting Visual verification of Suspected Hazardous Areas*

SURVEY DOCUMENTS

The questionnaire contains four modules that mirror the structure of the database (IMSMA) that stores the information. The modules are further subdivided into segments that anticipate the logical flow of conversation. The modular structure of the questionnaire appears in the box, "The Modules and Segments of the Community Interview Questionnaire" (see text box on next page). The survey tools were adapted to Armenia using advice from various sources. A draft version of the questionnaire was distributed to the main survey stakeholders for feedback. The final shape of the questionnaire for the UNDP Armenia LIS 2005 was developed based on comments from the LIS Management, Armenian Sociological Association and national stakeholders. The translation and back - translation was done by the Yerevan State University of Foreign Languages. The questionnaire was further modified following field-testing during the pre-test and the pilot test.

THE MODULES AND SEGMENTS OF THE LIS QUESTIONNAIRE

Community-level module—Part 1

- Segment 1: Identification
- Segment 2: Certification
- Segment 3: List of attachments
- Segment 4: Background observations on the community
- Segment 5: Introduction (to the community interview)
- Segment 6: Community mapping and mined areas summary
- Segment 7: Historical Context (information)
- Segment 8: Total victim numbers

Mined-area module (one for each mined area)

- Segment 9: Reference point, description and size of this particular mined area
- Segment 10: Marking, terrain, suspected ordnance
- Segment 11: Impact
- Segment 12: Verification from a safe point

Individual victim module (one for each recent victim)

- Segment 13: Victim Descriptors
- Segment 14: Accident and consequences

Community-level module—Part 2

- Segment 15: Victims of less recent date
- Segment 16: Mine action
- Segment 17: End of the meeting
- Segment 18: Observations after the visit

Meeting attendance sheet

*CODING SHEETS*

The Armenia LIS developed two documents that supported the transfer of the data from questionnaires to the database. Firstly, in the Data Entry protocol, a special section of the Data Entry Protocol Annex B, specifies which questions of the LIS Questionnaire shall be entered into IMSMA database. Due to the fact that the customization of the database could not allow for the sequential numbering of questions, this Annex also helped the data entry specialist to associate the questions to be entered with their corresponding fields in IMSMA.

Secondly, the Armenia LIS developed and used a special electronic translation sheet where the Field Editors provided the exact English translation of questions to be entered into the database. The Field Editor recorded all the narrative questions on the electronic sheet, which the Data Entry Specialist copied and pasted directly into the IMSMA relevant fields. When a questionnaire is fully entered into IMSMA the DES will print the data entry sheet for double-checking by FE.

*PROTOCOLS*

On the basis of Survey Action Center (SAC) protocols, Iraqi LIS Protocols, pre-test and pilot test results, the Armenia LIS developed 4 basic working documents which included more detailed information on the methodology of the Armenia LIS regarding 4 key processes.

- The *Armenia LIS Data Collection Protocol* was developed to give data collectors more detailed explanation on how the Questionnaire must be filled out.

- The *Armenia LIS Field Protocol* provides guidance for field operations in the context of the conduct of the Landmine Impact Survey of Armenia.

- The *Armenia LIS Data Entry Protocol* defines the main rules of the data entry, checking, and data security.

- The *Armenia LIS Quality Assurance Protocol* contains information on the main principles and procedures of the quality assurance (QA) of the survey in impacted communities. Principles, components, procedures, and reporting of the QA results are also introduced in this protocol.

*REPORTING FORMS*

The Armenia LIS developed four reporting forms for data collection and operational purposes:

- Data Collectors Mission Report - containing observations made during the community interview and the visual verification, which could not be fit into the questionnaire;

- Field Editor Weekly Productivity Report Form, stating the productivity of each of two field editors during the working week;

- Data Entry Specialist Weekly Productivity Report Form, stating the productivity of the data entry specialist during the working week;

- Province report and table, submitted by the SGL after the completion of the survey in each province. The reports included the table-type quantitative data on the productivity of the

survey group in a particular province as well as narrative description of the process of data collection, main results, challenges faced and solutions found during the survey.

- In total, four QA forms were created. One for control revisits to each type of community: unaffected, formerly affected, and affected. The fourth form that was developed is a QA monitoring visit report form.

*OTHER SUPPORTING SURVEY DOCUMENTS*

The Armenia LIS also developed and used a UXO Spot Report Form, Shared Mined Area Form, Unaffected Community Questionnaire, Unaffected Region Questionnaire and a Form for False Negative Sampling.

*AHDC conducts mine clearance in Shurnukh community (high impact)*

DATA PROCESSING AND DATA CHECKS

Once the interview process was completed, the Data Collectors re-checked the entered information and proceeded to the visual verification. Upon completion of the visual verification, once the team returned to the FOB, the Data Collectors once again re-checked all collected information, including the community map and the sketch of the SHA. Next, a daily mission report was prepared by the team with indications of observations made during the community interview and the visual verification, which could not be fit into the questionnaire.

After that the Data Collectors would turn over the collected information to the Field Editors (in Armenia's LIS, there was one Field Editor per Survey Team). The field editors rechecked the file and addressed any inconsistencies or missing data, where necessary rechecking was carried out with the data collectors or even the community leadership itself. Field editors translated the data from Armenian (in which the questionnaire was filled out) into English. This translation-coding sheet enabled data quality checking and the fast, efficient entry of data into the English-language IMSMA. The experience of the data collectors, their observations and ideas regarding the communities and its problems were also summarized and entered as text into the questionnaire. The impact scoring system is further explained in a separate section of this report.

Once edited, the data was entered by the Data Entry Specialist into the IMSMA and Output was produced for further checking. If during the data entry, some inconsistencies were found by the Data Entry Specialist, the community file would go back to Data Collectors and Field Editors. The final IMSMA Output was once again checked by Data Collectors, Field Editors, the Data Entry Specialist and the Survey Group Leader.

A back up CD would be created in the IMSMA after entering every single community into the system. Data Entry and verification was completed in the FOB, before the relocation of the Survey Group back to the HQ. Upon completion of data collection, editing, entry and verification in one region, all of the information on this particular region would be transferred to the Armenian Humanitarian De-Mining Center (AHDC) of the Ministry of Defense (MoD).

An example of utilization of the LIS findings by the national authorities was that upon completion of the region of Syunik on May 21, 2005, data on this region was submitted to the AHDC, and based on the information received, the AHDC made a decision to start mine clearance works in the most contaminated community of the Syunik region – the village of Shurnukh. This example illustrates the utility of the LIS in Armenia even before being certified by the UN and formally recognized by the Government of Armenia.

## SEARCH FOR FALSE NEGATIVES

Following VVAF training, the ALIS was informed by VVAF trainers that no Search for False Negatives is necessary because the assumption was that the EOC list of suspected communities was regarded as highly reliable. However, after the UNMAS QAM visit to Armenia from June 15-to July 25, 2005, based on his recommendations, it was decided to conduct a Search for False Negatives in the five affected regions. In the remaining non-suspected five regions and Yerevan, it was decided to acquire an official written statement of the Regional Administration about the non-affected status of the region.

The methodology of the Armenia LIS for the Search for False Negatives relied predominantly on Protocol Document # 11 "Assuring High Coverage of Impact Surveys of the Global Landmine Survey". The main method used for sampling-for-false-negatives was the systematic sampling.

However, the Armenia LIS also considered two conditions specific for Armenia while developing its methodology. Since there are no district units in Armenia, an entire Marz (regions) was used as the sampling unit. Due to the fact that the provinces are usually not big (highest number of communities in affected province is 109; in non-affected province -119) there was no need to divide them systematically into virtual districts. Therefore, the province was taken as the main administrative tier for the FNS.

However, if applied to all regions, this would result in the situation where regions with very few suspected communities along the border and high number of non-suspected communities far away from the Azeri border and less likely to be affected (because the only reason for landmine and / or UXO contamination was the military activities), would be included in the sampling unit. This would lead to low efficiency of the search for false negatives by decreasing the number of communities sampled from borderland areas and increasing the operational costs of the sampling. Based on this, the sampling methodology developed by the Armenia LIS was as follows:

As a pilot test, it was decided to use a standard sampling approach to one Marz having clear division of suspected communities along the border with Azerbaijan and non-suspected communities in the remaining part of the region.

If no false negatives were found, a cluster (definition of a virtual district) of non-impacted communities would be selected within a conservative distance from the border (e.g. 10km) for province with suspected communities located only close to Armenian-Azerbaijani border. If the approach of a virtual district was approved, the development of the virtual district in each particular community was to be based on the written approval from the Government of Armenia on the depth of military actions in each particular region and list of the communities, which are within the specified range from the border. It was also decided to round up all the figures provided by the Government in order to increase

the confidence. As well the FNS has included a number of communities outside of the virtual district as well.

However, in those regions where suspected communities have rather dispersed locations and were deeper in the region or the military activities were known to take place in larger parts of the region a standard sampling method was applied. The pilot test for sampling was conducted in Gegharkunik region of Armenia and was comprised of 22 sampled communities. During the search for false negatives no false negative was found. This, on the one hand, confirmed the assumption of a rather low chance of finding affected communities in parts of the region with no border with Azerbaijan and, on the other hand, confirmed the reliability of the Marz Gazetteer. Based on the results of the pilot test for FNS, in three provinces, including the regions where the pilot test was conducted, a standard systematic sampling was applied.

In each of the two remaining provinces only 7 communities were suspected which were situated very close to the Armenia-Azerbaijan border. Based on the written approval from the appropriate Departments of Territorial Administration of the Marzes on the depth of military actions and on the list of the communities, which are within the specified range from the border, a cluster (virtual district) of communities in borderland area was defined as the sampling frame. Armenia LIS has rounded up all the figures provided by the Government in order to increase the confidence. It has also included a number of communities from outside of the virtual district for the same purposes.

Table 38: FSN Sample By Province

| Province | Number of communities | Number of not suspected communities | Number of suspected communities | Sample size | FN |
|---|---|---|---|---|---|
| Ararat | 15 | 8 | 7 | 8 | 0 |
| Tavoush | 62 | 34 | 28 | 17 | 0 |
| Syunik | 109 | 80 | 29 | 21* | 0 |
| Gegharkunik | 91 | 64 | 28** | 22 | 0 |
| Vayots Dzor | 16 | 10 | 7 | 10* | 0 |
| Total Number | 293 | 196 | 99 | 78 | 0 |

* One community was added for a better geographic representation of the sample

** One community was known to be inaccessible

RESTRICTED MILITARY ZONE (BORDER BUFFER ZONE)

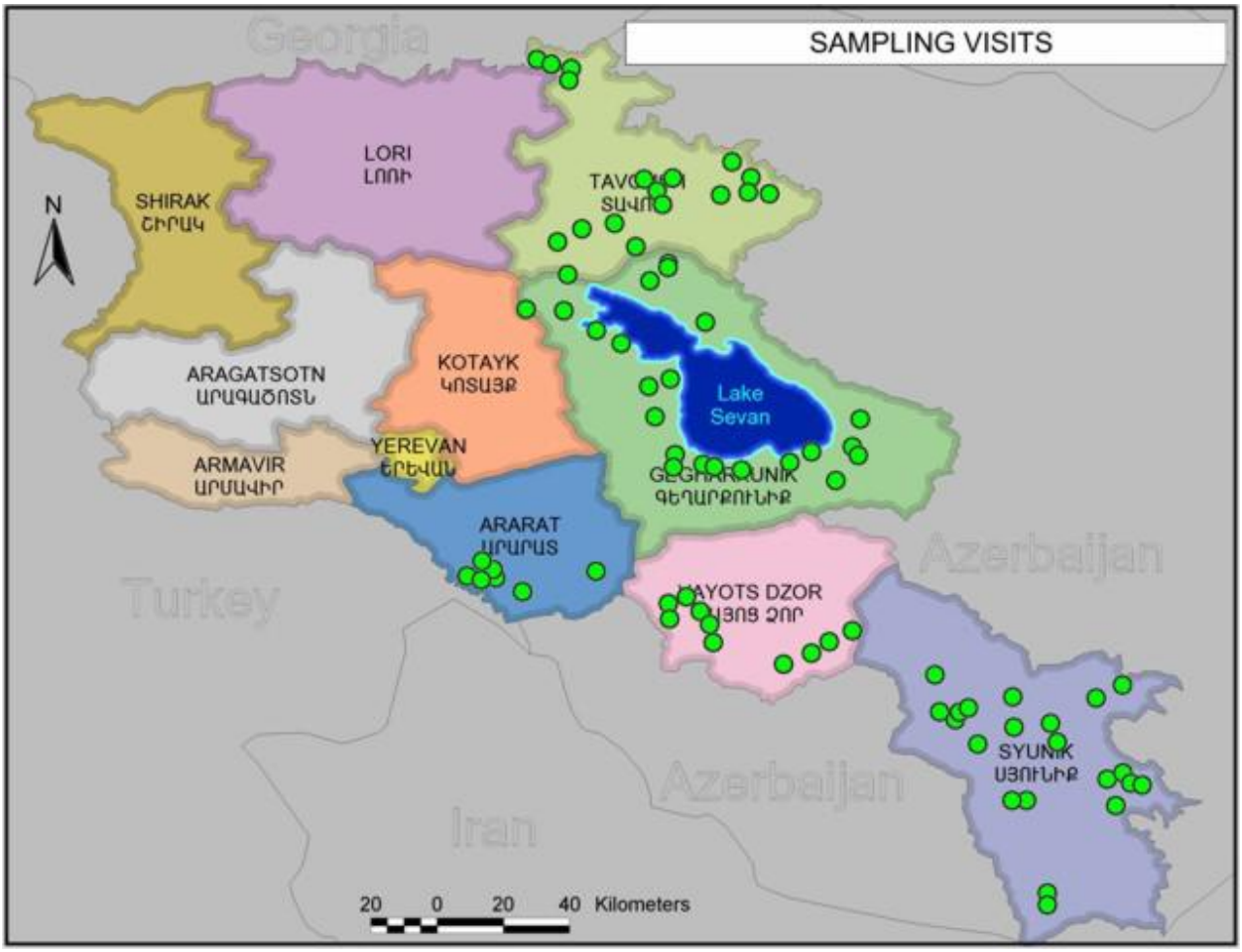
Restricted military zones or border buffer zones are territory on Armenian soil, which is within the proximity of 500 meters from the state border and is not accessible for civilians. As back in Soviet times, there was not actual border between Armenia and Azerbaijan, the international state border was established once the Soviet Union collapsed. No matter if the military activities would or would not start between Armenia and Azerbaijan, the new state border had to be established, like the state border of Armenia with Turkey. Usually the buffer zone is identified as 500 meters inside the country counted from the actual border; however, it does very much depend on the landscape and in some places varies between 200 and 2000 meters.

Once the new international state borders were established between Armenia and Azerbaijan after the collapse of the USSR, the buffer zone was drawn and civilian access to these areas was discontinued. This issue does not have strong links with the landmine and / or UXO contamination of the area, as the restricted military zone would have to be established no matter if there were military activities

between Armenia and Azerbaijan (respectively if there was landmine and / or UXO contamination) or not.

A considerable number of SHAs were found to be located in the restricted military zone. In most cases, no visual verifications were conducted. The community map, however, was drawn at the community meeting during the community interview and the respective modules of the questionnaire were filled out by data collectors.

Map 5: Search for False Negatives




SCORING SYSTEM

Scoring and classifying mine-affected communities according to the severity of impacts is a central element of the Landmine Impact Survey. While the score's basic function, to permit a priority ordering of communities, is easy to understand, its technicalities may evade quick comprehension.

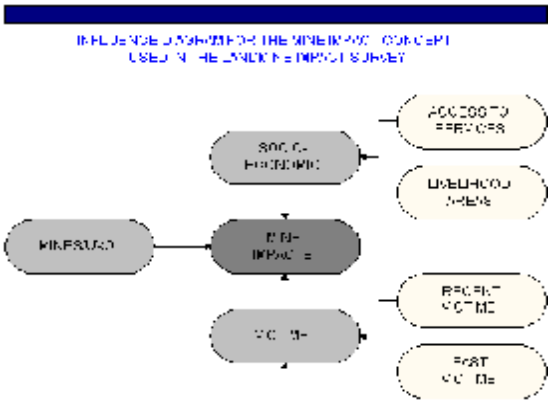
The mine impact score is a property of the community, not of any or all of the mined areas in or around the community, nor of the victims that have come to harm there. The score is indifferent to

the number and size of the mined areas; it responds to three aspects of the local mine problem, listed below and reflected in Figure 9:

- The nature of munitions;
- The types of livelihood and institutional areas to which mines are blocking access;
- The number of recent victims.

Technically, the score is a linear combination of two munitions variables (presence of mines, presence of UXO), 10 or more livelihood and institutional blockage variables, and of the number of recent victims. The first two groups hold binary variables, with values one and zero, to express statements of the kind: "Problem of type X does occur somewhere in the community — yes or no." The number of victims, by contrast, is their actual natural number counted over the past 24 months, not the true value of the assertion that there had been some victims in that period. The coefficients are the weights that users can set in response to their preoccupations and country conditions, within the guidelines that the Survey Working Group and the Survey Action Centre have set in the interest of international consistency. The weights will be explained further on the following pages.

Figure 9: Diagram for the Mine Impact Concept Used in LIS



*ELEMENTS OF THE SCORING MECHANISM*

Four elements underlie the scores and classification:
1) the selection of variables (the indicators)
2) metrics (the way values are determined for the indicators and are passed to the scoring scheme)
3) weights (the relative influence given to the indicators), and
4) category bounds (the limits of numerical ranges of the scores corresponding to the categories).

*VARIABLES*

In the database default configuration, the following are considered in the scoring:

- The presence of mines
- The presence of unexploded ordnance
- Access to crop land
- Access to community 's pasture
- Access to water points
- Access to non-cultivated area
- Access to housing area
- Roads that are blocked
- Access to other infrastructure
- Mine victims in the last 24 months

Within cropland, pasture, water and roads, distinctions are made. Irrigated land is distinguished from rain-fed land. Fixed pasture is distinguished from migratory pasture, mostly used by nomads. Drinking water is distinguished from water used for other purposes. Roads that lead to some administrative center are distinguished from purely local roads and trails.

Each of these subcategories contributes to the score if access to some element of it is found blocked, except the local roads and trails, which do not count in the scoring.

With these distinctions, 15 different variables enter the scoring in the default configuration. However, the database can be configured to include up to five user-definable variables to collect information on socio-economic blockage types.

Here, it is important to note that the score is indifferent to the population or territory of the community and considers neither the number of distinct mined areas nor their surface area or their proximity to the center of the community.

*METRICS*

The scoring follows a weak metric approach. The indicators only say whether a certain type of livelihood or institutional area is blocked by landmines (or littered with unexploded munitions). They do not say how much of it is blocked or how valuable the blocked area is. In other words, the existence of a problem is the criterion, not a threshold measured by size, value, population directly affected, or number of alternatives. Similarly, in the type-of-munitions area of the scoring, the scoring looks only at the presence of generic landmines and of UXO, not at numbers laid, sub-type, age, or origin. The weak metric was chosen for a number of consensus, validity and reliability reasons.

The victim part of the score has a stronger metric. The number of recent victims is a count variable. Although information is collected on the number of victims of less recent date, it does not affect the score. However, each recent victim contributes to the score. A victim who had a mine accident within the last 24 months prior to the survey date is considered a recent victim.

*WEIGHTS*

Once the presence of a certain blockage or munition type has been assessed over all the distinct mined areas in a community, the community-level indicator value is passed to the scoring mechanism. As an example, if a community has three mined areas and two of them are blocking access to two distinct pieces of irrigated crop land, only the value: “In this community, some irrigated land is blocked” =TRUE is passed to the algorithm. These values — expressed as 1 (TRUE) or 0 (FALSE) — are then multiplied with weights. The exception is the recent victims, for which not a binary, but the full count is passed and multiplied with its weight.

Country surveys can vary the weights for institutional and resource area blockages. The permissible variations have certain limits. The technicalities are described in the weights budget segment that follows. Different community classification outcomes in response to a hypothetical different weight set are also reported in this segment.

The weights used in the computation of the impact scores in Armenia are shown in table 39:

Table 39: Weights Used in Computation of Impact Scores in Armenia

| Variable | Weight |
|---|---|
| There were mines | 2 |
| There was unexploded ordnance | 1 |
| Access to some fixed pasture was blocked | 2 |
| Access to some migratory pasture was blocked | 0 |
| Access to some rain fed crop was blocked | 2 |
| Access to some irrigated crop land was blocked | 2 |
| Access to some drinking water points was blocked | 1 |
| Access to some water points for other uses was blocked | |
| Access to some non-cultivated area was blocked | 1 |
| Access to some housing area was blocked | 0 |
| Some roads to administrative centers were blocked | 1 |
| Access to some other infrastructure was blocked | 1 |
| Mine victims in the last 24 months | 2 |

*CATEGORY BOUNDS*

The survey works with four impact categories: “no known mine problem, ” “low impact, ” “medium impact, ” and “high impact. ”

The category bounds are set as follows:

- No known mine problem: Score =0
- Low impact: Score between one and five
- Medium impact: Score between six and 10
- High impact: Score 11 and above.

*THE “WEIGHTS BUDGET”*

The weights used in this survey were set by the survey implementing organization. They conform to the weight-setting rules as authorized by the Survey Working Group. Within this framework, the survey-implementing organization set the country-specific weights after an internal discussion of country conditions. The weights respect certain limits, notably a “weights budget” that must not be exceeded. The limits help to safeguard against grade inflation, and also to keep the relative influence of the socio- economic, munitions, and victim components in proportion.

The rules allow country surveys to set weights for the following indicators:

- Access to some irrigated cropland was blocked.
- Access to some rain-fed cropland was blocked.
- Access to some fixed pasture was blocked.
- Access to some migratory pasture was blocked.
- Access to some drinking water points was blocked.
- Access to some water points for other uses was blocked.
- Access to some non-cultivated area was blocked.
- Access to some housing area was blocked.

- Some roads were blocked.
- Access to some other infrastructure was blocked.

There are also up to five user-definable socio-economic blockage types.

The weights are subject to the following rules:

- Weights are one of the following integers: 0, 1, 2 or 3.

- The sum of these weights equals 10.

- The weight for access to migratory pasture is zero unless pastures essentially used by nomadic communities pose a mine problem.

It is permissible to set a weight to zero for an indicator for which there are occurrences in some affected communities.

*SENSITIVITY OF THE COMMUNITY CLASSIFICATION TO WEIGHT CHANGES*

The number of communities classified as high, medium, or low impact may vary with variations in weights assigned to socio-economic blockage indicators, where allowed. Setting of weights for various socio-economic blockage indicators in Armenia was developed by UNDP Armenia and approved by national experts – representatives of the prospective Inter-Agency Governmental Committee on Mine Action. The scoring system was tested and proved for LIS utilization during the pre-test and pilot.

Access to some irrigated crop land is blocked - 2:
Croplands are limited in Armenia, especially irrigated cropland. Also, the irrigated cropland is usually the most productive land, utilization of which will lead to the more effective social and economic development of the impacted community. Based on this argument , blockages of irrigated cropland were assigned 2 points.

Access to rain-fed cropland is blocked - 2
As mentioned earlier, cropland is limited in Armenia due to its landscape. A considerable number of communities surveyed did not have irrigated croplands at all. In this case rain fed cropland becomes as important as irrigated cropland. And in many communities, which had irrigated land, the irrigation system was developed in Soviet times and has not been functional for many years now. Also, rain fed cropland is, in many cases, the only alternative for the agricultural survival activities of the community population. These factors influenced the decision to give 2 points to rain fed cropland in the Armenia LIS scoring system.

Access to some fixed pastureland is blocked -2
Two points were allocated for pasture, which appeared to be the most common problem in the impacted communities. Also, because of limited cropland of any type in Armenia in general and in contaminated communities in particular, pasture lands become critical for the population, which in many cases has cattle as the only type of agricultural activity and income generation. Therefore, pastureland is critical in all cases reported and the decision to allocate 2 points was based on the mentioned above arguments.

Access to some migratory pastureland is blocked - 0

As Armenia is a small country and has limited territories available for agriculture in general because of its mountainous landscape, the communities historically were formed around the lands useful for one or the other type of agriculture. This led to the reality that in Armenia there are no migratory pasturelands. Therefore 0 points is allocated to this category.

- Access to some drinking water points is blocked
- Access to some water points for other uses is blocked

Access to some water point is blocked - 1

Access to drinking and other types of water was combined in one category, because of the limited number of cases and similar or identical impact on communities. Even combined, these two categories weighted for 1 point. One of the reasons for this is the fact that 11 years has passed since the conflict and access to water, being the critical survival need for the communities, has been cleared by the army or by local clearance or alternative routes have been established.

Access to some non-cultivated area is blocked - 1

15 cases (12 communities) of blockages of non-agricultural lands were identified by Data Collectors. Most of these cases are blockages of forests, which are used predominantly for collecting wood. This blockage was assigned a relative weight of 1 point.

Access to some housing was blocked - 0

There was only one case recorded where access to housing was blocked. In this particular case, the alternative road, although a longer one, was identified by the community. Based on the relative importance of different factors and the limitation of the score weights within the scope of 10 points, this particular category was assigned 0.

Some roads were blocked - 1

43 cases (31 communities) of road blockages were identified by the LIS Armenia. In many cases blocked roads lead to "disputed" territories or to crop land/pasture, which already have alternative roads. So, there are not many strong arguments for giving two points for roads, and 1 point was allocated to the road blockages.

Access to some other infrastructure was blocked - 1

3 cases (3 communities) of infrastructure blockages were recorded by the LIS Armenia. 1 point was allocated to this category based on the relative importance of this and other categories and importance of the infrastructure, to which the access is blocked.

## THE TOTAL VISIT AND SURVEY EFFORT

Total number of community visits and the survey efforts are as follows:

- 97 survey visits;
- 78 sampling visits;
- 6 preparatory visits to the regional centers (2 in Syunik region, where 2 Forward Operating Bases were established);
- 45 QA visits;
- 6 visits to the unaffected regions.

Total: 232 visits

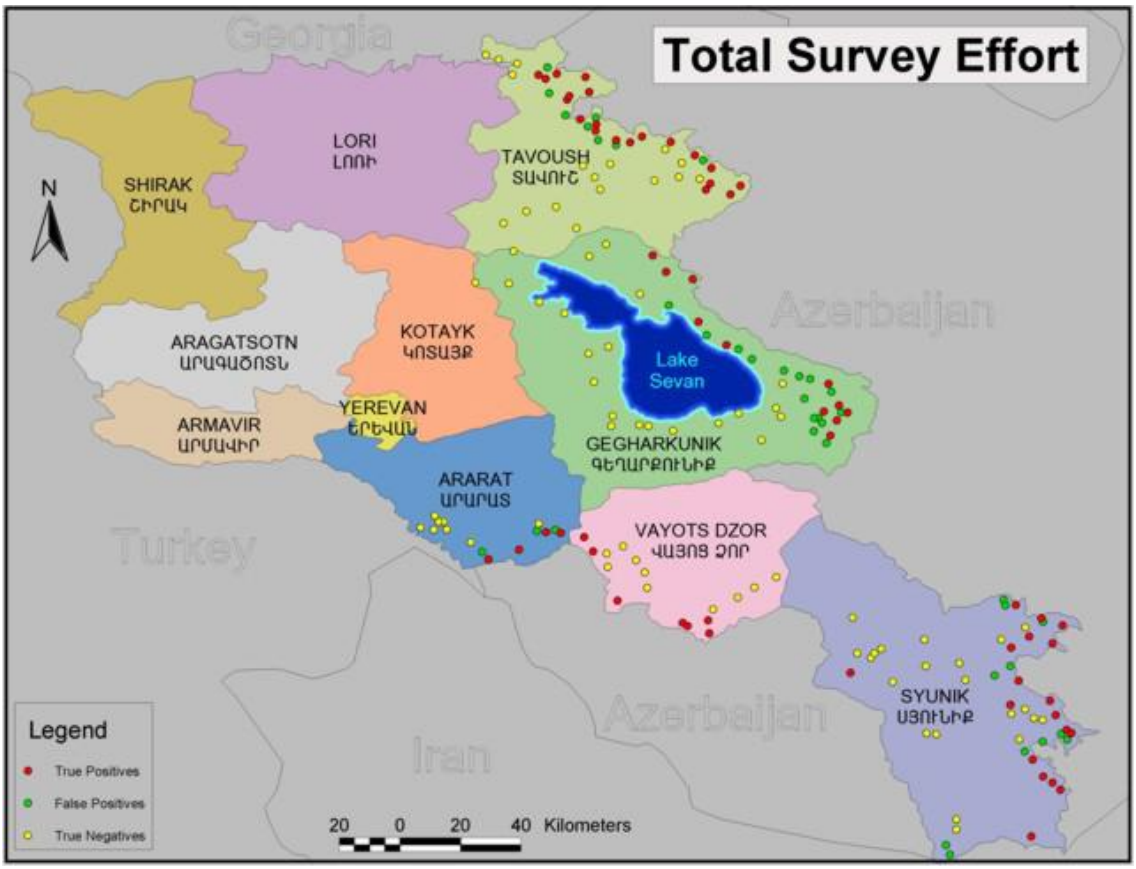
| Table 40: SUMMARY: Surveyed Communities by District | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Province | Community | EOC Status | Inaccessible | Visited | True Positives | False Positives | Sampled | False Negatives |
| Ararat | Aigavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Ararat | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Ararat | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Armash | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Avshar | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Eraskh | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Lanjar | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Lusashogh | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | M.Egeghnavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | M.Noiakert | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Sevakavan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Surenavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Urtsalandj | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Vardashat | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Zangakatun | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Total | | 7 | 0 | 7 | 4 | 3 | 8 | 0 |
| Gegarkounik | Aghberk | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Aghpradzor | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Aigut | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Airk | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Areguni | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Arpunq | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Artanish | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Artsvanist | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Artsvashen | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Avazan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Azat | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Chkalovka | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Chmbarak | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Daranak | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Dzoragiugh | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Gavar | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Gegamasar | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Gegamavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Geghamabak | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Jaghatsador | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Jil | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Kakharan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Kalavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Kartchagpiur | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Khachaghpiur | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Kut | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Kutakan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Lanjaghbiur | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Martuni | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Mets Masrik | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | N. Getashen | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | N.Shorja | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Norabak | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Noraduz | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Norakert | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Pambak | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Semionovka | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Shatjrek | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Shatvan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Sotk | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Tazagiugh | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Torfavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Tretuk | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Tsapatagh | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Tsovazard | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Ttudjur | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | V.Shorja | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Vahan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Zolaqar | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Zovaber | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Total | | 28 | 1 | 27 | 11 | 16 | 22 | 0 |
| Syunik | Agarak | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Agarak | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Aravus | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| | Arevis | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Artsvanik | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Ashotavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Bardzravan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Chakaten | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Dastakert | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Davit-Bek | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Egheg | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Ervand | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Geghanush | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Geghi | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Getatakh | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Goris | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Hand | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Hardjis | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Hartashen | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Hatsavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Kaghnut | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Kapan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Karchevan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Khdrants | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Khnatsakh | 1 | 0 | 1 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Khndzoresk | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Khotanan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Khoznavar | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Kornidzor | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Lehvaz | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | N.Khndzoresk | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Niuvadi | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Paiahan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Qarashen | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Salvard | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Sevaqar | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Shakhat | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Shikahogh | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Shurnukh | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Siunik | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Srashen | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Tasik | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Tatev | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Tegh | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Ujanis | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | V.Khotanan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Vaghatin | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Vaghatur | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Vardanidzor | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Vorotan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| Total | | 29 | 0 | 29 | 18 | 12 | 21 | 0 |
| Tavoush | Achajur | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Agavnavank | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Aigedzor | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Aigehovit | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Aigepar | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Airum | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Artsvaberd | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Azatamut | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Baghanis | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Bagratashen | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Barekamavan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Berd | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Berdavan | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Berqaber | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Chinari | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Choratan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Dilijan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Ditavan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Dovegh | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Enoqavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Gandzaqar | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Hakhtanak | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Hovq | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Idjevan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Itsakar | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Jujevan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Kirants | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Koghb | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Koti | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Lusahovit | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Movses | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | N. Tsakhqavan | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | N.K.aghbiur | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Noemberian | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Norashen | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Paravaqar | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Ptghavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Sarigiugh | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Sevkar | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Teghut | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Tovuz | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Varagavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Vazashen | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Voskepar | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| | Voskevan | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Total | | 28 | 1 | 27 | 20 | 6 | 17 | 0 |
| Vayots Dzor | Aghavnadzor | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Areni | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Arpi | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Artavan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Bardzruni | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Chiva | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Elpin | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Gnishik | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Gomq | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Khachik | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Khndzorut | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Martiros | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Mozrov | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Nor Aznaberd | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Rind | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Saravan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Sers | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Total | | 7 | 0 | 7 | 7 | 0 | 10 | 0 |
| Grand Total | | 99 | 2 | 97 | 60 | 37 | 78 | 0 |

Map 6: Total Survey Effort




USE OF EXTERNAL DATA

The Survey Management expended a considerable amount of time and energy trying to obtain external socio-economic data suitable for the LIS purposes in ways that would improve the value for strategic planning. The survey succeeded in obtaining valuable information from the Ministry of Defense, UNDP, VVAF, American University of Armenia, Emergency Management Administration of Armenia and other national and international partners. This data was processed in a way to permit it to be cross-tabulated with LIS data.

# CASE STUDIES

## VOSKEVAN

### Background

Voskevan is a borderland village of Tavoush Marz, in the north-east of the country. The village is adjacent to the Republic of Azerbaijan, its administrative territory covers 1535 ha, and the community is located at an altitude of 930 m.

Up until 1978 this village was known as "Ghotghotan", but in 1978 it was renamed "Voskevan". The date of village establishment is estimated as 350-400 years ago.

The village was inhabited mostly by Armenian settlers from Georgia and Nagorno Karabagh. Traditionally, the main occupation of village has been farming and herding. The villagers were widely involved in collective farming, which later in 1958 was converted into state farming.

In 1979 a branch of the Dilijan factory was opened in the village, where 150 villagers were employed. The plant was producing different communication products, but after the collapse of the Soviet Union it was closed. Nowadays the principle source of income is farming and herding.

Voskevan's registered population is 1506, but the number of actual inhabitants is presently around 1300. More than a half of the local households are short of domestic animals (290 households do not have animals at all). The villagers mostly cultivate vegetable crops, grain and wheat. Lack of an irrigation system is a major obstacle to agricultural prosperity. Thus, the main problem for this community is the need of irrigation system construction/renovation. However, due to the joint efforts of Voskevan, Baghanis and Koti communities, a project proposal is being developed and the problem will be solved by the process of collaboration between all of the above-mentioned villages.

During the Soviet Union period Voskevan village had strong trade relations with Ghazagh, a town of the Azerbaijan Republic. But due to a conflict related economic blockade all trade relations between the communities have been interrupted. The village has 350 ha of cropland, above 500 ha of pastureland and some forests adjacent to the cropland. Voskevan has some land by the border in its administrative territory, which is contaminated and for that reason is not used for agricultural purposes.

Despite the desire to set up new family dwellings , local villagers are forced to live with their parents even after their marriage, due to the lack of financial opportunity to build new houses. Men and women in the village marry at about 27 and 20 years of age. The average family has two children, which is not typical for traditional rural communities. However due to the difficult socio-economic conditions the level of reproduction in Voskevan community has reduced. Due to some emigration flows and the reduction in the level of reproduction, the local population of Voskevan is falling. All of the school-aged children attend school and most of them tend to get a full middle education (10 years). The number of school children is 216.

Voskevan village is a compact village that has one secondary school, one basic health facility, a public library, a culture house, a church and a kindergarten. All the houses in the village have electricity and access to piped water. There is no higher education institution in Voskevan; for that reason those who want to get a higher education, must move to the capital or marz center. Although higher education is valued by local villagers, only a few of them have the economic opportunity for it.

History of landmine contamination

According to the Armenian Landmine Impact Survey, Voskevan community is classified as a "high impact" community. This community is impacted by one suspected area, which is locally called Khlezdzor or Tlut. It forms a 400 m wide and 2000 m long broken-shaped line along the border between Armenia and Azerbaijan. The dangerous area is to the north-east direction from the community center of the Voskevan and is not very close to the residential area. Though the SHA is located in the military restricted safety border zone, this community has two recent victims in this territory, which is evidence of breaching of the restriction.

Mines were planted near the village by both sides of the armed conflict. In 1990 local villagers were impacted by these mines for the first time. There were a lot of military actions in the region with a wide involvement of local villagers. However, the village itself was not an arena for military activities. Voskevan community participated in the military activities without army intervention for about a year. During this time the majority of the local population was evacuated and just a few of the villagers (4-5 people) looked after more than 300 cattle, 2000 pigs, and maintained a battery farm which was adjacent to the border with 240 greenhouses. During that period a lot of cars driving on the road leading to the village were under fire. Six local freedom fighters were killed, and many were injured during this military activity.

Impact of mines

A significant part of potential agricultural land is located near the border in the military restricted zone, and is partly mined; however, the whole borderland territory is under fire. For that reason the available agricultural lands are not enough for the Voskevan community. The SHA covers pastures, forests, croplands, as well as the field roads. It is contaminated with anti-personal and anti-tank mines. Before the area was mined, the villagers had taken firewood, picked fruit and brought building materials from the forest. They also had cultivated different crops such as wheat, onion and potato. Because Voskevan community is short of pasturelands the damage caused by the blockage of pasture is the most significant one. However, in spite of the military restriction, a few villagers still use this area as a pastureland. Both recent victims were grazing animals at the moment of the accident. They went to the restricted zone despite the mine risk since it was the only convenient pasture place.

Accident survivors

All mine accident victims during the past two years were from the village. The first victim's name is Sasun Khachikyan Khachiki (27 years old). He was grazing the cattle in the dangerous area when an antipersonnel mine exploded. Sasun received emergency medical care and was conveyed to Yerevan. Doctors were forced to amputate his leg in order to save his life. He was

also given a prosthetic device. Due to the accident the family lost its main breadwinner as Sasun is no longer able to work.

The second victim is Dzhan Beglaryan Arshaki, a musician. At the time of his injury he was herding his cattle. Due to the mine accident his leg was injured. He also got emergency care and was conveyed to Noyemberyan. Due to the accident his family also lost its main breadwinner since Dzhan is not able to work either. The village also has 3 non-recent victims injured because of the mines.

Village socio-economic situation

As was mentioned above, the main source of profit for the village comes from agriculture and husbandry. The villagers mainly cultivate wheat, onion and potato. The village has 350 ha of cropland, above 500 ha of pastureland and some forests adjacent to the cropland. According to the village's statistics, kindly provided by village leader Mrs. Emma Hakobyan, Voskevan community has the following domestic animals distributed by households:

Table 41: Quantity of Animals in the Village

| | |
|---|---|
| Cattle | 604 |
| Pigs | 162 |
| Sheep | 173 |
| Goats | 185 |
| Horses | 6 |
| Donkeys | 23 |
| Bee-families | 75 |

Table 42: Distribution of Animals by Households

| Total number of actual households | Quantity of households, which lack the animals | | | | | |
|---|---|---|---|---|---|---|
| 428 | All kinds | Cattle | Cows | Pigs | Sheep | Goats |
| | 290 | 257 | 266 | 381 | 392 | 424 |

According to the village leader and other community members, village resources are not enough for development of Voskevan community. Many household budgets are supplemented due to outside assistance of relatives and temporary migration: local villagers move to Russia and work there as builders or other contractors.

Household one

Sasun Khachikyan Khachiki is a former shepherd, 27 years old. Sasun was injured by an antipersonnel mine while grazing animals in June, 2004, and lost his leg. He lives with his mother Shushan and brother Vachagan. Their oldest brother lives in Yerevan and works in the State University. His sister is married and lives in the neighboring community. Originally, the Kachikyan family was from Karabagh. This family suffered more than any other from the armed conflict, and particularly from mines. Sasun's father was taken prisoner by the Azerbaijani side during the armed conflict. To this day there is no information about him so his family doesn't know whether he was killed or is still alive. Sasun's brother Vachagan was hurt by an artillery round which was dropped in their yard. The latter lost his one eye and his palm. Their family is under difficult economic conditions. During the Soviet Union period both parents worked on land cultivation, but also had an additional income from regular employment. Sasun's father worked as an engineer in the water reservoir, his mother worked in a shop. This family has about 1 ha of land, which is not irrigated and therefore has a low price. However, the family decided to sell this land because of difficulties in cultivating it. Their only current source of

income comes from growing onions and other vegetables. The remaining land still owned by the family is mainly cultivated by the mother. Sometimes Vachagan helps her. The family has no other help outside the village, but relatives from the same village assist them by providing agricultural machines and helping with some food. The family budget has slightly increased due to his disability pay (3800 dram), however, the income of this family is so low, that they can hardly sustain their existence.

Household two

Margaryan Aghas (about 48 years old) is married and has a daughter and a son. His family was also originally from Karabagh. Both children are married. The daughter lives with her family outside the village (Berdavan community). The son has one child and lives with Aghas's family. He is a driver and owns a car. He used to work in the program implemented by Lince Foundation, but now due to the program's completion he is unemployed.

Aghas was injured by a mine in 1991, while grazing animals. The accident took his eye, leg and fingers. After getting emergency care he was taken to Yerevan, however, he did not get a prosthetic device due to medical causes. Before the accident Aghas worked in Russia as a builder. Nowadays the family survives due to disability pay (25000 dram), assistance of relatives, and some products from domestic animals. All work connected to housekeeping is done by Aghas's wife, who is also disabled. This household owns one pig, one cow and a few chickens. Due to the difficult economic situation the household was forced to sell most of their domestic animals. The milk (5-6 liters per day) they get from the cow is fully consumed by the family. They either sell eggs or exchange them for potato, or some other necessities. Thus the products produced by this household satisfy only the primary needs of the family. The household has a small piece of land adjacent to the house and another piece of distant land about 8000 square meters in area. Previously, this land was cultivated by Aghas's wife, but she cannot continue to work now due to her health conditions. Therefore they do not use this land anymore.

Willingness to contribute towards clearance

The community leader stressed that Voskevan community has the willingness and financial ability to contribute to the expenses of mine clearance. Though the community is not economically well developed, its leader assures that the taxes are almost completely collected in the village. According to the community members, in additional to material contribution Voskevan is also ready to share its human resources to reach the goal. Voskevan community already has the experience of contribution to different programs successfully implemented in the village.

Mine action

Local villagers had learned about existence of mines from neighboring communities and cases of animal and vehicles explosions in the area. No official mine clearance activities had been held in Voskevan community. In order to reduce the mine threat local villagers attempted to clear pieces of the territory by themselves. The Ministry of Defense assisted mine victims by providing them with non-permanent welfare ($100). However, there is still low mine awareness in the village. Also, no marking and fencing has taken place.

## Conclusion

The impacts of military activities on the Voskevan community are significant. A lack of agricultural land and working places, difficulty in selling the agricultural crops and animal products, as well as limitations in trade opportunities due to economic blockages causes the low socio-economic level of welfare in Voskevan community. In addition to all listed obstacles, the villagers have a large amount of territory located in the military restricted border zone, which is contaminated by landmines and is under shelling. This area, which administratively belongs to Voskevan community, is under military restriction due to consequences of the conflict between Armenia and Azerbaijan. Despite the risk, local villagers sometimes break the military restriction and use the lands located in suspected hazardous area for pasture. This is supported by the existence of two recent victims, local villagers injured by antipersonnel mines while grazing animals.

The impact of landmines on the economic life of the survivors and their families has also been considered. Two interviewed injured people were the main breadwinners of their families. As a result of the accidents they could no longer support their families. Mine accidents caused both interviewed survivors to feel feebleness and self-vainness. Though agriculture was not the main occupation of both interviewed families during the Soviet Union period, nowadays because of the lack of work places, farming and herding is the only means of support for those households. However, due to the housefathers' disabilities, their families cannot use the land for agricultural purposes as a supplement to income.

Different programs have been implemented in the village to contribute to the local villagers' level of life. However, the lack of the agricultural land is still the main obstacle for maintaining a sufficient level of welfare.

Despite the mine victim assistance, no mine action activity has taken place in Voskevan community. In order to reduce the mine threat, local villagers attempted to clear some pieces of the territory by themselves.

Villagers realize that the existing military restriction is a requirement of security caused by the conflict situation. For this reason, they do not have many expectations for the possibility of mine clearance. However they are ready to contribute to this process and they resist selling their lands.

# SHURNUKH

## Village background and geographical information

Shurnukh village is located in Goris district of Syunik province. The elevation of the village is 1450 m above the sea, the administrative area is 883 ha and it is 37 km away from the center of the province. The distance from Goris town to Shurnukh community is 28 km. The village is located on Yerevan – Meghri highway. The climate is bitterly cold in wintertime and chilly in summer time. Dry and arid years are frequent which affect on the villagers who do farming.

Shurnukh has a distinctive story because nobody knows anything about the founders of the village nowadays as the villagers have only lived there since 1993. They only know that the community was founded in 1920-1930 and it was an Armenian village. The Azerians populated the village shortly

after and in 1946 the overwhelming majority of the population were Azerians, which subsequently made the Armenians leave.

Thus, from 1946 up to 1990, that is the beginning of the Armenian-Azerbaijani armed-conflict; Shurnukh used to be an Azerian village. Once the tension started, the Azerians had to leave and the village was repopulated with Armenians who mainly were from Goris, Kapan, and Yerevan.

Table 43: The Social-Demographic Structure of the Community

| | |
|---|---|
| Children (0-6 y.) | 24 |
| Schoolchildren (7-17 y.) | 50 |
| People at the age of 18-62 | 95 |
| Pensioners | 3 |
| Disabled persons | 7 |
| Able-bodied | 88 |
| Total population (census) | 179 |

There are 48 households in the community, 6 of them are involved in the "Paros" system. There is one secondary school and medical section in the village, which have been renovated recently by international organizations. There is also one culture house in the village but the building is unsafe. The operating library has 1200 books. Shurnukh does not have a community sports square. The football games are usually organized in the sport square of the school, which is always occupied by the schoolchildren. At the moment there are 3 students in Goris town from Shurnukh community. The village is considered to be a young village since about half of the population is young men and women. Men and women in this village marry at about 25 and 22 years of age respectively.

Village socio-economic situation

The village leader mentioned that the danger of the mines and lack of agricultural techniques does not let them plough their arable lands fully. Mostly people grow potato, cabbage and other vegetable crops in their personal plots.

There is no separate store in the village; most necessary items are brought from Goris and/or Kapan and are sold from houses or are exchanged with agricultural products. The prices do not differ much from those of the city .

Since the arable lands are unusable, it leads to the fact that the villagers do not grow grain and have to import their flour from outside, particularly from Goris. One sack of flour costs 8000 AMD (1 USD = 485 AMD).

The village does not have a sewage system. The UNDP "WFP" project assisted in fixing the water line in the village. The villagers use 3 sources of water, which are treated with chloride by the villagers.

The villagers are complaining that due to the hard economic conditions the villagers have to leave the village; mainly people leave for the Russian Federation for permanent living. Four families have left in the last 3 years. At the same time the birth rate has gone down. Due to the hard economic situation in the village, difficulties appear when collecting taxes and rental fees, which is a threat for the budget of the community.

Table 45: Quantity of Animals in the Village

| | |
|---|---|
| Cattle | 80 |
| Among which cows | 60 |
| Small stock, | 250 |
| Among which females | 150 |
| Pigs, | 40 |
| Among which females | 10 |
| Birds, | 300 |
| Among which chickens | 200 |
| Bee families | - |

Military activities and mining

During the Armenian-Azerbaijani war, Shurnukh was always in the center of armed conflict. This was the result of the position of the village, particularly that it is located on both sides of Yerevan–Meghri highway. In 1991 the tension between the conflicting sides had increased. The Azerbajanis, having a more convenient and high-elevated position, were keeping the road under fire all the time. People had to travel with convoys and were always in fear of being robbed or killed.

The village was shot with different types of ammunition. At that time all areas near the village were planted with mines including one part of Yerevan-Meghri highway which is an international state road. The Shurnukh community had 38 victims at that time who mainly were peaceful villagers. The majority were either was kidnapped or shot in the forest and fields while gathering food.

The extremely difficult situation made people leave the village, and Shurnukh was completely emptied out. There were only defending soldiers left in the village. The tense situation continued to exist until 1994 when the contract of a ceasefire was signed between the two sides.

Impact of Mines

According to the Landmine Impact Survey results, Shurnukh community is a high impact village. The village has 3 mined areas.

Suspected area 1

The mined area is an abandoned village. The locals call it Vanand (Ghurtughlagh). Its size is 270000 sq.m, and it is 8000m away from the community center in the South-West direction. The area has the shape of a triangle, it is hilly and covered with trees and bushes. In the past it was used as pastureland or cropland; there is also a forest where the villagers would pick herbs and wild fruit as well as collect firewood. It is known that there have been explosions of vehicles and people in this area. The area is abandoned and not being used.

Suspected area 2

The second mined area is the part of the Yerevan –Meghri highway. The surface of the suspected area is 77000 sq.m, 35000 sq.m of which has been cleared of mines. The distance from the community center to the suspected area is 2000m in the south-west direction. The area is flat and covered with low grass. It is the grassy areas on the sides of the road that are dangerous, the road itself is safe. Venturing off the road can be fatal, and the situation is particularly dangerous for large trucks. A few vehicle and truck accidents have been recorded here.

There have been two mine victims in the last two years. It should also be mentioned that there were mine wells, tracks of explosions and debris from blown up vehicles.

Suspected area 3

The area is called “Khndzori aigi”. It is 500 m away from the community center in the south-west direction and is 8000 sq.m large. The mines make use of the orchards and general agriculture lands impossible. However, some areas can be used as pastureland. In this SHA people bump into UXOs (Unexploded Ordnance) from time to time, most often it is discovered by schoolchildren. There has

been one mine victim in the last two years in this area.

Household 1

The Harutyunyans family came to Shurnukh in 1993. The family consists of 5 people: the father, mother, and their 3 children. The two brothers, Andranik and Vladimir had gone into the fields in the summer of 2000, when they found a round metal object. The kids did not immediately understand what that thing was until they decided to push the pin. Vladimir, who was 8 years old at that time, climbed up the tree and Andranik, who was 10 years old, left to look at how the round metal subject be exploded.

*Vladimir says that he ran in the direction of the house but Andranik was not able to , later he was brought home.*

Due to the explosion, Andranik received a few shrapnel wounds. The fragments were removed at the hospital Goris town, but the doctors could not remove the fragment from Andranik's hip since it was stuck in a tendon. The mother of the boys mentioned that they do not have sufficient funds to take Andranik to the capital for treatment. The monthly income of the family makes up 25-30000 AMD (1 USD = 485 AMD). The main source of income is her husband's work, which is chopping firewood in the forest. Around 60% of Shurnukh villagers do the same work. Tatevik, the mother of the family, works in the village library as a librarian and her monthly wage is 8000 AMD (1 USD = 485 AMD). Their daughter Rousanna is attending courses to become a hairdresser.

The family lives in a one-story house that has 1000 sq. m. of personal plot. They get the necessary fruits and vegetables from this plot, which is only sufficient for the families use This crop is not being sold and is not bringing in any additional profit. The Harutyunyans also have a cow, pig and goats.

It should also be mentioned that there are no privatized houses or land in the village. Everything is being used based on rent. The rental price for a 1000 sq. m plot is 790 AMD (1 USD = 485 AMD) per year and 1 ha of meadowland is 4650 AMD again per year. It is impossible to count all of the expenses and earnings of one village household since the village leader did not have the appropriate information. Tatevik mentioned that they all know the forests where the villagers cut wood are suspected. There is a possibility of mines there but her husband has to go there every day in order to make money for food.

Household 2

Dallaqyan Garen also came to Shurnukh from Goris after the war was finished. Though the consequences of the war did not pass by him. In August 1999, Garen went to the field to graze his cattle. There were anti-tank mines left from the armed-conflict and the unfortunate villager accidentally stepped on one of these mines. Due to the accident the thirty-one year old young man lost his left leg. Garen was taken to the capital where he received a free prosthetic limb and came back to Shurnukh. He has 3 daughters under the legal age; one of them is Shahaneh who is disabled. Garen along with his wife plow their small plot. He has a one story house along with a 1000 sq.m plot, 1 Ha of meadowland and 2 cows. His yearly income is about 50000 AMD (1 USD = 485 AMD). To count more accurately the expenses and earnings of his family is impossible. No one in the village keeps records of their finances. The villagers witness that nobody has the diligence like he does and they point out that misfortune did not break him down. When the time for planting comes, they find out from Garen because he is the first who starts this work. As well, he goes alone to the forest for cutting

firewood (the electrical saw weighs 20 kg. Garen mentioned that he did not receive any assistance from the government and/or any international organization, and he was used to relying on himself. Despite his challenges he is ready to support the de-mining operations because he knows what it is like to be blown up on a mine.

De-mining

Starting in June 2005, the Armenian Humanitarian De-mining Center staff is implementing de-mining operations in this region. The de-mining is being conducted based on the preliminary technical survey results, and the results of the UNDP implemented Landmine Impact Survey are also being used. The authorities of Syunik Marz are also contributing to the implementation of the de-mining. Many explosives were found during the clearance and ordnance of different diameters, anti-tank and anti – personnel mines were blown up in place. The de-mining operations show that the suspected areas are quite big. The cleared areas are mainly roads leading to the pasturelands that are especially important for the villagers. The village leader mentioned that they supported the de-mining operations with what they could (manpower, technical assistance, firewood). Some of the villagers are always present during this operation.

Conclusion

Thus, we can come to a conclusion that the mines really create a serious issue for the villagers of Shurnukh community. Especially, people emphasize the factor of fear and constant concern. Since the majority of men work in the forest as woodcutters, their families see them off every morning with fear, and in the evening when they return home safe and sound, they consider it good luck. The village leader and the villagers witness that the socio-economic problems created by mines are one more reason for leaving the village. The accidents, which have happened to the villagers, create a stressing situation for the others. The village has sparse land for agriculture to begin with, and the mined areas make 107000 sq.m more land unusable.

If no projects are implemented in the village, it will be completely emptied out, since the people of Shurnukh community are prepared to emigrate if the situation remains unbearable.

*Aldo Benini / Lawrence Moulton*

These numbers are based on the information that the survey-implementing organization tabulated on the results of the Expert Opinion Collection and subsequent visits to suspected and non-suspected communities. The country gazetteer lists 914 communities. Two special cases were added:

- One community is under occupation by Azeri forces;
- One location was included although it is a village that forms part of a larger gazetted community (whose main town was also visited).

The latter special case suggests use of the term "location" throughout, but this may be distracting, and we prefer to use "community" for the remainder of this note.

Among the 916 communities, experts suspected 99 to be contaminated with mines / UXO. Of the suspected and visited communities, 60 were found to be affected. In addition, the one occupied community was presumed affected. One of the suspected communities remained inaccessible. All accessible affected communities were surveyed. A stratified (on Regions) sample of those communities not suspected was performed, in accordance with a pre-determined LQAS [Lot Quality Assurance Sampling] rule. The protocol provided that in the event that any sampled community was found to be affected, neighboring communities would also be investigated. However, of 816 "not suspected" communities, 196 were considered part of areas with possible contamination (the others were too far removed from any known emplacements). Of these, 78 were sampled and investigated, of which zero were found to be affected.

ESTIMATION 1

Table 46: Summary of the First Estimation of Prevalence of Mine-Affected Communities

| | |
|---|---|
| Prevalence | |
| *Affected communities / all communities* | |
| Estimation 1 | 6.7% |
| Estimation 2 | n/a |
| Estimation 3 (conservative) | 7.4% |
| Identification rate | |
| *Detected / all affected* | |
| Best estimate | 100.0% |
| Conservative | 89.7% |

This estimation procedure assumes that the strategy of going to neighboring communities is equivalent to the full procedure of investigating all communities in a Region in which a sampled "not suspected" community was found to be affected. Alternatively stated, it is assumed that because of an expected strong spatial correlation, this procedure would have found virtually all affected communities, because of the small chance of having isolated affected communities being randomly (or even haphazardly) distributed throughout a Region.

The estimated proportion (prevalence) of affected communities among the 916 listed in the gazetteer, including special cases, is 61/916 = 0.0666, or just below 7%. Under the above assumption and classical sampling theory, this estimate has zero variance associated with it. Since the sampling area of each Region, in which there were zero affected communities found through the sampling, has an unbiased estimate of zero affected communities and zero variance, and for those with non-zero affected

communities in the sample, the assumption is that the search around those found all affected communities, and thus there is no variability.

ESTIMATION 2

In countries where the Landmine Impact Survey finds a positive number of false negatives, an additional method is applied. This estimation is carried out under the much milder assumption that the sampled and investigated communities were representative of the non-sampled (and non-suspected) communities in the given Region. This results in a "worst-case" scenario, in which we apply the proportion of the sampled communities that are affected to the number of non-sampled communities to estimate the total affected communities in a Canton/Region.

In such situations, the logic is as follows: Let $N = \sum N_h$ be the total number of non-suspected communities from which the samples are drawn, with $N_h$ the number in the *h*th Region (or, if only part of the Region is considered for the sampling, then the sampling district of the Region). The proportion of affected communities in a sample of $n_h$ in a Region is given by: $p_h = a_h / n_h$, and the proportion of affected communities in all the 5 affected Regions, according to the classic formula for stratified sampling (Cochran, *Sampling Techniques*, Third Ed., 1977; Wiley, New York; p.107) is: $p_{st} = N^{-1} \sum_{h=1}^{5} N_h p_h$. Further, its variance is estimated by:

$$\hat{V}(p_{st}) = N^{-2} \sum N_h^2 (N_h - n_h) p_h (1 - p_h) / [(N_h - 1)(n_h - 1)].$$

However, since $p_h = a_h / n_h$ = 0 everywhere, the variance is also zero, and this method is not applicable.

ESTIMATION 3

Intuitively, even if zero affected communities were found among 78 sampled and visited communities, there is a small probability that some affected ones may exist among the 196 – 78 = 118 non-suspected and non-visited ones. Of the five Regions where false negative sampling was carried out, two of the Regions had every community visited, and thus there is no possibility of an affected community in them. For the other three Regions, where 22+21+17=60 were sampled and visited:

- Gegarkounik - Unsuspected within sampling area 64; Whereof sampled and visited 22
- Syunik - Unsuspected within sampling area 80; Whereof sampled and visited 21
- Tavoush - Unsuspected within sampling area 34; Whereof sampled and visited 17
- Total - Unsuspected within sampling area 178; Whereof sampled and visited 60

We calculated the upper bound of a 95% confidence interval for the true proportion affected, assuming the proportion to be equal over the three Regions. This was done by using exact binomial calculations to determine the true proportion value such that the probability of observing zero affected communities among the sampled 60 is 0.025 (which corresponds to the upper tail of a 95% confidence interval). Specifically, we solved $(1- p)^{22}(1- p)^{21}(1- p)^{17} = 0.025$ for *p*, yielding an upper bound of 5.96% affected.

Applying this 5.96% value to the 118 non-sampled communities, we get 7.03 possibly affected communities. Thus, a 95% upper bound on the prevalence is (61+7.03)/916, or 7.43%, and the corresponding lower bound on the percentage identified is 100%*61/68.03 = 89.67%.

COMMENT

The high degree of sensitivity of the designation of suspected areas resulted in finding not a single negative community. Our best estimate is that all affected communities have been identified. A somewhat conservative estimate is based on the non-negligible probability that, despite zero detected false negatives, some affected communities may exist among the non-sampled non-visited communities. Based on this calculation, we are highly confident that at least 90% of the affected communities have been identified.