Mine/ERW Risk Education

2012 Reader Survey

FEATURE: Challenges in Africa

SPECIAL REPORT:
Mine Action Disability Rights Issues & Rights of Persons with Disabilities

PLUS: Notes from the Field
Research & Development
Dear Readers,

Every few years we are reminded of our increasing interconnectedness as a global community and of the prodigious responsibility this presents. Images of the Arab Spring, most recently from Syria but also from elsewhere in the Middle East, vault from the Internet to the evening news and into newspapers everywhere. We can easily get caught up in newer conflicts and lose sight of long-term recovery. The seemingly unending period of post-conflict recovery can be dispiriting. Even the most stable communities face decades of rehabilitation to overcome trauma. How then can we tackle these problems in a world with a shorter attention span? What components for stability can we cultivate in our community of practice that will endure long after we leave?

Time and again, CISR has witnessed how protecting and promoting the rights of people with disabilities can be a catalyst of change for communities affected by war, conflict and trauma. Survivors are champions, pushing boundaries and overcoming prejudice to remake societies into inclusive spaces. When the world’s attention shifts to the latest hot spot, survivors remain in their communities to work, unabated. Resourceful and indomitable, they persevere and promote the long-term success of their communities.

In this issue of The Journal, our Special Report section focuses on how conversations about disability rights are driving development in communities around the world. When survivors and their advocates push for access, dignity and change, everyone benefits. In her article, “Victim Assistance and Disability Rights: Beyond the Rhetoric,” Sheree Bailey discusses the importance of turning the ideas from the Convention on the Rights of Persons with Disabilities into concrete action in the mine action community. Dr. Martin Chitsama discusses an HIV/AIDS survey of deminers in southern Angola, with some surprising findings. In the Feature section, CISR Trauma Rehabilitation Specialist Cameron Macauley explains the development of the Centre d’Encadrement et de Développement des Anciens Combattants’ (Training Center for Development of Ex-Combatants) peer-support programs in Burundi. More articles on related topics can be found in our online-only edition at http://bit.ly/ZvvGNm.

My hope is that CISR, through The Journal and other resources, can serve as a place to convene our community of practice. What innovations are your organizations bringing to the field? Where are the next frontiers for humanitarian assistance? What’s next? We would love to dialogue with you. Join our post-conflict forum at http://bit.ly/SxT5ej, and start a conversation by telling us what you think.

Sincerely,

Ken Rutherford

Notes from the Field
42 Sri Lanka: A Photographic Essay by Sean Sutton
47 Providing Safe Drinking Water in Post-Civil War Sri Lanka by Hartmut Thoms
50 The Lethality Ratio of Anti-vehicle Mines by Armen Harutyunyan

Research and Development
54 5D: A GIS-based Approach for Determining and Displaying the Degree of Operational Difficulty of Demining by Pierre Lacroix and Rocio Escobar
61 Mine Detection Rats: Effects of Repeated Extinction on Detection Accuracy by Amanda Mahoney, Amy Durgin, Alan Poling, Bart Weetjens, Christophe Cox, Tess Twelde and Tekimiti Gilbert

Endnotes 65

2012 Reader Survey

We thank the authors and readers of The Journal of ERW and Mine Action, as well as our website visitors, for your support. Your feedback is important to us. It helps us improve and assists us with providing valuable information to our readers. We encourage you to take the survey online at http://bit.ly/PUQ87N, or fax or mail it to us to the address on page 7. We must receive your completed survey by 1 March 2013 to include your feedback in the results to be published in our next issue.

1. What are the most important topics in conventional weapons destruction and related issues that you would like to see covered in The Journal?

2. Which of these Journal topics interest you (multiple selections acceptable)?
   - Mine action/explosive remnants of war, for example: Lessons learned/case studies, Mine/munitions risk education, Surveys/land release, Unexploded ordnance/ERW
   - Other conventional weapons and/or topics, for example: MANPADS (man-portable air-defense systems), Post-blast cleanup, Small arms/light weapons, Stockpile destruction
   - Chemical, biological or nuclear weapons
   - Social Issues, for example: Environmental effects, Gender issues, Health issues, Survivor assistance
   - Legal and policy issues, for example: Conventions and instruments of law, Disability rights and laws, Insurance, Land tenure/ownership, Public policy issues
   - Profiles, for example: Country profiles, Donor profiles, People in the field, Obituaries, Industry news
   - Research & Technology, for example: Biosensors (dogs, bees, etc.), Environmental effects, GIS mapping, Information technology, Mechanical equipment, Personal protection equipment, Robotics, Water-borne technologies
   - Other, please specify: ________________________________

3. Do you think any of the topics listed in the previous question are NOT appropriate for The Journal?
   - Yes
   - No
   - If yes, please explain:

4. Which sections in The Journal do you read? (multiple selections acceptable)
   - Letter from the Director
   - Letters to the Editor (feedback)
   - Editorial
   - Focus
   - Feature
   - Profiles
   - Book Reviews
   - Notes from the Field
   - Research and Development
   - Endnotes and Glossary

5. Which section of The Journal is your favorite to read? (check one)
   - Letter from the Director
   - Letters to the Editor (feedback)
   - Editorial
   - Focus
   - Feature
   - Profiles
   - Book Reviews
   - Notes from the Field
   - Research and Development
   - Endnotes and Glossary
6. What length do you prefer Journal articles to be? (check one):
- Their current length
- Somewhat shorter than they are now
- Considerably shorter than they are now
- Somewhat longer than they are now
- As long as they need to be to convey the information
- Considerably longer than they are now (more in depth)

7. Which of these options is easier to read?
- We work to decrease the unintended consequences of explosive remnants of war (ERW) through mine risk education (MRE) and proper marking of confirmed hazardous areas (CHAs). The purpose of MRE is to educate people of the dangers of ERW and to avoid CHAs.
- We work to decrease the unintended consequences of explosive remnants of war through mine risk education and proper marking of confirmed hazardous areas. The purpose of MRE is to educate people of the dangers of ERW and to avoid CHAs.

8. Have you been an author for The Journal?
- Yes
- No
  - If yes, were you happy with the editing process?
    - Yes
    - No
      - If no, what could have improved the process?

9. Would you like to be contacted about writing for The Journal?
- Yes
- No
  - If yes, please provide the following:
    - Name: 
    - Email: 
    - Organization: 
    - Occupation: 

10. As an author, would you submit an article to an ONLINE-ONLY edition of The Journal?
- Yes
- No
  - In no, why?

11. Did you know that issue 16.1 of The Journal was online only?
- Yes
- No
  - If yes, how did you find out?
    - I saw it on the CISR website
    - I received an email about it
    - I saw an advertisement about it
    - Someone told me about it (who?)
    - I don’t know how I found out

12. Which version of The Journal do you access? (check one)
- Print version
- Online version
- I use both

13. Which version of The Journal do you prefer to access? (check one)
- Print version
- Online version
- I prefer to have both available to me
- I do not have a preference
  - Comments:

14. Are the layout and design of the PRINT version of The Journal easy to follow? (check one)
- Yes
- No
  - If no, please explain:
15. Are the layout and design of the ONLINE version of The Journal easy to follow? (check one)  
☐ Yes  
☐ No  
If no, please explain:  
______________________________________

16. What overall suggestions do you have for improving The Journal?  
______________________________________  
______________________________________

17. What devices do you use to access the Internet?  
☐ PC  
☐ Mac  
☐ Smartphone  
☐ Tablet  
☐ Other (please list)  
______________________________________

18. If The Journal was available to be viewed equally well in each of these devices, which of them would you use to access The Journal? (multiple choices acceptable)  
☐ PC  
☐ Mac  
☐ Smartphone  
☐ Tablet  
☐ Other (please list)  
______________________________________

19. What type of Internet connectivity do you use most frequently?  
☐ Broadband Internet (DSL, cable)  
☐ Wireless technology (3G, 4G wireless)  
☐ I have Internet access, but it is unreliable or costly  
☐ I do not have Internet access  

20. Did you know that you can comment on Journal articles on the CISR website?  
☐ Yes  
☐ No  
If yes, how did you find out?  
☐ I saw it on the CISR website  
☐ I received an email about it  
☐ I saw an advertisement about it  
☐ Someone told me about it (who?)  
☐ I don't know how I found out  

21. Have you ever commented on a Journal article on the CISR website?  
☐ Yes  
☐ No  

22. Did you know that The Journal has developed an online forum found at http://bit.ly/SxT5ej to allow our readers to engage with one another online?  
☐ Yes  
☐ No  
If yes, how did you learn about it?  
☐ I saw it on the CISR website  
☐ I received an email about it  
☐ I saw an advertisement about it  
☐ Someone told me about it (who?)  
☐ I don't know how I found out  

23. Have you ever posted a comment in the online forum found at http://bit.ly/SxT5ej  
☐ Yes  
☐ No  
If no, what would entice you to post?  
______________________________________

24. Did you know that CISR has developed an informative blog that can be found at http://cisrjmu.tumblr.com?  
☐ Yes  
☐ No  
If yes, how did you find out?  
☐ I saw it on the CISR website  
☐ I received an email about it  
☐ I saw an advertisement about it  
☐ Someone told me about it (who?)  
☐ I don't know how I found out  

25. Do you follow the CISR blog?  
☐ Yes  
☐ No  
If yes, do you have suggestions for improvement?  
______________________________________
Please help us understand our readers by telling us about yourself:

26. Are you male or female?
   - Male
   - Female

27. What is your age?
   - 18–25
   - 26–40
   - 41–54
   - 55 or older

28. Where are you located?
   - N. Africa/Middle East
   - Sub-Saharan Africa
   - Asia
   - Australia
   - Europe
   - North America
   - Central/South America

29. What type of organization do you work for?
   - Academic
   - Corporate
   - Government
   - Military
   - NGO/INGO

30. What type of work do you do? (multiple selections acceptable)
   - Advocacy and diplomacy
   - Clearance and detection
   - Demining equipment
   - Fundraising and sponsorship
   - GIS and mapping
   - Humanitarian coordination
   - Information management
   - Mine risk education
   - Policy
   - Program management
   - Prosthetics
   - Personal protective equipment
   - Quality assurance
   - Survey
   - Survivor assistance
   - Training
   - Other, please explain

Thank you for taking the time to provide us with your feedback. It is our goal to continuously improve The Journal so it is the primary resource for issues that are important to our readers.

You may complete the survey online: http://bit.ly/PuQ87N. Or, submit your completed hard copy of the survey by mail or fax for arrival on or before 1 March 2013 to:

Lois Carter Crawford
Editor-in-Chief
The Journal of ERW and Mine Action
Center for International Stabilization and Recovery
James Madison University
MSC 4902
Harrisonburg, VA 22807
Fax: +1 540 568 8176
The Need for Collaboration Between Ordnance Manufacturers and UXO Clean-up Personnel

The ability to locate unexploded ordnance remotely and accurately increases the safety and efficiency of clearance efforts. To achieve maximum effectiveness, UXO manufacturers and removal groups should coordinate resources and information to create new and practical technologies to assist in efforts to identify failure rates and prevent civilian casualties. The Lost Puppy Proposal is one example of a life-saving technology that could result from such collaboration.

by Jack Imber [Imber Demining International]

Long-term danger from unexploded ordnance is a major concern for our generation and future generations. As war and military training continues, the number of munitions used increases, resulting in increased UXO contamination. As new ordnance is deployed, mine action companies will likely fall even further behind in clearance efforts, leading to more threats from explosive remnants of war to civilians and a further reduction in useable land.

ERW causes casualties and prevents land usage long after war is over. For example, in the 32 years (1975–2007) following the end of the Vietnam War, the Ministry of Labor, Invalids and Social Affairs in Vietnam reported that landmine and ERW-related incidents killed 38,849 people and injured 65,852 in Vietnam.\(^1\) The total number remains unknown, due to the absence of a nationwide casualty-data collection system. According to the Landmine and Cluster Munition Monitor, in 2011 there were 31 reported casualties (14 killed/17 injured) and in 2010, there were 42 casualties (8 killed/34 injured).\(^2\)

These casualties are reminders that ordnance life cycles do not always end at military deployment. If ordnance fails to explode as planned against military targets, it may later explode on civilian or explosive ordnance disposal contact, resulting in noncombatant casualties.

Contemporary civilian mine-clearance initiatives began in the late 1990s, in part with MAG’s (Mine Advisory Group) survey efforts in Afghanistan after Soviet withdrawal.\(^3\) Only recently has traditional thought involving the use and subsequent failures of deployed ordnance shifted. Since UXO decay leaves behind explosive, chemical, biological and/or nuclear hazards, as well as heavy metal residue, failed ordnance is considered hazardous waste.\(^4\)

Ordnance manufacturers have not been held accountable like other manufacturers that produce hazardous waste. Ordnance consumers—militaries and nation states—bear responsibility for failed ordnance if they are used contrary to the specifications for the product given by the manufacturer. However, if munitions are used in line with the manufacturer’s specifications, and their failure rates are higher in the field than in testing, the manufacturer should be held accountable. At this point, there is no accurate recording of actual failure rates in the field, and thus this reality is not clearly known.

As any failure may result in post-conflict civilian casualties, even “acceptable” rates that are within the purchase specifications require swift and effective remediation. The absence of sufficient recording of field failure rates has contributed to the largely undocumented deployment of ordnance globally over the last century. In addition munitions have been dumped or abandoned following conflict. This points to the reality that current methods of location, identification and disposal must evolve in order to progress toward efficient land clearance.

Collaboration Across Sectors

The primary goal of a weapons manufacturer is efficiency: Munitions should be safe for the handler and do what they are supposed to do with minimal failure rates. Exact failure rates in real world conditions, historically and currently, are largely unknown. The results seen in testing ordnance are significantly better than the wide variance seen in actual field rates. Where this is not the result of variant factors in the field, UXO contamination remains from ordnance that failed to perform to standard, that is, failed to explode as intended.
Ordnance manufacturers need to know overall failure rates in the field, beyond the limits of their testing. Subsequent reporting of clearance efforts is one of the only ways manufacturers/users can verify failure rates. Knowing these failure rates will help manufacturers improve their product, and eventually reduce these rates. As a result, cooperation between manufacturers and UXO-clearance companies is the next logical step to achieving increased efficiency and safety.

Manufacturers and clearance companies are related by their work with ordnance. The absence of manufacturers in the clearance process is problematic and contributes to contamination challenges today. Collaboration between ordnance manufacturers and clearance firms may lead to the following outcomes, which would benefit all parties involved:

1. Decreased failure rates and thus increased effectiveness
2. Increased safety protocols for handlers and remediation teams
3. Limited hazardous waste from failed ordnance
4. Decreased casualties from failed ordnance
5. Increased avenues to analyze effectiveness of copycat munitions systems not subject under law to the same scrutiny as original models
6. Decreased long-term expenses, as clean-up time and effort would be greatly reduced

Manufacturers and clearance personnel have been engaged in dialogue while attending various conferences. By attending each other’s conferences, understanding of perspectives will improve and may develop into effective and collaborative clearance strategies beneficial to all affected parties. By expanding existing technologies and collaborating in clearance efforts, ordnance manufacturers and UXO-clearance personnel may make a post-conflict country safer within a matter of months rather than several decades.

Lost Puppy Proposal

A potential solution that may effectively address the inability of manufacturers to detect failure rates and facilitate clean-up efforts is a theoretical concept referred to as the Lost Puppy Proposal. To facilitate the collection of failed ordnance, or “lost puppies,” a radio-frequency identification microchip would be placed in both the ordnance and the fuze at the time of manufacture. After deployment of the ordnance, personnel would be able to locate the chip from a distance within any UXO with a compatible detector. The detector receives a numbered code from the chip, which corresponds to information in a secured database that identifies the item for the UXO technician and suggests how best to deactivate it. Similarly, most commercial explosives are required to have “taggets” or other labeling processes so that origins of explosives may be identified when used in commission of a crime. Even if involved military or national actors would not agree to share render-safe procedures with appointed clearance teams, the tool would still be useful as it would significantly ease efforts to locate UXO and would facilitate UXO identification and the calculation of failure rates.

Potentially, manufacturers would adopt this procedure once their customers—i.e., nation states—require it. This proposal’s implementation is dependent upon the collaboration and cooperation between manufacturers, state actors and UXO-clearance technicians. The specific process, technology and databases will evolve through needed communication and understanding of the processes required in each field.

Accountability, responsibility and profitability will be key components of the process:

1. Accountability: identifying ordnance that failed to function, tracking transfers, identifying unused stockpiles of munitions
2. Responsibility: following international humanitarian laws, preventing hazardous waste in the environment, clearing post-conflict countries
3. Profitability: developing more efficient technologies, reducing ordnance failure rates, increasing efficiency and decreasing cost of clearance
The increased cost of production to implement this procedure is transferred directly to the customer, as are all costs of manufacturing. Controlled testing of a prototype technology is the best way to prove the economic viability of this process. Once developed, increasing the volume will decrease the cost. Additionally, as this technology will significantly ease clean up, it will pay for itself many times over through the reduced need for surveys, EOD clearance teams, victim assistance, mine risk education, etc.

As the ordnance consumer becomes familiar with these new protocols of cooperation, certain advantages could be gained from tactical and safety perspectives. For example, with the proposed radio detection chip and the correct detector, quickly assessing the contamination level of a carpet-bombed battlefield of cluster munitions would be possible before sending in a military unit. Statistically, individual bomblets have extremely high failure rates and create a situation similar to scatterable landmines. Another advantage of the proposal is that EOD units responding to improvised explosive devices may be able to remotely locate and identify a piece of ordnance used as the main charge of a booby trap, a major safety advantage.

Using this protocol, which enables clearance teams to gather failure rates and facilitates clearance, the military can discover which ordnance companies deliver the best performing products. This information will help determine who will obtain contracts and ultimately who will assist the military in performing its operations efficiently. The collaboration between ordnance manufacturers and UXO clearance personnel can help all parties reach goals with greater efficiency and, more importantly, save innocent lives.

Where We Are Today

The Lost Puppy Proposal is very timely. Recent advances in microships with radio-frequency technologies, to aid in post-deployment detection, may be suitable for installation in newly manufactured ordnance. The microchip currently is used for inventory of ordnance and nuclear-facility equipment. The technology used in the microchip and detection system has been promoted as explosive- and fuze-safe. It can be easily detected at length through metal and water, should withstand the rigors of deployment and can pass the very crucial Hazards of Electromagnetic Radiation to Ordnance (HERO) standards. Including microchip technology in munitions could contribute to

1. Quickly locating failed and hazardous weapons in the field
2. Identifying UXO items before excavation begins
3. Efficiently eliminating harm to civilian populations

UXO professionals worldwide acknowledge the concept of Lost Puppy as a possible and viable solution. It was presented at the 2011 Parari ordnance conference centered on safety in Brisbane, Australia, to ordnance manufacturers and those involved in UXO remediation. While questions remain about the implementation of such protocol, the consensus at this conference was overwhelmingly positive for the need of a similar solution and for dialogue between related industries. See endnotes page 65.

Operation Lost Puppy Proposal—Maximum Accountability of Explosives (MAX). Drawing and photo courtesy of Julie Pollock.

Jack Imber is a deminer and civilian EOD Level II specialist. He received certification from Texas A&M University in the United States and International School for Security and Explosives Education in the United Kingdom. He participated in more than 22 projects during the last 10 years. In 2005 he founded Imber Demining International, promoting safety education to professional and civilian audiences. He currently works as a consultant promoting more efficient and safe procedures.

Jack Imber
Consultant
Imber Demining International
161 Junco Way
Savannah, Georgia 31419 / USA
Tel: +1 831 236 0402
Email: jack_imber@yahoo.com
Darfur: Baseline KAPB Survey

This article summarizes the first baseline Knowledge, Attitudes, Practices and Beliefs Survey conducted in Darfur since 2003. The purpose of the survey was to gain a better understanding of the knowledge, attitudes, practices and beliefs of the at-risk population in Darfur regarding explosive remnants of war, and to evaluate aspects of transfer of knowledge, use of mass media and surveillance mechanisms.

by Beatrice Winkler and Shaza Ragab [UNAMID]

On the initiative of the African Union/United Nations Hybrid Operation in Darfur (UNAMID) Ordnance Disposal Office the first Knowledge, Attitudes, Practices and Beliefs Survey since 2003 was conducted in 2011–2012 in Darfur to assist with the annual work plan. The KAPB survey was developed and implemented in close cooperation with National Mine Action Centre Sudan, UNICEF, MineTech International and the two national nongovernmental organizations, the Friends of Peace and Development Organization and JASMAR Human Security Organization (formerly known as the Sudanese Association for Combating Landmines).

The KAPB study’s main purpose was to acquire a baseline and direction for the risk education program in order to better adapt risk education to the local context and needs. Under the supervision of UNAMID Ordnance Disposal Office and NMAC Sudan, a total of 1,671 persons (893 female/778 male; 745 children/926 adults) of different subgroups (students, nomads/herders, farmers, teachers, community leaders, workers, etc.) were interviewed between May and July 2012 in 29 different villages and internally displaced persons camps in North, South and West Darfur.

The results of this first baseline KAPB study provided useful information and highlighted several gaps to be addressed by risk-education stakeholders working in Darfur.

Background

In 2003, the Darfur conflict devastated western Sudan’s Darfur region, an area with approximately 7.5 million people of different ethnic groups and covering about 493,180 sq km (190,418 sq mi). As a result of persistent violence and fighting, many people fled their homes; estimates indicate the number of IDPs is 2.2 million.1 Due to ongoing fighting, explosive remnants of war continue to pose a significant threat to the safety and security of residents, displaced and returning populations.

In Darfur, mine action work largely focuses on disposing unexploded ordnance. The changing situation of the Darfur conflict implies high risk of recontamination wherever fighting occurs regardless of previous clearance efforts. UXO, such as mortars, rockets, aerially delivered bombs and grenades, pose a high risk to the individual in terms of casualty and lethality radius due to the large amount of explosives and the fragmentation effect. The reported UXO accidents also involved children, usually boys. In 2011, 122 mine/UXO casualties (32 killed/90 injured) were reported in Sudan.2

Since 2007, risk education teams from two local NGOs, FPDO and JASMAR Human Security Organization, have worked in Darfur under the coordination of the UNAMID Ordnance Disposal Office, NMAC Sudan and UNICEF.3,4 They work to raise awareness of ERW dangers among communities and displaced populations by providing community and school-based risk education through various training and public-information activities.
Methodology

The study took a broad approach, including not only questions regarding knowledge, attitudes, practices and beliefs, but also exploring knowledge transfer and surveillance mechanisms. The study was informed by the *IMAS Mine Risk Education Best Practice Guidebook 2 on Data-collection and Needs Assessment for MRE* and took into consideration recommendations of the *National Technical Standards and Guidelines for Mine Risk Education*.5,6

The final KAPB questionnaire, which was translated into Arabic and pretested on a small sample in the El Fasher rural area and in two IDP camps, consisted of 50 questions, each with short instructions for the interviewers. The survey contained questions for quantifiable data but also left space for individual additions and comments from the respondents, allowing more flexibility and maximizing data reliability by avoiding typical and normative answers.

This research required a two-stage geographic cluster sampling approach with the selection of different subgroups according to probability proportional to size. In Darfur, children represent one of the main at-risk groups, and the population aged 16 or younger makes up 47 percent of the population.7 For these reasons, interviewers were encouraged to include at least as many children as adults. Other subgroups of interest for this study were men and women in general, boys and girls, religious or community leaders, teachers, nomads/herders and farmers.

The KAPB questionnaire was administered in the three states of North, South and West Darfur, in six different localities (El Fasher, El Geneina, Jebel Moon, Kass, Marshang and Sirba) and 29 different cluster locations. In Darfur, 50 percent of the population is living in the triangle comprised of El Fasher, Nyala and El Geneina, and this area contained most of the clusters. However, interviews conducted in IDP camps managed to capture data from many different locations that might be ERW-affected.7 The interviews in El Fasher ZamZam IDP camp for example were conducted in the clusters of new arrivals from heavily ERW-affected areas such as Shangil Tobay, Dar al-Salaam, Tukumare, etc. In this way, teams gathered information from a wider area than just the El Fasher locality.

Prior to data collection, all survey workers received a two-day training in data collection for KAPB survey, enabling workers to practice and gain a good understanding of the survey’s purpose, the data-collection tool and interview standards. After the training, a short two-week pilot was conducted in North Darfur with IDPs in the ZamZam IDP camp. The pilot information and methodology was then revised to support better conduct of the survey.

Findings

All Sudanese residents, but especially those from West Darfur, perceive ERW as one of the main problems facing their communities. The real threat present in the survey locations and the people’s knowledge of ERW seemed to influence overall attitudes. Respondents in West Darfur felt the worst affected: 38.7 percent considered ERW to be one of their main problems, 74 percent indicated the presence of ERW in their village and many people explicitly requested clearance of their villages and surroundings. People interviewed in IDP camps did not seem to face ERW threats, and as they tend to stay there for long periods (6–10 years on average in South Darfur), some respondents suggested focusing risk-education activities more on ERW-affected villages than IDP camps.

The findings indicated that mostly boys, farmers, herders/nomads, and to a lesser extent men and people collecting water or wood, go to ERW-affected locations, therefore exposing themselves to risks. The finding that boys constitute the primary at-risk group is further confirmed by the responses on ERW incidents, which showed that most casualties involved boys (58.5 percent) and happened while they either tended animals (35.8 percent) or tampered with UXO (34.1 percent). A high number of children interviewed are out of school, especially in West Darfur, and they work mostly as herders and farmers. For this reason, complementary to school-based risk education, targeted risk education activities need to be provided to out-of-school youth.

With regards to the most appropriate channels for providing risk education, the results show that people in Darfur,
both children and adults, generally acquire new information through community leaders, radio, family and friends, and circulate it within their community, mainly among friends, family and neighbors. Television is not a main source of information (only 7.8 percent), nor are newspapers (2.7 percent). Around 62.7 percent of all respondents listen to the radio at different frequencies, mostly in the morning and evening. The most popular radio station in Darfur is Omdurman radio. El Fasher radio is the most popular station in North Darfur, Nyala radio in South Darfur and El Geneina radio in West Darfur. Dabanga is also very popular in all three states, whereas respondents only seldom listened to Al Salam radio, the shortwave channel UNAMID radio uses. Possibilities should be further explored to use the most popular radio channels for dissemination of risk education messages.

Another clear finding this study highlighted is the need for a strong focus on community liaison. Community and religious leaders, especially sheikhs and umdas play a very important role in the transfer of knowledge. These leaders receive information first and constitute one of the main two sources of information for the communities. They are widely trusted and are the best-informed (besides military and police) about ERW presence, accidents and victims. Of the 1,671 respondents, 165 mentioned that they would prefer to get awareness messages from sheikhs/umdas and suggested that the teams work more closely with them.

Information about UXO dangers was considered very useful by a vast majority of people whom previously received such information through different means (36.9 percent of the whole sample previously received information mostly through posters, briefings and presentations, etc.). Most beneficiaries indicated a subsequent change of behavior as a result of the information received: They now mainly stay away from ERW (49.5 percent) and avoid dangerous areas (42.8 percent). Despite possible courtesy bias, this shows that risk education messages have had a positive impact. Direct presentations and materials were also considered appropriate ways for raising awareness. However, due to rather high illiteracy rates (38.8 percent of the whole sample, 92.5 percent of nomads/herders, 50.2 percent of all women interviewed), risk education materials used in Darfur should consistently provide clear visual messages.

In terms of ERW knowledge, the findings point out that the majority of respondents—adults and children,
female and male—are mostly aware of the danger of ERW (92.8 percent) and know that an explosion may lead to death (81.7 percent). However, in most cases this knowledge is not complete enough to allow for full risk-minimization. After having received awareness messages in different ways, less than 40 percent of children and adults knew the most common events that cause an ERW to detonate. Of those who received risk education messages, 13.8 percent still thought carefully picking up an ERW was safe, and 48 percent of the children who had previously received risk education messages did not know that tampering with an ERW could lead to an explosion. These findings illustrate that risk education messages need to include more complete, clear and precise information on what leads to ERW explosions and the potential consequences of explosions to humans, as well as information about safe and dangerous behaviors.

The findings also demonstrate that more than just a lack of knowledge leads to dangerous risk behaviors. Well-intended efforts to eliminate dangers for others by burying UXO result in dangerous risk-taking. Furthermore, a number of persons—14.9 percent of all respondents—in 25 survey locations also showed intentional exposure to UXO through the following activities:

- Collecting ERW for future use and income generation
- Using ERW for distraction (making fireworks with ERW, using ERW as toys for kids)
- Substituting ERW for certain items, such as school bells
- Using parts as bracelets, necklaces, kitchen tools, agricultural tools, including using warheads of rocket-propelled grenades as bells and jewelry for animals (especially in West Darfur)

Despite known local marking signs and methods, the findings showed that marking is not broadly practiced. Especially in West Darfur, people mentioned that marking would attract people to the ERW instead of protect them from it. They preferred to bury the UXO, a dangerous practice that just recently resulted in a deadly incident, killing a farmer.

The fact that incidents were mentioned in 28 out of 29 cluster locations confirms the assumption that the number of ERW deaths and injuries is actually much higher than recorded in the Information Management System for Mine Action due to lack of direct reporting of ERW presence and incidents to NMAC, U.N. bodies or national risk education teams. NGOs working in risk education were only rarely informed of incidents, making it all the more important to build strong links with the communities for better surveillance and victim assistance. In response to incidents, risk education teams mainly conducted awareness sessions and did not systematically collect information about the incidents. As part of their community liaison efforts and for the benefit of the other pillars of the mine action program, risk education teams should put more emphasis on collecting information about incidents and the victims.

Conclusion

Most people in Darfur are aware of ERW dangers, but their level of knowledge often does not suffice for full risk minimization. Communities that had previously received awareness information generally considered risk education very useful. Direct community or school presentations were broadly accepted and considered appropriate ways for raising awareness.

The study showed that there is still potential for better outreach to at-risk communities by using more appropriate channels, better targeting the activities to affected areas and at-risk
groups, and providing more complete, precise and suitable messages. Reinforcing community liaison and broadcasting radio messages via the most popular radio stations seem to bear great relevance in the search of higher risk education impact in Darfur.

Since UXO are used as substitutes for everyday items, and everyday items are even available in the shape of ERW—in El Fasher markets, cigarette lighters in the shape of hand grenades were found in the period of data analysis—traditional message-based approaches alone may not be sufficient to achieve behavior change. Risk education messages should be communicated with pertinent materials and a range of activities addressing the underlying vulnerabilities which lead to such voluntary exposure to UXO risks.10,11

See endnotes page 65

Beatrice Winkler was risk education coordinator for MineTech International within the UNAMID Ordnance Disposal Office in Darfur, Sudan from July 2011 through October 2012. She has experience in the fields of humanitarian assistance, communication and protection. She worked for local NGOs and international organizations, including the International Committee of the Red Cross and also started up a freelance project for young women in Syria. Winkler holds a degree in translation and cultural studies from Zurich University of Applied Sciences, Switzerland and a master’s degree in international humanitarian assistance from the Universidad de Deusto, Bilbao, Spain.

Shaza Ragab is a Sudanese national and has been the regional risk education assistant in the UNAMID Ordnance Disposal Office in Darfur since 2008. Ragab holds a university degree in English and literature as well as a diploma in teaching methodologies from Shendi University in Shendi, Sudan. She previously worked as a teacher and gained extensive experience in risk education as a trainer and team leader for Friends of Peace and Development Organization and the Association for Aid and Relief Japan, working in Kassala state and South Kordofan state in eastern Sudan.

Grenade Depot Blast Kills 25 in Turkey

Examiners continue investigating the 6 September 2012 blast that killed 25 soldiers and injured four more at a Turkish ammunition depot in the western province of Afyonkarahisar, Turkey.1 The Minister of Forestry and Water Affairs, Dr. Veyssel Eroglu, ruled out terrorism as a motive and said that a hand grenade was likely accidentally dropped as soldiers conducted a stock check at the depot, causing the explosion and ensuing blaze.2

The blast shattered windows in nearby homes, and civilians were encouraged to stay away from the area. Emergency services initially found it difficult to access the scene due to scattered unexploded ammunition and a large fire that burned at the depot for several hours. The military also needed to carry out controlled explosions and cordon off areas for safety purposes before emergency services could reach the scene.1,3

Haldun Solmazturk, a retired military officer, commented that the stock check should not have been conducted at night and that the number of soldiers who participated seemed higher than the number needed for a standard stock-checking procedure.1 President Abdullah Gul called for a full investigation into the incident.3

Those wounded in the blast were sent to a military hospital, while a local school set up facilities to assist families and residents of the affected area.2 The blast occurred late Wednesday evening, and the area was safe for residents to return to the next morning.2

~ Elisabeth Reitman, CISR staff

See endnotes page 65
Handicap International’s Risk Education Challenges

Handicap International advocates an integrated approach to mine/explosive remnants of war education that on one hand involves participants ranging from actors in the field to national and international policymakers, and on the other hand includes all pillars of mine action. This article examines some prominent challenges facing these practitioners.

by Valentina Crini [Consultant]

In February 2011, I monitored a mine and explosive remnants of war risk education session at a primary school in Ziguinchor, in the Casamance area of Senegal. During an awareness-raising session in class performed by Handicap International’s local partner, Association Sénégalaise des Victimes des Mines (Senegalese Association for Mine Victims), one of the students reported that he saw a suspicious object in the forest while collecting wood for his family. ASVM’s risk education agents promptly informed the Senegalese National Centre for Mine Action, which then phoned HI’s chief of operations. The suspected dangerous item was checked the same day and found not to be dangerous.

This is an example of collaboration between mine action actors at local levels and the community based reporting system technique, which is the clear result of an integrated approach by various mine action stakeholders in Casamance, such as HI, the national mine action center and ASVM, a local nongovernmental organization supported by HI. While the suspected dangerous item was not a mine or ERW, this story highlights how well the reporting mechanism worked. Similarly, HI’s integrated approach continues successfully at the field level in many countries. HI has a holistic response to mine/ERW contamination, linking interventions in advocacy, victim assistance, clearance and risk education to achieve positive impacts on affected populations.

Risk Education Challenges

While the integrated approach has been theorized and widely applied, current challenges in the mine risk education sector are still not properly discussed at international and national levels. As a result, risk education practitioners and mine action actors also do not address them appropriately.

Completion deadlines. As is widely known, several countries, including Mozambique and Uganda, are approaching the end of their mine action activities, while others are already mine free, such as Malawi, Nigeria and Rwanda. Despite this triumph, additional questions often remain: How will the affected populations and national and local authorities face the residual risks? What precautions will reduce the risks of potential accidents?

HI is working on this issue in Uganda. HI’s risk education/community liaison activities ended in conjunction with the completion of mine clearance in July 2012. HI coordinated a handover of its responsibilities to Ugandan national and local authorities, including

- Monitoring and supporting established, trained and equipped Community Focal Points to continue the community based reporting system and risk education sessions
- Managing the free hotline the population uses to report suspicious objects or mine/ERW accidents
- Consolidating a local referral system linked to the Uganda Mine Action Centre
In the final stages of its engagement in Uganda, HI will assist UMAC as much as possible in these tasks.

Other questions often arise as countries near completion of mine clearance: What initiatives do national and local authorities identify and plan? How can international NGOs support them? International standards for residual clearance and related activities after a country is mine-impact free have yet to be established.

Sustainable livelihood alternatives for risk reduction and management. Following the results of several Knowledge, Attitudes and Practices surveys implemented by HI from 2007–2012 in Afghanistan, Iraq, Laos, Senegal and Uganda, the main gaps largely concern the behaviors of mine/ERW affected people. After years of exposure to mine/ERW risk education sessions, the level of knowledge and awareness of at-risk and risk-taking groups improved. However, economic and social needs still pose real obstacles to the application of safe behaviors, creating a dangerously high likelihood of munitions incidents. Those working in mine action need to better address this particular point, not only through improved coordination with development actors, but also with risk-education/community liaison meetings where affected communities participate in identifying and implementing alternative solutions for serious risk reduction in the medium- to long-term future.

One such example is HI’s project to link mine action and development in Bosnia and Herzegovina, called Participatory Mine Action and Development in Stolac and Berkovici municipalities. Launched in 2007 and financed by the Swiss Agency for Development and Cooperation and more recently by the Direction de la Coopération International Principauté de Monaco (Directorate of the International Cooperation, Principality of Monaco), this project promoted socioeconomic development by working with local communities to identify their priorities using a systematic and participatory approach, which directly involves them in decision-making. In total, 16 communities benefited from the project activities, which largely focused on promoting agriculture, tourism, community infrastructure, irrigation and social inclusion. Where mine/ERW contamination was identified as a development constraint, program funding was allocated to mine action.

Risk education rapid response during emergencies. NGOs have improved their capacity and planning for quick response in the last few years, as per the recent interventions in Gaza, Libya and Mali where the mine action actors successfully integrated emergency relief efforts. However, mine action organizations still face issues that require better coordination, strategic solutions and more discussions between relevant risk education actors, including

- Lack of guaranteed access to highly unstable contaminated zones
- Understanding of the national government’s role
- Implementation of proper data collection processes in conflict zones
• Rapid deployment of human resources and partner organizations
• Relationship and coordination with armed violence reduction activities
• Rapid adaptation and contextualization of awareness-raising materials for mass distribution

To facilitate a quick response, HI emplaced guidelines and a tool kit for its project managers and field staff. This tool kit includes guidelines, a sample poster and leaflet, and notebook for children, as well as a CD-ROM of the information. The guidelines explain in which context to intervene, for whom, for how long and through which communication channels information should be disseminated. The tool kit provides practical and straightforward support to any HI project manager for implementing risk education activities in a timely and efficient manner during an emergency phase, taking into consideration the different emergency contexts (for example, new contamination, a natural disaster or the stabilization of a long-term conflict).

The tool kit is created for interventions in four main geographical areas of the world (two areas in Africa, one in Eastern Europe and one in Southeast Asia), where emergencies are likely to occur. These emergencies consist of any types of landmine/ERW related catastrophes that could pose a threat to the population.

The tool kit also includes a sample of a radio and television advertisement script, a field-test questionnaire and simplified data-collection forms. The goal is making a base of awareness-raising materials easily and rapidly adaptable to various countries and emergency contexts. The tool kit was successfully tested in HI emergency projects in Pakistan and Libya, and it helped improve HI’s risk education rapid-response capacity.

Monitoring and evaluation of risk education interventions. Improved and adapted Knowledge, Attitude and Practice surveys and impact assessments have advanced impact monitoring methodologies and tools. However, much remains to be done and agreed upon when evaluating the long-term effects of these activities. NGOs and U.N. agencies created and consolidated their monitoring and evaluation processes for risk education, but no standards and common methods or tools were discussed or developed in a participatory and systematic way. The amended Guide for the Application of International Mine Action Standards and the Landmine Casualty Data: Best Practices Guidebook contain
chapters on the matter, but they mostly set minimum principles, give general suggestions and assign responsibilities among stakeholders. A shared practical guideline for practitioners on how to implement monitoring and evaluation activities in the most efficient way is missing. This guideline should consider the specificities of MRE activities and their links with other mine action, emergency and development interventions. Risk education can, in fact, be implemented in several different country contexts, and we should have an agreed way of evaluating progress and results for each. Depending on the local and national needs, education initiatives and activities are integrated differently, all of which require different evaluation monitoring tools and procedures. Systemizing the different procedures needed for the various situations is necessary to objectively evaluate the results.

“Effective and locally-owned MRE is not sufficient to encourage them [local residents] to stop high risk behaviors. As a result, there is increasing recognition of the need for new approaches to reducing risk. These should be linked to livelihood assistance and enterprise development opportunities, to discourage risk-takers and provide them with other livelihoods.”

~GICHD

Conclusion

All of these challenges, and more, should be better discussed and appropriately analyzed at international and national levels. Potential solutions can be envisaged and evaluated for maximizing the impact of risk education interventions by each stakeholder. A formal space for practitioners to exchange ideas, good practices and lessons learned about risk education activities is needed.

Risk education practitioners meet informally during the Member State Parties conferences, during their missions in the field and by exchanging information through email when possible. However, this is clearly not enough. Practitioners need a formal space where they can analyze situations, discuss methodologies and opinions, compare practices, and share lessons learned to benefit each and every organization and individual working in the sector and to maximize the efficiency and effectiveness of all interventions in the field, for the sake of beneficiaries.

This article is dedicated to the loving memory of Rachid Dahmani, HI’s key member of the Risk Education/Victim Assistance project team in Algeria, who died in 2011.

Valentina Crini was Handicap International’s risk education/community liaison technical advisor and is now a consultant with 10 years’ experience in the mine action sector, particularly in coordinating, managing, evaluating and supporting risk education programs and knowledge, attitude and practice surveys worldwide. Crini has a Master I Level in political science and a Master II Level in peacekeeping and security studies. She has worked in risk education with international NGOs and with UNICEF as a consultant in Afghanistan, Algeria, Angola, Bosnia and Herzegovina, Chad, Lebanon, Niger, Senegal, Tajikistan and Pakistan.

Valentina Crini
Mine/ERW Risk Education and Survey Consultant
Viale del Tintoretto 88
00142 Rome / Italy
Mobile: +0033 617196851 / +0039 333 7119248
Fax: +39 (0) 64 469 29 0
Email: valecrini@yahoo.com
Website: http://www.handicap.international.org

Published by JMU Scholarly Commons, 2012
Mine/ERW Risk Education in Afghanistan

Afghanistan continues to face many challenges from landmines and explosive remnants of war. The Mine Action Coordination Centre of Afghanistan and its many partners coordinate to reduce risk for affected communities. Teacher training, mass media and a revamped mine risk education curriculum for schools are important facets of recent efforts. In addition, regular monitoring of MRE ensures quality education for all citizens in at-risk areas.

by Samim Hashimi [Mine Action Coordination Centre of Afghanistan]

Mine/explosive remnants of war risk education refers to all educational activities seeking to reduce mine and ERW injuries by raising awareness and promoting behavior changes among at-risk groups. The objective of MRE is to provide sufficient information to recognize and report these items to the appropriate authorities. The authorities can then remove the items, making the area safe for people and creating an environment where economic and social development can occur free from the constraints imposed by contamination.

The Mine Action Programme in Afghanistan represents the 40 nongovernmental organizations working in humanitarian mine action in Afghanistan. MAPA is involved in every aspect of mine action, including advocacy, clearance, stockpile destruction, victim assistance and MRE. After Coalition Forces ousted the Taliban-controlled government, the Afghan Transitional Authority asked the United Nations to assume control of mine action in Afghanistan. In 2002, the Mine Action Coordination Centre of Afghanistan, funded by the United Nations Mine Action Service, assumed national responsibility for the coordination of all mine action activities throughout Afghanistan, with the eventual objective of returning responsibility to MAPA. Despite MACCA assuming command of MRE and victim assistance projects, progress to assume accountability over the country’s mine action has been slow.

MACCA’s MRE operations within Afghanistan are based on the ability to
- Understand the mine/ERW threats to communities and individuals
- Identify vulnerable or target groups
- Provide appropriate and targeted messages
- Confirm new knowledge used in MACCA/MAPA annual planning and priority settings

Afghanistan’s Landmine and ERW Challenges

Based on recent MACCA analysis,
- ERW and landmines injure or kill 40 people each month, and 65 percent of these victims are children.
- More than 75 percent of casualties occur while playing or tampering with/collecting scrap metal.
- Mines/ERW contaminate 563 sq km (217 sq m) of Afghanistan’s land, affecting 1,847 communities.
- Large numbers of internally displaced persons and returnees from Pakistan and Iran face increased risks from the ongoing conflict and the possibility of moving/returning to contaminated land.

These problems will continue affecting Afghanistan for years to come. MACCA works with the Department of Mine Clearance and other government entities, in particular the Ministry of Education, to provide technical and management support to assist the government of Afghanistan. MACCA focuses on building national capacity for oversight and
Coordination of MRE activities within its designated mine action focal point, the Department of Mine Clearance under the Afghanistan National Disaster Management Authority.

**Developing Community Based MRE**

Before 2003, MRE activities were not standardized within MAPA. Each MRE implementing partner used its own methodologies and materials when delivering MRE. In order to ensure that MAPA’s MRE activities met national standards for Afghanistan’s MRE, MACCA started working with MAPA MRE-implementing partners and UNICEF.

In 2003, MAPA’s MRE program shifted from an emergency modality to a long-term, community based approach. This program was designed using the standard mine/ERW package developed by MACCA/MAPA in 2003 to ensure all MAPA MRE activities are coordinated under the MACCA umbrella and comply with the new standards package (guidelines and materials) in Afghanistan. This coordination also enabled the creation of a network of community volunteers throughout Afghanistan to act as focal points for mine/ERW-related issues.

The community based MRE program aims to understand the needs of mine/ERW-affected communities, provide MRE and training for community members and volunteers, and link mine action and the affected communities to ensure the awareness of threats posed by mines/ERW. The program also encourages community members and volunteers to mobilize, take responsibility for their safety in mine/ERW-impacted areas, educate others on mine/ERW risks, liaise with survey, demining and MRE mine action teams, and share any recent changes with their communities, in particular by reporting mines/ERW as well as new hazards/minefields.

The community based MRE program consists of the following MAPA mine/ERW risk education implementing partners:
- Organization for Mine Clearance and Afghan Rehabilitation
- Afghan Red Crescent Society
- Association for Aid and Relief
- Mobile Mini Circus for Children
- Danish Demining Group

MACCA conducted two Knowledge, Attitudes, Practices and Beliefs surveys in Afghanistan in 2004 and 2005 and another KAPB survey in 2009 and 2010 to assess the impact of mine/ERW-risk education on affected communities as well as returnees. The KAPB surveys highlight target areas for future MRE programming.

Following the community based MRE program, all MAPA MRE implementers and other entities including the Ministry of Education, community networks and media, made an effort to extend MRE’s reach using standard messages and materials distributed through religious leaders, the Swedish Committee for Afghanistan, UNICEF vaccination teams, police officers and community based first-aid volunteers of the Afghan Red Crescent Society networks.

From 2010–2011, MACCA and the Department of Mine Clearance, under the supervision of the Afghan National Disaster Management Authority, began working with the Ministry of Information and Culture, the Ministry of Religious Affairs and the National Solidarity Programme. This last organization works under the Ministry of Rural Rehabilitation and Development and has 29 facilitating partners in Afghanistan to support MRE activities. Joint field visits and spot checks started in collaboration with the Ministry of Education, the Department of Mine Clearance and area mine action centers to monitor MRE activities and ensure MRE teams were allocated to the most-affected communities. In 2010, MACCA began working with the Ministry of Education’s Educational Radio and Television to release MRE radio and TV advertisements.

MACCA, in collaboration with the Geneva International Centre for Humanitarian Demining, Afghanistan’s Ministry of Rural Rehabilitation and Development, and MAPA implementing partners, facilitated the Mine Action Sustainable Livelihoods Surveys (2010–2011). The results of the surveys indicate the requirements for prioritization of mine action programs and specify the need to target specific groups with MRE, e.g., reaching women in their homes through MRE female teams and distributing additional MRE materials in contaminated communities.
Priority Settings for Mine/ERW Risk Education

As seen in the previously mentioned surveys, MACCA continuously analyzes MRE activities with the intent of improving outreach and outcomes. Communities are classified according to their MRE needs. Any community where an incident has occurred every year for the past five years (called a killing zone) is automatically classified as high priority. The classification of remaining communities is dependent on scores resulting from the indicators shown in Table 1.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victims recorded in the last 24 months (score is per victim, not per accident)</td>
<td>3</td>
</tr>
<tr>
<td>Community with no school</td>
<td>1</td>
</tr>
<tr>
<td>Community with ERW (because more accidents result from ERW than mines)</td>
<td>2</td>
</tr>
<tr>
<td>Community with mines</td>
<td>1</td>
</tr>
<tr>
<td>Community with cumulative hazards smaller than 200,000 sq m</td>
<td>1</td>
</tr>
<tr>
<td>Community population &gt; 200 families</td>
<td>1</td>
</tr>
<tr>
<td>Casualties aged 18 or younger</td>
<td>1</td>
</tr>
<tr>
<td>Casualties resulting from “playing”</td>
<td>1</td>
</tr>
<tr>
<td>Casualties resulting from “traveling”</td>
<td>2</td>
</tr>
<tr>
<td>Communities with minefields within 1 km of the community center</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1. Community need indicators for risk education and associated scores.

Communities without schools are given higher priority, as they are less likely to have access to MRE through the Ministry of Education system. MACCA's casualty data from the last year shows that ERW rather than landmines caused more than 75 percent of casualties; therefore, ERW-contaminated communities are given higher priority than communities containing only mines.

Indicators 5 and 6 in Table 1 are based on factors from the Survey Action Centre’s Victim Prediction Model, which indicates hazards smaller than 200,000 sq m (49.42 acres) are more likely to cause incidents than hazards larger than 200,000 sq m, and that affected communities with more than 200 families are also more likely to suffer from accidents. After adding all indicators, communities scoring above six are designated high priority; those between four and five are medium priority; and communities scoring three or under are low priority.

Teacher Training

In 2008, MACCA trained 122 Ministry of Education child-protection officers to train schoolteachers in MRE. In turn, these schoolteachers provide MRE activities to protect the lives of students, fellow teachers and community members. Participants are instructed to report dangerous objects and mine/ERW incidents in their areas to MACCA regional offices and the Department of Mine Clearance. The Ministry of Education child-protection officers trained 19,756 teachers, in approximately 9,000 schools throughout Afghanistan (17,451 male teachers and 2,305 female teachers). These trained teachers also received MRE kits to use in their classrooms. Recently, a joint action plan was developed between MACCA/the Department of Mine Clearance and the Ministry of Education to monitor the implementation of MRE activities within target schools.

MRE lessons appear in textbooks that are printed and distributed to most of the target schools throughout the country. MRE messages have been translated into the Pashto and Dari languages and integrated into the new national curriculum for grades seven to nine (ages 13–15). The MRE lessons include “Malumat-e-Madani,” a program that teaches Afghan children about social issues. MRE messages were also integrated into the curriculum for grades 10–12 (ages 15–18). Integrating MRE messages in grades one to six (ages seven to 12) was delayed due to recent changes the Ministry of Education is making in textbooks; these textbooks are expected to be published after the changes are finalized in 2013.

MACCA and the Department of Mine Clearance provide technical and management support aimed at the development of the Ministry of Education Mine Action/MRE Directorate. Ministry of Education mine action advisors are responsible for the national curriculum, school and textbook development, continued teacher training and monitoring of MRE activities in schools. The Directorate ensures that the child-protection officer project is implemented to

- Provide MRE training for new teachers/new schools
- Conduct refresher trainings and distribute MRE materials to trained teachers throughout Afghanistan
- Regularly monitor MRE activities in Afghanistan
- Report regularly to MACCA and the Department of Mine Clearance on MRE activities within the Ministry of Education, including Directorate and Educational Radio and Television of Afghanistan activities as well as field and mission reports.

<table>
<thead>
<tr>
<th>Region</th>
<th>Trained Teachers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Central</td>
<td>3,653</td>
<td>801</td>
</tr>
<tr>
<td>Northeast</td>
<td>3,203</td>
<td>236</td>
</tr>
<tr>
<td>East</td>
<td>2,728</td>
<td>40</td>
</tr>
<tr>
<td>South</td>
<td>1,194</td>
<td>92</td>
</tr>
<tr>
<td>Southeast</td>
<td>2,109</td>
<td>142</td>
</tr>
<tr>
<td>North</td>
<td>2,784</td>
<td>587</td>
</tr>
<tr>
<td>West</td>
<td>1,783</td>
<td>407</td>
</tr>
<tr>
<td>Grand Total</td>
<td>17,454</td>
<td>2,305</td>
</tr>
</tbody>
</table>

Table 2. Number of teachers trained by region in Afghanistan since 2008.

Mine/ERW Risk Education Materials

The mine/ERW training materials and kits are equipped with 10 activity cards that each present a key message: sev-
Board games and graphics reinforce MRE lessons.

Mass Media

To reach the general public and provide MRE messages in remote or insecure areas, in 2003, mass media began broadcasting MRE messages at different times on different days and through different radio and TV channels.

The MACCA MRE department and partner NGOs, including the Association for Aid and Relief, Japan, developed the MRE radio messages, which are broadcast through local public and private radio stations, on national TV and in government newsletters. To date, 443 radio programs and 12 TV advertisements were developed and broadcast through national radio and TV, as well as Aryana, Arman, Salam Watandar, Killeed, Takharistan and Lahza radio stations. Countrywide coverage focuses on areas with high impact and communities with no or limited access to MRE teams in the southern, southeastern and eastern areas.

The MRE radio and TV ads target community members, particularly children. The media spots focus on risky behaviors according to the MACCA/MAPA victim data and risk analysis. They are transmitted in local languages: Dari, Pashto, Uzbeki and Balochi. In addition to these regularly programmed messages, more than 10 radio and TV messages were developed and broadcast supporting the annual International Mine Awareness Day and other mine action related events.

Quality Assurance

MACCA continues the review and updating of Afghanistan Mine Action Standards for MRE. The MACCA MRE department ensures the accreditation of MRE implementing partners through a desk and field review process and provides feedback to the MACCA Quality Management department and MRE implementing partners.

To ensure the overall quality assurance of MRE activities, MACCA’s MRE/Victim Assistance department and the Department of Mine Clearance conduct regular monitoring missions of MRE field activities. The MRE department conducts regular MRE technical working group and materials development review activities, providing a venue for MRE agencies and the government to discuss planning, methodologies, materials development and implementation.

Conclusion

Following 20 years of MRE delivery, MACCA conducted an evaluation of its MRE activities in 2012 through an independent organization, Samuel Hall. The evaluation assessed the effectiveness of MACCA’s MRE approaches to change public behavior. The final report is available on MACCA’s website. An action plan was developed with MAPA implementing partners to execute the recommendations to further strengthen Afghanistan’s MRE activities.

See endnotes page 66
Healing the Wounds of War: Victim Assistance in Post-conflict Burundi

Although violence in Burundi has subsided, the majority of the survivors still suffer from psychological trauma, including depression, poor self-esteem and anxiety. To manage these negative effects, the Centre d’Encadrement et de Développement des Anciens Combattants (Training Centre for Development of Ex-Combatants) initiated a peer-support program to help ex-combatants solve their challenges as a group. James Madison University’s Center for International Stabilization and Recovery and Action on Armed Violence worked with CEDAC on this peer-support program. The program is funded jointly by the Stavros Niarchos Foundation and AOAV.

by Cameron Macauley [CISR]

Since its independence in 1962, Burundi has been plagued by periodic violence resulting from ethnic and political divisions, which reached a peak during the mass killings of 1993 and led to years of instability. Violence subsided with the 2008 peace accord, but many Burundians are left with permanent scars, long-term poverty and few social services. In a 2007 “satisfaction with life” study conducted with data from 178 nations, Burundi ranked last.

In recent years international aid agencies, including World Vision and HealthNet TPO, a Dutch aid agency affiliated with Médecins Sans Frontières-Holland (Doctors Without Borders), have implemented new programs to help Burundians learn how to recover from past traumas and assist one another. Psychosocial support promotes autonomy and empowerment among survivors who may have spent years as forced conscripts, refugees or political prisoners—situations in which they had no control over their lives. For these survivors, psychological recovery is facilitated by engaging in new activities designed to enhance self-esteem while generating income and interacting with others in a positive environment.

CEDAC

An example of this approach is the program operated by the Centre d’Encadrement et de Développement des Anciens Combattants (Training Centre for Development of Ex-Combatants), a Burundian nongovernmental organization established in 2005. Its founder, Eric Niragira, is a former child soldier with first-hand knowledge of the helplessness many ex-combatants experience upon demobilization. “You’ve spent so many years being told what to do and when to do it that your own initiative disappears,” he says. “Once demobilized, you find yourself in a country with few opportunities for education or employment, and that feeling of powerlessness persists.”

Niragira himself struggled during the post-conflict years to learn English and find funding to start CEDAC. His goal was to unite ex-combatants to solve their problems as a group, so that they could support each other just as they had during the
The Burundian crisis—known in Burundi as la crise. This peer-support strategy is a central feature of many psychosocial support programs and is gaining wide acceptance as a cost-effective means of promoting recovery in post-conflict settings.7,8

CEDAC began by gathering female ex-combatants into groups where they could discuss concerns and experiences. Very often these discussions focused less on psychological trauma and more on practical concerns such as poor housing, illiteracy, unemployment and illness. Advice and information from peers suggest sensible options for solving problems, and problem-solving builds self-esteem. Moreover, helping others is fulfilling. These peer-support groups counteracted the humiliation and helplessness that people experienced during the war.

Niragira also wanted to provide assistance for ex-combatants who were so depressed and withdrawn that they would not attend group meetings. He sought to train survivors so that they could offer not only friendship but individual counseling as well. He also wanted to include survivors with disabilities in his program. In 2010, CEDAC formed a partnership with the Center for International Stabilization and Recovery at James Madison University.

**Peer Support Programs**

Starting in 2011, CISR trained peer-support workers and other CEDAC staff so they could in turn conduct their own trainings.9 One of the obstacles CISR faced was how to instruct peer-support workers who could not read or write. Literacy in Burundi is around 77 percent for the 15- to 24-year-old age group; however, it is significantly less for those over 24 and for persons with disabilities.10 This means that many survivors in their thirties and forties cannot read or write, especially those living in rural communities. CEDAC did not want to exclude peer-support worker candidates who are not literate; therefore, CISR developed a curriculum that did not rely on reading and writing. Exercises and presentations had to be entirely verbal while recognizing that the participants were adults with significant life experience.

The training of peer-support workers was only the first step. In order to implement a full-scale psychosocial support program, CEDAC also created an administrative structure to ensure the provision of quality services. Peer-support workers needed supervisors to whom they could refer survivors who had complex issues to resolve. Supervisors had to be familiar with other agencies and institutions that assist survivors in need of health care, education, employment and legal issues. All of this required a reliable system of communication and transportation.

Additionally, a program of this kind needs monitoring and evaluation to learn what works and what does not. This depends on data collection by literate peer-support workers who record information about survivors for their supervisors to analyze, including periodic mental health assessments to determine if survivors are benefiting from peer support.

In late 2011 another partner entered the picture: Action on Armed Violence, a London-based NGO formerly known as Landmine Action. Its work in Burundi began with an interest in controlling the large numbers of handguns, rifles and grenades that remained in the hands of citizens following the
conflict. These weapons contribute to violent crime and political instability.

AOAV identified psychological trauma as one of many motivations that lead to acts of violence and felt that CEDAC’s peer-support program could help mitigate anger, bitterness and the desire for revenge—commonly felt by people experiencing unresolved traumatic stress. AOAV decided to conduct a baseline population survey to examine mental health indicators as well as socioeconomic conditions in the communities where CEDAC works. AOAV also stepped in to provide mobile phones for all of CEDAC’s peer-support workers and bicycles for supervisors, therein providing the communication and transportation necessary to facilitate the program.

The results are impressive. Although quantitative data is still being compiled, interviews with 16 randomly selected survivors showed that participants have enthusiastically positive opinions of the services received.

“I have been lonely and sad since I lost my arm during the violence that devastated my community. A woman with one arm is nobody—people act as if she doesn’t exist. But my peer-support worker cares about me, wants me to feel better. She has made me think about myself differently. When I talk to her, I feel as if my life has meaning once again.”

~ Languide Nsabiyumwa

For peer-support workers, work days are long and strenuous as many homes are remote and accessible only on foot. Yet, the rewards of helping others make every step worthwhile. “Even when I’m not working, I think about the people that I’m trying to help,” said Candide Nsabiyumva. “Knowing that I can make a difference in their lives is an inspiration for me.”

CEDAC collected monitoring and evaluation data on hundreds of survivors that will be analyzed during the next few months and used to improve program activities in 2013. “Each day brings new refinements to this program,” says Eric Niragira. “We look forward to expanding into new communities and eventually helping the entire nation. We are assisting each other to recover from Burundi’s violent past.”

CISR Trauma Rehabilitation Specialist Cameron Macauley rests for a moment with CEDAC Operations Coordinator Joël Nibigira on their way to visit peer-support workers in Bugarama, Burundi. A group of children want to see the muzungu (anyone who is not African) up close.
On 11 June 2012, the Center for International Stabilization and Recovery at James Madison University donated 200 mobile phones to its partner organization IBUKA (“Never Forget” in Kinyarwanda), the largest support network for genocide survivors in Rwanda. Since 2009, IBUKA has operated a peer-support program for genocide survivors in Rwanda who suffer the psychological effects from the 1994 Rwandan genocide. More than 800,000 Tutsis and moderate Hutus were killed during the genocide between 6 April and mid-July 1994. Many more died in refugee camps during the following months.

IBUKA trains genocide survivors to provide psychosocial support to traumatized survivors and their families in some 30 Rwandan communities. For these peer-support workers, communication is essential in order to obtain guidance and support from psychologists and program administrators. The phones help IBUKA staff handle emergencies such as suicide attempts and they enable peer-support workers to maintain contact with survivors over a wide geographic area.

In July 2012 IBUKA expanded its program from 25 to 65 peer-support workers with technical assistance from CISR. Since 2010, CISR has hosted five peer-support training workshops in Rwanda, including a training of trainers and a peer-support training for Rwandan psychologists and counselors. Participants engaged in role-play and problem-solving exercises, as well as peer-support practice sessions. They were taught specific techniques of peer counseling, such as active listening and interpretive questioning. All training materials were in Rwanda’s native language, Kinyarwanda. In addition to listening and questioning skills, the peer-support workers received technical guidance on monitoring and evaluating participants’ progress.

“This support has been enormously useful for us to provide high-quality psychosocial services,” said Janvier Forongo, executive secretary of IBUKA. “With CISR’s assistance, IBUKA is rapidly becoming one of the foremost trauma survivor support programs in Africa. The profound level of damage inflicted by the genocide requires expertise in trauma rehabilitation, and we thank CISR for helping us respond effectively.”

The Stavros Niarchos Foundation funded the trainings, providing a US$100,000 grant to CISR to focus specifically on East Africa. Of the total grant, $33,000 funded peer-support training in Rwanda and $72,000 funded peer-support programs in Uganda and Burundi. The remaining $5,000 of the grant bought the 200 mobile phones donated to IBUKA.

See endnotes page 66
Victim Assistance and Disability Rights: Beyond the Rhetoric

This article provides a brief overview of the evolution of victim assistance, the coherence between victim assistance and the Convention on the Rights of Persons with Disabilities, and stresses the importance of moving beyond disability rhetoric by turning ideas and words into concrete action.

by Sheree Bailey

Landmine survivors were first given an international voice to raise awareness of their rights and needs at the Review Conference of the Convention on Certain Conventional Weapons in Vienna in September 1995. Later, in October 1996 at a Canadian-hosted landmine conference in Ottawa, Landmine Survivors Network founders Jerry White and Ken Rutherford spoke in the plenary on behalf of survivors around the world and challenged delegates to do more to give survivors "a chance to be productive again, not to be dependent on charity."1

In the early years of efforts to assist survivors of landmines and other explosive remnants of war, photos often depicted survivors as objects of pity with sad faces and amputees with no prosthesis. Over time, the Parties to the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and their Destruction (Anti-Personnel Mine Ban Convention or APMBC), Protocol V to the CCW and, more recently, the Convention on Cluster Munitions, came to understand that victim assistance is not about providing charity. Assisting survivors is no longer understood as merely a medical or rehabilitation issue. Rather, victim assistance is about empowering survivors and the families of those killed or injured to access their rights and opportunities through an integrated, rights-based approach.

CRPD

The 2006 U.N. Convention on the Rights of Persons with Disabilities reinforced the importance of respecting human rights in the process of assisting survivors. Survivors and civil society played a role in the 1990s during the APMBC negotiations, which in turn encouraged the active participation of persons with disabilities in the negotiations of the CRPD. The catchphrase “nothing about us without us” has become significant as survivors and other persons with disabilities are recognized as constructive partners on issues affecting their lives.

The relevance of linking victim assistance and disability rights gained momentum as many States Parties and signatories to the CRPD are also parties to the APMBC, Protocol V to the CCW and/or the CCM. Nevertheless, is talk of linking victim assistance and disability rights simply rhetoric, or might real potential exist to impact and improve the daily lives of survivors?

Assisting the victims is a relatively new concept in international humanitarian law, having first appeared in...
the 1997 APMBC. However, after more than a decade, clear principles and understandings now guide humanitarian efforts to assist victims of landmines, cluster munitions and other ERW.2 These principles include: nondiscrimination; victim assistance in the context of disability, development and human rights; effective inclusion and participation; accessibility; gender equality and diversity; responsibility and national ownership; sustainability; and coherence with other instruments of international humanitarian and human rights law.

Likewise, the CRPD, often hailed as the first human rights convention of the 21st century, introduced a paradigm shift in approaches to disability. Persons with disabilities were previously viewed as objects in need of medical treatment, charity and social protection. However, the CRPD now promotes a social model where persons with disabilities are subjects of human rights, active in the decisions affecting their lives and empowered to claim their rights. The CRPD does not introduce any new rights not already covered in other human rights instruments. Instead, the CRPD sets out the State’s necessary obligations to meet the existing civil, cultural, economic, political and social rights in the specific context of persons with disabilities.

The CRPD is relevant to victim assistance, because many survivors of landmines, cluster munitions or other ERW incidents are left with a permanent disability and may require various forms of assistance throughout their lifetimes. Individuals with a disability have specific needs that require consideration in efforts to address obligations under relevant instruments of international humanitarian law to assist the victims. The CRPD aims “to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms of all persons with disabilities.”3 Of its 50 articles, many directly relate to assisting survivors; some of these are on issues such as

- Health
- Personal mobility
- Accessibility
- Habilitation and rehabilitation
- Education
- Work and employment
- Adequate standard of living and social protection
- Living independently as a productive and contributing member of society
- Raising awareness of the capabilities and contributions of persons with disabilities
- Statistics and data collection
- Women and children with disabilities
- Equality and nondiscrimination
- Situations of risk and humanitarian emergencies
- National implementation and monitoring
- International cooperation4

Given the coherence between the three disarmament instruments and the CRPD, promoting greater efforts to link victim assistance and disability rights offers potential to improve the quality of daily life for survivors and their families. By bringing victim assistance into broader policy and planning processes for all persons with disabilities, a more systematic, sustainable, gender-sensitive and human rights-based approach may be possible.

**Challenges**

Is this coherence in legal texts and understandings reflected in the reality of efforts on the ground in affected communities? What challenges and obstacles may prevent the progress of improving the quality of daily life of survivors?

Many affected countries are among the poorest and least developed in the world—one of the most significant challenges. The concept of disability rights has little resonance for many survivors who live in poverty and lack...
access to basic necessities such as food, clean water, clothing and shelter. Often, they do not enjoy equal rights and are denied access to resources that would allow them to meet their basic needs.

Under the CRPD, implementation efforts should clearly focus on addressing the rights and needs of the individual—the person living with a disability—and to a lesser extent, the family and/or caregiver. However, the Parties to the APMB, Protocol V to the CCW, and the CCM understand that landmines and ERW affect not only direct victims but also have larger social and economic consequences and therefore may extend survivor assistance to families and communities. The CCM included a broad definition of victim in its Article 2, “‘Cluster munition victims’ means all persons who have been killed or suffered physical or psychological injury, economic loss, social marginalisation or substantial impairment of the realisation of their rights caused by the use of cluster munitions. They include those persons directly impacted by cluster munitions as well as their affected families and communities.”

Landmine, cluster munition and ERW contamination impacts entire communities. It threatens community security, causes casualties and hinders social and economic development. Nevertheless, victim assistance-related efforts should not be diluted when ensuring that this broad scope is addressed. Focusing attention on the most vulnerable individuals in affected communities, which may include survivors and the families of those killed or injured, will greatly affect the improvement of their quality of daily life.

Government authorities with responsibility for disability-related issues in affected countries often lack the human and financial resources necessary to comprehensively address the rights and needs of persons with disabilities, including landmine and other ERW survivors. Often mine action centers and mine action authorities take the lead on victim-assistance efforts. These mine action structures play an important role in assisting the community through clearance, risk education and post-clearance activities. However, unless activities to assist those directly impacted are integrated into the budgets and work plans of relevant ministries, the potential for sustainability will be limited.

In many affected countries, efforts are underway to raise awareness on the CRPD and disability issues among a wide range of stakeholders. However, victim assistance is rarely linked to these efforts. As a result, victim assistance remains somewhat unfamiliar outside of the disarmament community and in rural areas. In some instances, survivors do not have access to disability or development programs because of the perception that they
already benefit from victim-assistance programs or that victim assistance is the responsibility of other providers.

To ensure that limited resources are used efficiently, all actors should be more proactive in integrating victim assistance into efforts to implement the CRPD and other relevant activities at the national level. In order to ensure sustainability, addressing the rights and needs of survivors must not be viewed in isolation or promoted as a separate activity. Government authorities and other actors should be made aware of their State’s obligation to assist the victims under relevant instruments of international humanitarian law and ensure that all policies, programs and services are accessible to survivors and their families in their communities.

The time may have come to move beyond the concept of victim—to stop implementing victim assistance projects. Instead, all actors should be encouraged to implement projects and programs that are explicitly accessible to survivors, other persons with disabilities and all those living in vulnerable situations. While the reality on the ground may be that victim assistance projects do not discriminate, the perception remains that victim assistance is somehow a separate activity.

Integrating victim assistance into broader efforts will not remove the obligation of Parties to the disarmament conventions to report on their efforts to assist victims. However, in order to report appropriately, affected States must improve disability data information systems to clearly identify survivors who access services and other relevant programs.

Transforming Words into Actions

Survivors and other persons with disabilities are not a problem to be solved; they are individuals with hopes and dreams for themselves and/or their families. They are assets with the capacity to be productive members of society. For more than a decade, I have been privileged to work with and for survivors at the national and international level. In many countries I witnessed the challenges of daily life for survivors and their families. I also saw the ability of empowered survivors to reach their full potential through access to their rights and opportunities. Many of these individuals are now effective advocates for change and positive role models for other persons with disabilities.

The APMBC, Protocol V to the CCW, the CCM and the CRPD have given hope to survivors and their families that actions will be taken to improve the quality of their daily lives and to ensure they enjoy equal opportunities to participate in the social, cultural, economic and political life of their communities. However, a vast majority of survivors live in countries with limited resources to address their rights and needs or those of others living in vulnerable situations.

The time has come to move beyond the rhetoric of victim assistance and disability rights and turn words into concrete actions in affected communities. Although short-term solutions such as vocational training and microfinancing help, efforts should focus on long-term developmental strategies. These strategies include raising awareness in communities where survivors do not enjoy their rights and others do not realize survivors’ true capabilities. In addition to the continuous need for targeted, disability specific policies and programs, governments, the donor community, international agencies, nongovernmental organizations and other service providers must provide an environment that will ensure survivors and other persons with disabilities enjoy equal rights and access to services and opportunities that could improve the quality of their daily life. Only then will they be empowered to reach their full potential. Only then will the promise of the conventions be realized.

See endnotes page 66

Sheree Bailey lives in Brisbane, Australia and has worked with survivors for 12 years in more than 25 countries. From 2006 until recently, she served as Victim Assistance Specialist in the Implementation Support Unit of the Anti-Personnel Mine Ban Convention at the Geneva International Centre for Humanitarian Demining. She was appointed a Member of the Order of Australia in 2010 “for service to humanitarian aid through the International Campaign to Ban Landmines, and through programs assisting survivors.” Bailey continues conducting research and providing advisory services to advance the rights of survivors in the context of disability and development.

Sheree Bailey AM
Disability/Victim Assistance Advisor
PO Box 98
Toowong, Queensland 4066 / Australia
Email: sheree.bailey.va@gmail.com
In looking at the approach taken by three different articles that deal with mental illness, the author finds peer-to-peer support to be a common thread among all three.

by Sam Nickels [ Center for Health and Human Development ]

Peer-to-peer support provides effective coping strategies across disability groups—from helping landmine survivors to those with mental-health issues. My personal experiences and work with mental-health services in El Salvador highlight the success of peer education and support programs for those with mental illnesses. I was impressed with three articles in issue 15.2 of The Journal of ERW and Mine Action (Summer 2011) that exemplify effective peer-to-peer support for landmine survivors. These articles provide a good platform for discussion of peer-to-peer support groups for those dealing with mental illness. “Survivor Heroes Heal Lives and Landscapes Throughout the World” by Ken Rutherford outlined the impressive stories of landmine and traumatic-accident victims as they rose from personal tragedy to becoming peer advocates on a global scale.1 “Peer Support and Recovery From Limb Loss in Post-conflict Settings” by Cameron Macauley, et.al., reviewed a recent study on peer-support services for survivors, showing significant benefits “for trauma survivors, their families and their communities.”2 The third article, “Art Therapy and Sport Activities Enhance Psychosocial Rehabilitation” by Reykhan Muminova, described how survivors improved their emotional and relational needs through a summer program of peer-to-peer support in Tajikistan.3

What moved me in these articles was the common thread of peers serving peers. I am not a survivor. No one in my family suffered the trauma of mines or explosive remnants of war, but I understand this program. I know exactly how the dynamics of peer and family support bring about healing. I understand the importance of peers working with peers, because I am part of a family that deals with a disabling condition too—mental illness.

Thirty years ago my brother was diagnosed with schizophrenia. For 15 years our family struggled with depression, anger, misunderstanding, stigma and social isolation. Then in 1992, two things happened. My brother received a new medication that helped control the worst symptoms of his schizophrenia, and my family entered the National Alliance on Mental Illness, a peer education and support program. My parents were so appreciative of this program that they became peer instructors in NAMI’s Virginia group, working with other families for the next 15 years. I remember listening to my mother answer call after call and talk for hours with other families who had a child or a spouse who was recently diagnosed with schizophrenia, bipolar disorder or had attempted suicide because of major depression. Of everyone in our family, my mother was the most deeply affected by my brother’s illness. She mourned the loss of his intellectual abilities, but she is my hero because she responded with courage, never gave up and reached out to others in need.

Peer Support

This is what peer programs are about. Family reaching out to family, survivor reaching out to survivor, or—as we call people with mental illness in the United States' peer movement—consumer reaching out to consumer (consumers are people with severe mental illnesses who consume mental-health services). The goals of survivor and consumer peer programs are the same—to end discrimination, empower individuals to find healing and recovery and become advocates for change.

In his article, Rutherford uses phrases that apply equally to landmine survivors and mental health consumers. He writes “victims often experience extended separations from family members.” Persons in psychiatric crisis can spend months or years in psychiatric hospitals. This often means being far removed from family. Rutherford writes that victims face “decreased employment opportunities … tasks that were once easy to complete can become Herculean chores … many [victims]
Consumer advocates participate in a march for affordable medications while holding ACISAM sign in El Salvador, September 2010.
All photos courtesy of Asociacion de Capacitacion e Investigacion Para la Salud Mental (ACISAM).

can no longer find work … survivors are often ostracized and are denied proper medical care ….” Persons with mental illness often experience the same things.

Rutherford praises the courageous response of survivors, as they have become “leaders and productive community members by devoting their lives to helping other victims … Survivors’ peer skills are in many cases essential in helping other survivors recover.” This is true also in mental health peer programs.

According to People, Inc., a New York nonprofit supporting people with disabilities, “In the peer community of people with the lived experience of psychiatric or emotional issues, it is well known that there is a connection to the relationship among peers and wellness. For some people, developing a peer-to-peer relationship has long been more healing than traditional treatment. Peer-to-peer engagement has often provided efficient and effective outcomes that traditional services cannot or do not provide due in part to limited or poor engagement between the provider and person and/or barriers to trust between the provider and person in need.”

The U.S. has used mental health peer services for several decades. Studies on the effectiveness of consumer-operated service programs began in the early 1980s, and their effectiveness became more apparent in recent years. Peer-run self-help programs are shown to “lessen feelings of isolation, increase practical knowledge [about mental illness and self-care] … enhance coping … [replace] self-defeating thoughts and actions with wellness-promoting activities … improve employment involvement … [improve] social support and shared problem solving … increase empowerment, and realistic hope for the future.” Importantly, participants in such groups are shown to have “fewer symptoms and fewer hospitalizations.” A report by the U.S. Surgeon General cites a study comparing peer-case managers with professional-case managers that found “clients assigned to either case management program fared equally well in clinical, social and quality of life outcomes.”

### Peer Support in El Salvador

The study of survivor peer services discussed in Macauley’s article shows impressive results of peer-support programs in six countries. The positive outcomes remind me of the Family Education and Support Program I helped start 10 years ago in El Salvador in partnership with the nongovernmental organization Asociacion de Capacitacion e Investigacion para la Salud Mental (The Association for Training and Research on Mental Health). The Family Education and Support Program’s facilitators train family members to be instructors and the program provides a support structure that allows them to carry out peer education and support. This program aims to provide an educational mental health curriculum and empowering activities that train family members and consumer leaders to take on the fight for policies and funding related to mental-health services in El Salvador. Five years ago, it expanded to include a psychosocial group for severely mentally ill consumers.

Myrna Rojas, a psychiatrist who volunteers with the Family Education and Support Program in El Salvador, noted five goals and the program’s subsequent achievements, as well as several recommendations to improve effectiveness (listed below).

#### Goals:
1. The consumer becomes involved in psychoeducation and self-help.
2. Family members experience positive changes in perception toward their loved ones with mental illness.
3. Consumers learn of their rights to improved services.
4. Participants act at the national level regarding policies that affect consumers.
5. Family members and consumers participate in a growing national and regional network.
Achievements:
• The legalization in 2010 of the family group as a nonprofit entity under Salvadoran law (a difficult process in El Salvador that can take years to accomplish)
• Participation on the Mesa Redonda Permanente por la Defensa de los Derechos Humanos de Personas con Discapacidades (National Permanent Council for the Defense of Human Rights of Disabled Persons)
• Participation on the Consejo Nacional de Atención Integral a la Persona con Discapacidad (National Council for Integrated Attention to Disabled Persons)
• Participation as an association partner with two citizens’ national health-care advocacy coalitions—the Fundación Maquilishuatl (Citizens Alliance Against the Privatization of Health) and the Foro Nacional de Salud (National Health Forum)

Recommendations:
• At the national level, extend assistance to these types of programs in order to achieve greater national advances for mental-health improvement.
• At the Ministry of Public Health level, collaborate with these types of organizations to develop partnerships that increase the reach of mental health services; identify suitable leaders within these organizations to collaborate with to establish intervention strategies for community-level development; demystify psychiatry and permit the development of community based psychiatry.
• At the level of nonprofit organizations, encourage a culture of research and studies on the evidence regarding the impact of these programs.
• At the level of family and consumer associations, establish partnerships that will achieve the defense of patient rights.

Recently, Rojas completed a descriptive case study of family and consumer programs, which showed many results similar to the survivor study noted above. Rojas’ study reflected the same peer support results as reported by Macauley, showing improved self-perceived mental health, improved social functioning and improved role-taking due to improved emotional stability.2,6,7

Art Therapy
The third article in The Journal, "Art Therapy and Sport Activities Enhance Psychosocial Rehabilitation," reminded me of the Family Education and Support Program’s art therapy and psychosocial education for consumers in El Salvador. Recently, one of our family-member leaders turned on the radio and began to dance. Almost immediately, nearly everyone in the group was
dancing! Perhaps we should rename our group “Art Therapy with Rumba Dancing Breaks.” This therapy group is based upon the same concepts as the art therapy and sports activities camp in Tajikistan. People on psychotropic medications struggle with side effects, many of which include lethargy and obesity. Physical activity is essential to their health.

Unlike the program in Tajikistan, the El Salvador art-therapy program evolved into a supported employment setting. Consumers learn artistic and production skills and apply them to make candles, hammocks, cards and other items. When sold, after deducting the cost of materials, profits are distributed to the consumers. Everyone smiles when the small paychecks are given out.

Comprehensive Disability Services

How do mental health and survivor support efforts align? An example is an advocacy gathering held by multiple Salvadoran NGOs I attended in a large central park on a sunny day in San Salvador, El Salvador’s capital. The event’s purpose was to hear speeches about the need for a new law that would provide affordable access to medications for people with various kinds of disabilities—a huge need in the mental health community. It also concerns people with special needs in many sectors, since the cost of medications is very high in El Salvador. Our family and consumer group set up early—chairs and microphones for the speakers and display tables for the arts and crafts our group would sell. Soon people began to arrive—dignitaries from the Ministry of Health and the national assembly. Then a large truck pulled up, an electric ramp was extended to the back of the truck and the truck’s back door slid up. I could hardly believe my eyes; 30 or so people in wheelchairs with their families and friends filed out and were lowered on the electric ramp. Soon the speeches began, followed by a march through the park and down the street. Banners were unfurled, and people walked/wheeled with pride—people with mental illness, people without limbs, wheelchair users and blind people. I was deeply moved to see them all working together and advocating in public for their rights and needs.

We are not alone. Disability Rights International states "there are 650 million children and adults with disabilities worldwide—most still segregated from society in abusive institutions, living in poverty, or left without educational and economic opportunity." Each type of disability brings its challenges, and yet we are united. We may be different, but we are equal. We may be misunderstood, but we will take our rightful place in society. We may face more challenges than other people, but we will empower one another to overcome those challenges. ©

See endnotes page 66
HIV/AIDS Survey in Southern Angola

Deminers in Angola have a higher than average risk for HIV infection and transmission as a result of their work in border areas and their high mobility. The Demining HIV/AIDS Partnership conducted a Knowledge, Attitudes, Behaviors and Perceptions survey to explore deminers’ HIV/AIDS knowledge in Cassinga, southern Angola. Among other conclusions, the results stressed the need for an increase in HIV/AIDS education.

by Dr. Martin Chitsama, Joao Artur Dumba, Charlotte Mabhiza-Berejena and Nzola Dimbu
[ Demining HIV/AIDS Partnership ]

The necessary mobility of deminers across Angola may increase the spread of HIV/AIDS across a country with a low HIV-prevalence rate. This survey, conducted by the Demining HIV/AIDS Partnership in 2011, explores the HIV/AIDS-related knowledge, attitudes, behaviors and perceptions among deminers in southern Angola. The Demining HIV/AIDS Partnership is a coalition of international HIV/AIDS non-governmental organizations comprised of the Demining HIV/AIDS Service Foundation (South Africa) and the Organization of National Humanitarian Aid (Angola).

The survey was conducted with the intention of stimulating evidence-based HIV/AIDS strategies targeting the landmine clearance sector and landmine-impacted communities around the world. The survey provides interesting and useful details about how lack of HIV knowledge leads to misconceptions and fear of people living with HIV, often resulting in stigma and discrimination. The results also provide key information regarding the interviewed deminers’ understanding of HIV/AIDS, and the ways in which their understanding (or lack thereof) affects their attitudes and behavior, including sexual associations while on demining contracts and attitudes toward HIV, HIV testing and people living with HIV.

According to the U.S. Agency for International Development, “The countries of Southern Africa have some of the highest HIV prevalence rates in the world, and the region remains the global epicenter of the epidemic … According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), nine countries in Southern Africa continue to bear a disproportionate share of the global AIDS burden: All except Angola have an HIV prevalence greater than 10 percent and have some of the highest HIV prevalence rates in the world.”

Issues relating to HIV/AIDS and deminers have international dimensions, which are reinforced by the Interagency Coalition on AIDS and Development’s observations and recommended intervention programs for the sector published in a factsheet in 2002–2003. In Mozambique, the Accelerated Demining Programme claims it lost 10 deminers to HIV/AIDS, but only one deminer to a mine accident.

Relatedly, the labor laws in some countries, such as Mozambique, reveal the legal difficulties that demining companies face regarding HIV tests. In June 2005, the Ministry of Public Administration, Labour and Social Security fined the U.S.-based demining company RONCO Consulting Corporation after discovering that RONCO required Mozambican sappers to take HIV tests when selecting them for a demining mission to Afghanistan.

Demining and AIDS in Angola

The well-developed landmine clearance sector in Angola employs local and international deminers. Decades of war in Angola, from the 1970s to 2002, left an estimated 20 million landmines in Angolan soil. Norwegian People’s Aid, Menschen gegen Minen (People Against Landmines), The HALO Trust, MAG (Mines Advisory Group), DanChurch Aid, Handicap International, Santa Barbara and other agencies trained thousands of deminers in Angola over the past two decades. The Instituto Nacional de Desminagem (National Institute of Demining) in Angola, supported by the United Nations Development Programme, trains thousands of Angolans in manual demining, mine detection dog handling and mechanical-demining support asset skills at the INAD School in Luanda. Angola has thousands of deminers removing landmines across
the country. Clearance efforts are priorities in all of Angola’s 18 provinces.

As a result of clearance needs, deminers are a highly mobile population. Angolan deminers are vulnerable to HIV infection and are in turn a potential vector of HIV transmission. According to the International Organization for Migration, “...mobile populations in general—have played a significant role in the initial spread of HIV in the southern African region. The largely seasonal or temporary character of migration in southern Africa, with migrants returning home to their families on a regular basis, has facilitated the rapid spread of the virus. However, the fact that population movement distributes HIV has become less relevant in the current stage of the AIDS epidemic in southern Africa (with extremely high HIV prevalence levels in the population in general). Migrants are no longer agents that help to spread HIV, but have become individuals at high risk. Several studies have shown that migrants are more vulnerable to HIV infection than their non-migrant counterparts.”

USAID further explains the situation: “With an estimated 2 percent of the adult population living with HIV, Angola has one of the lower HIV prevalence rates in sub-Saharan Africa... Since the war, however, movement has become less restricted, and the likelihood of HIV reaching once-isolated communities has increased... Data collected from women attending antenatal clinics suggest the intensity of the HIV epidemic varies among Angola’s different provinces, with the highest rates of infection occurring in the areas bordering Namibia, along the transport route to Luanda, and along the border of the Democratic Republic of the Congo; the lowest rates are found in the center of the country.”

**Methodology**

To examine the HIV/AIDS realities and risks to deminers in Angola, the Demining AIDS/HIV Partnership conducted a targeted survey. The survey included 45 in-depth interviews with deminers in Cassinga in southern Angola. All respondents were male Angolan deminers employed by Vanguard Demining Services on the Tchamutete Demining Project in the Huila province. The interviews were conducted at the VDS Tchamutete Base Camp in a six-week period from August to October 2011. All interviews were conducted in Portuguese, and each interview took approximately three hours to complete. Joao Artur Dumba translated the research tool and the survey responses into English.

**Demographics**

The respondents were between the ages 20 and 49 and self-identified as sexually active. They came from the Benguela, Cunene, Huila, Kuando Kubango, Kwanza Sul and Malanje provinces. The following shows the respondents’ education:

- 67 percent of the deminers received at least eight years of primary school education.
- 21 percent received more than eight years of primary school education.
- 12 percent said they had never attended school.

The mean duration of demining work experience in the survey population was eight years. Only 25 percent of participants believed their salary levels to be poor, while 75 percent of participants found their salary levels satisfactory.

Over the past five years, 31 of the deminers said they spent nine months each year living in demining camps, and 14 deminers reported that they lived in camps for at least six months each year. All respondents lived in tents, returning home once every three months for two weeks. Their work conditions did not allow their spouses to visit. All 45 respondents also said they would opt out of demining if alternative, closer-to-home opportunities arose.

---

![Figure 1. Participants' ages.](image1.png)

![Figure 2. Participants' number of wives.](image2.png)
All respondents said they were circumcised through cultural initiation rites. The deminers reported their marital status as follows:

- 28 had one wife.
- 6 had two wives.
- 7 had three wives.
- 4 were single.

Six deminers said they had no sexual partners outside marriage, 36 deminers had one regular sexual partner outside marriage and three said they had at least two regular sexual partners outside marriage. Nearly all (43) of the 45 interviewed deminers said they had sexual partners while on demining contracts. Two respondents said they never had sexual partners while on demining contracts. More than half, 28 deminers, said they had a sexually transmitted infection previously.

Results

Basic HIV/AIDS knowledge. All interviewed deminers confirmed that HIV and AIDS exist, and all respondents said that no treatment exists for AIDS. The following shows the breakdown of responses when asked about the transmission of HIV/AIDS:

- 21 deminers said that HIV is transmitted through sex.
- 17 said through blood transfusion.
- 15 said through sex without a condom.
- 6 believed that kissing and touching transmit HIV.
- 27 said barber shops, needles and sharps transmit HIV.
- 4 deminers could not mention a single method of HIV transmission.
- 2 deminers mentioned mother-to-child HIV transmission.

All stated that prolonged coughing, diarrhea, weight loss and hair changes are AIDS symptoms. The respondents identified these high-risk groups:

- 37 deminers said prostitutes are the biggest HIV/AIDS risk group.
- 40 deminers cited youths, foreigners and truck drivers as HIV vulnerable groups.
- 4 deminers said everyone is equally vulnerable to HIV infection.

The deminers reported their sources for HIV/AIDS information:

- 42 mentioned both the Angolan media and health centers.
- 20 confirmed receiving HIV/AIDS information at the demining workplace.
- 25 said they had never received HIV/AIDS information at the demining workplace.

Deminers’ attitudes toward HIV prevention, testing and stigma. To prevent HIV infection, the respondents listed the following actions:

- 41 of the 45 deminers said they prevent HIV infection by always using condoms when having sex with non-regular partners.
- 4 said they do not use condoms.
- 2 said they abstain from sex when they are not with their wives.
- 4 said they prevent HIV through being faithful to their wives and regular partners.
- 6 said they avoid sleeping with prostitutes.

The majority, 43 of the deminers, said they get condoms from health centers, 37 said they buy condoms from shops, six said they get them from their partners. Two deminers said they get condoms from the demining workplace.

Regarding other HIV transmission methods, 28 deminers said they do not share shaving kits. Most, 39 of the 45 deminers interviewed, said they had evacuated a landmine-injured colleague in the past. All deminers involved said they had not worn gloves during the casualty evacuation process.
HIV testing and stigma. Of those interviewed, 32 said they had HIV tests in the past, were prepared to take regular HIV tests and would encourage their sexual partners to test for HIV as well. Deterred by fear of what their sexual history could mean for HIV test results and the stigmas and responsibilities that come with a positive result, 12 deminers said they had not taken HIV tests in the past. All of the interviewed deminers said they would visit a health center for advice if they suspected they became HIV-infected.

Seven deminers said they would separate from a sexual partner exhibiting AIDS symptoms, while 25 said they would continue with the relationship but advise their partner to visit a health center. Slightly more than one-third, 17 deminers, said they would abandon sexual relationships with a partner if HIV test results are discordant, while 28 said they would seek advice from health centers. Twenty-nine of the deminers accept HIV/AIDS-affected people as normal, while 16 said HIV-positive people should be avoided. Twenty-one of the deminers said they discuss HIV/AIDS issues with their families; 24 said they do not.

Analysis

The responses reveal that deminers would prefer to work closer to home. However, due to limited employment options, they are compelled to continue with this trade.

Almost all surveyed deminers admitted having sexual partners while on demining contracts. The history of STIs in 66 percent of the study population adds up to a high-risk HIV-transmission scenario. Persons with STIs are more susceptible to HIV infection and are more likely than uninfected persons to spread HIV to their sexual partners. The majority of deminers admitted to earning sufficient funds, making possible the purchase of sexual favors. While most deminers mention condom usage as a means of protecting oneself against HIV/AIDS, condoms are largely unavailable at the demining workplace. Additionally, 10 percent of the interviewed deminers mentioned that they never use condoms. Safe sex education needs to be conducted regularly for deminers, including provision of workplace condoms.

The deminers’ main sources of HIV/AIDS information are the media and health centers, which 42 of the 45 deminers identified as their greatest source of information. However, these resources are often not easily accessible to deminers. Comparatively, only 20 of the 45 deminers identified the demining workplace as a resource center for information about HIV/AIDS. The respondents demonstrate a limited understanding of the messages, considering that questions on HIV/AIDS existence, treatment, prevention and transmission resulted in typical answers. The demining workplace is clearly falling short in providing HIV/AIDS education and condoms to landmine clearance workers. Failure by all deminers who previously assisted in casualty evacuation to put on gloves demonstrates a high risk to HIV occupational exposure when deminers come in contact with blood and bone fragments during evacuation of injured colleagues.

All deminers who were interviewed were circumcised through cultural initiation rites, thus suggesting better protection from HIV transmission. According to the World Health Organization, “There is compelling evidence that male circumcision reduces the risk of heterosexually-acquired HIV infection in men by approximately 60% ... WHO/UNAIDS recommendations emphasize that male circumcision should be considered an efficacious intervention for HIV prevention in countries and regions with heterosexual epidemics, high HIV and low male circumcision prevalence.” Voluntary male circumcision should be encouraged and supported among deminers and local communities in Angola. Keeping employees healthy is in the best interest of demining companies, and this could be accomplished with a policy change that incorporates the procedure into medical and surgical care already provided by the company.

The majority, 72 percent of the deminers, said they took HIV tests in the past. This positive attitude toward HIV testing needs sustainment through continued HIV/AIDS education for deminers. With 30 percent of deminers saying they would avoid HIV/AIDS-affected persons, stigmatization of HIV/AIDS and of the positive HIV state among deminers is apparent. HIV/AIDS-destigmatization advocacy needs promotion in the demining sector. This challenge of stigma and discrimination in the deminers is reflected in broader Angolan society: “A 2003 KAP [knowledge, attitudes and practices] study reported nearly half of all young people (and more than two-thirds of those with no education) said they would refuse to buy food from a local shopkeeper whom they knew to be HIV positive. Similarly, more than one-third of all young people (and nearly two-thirds of those with no education) would refuse to share a meal with an HIV-positive person. According to the 2005–2006 KAP study, 80 percent of youth interviewed showed some discriminatory tendencies toward HIV-positive individuals.”
Conclusion

According to USAID, "Other conditions that increase the risk of continuing the spread of the virus in Angola include mobility among the 4 million people currently internally displaced by the war; high levels of civilian contact with military personnel; low levels of education; extreme poverty; limited female autonomy; weak social networks and public services; and cross-border interaction with Namibia and Zambia, where HIV prevalence rates are 13.1 percent and 13.5 percent, respectively, according to UNAIDS." 6

This study attempted to identify an occupation that exhibits traits characteristic of a high-risk HIV group. The demining workplace has insufficient HIV/AIDS prevention and education services for deminers. Deminers need continuous education on safe sexual practices, and demining companies must deliver HIV/AIDS services to their workers and local communities. HIV/AIDS hot spots emerging in Angola are illustrated in Figure 3 on page 36.

Hard-to-reach mobile groups such as deminers, which are often invisible and inaccessible to the public-health eye, partly drive the HIV/AIDS pandemic. With HIV/AIDS programs hardly reaching deminers, they are silent HIV transmission vectors. Such groups threaten to reverse gains made in the global HIV/AIDS mitigation drive. Efforts must be made to identify such HIV high-risk groups and engage them in traditional HIV/AIDS intervention efforts. 3

Reprinted with permission from Demining HIV/AIDS Partnership. The authors appreciate the permission and support they received from Vanguard Demining Services Project Manager Johannes Van Schalkwyk and Technical Adviser Johan Strydom to conduct the survey. They would like to thank the deminers who participated in the survey for their consent and for the time donated by Farirai Berejena, Demining Supervisor Joao Bango, Dr. Tamuka Chivonivoni (Elizabeth Glaser Pediatric AIDS Foundation), Dr. Desire Mangama (Zagope-Brazil), Dr. Silence Gavi (Zimplats), Dr. Panganai Dhliwayo (Centers for Disease Control) and Kinirosi Dimingo for giving valued advice on the study.

See endnotes page 66

HIV/AIDS Facts

- HIV is a virus that attacks the immune system. AIDS is a syndrome where the body has a reduced ability to fight infection and disease.
- HIV cannot be transmitted by touching another infected person or through kissing, unless one or both people has an open mouth sore that is bleeding
- HIV can be transmitted through interchange of blood or bodily fluids with an HIV infected person, primarily in cases of:
  - Unprotected sex (vaginal, anal or oral)
  - Sharing needles with other people
  - Transmission between mother and child during pregnancy, childbirth or nursing
- 34 million people live with HIV in the world
- There are therapy programs that can stop HIV virus from reproducing in the body. 9
Dr. Martin Chitsama holds Bachelor of Medicine and Bachelor of Surgery medical degrees and attained an Executive Certificate in Strategic HIV/AIDS Project Management from the University of Zimbabwe. He has 14 years’ experience working as a medical advisor in landmine clearance operations in Africa (Angola, Eritrea, Mozambique, Somalia, Sudan and Zimbabwe). Dr. Chitsama is a member of the Board of Trustees of the U.K.-based Landmines HIV/AIDS Trust. He is also the director for the Global Landmines HIV/AIDS Program.

Dr. Martin Chitsama
Director Global Landmines HIV/AIDS Program
Landmines HIV/AIDS Trust UK
310 Hitchen Road
Henlow Camp
Bedfordshire SG16 6DP / United Kingdom
Tel: +244 93 2268 772
Email: martin@landmineshivaids.ws
Website: http://landmineshivaids.ws

Charlotte Mabhiza-Berejena has a Bachelor of Business Management and Information Technology (Honors) degree from the Catholic University in Zimbabwe and a postgraduate diploma in International development studies from Bindura University of Science Education. She has seven years of information technology and computer networking experience. Her interest in community development grew while working in the telecommunications industry in Namibia and Zimbabwe, where she realized how technology enriched people’s lives.

Charlotte Mabhiza-Berejena
Service Desk Analyst
Pomeroy IT Solutions
2D 786 Ravine Circle
Southgate, KY 41071 / USA
Tel: +1859 444 0328
Email: cmabhiza@gmail.com

Joao Artur Dumba has worked in demining for the past 13 years. In mine action he holds an international qualification diploma for IMAS Level 3 Explosive Ordnance Disposal acquired at the International Mine Action Training Centre in Kenya and a demining supervisor diploma from Norwegian People’s Aid Angola. He has held positions as Deputy Director of the NPA’s Mine Dog Training Centre Angola and as a Technical Advisor in Sudan working with Norwegian People’s Aid, Vanguard Demining Services/MECHEM and the UNDP.

Joao Artur Dumba
Public Relations Officer
Vanguard Demining Services
Rua Albano Machado No. 6
Luanda / Angola
Tel: +244 92 6199 553
Email: joaodumba@yahoo.com.br

Nzola Dimbu is a qualified clinical officer trained by Norwegian People’s Aid Angola. He was formerly the deputy program manager of the Comité Regional Sul Para O Desenvolvimento (Demining Committee for Southern Regional Development) in Angola. He is a founding member of and technical advisor to the National Demining Society and Mineral Protection in Angola. Dimbu has vast experience working in HIV/AIDS projects in public and private sectors and nongovernmental organizations in Angola and the Democratic Republic of the Congo. Dimbu is the President of the Organization for National Humanitarian Aid in Angola.

Nzola Dimbu
President
Organization for National Humanitarian Aid
Bairro Tchioco Zona 1
Lubango / Angola
Tel: +244 939 145 735
Email: ondah92@yahoo.com.br
Sri Lanka: A Photographic Essay

Since 1997, the author has worked for MAG (Mines Advisory Group), documenting the impact of landmines and explosive remnants of war on countries such as Iraq, Laos, Lebanon, Sri Lanka and Sudan. Through a multimedia approach, Sutton creates photo exhibits and films to educate the public on landmines, unexploded ordnance, and small arms and light weapons.¹

by Sean Sutton [ MAG ]

The Liberation Tigers of Tamil Eelam, a separatist group in Sri Lanka, began fighting against the Sri Lankan government in an effort to create an independent state for the Tamil people in 1983. The conflict evolved into the Sri Lankan Civil War (1983–2009), which killed an estimated 75,000 people.²

Landmines and other explosives were used throughout the conflict, leaving behind large-scale contamination in the northern and eastern provinces where the majority of fighting occurred. The contamination not only severely restricted internally displaced persons from returning to their homes but also delayed reconstruction and development activities.³ The Landmine and Cluster Munition Monitor reports that many Sri Lankans in the north live near, if not next to, mine/explosive remnants of war contaminated land. The contamination blocks access to vital agricultural land. As a result, people may ignore signs clearly warning of ERW contamination in order to meet their basic needs.⁴

In July 2011, the National Steering Committee of Mine Action, Sri Lanka’s national mine action authority, determined that an estimated 255.22 sq km (98.54 sq mi) of hazardous areas remained for clearance. Since the 1980s, 21,993 landmine casualties have been reported, including 1,419 IDPs (injured or killed). A survey conducted in Sri Lankan IDP camps determined that a large number of IDPs have mine-related disabilities.⁴ In 2009 Sri Lanka had 38 casualties (6 killed/32 injured), down from 79 casualties in 2008 (11 killed/68 injured).⁵

Mine risk education programs were crucial to reducing landmine casualties in Sri Lanka. Sinnapandivirichchan, 2011. All photos courtesy of the author.
Documenting the Changes

I traveled to Sri Lanka a number of times in the past 10 years. I first visited in 2002, not long after the ceasefire between the government and LTTE. The situation then was desperate; people were repeatedly displaced and suffering tremendously.

Sadly, however, the conflict re-ignited in 2006, forcing the population, particularly in the north, to move ahead of the violent offensives and carry what few belongings they could. Three years later, the Sri Lankan Civil War finally ended with the defeat of LTTE. According to MAG’s estimates, more than 360,000 people were displaced and their homelands left contaminated by landmines and countless other dangerous items.

In February 2011, I traveled to Mullaitivu district in the northeast of the country where the final battles took place. Some areas showed signs of life as recent arrivals from the camps re-established their homes, but most of the region remained desolate, abandoned and destroyed. We passed through military checkpoints and on toward the coast through overgrown villages. With the exception of the odd wild dog, stray cow or patrolling soldier, the atmosphere felt eerie and lifeless.

Other than the army, the only people allowed into the region were deminers and survey staff. I saw the teams from MAG hard at work surveying areas for signs of explosive contamination and then clearing landmines and other unexploded ordnance. Without a doubt, their work was vital to ensure that people could return safely to their homes. It was a race against time as the local inhabitants desperately longed to return home and build a better life.

Early in 2012, I returned to Mullaitivu district and the difference was extraordinary. Where once I saw utter desolation, I now saw bustling communities with crowded markets and well-attended schools. Everywhere I looked signs emerged of greater prosperity and a new sense of purpose; I had difficulty imagining that it was the same place.

I am very fortunate in my work, spending time with communities documenting what life is like for them. Sometimes the stories are tragic and hard to comprehend, but this was quite different and a joy to experience.

The last Sri Lankan IDP camp was closed, and its people relocated to their homes 25 September 2012. Many IDPs do not live in camps and have yet to return home or resettle. MAG, Danish
Demining Group, Devlon Assistance for Social Harmony, the Sri Lankan Army, Fondation Suisse de Déménagement (Swiss Foundation for Mine Action), The HALO Trust, Horizon, the Milinda Moragoda Institute for People’s Empowerment, Saravatra, the United Nations Development Programme and UNICEF are clearing the remaining areas.

MAG Helps People

Navaseelan owns nearly seven acres of land in Devapuram village, Sri Lanka. MAG cleared his land, making it safe to use, and he is growing crops and providing for his family for the first time since 2007.

Benjamin Romavl, a wiry man in his 60s from Sinnapandivirichchan, told me his incredible life story. When shelling began outside their home, he and his family packed their vehicle with their belongings and fled. They moved from place to place, remaining in one area for as short as three days or as long as six months, depending how quickly the fighting caught up to them. They often
Benjamin Romavl, a wiry man in his mid-sixties with an incredible life-story told me, “Soon it will be like it was before and we are very happy. One hundred and fifty three families are here now (in their village) only because of MAG. Otherwise how could we be here? Our lives would be a question mark.”
stayed in areas without access to food, water or medicine. The family finally found refuge in an IDP camp where they spent one year and four months. Romavl ended his story with, “Soon it will be like it was before, and we are very happy; 153 families are here now (in their village) only because of MAG. Otherwise, how could we be here? Our lives would be a question mark.”

MAG’s goal in Sri Lanka is to protect conflict-affected individuals by facilitating recovery activities. By contributing to the urgent requirement to survey priority areas and clear them of landmines and unexploded ordnance, MAG enables post-conflict reconstruction and development interventions. MAG’s program in Sri Lanka is supported by AusAID, the Canadian International Development Agency, Stichting Vluchteling and the Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA).

See endnotes page 66
Providing Safe Drinking Water in Post-Civil War Sri Lanka

After decades of Civil War, Sri Lanka is making positive strides toward recovery. As former refugees return home, it remains to be seen whether the poorest districts will have access to one of the most basic human necessities, clean water. Fondation Suisse de Déminage (Swiss Foundation for Mine Action) hopes to alleviate this situation by clearing contaminated wells.

The Sri Lankan Civil War (1983–2009) threw the country into turmoil for nearly three decades, claimed as many as 100,000 lives and resulted in thousands of “silent killers” scattered over northern and eastern Sri Lanka.1 The conflict left behind large numbers of various types of explosive remnants of war, including mortar bombs, artillery rounds, small arms ammunitions and landmines in unexpected locations such as water wells. Landmines and ERW continue to have significant negative impacts on individuals, communities, agriculture and the wider economy in Sri Lanka’s poorest districts: Mannar, Vavuniya and Mullaitivu. Even after resettlement, subsequent observations from the Ministry of Economic Development conclude that many people in these areas live adjacent to mine/ERW-contaminated land.2

“When we started clearance operations in the Mullaitivu district [in] April 2010, we found that all the wells had not been used for more than two years. The water was dirty and polluted, and we suspected explosive remnants of war, small arms and other dangerous items would be in the wells. During the survey it was confirmed that these wells are highly contaminated with explosive remnants of war and other devices. We immediately started our job [clearance].”

~ Noel Peacock, FSD Technical Advisor

Contaminated Wells

After the Sri Lankan government released land for resettlement, Fondation Suisse de Déminage (Swiss Foundation for Mine Action) became aware that returnees to Mannar, Vavuniya and Mullaitivu districts faced the additional problem of mine and unexploded ordnance contamination in wells. Internally displaced persons expressed lack of adequate safe water as the primary concern prior to resettlement.3

During the war, open wells were a convenient location to quickly dispose of unwanted ERW. As civilians returned to reoccupy their houses and properties, they often found discarded ERW at the bottom of open wells. ERW in and around open wells greatly affected the health prospects of returnees, the ability of communities to resume agricultural production and the maintenance of livestock welfare.

To address the need for safe access to water in post-conflict communities, FSD set up its first well clearance team in 2009. Since then, in response to the increase in returning refugees, FSD’s well clearance project expanded to four well clearance teams. Each local well clearance team consists of a team leader and three deminers who are trained and equipped to carry out well clearance. Clearance tasking and prioritizing is carried out in close coordination with local water sanitation teams, the provincial authorities and the regional mine action office. The well clearance activities are conducted parallel to ongoing mine clearance and survey operations. As a result of this close cooperation with partners and stakeholders, the well clearance teams achieved good success. For instance, in 2010 FSD reported clearing 1,084 wells in addition to removing 19 anti-personnel mines, 186 UXO and 33,688 ERW.2

Well Clearance

A tractor transports the teams and their equipment between tasks. Each FSD mobile team is equipped with all the necessary equipment to carry out well clearance, including...
submersible electric water pumps, generators, overhead gantry tripods, hose pipes and aluminum foldable ladders. Upon arrival in a village, the teams prioritize tasks based on a risk assessment. In broad terms, any confirmed hazardous area within the task location is a priority, with subsequent well clearance based on the priorities of local communities. Prior to well clearance, the teams clear a 25 m (82 ft) radius around a well to ensure team safety during the operation. Once the surrounding area is secure, the team pumps the well dry using the submersible pump to expose the bottom of the well.

Following the pumping process, one team member wears protective equipment to guard against biohazards, snake bites and debris, and is lowered into the well on a harness suspended from the overhead gantry. The deminer then searches the well bottom to a minimum depth of 15 cm (6 in). Any ERW in the well is placed into a basket and hoisted to the surface. At the surface, the explosive ordnance disposal team assesses the conditions of the items. If the team considers recovered items too dangerous to move, they are destroyed in situ. Items safe to move are taken to a central demolition site for later destruction. The EOD team is qualified to deal with all ERW discovered by well clearance teams.

The time taken to clear a well depends on a number of factors, namely, the well size and the amount of contamination including mud, general refuse, leaf litter and any items of ERW. Once clearance is confirmed, the well is marked with “FSD CLEARED” in blue spray paint.

As part of the follow-up process after clearance, a completion report is filed with regional mine action office, recording any items of ERW found. In addition, the national water board is informed of clearance completion. The national water board is then responsible for follow-up water purification of the well.

Achievements

Since the project’s commencement, FSD has cleared 2,214 wells, removing and destroying more than 42 AP mines, 556 items of UXO and nearly 57,468 ERW in FSD areas of responsibility in Vavuniya, Mannar and Mullaitivu districts. More than 47,000 IDPs have benefited from FSD’s well clearance initiative.

As the demand for clean water resources increases, some international nongovernmental organizations including Global Water and Hygiene and Sanitation for All (SWA), an international partnership providing sustainable, universal access to clean water, selected “FSD CLEARED” wells as a priority for water purification to improve the quality and quantity of water provision at the community level. Well clearance ensures that multiple families have sufficient safe water for personal and domestic use.
the National Water and Drainage Board staff. In turn, these agencies provide this material to all other organizations clearing wells in their districts.

The well clearance project is strengthened by the generous support of the Swiss Development Cooperation, the Australian Agency for International Development and the Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA).

Humanitarian demining extends beyond ground clearance with a metal detector to eliminating the threats landmines and ERW pose to human lives wherever possible. Well clearance is an effective mine action intervention for FSD. Additionally, well clearance is closely linked with national development priorities, helping communities to overcome obstructions to social and economic development.4

See endnotes page 67

Small Arms Survey Creates Playing Cards

In August 2012, Small Arms Survey, in partnership with the Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA), released a third set of small arms informational playing cards, the Marking, Record Keeping and Tracing Implementation Support Cards. The previously released cards focused on small arms identification (available in English and Spanish) and physical security and stockpile management (available in English and Serbian).

The new cards are designed to provide general knowledge of the International Tracing Instrument. One of the playing cards describes ITI as “designed to facilitate the successful tracing of small arms and light weapons (SA/LW) used in crime and armed conflict.” Other cards have information regarding marking identification, record-keeping and implementation of ITI in different countries.

According to Martin Field, the communications officer at SAS, the cards are of interest to workers involved in weapons manufacturing, removal, tracing, record-keeping, policy making and law enforcement.

All three sets of cards are available free of charge. Please contact sas@smallarmssurvey.org for more information.

~ Kathleen Sensabaugh, CISR staff

Hartmut Thoms holds a Master of Business Administration in economic engineering from the Ground Forces Officers School. Thoms joined FSD in 2008 and works as a Programme Manager in Sri Lanka. He has more than 14 years of field experience in mine action, including in Afghanistan, Angola, Croatia, Mozambique, Tajikistan, Uganda and Yemen. He previously worked with the United Nations Office of Project Services, United Nations Development Programme and a commercial company.
The Lethality Ratio of Anti-vehicle Mines

The Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and on Their Destruction (Anti-personnel Mine Ban Convention or APMBC) brought AP mines to the forefront of many people’s minds. Anti-vehicle mines, however, remain the most lethal mines today, and they are not banned under international conventions.

by Armen Harutyunyan

Since the signing of the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and on Their Destruction (Anti-personnel Mine Ban Convention or APMBC) in 1997, the issue of AP landmines has received much needed international attention. Over the past 15 years, the vast majority of governments have signed and ratified the APMBC. Most of those who have not adopted it formally claim to not have used or produced AP mines. More recently, in the late 2000s, cluster munitions came into the spotlight, culminating in the Convention on Cluster Munitions, which more than 100 countries adopted in 2008. While two dedicated treaties exist banning the use of AP mines and cluster munitions, anti-vehicle mines remain largely unregulated in most countries for use in armed conflicts.

Despite the relative low numbers of AV mines laid in Sudan, their impact on affected populations seems much greater than that of AP mines.

The Vital Few

Most online resources present data on civilian and demining casualties by dividing incidents based on the devices that caused them. This usually compels readers to examine the causes of higher number of incidents and make conclusions as to which devices are the most lethal. While this is one of the methods to measure the impact caused by various explosive devices, it does not necessarily reveal which devices have higher hit rates or lethality rates. This type of information is crucial to decide where to focus mine action assets in order to address immediate humanitarian threats.

Perhaps another way to look at the scale of a mine problem is to compare the ratio of the average number of devices found over a period of time against the number of incidents and casualties caused by a particular type of device over the same time frame. This type of lethality ratio analysis allows comparison between the two most important data sets in mine clearance and can be used as an additional tool in the decision-making process.

Lethality ratio analysis of mine related incidents in a number of countries indicates that AV mines do not account for the majority of mine and other explosive remnants of war incidents. However, they certainly are the most lethal considering the fewer numbers in which they are usually laid. This theory of more effect by fewer emplacements broadly resembles the Pareto Principle, or the law of the vital few. The Pareto Principle points out that for some events, 80 percent of the effects come from 20 percent of causes. The analysis of the lethality ratios of AV mines in Afghanistan, Angola, Cambodia and Sudan (now Sudan and South Sudan) indicates that the law of the vital few can be applicable to mine action. Theoretically, if managers focus their attention on resolving those 20 percent of the vital few, they should eliminate a larger share of their problems.

Anti-vehicle Mines in Sudan

In the territory of the former country of Sudan, fewer numbers of AV mines are found than AP landmines. An average of 24 percent of all mines cleared in Sudan between 2002 and 2011 were AV mines. Despite the relative low numbers of AV mines laid in Sudan, their impact on affected populations seems much greater than that of AP mines. Not only do AV mines cause a higher ratio of injuries and deaths per incident, they also have greater impact on blockage of areas for the civilian population. Even after years of mine clearance and 45,000 km (27,962 mi) of road assessment and verification, the Information Management System for Mine Action indicates that road blockage (which is mostly caused by anti-tank
minefields) remains one of the most common impacts of mines on the remaining affected communities in Sudan. Applying the introduced lethality ratio method to Sudan from 2005–2011, one AV mine incident occurred for every 141 AV mines found in Sudan (141:1). The AP mine ratio is 382:1, i.e., one incident per 382 AP mines found. In other words, each AV mine is 2.7 times more likely to cause an incident than each AP mine. As seen in Table 3, the statistics for the casualties are even more dramatic, where each 31st (31:1) AV mine caused death or injuries to a person, against the 446:1 ratio of an AP mine. This makes each AV mine in Sudan 14.4 times more likely to maim or kill a person than each AP mine.

Situation in Other Mine-affected Countries

Sudan is not the only country with such a high AV mine hit rate. Tables 3, 4 and 5 present a snapshot of the most recent situations in three of the most mine-affected countries: Afghanistan, Angola and Cambodia.

In Afghanistan, AV mines represented only around 5 percent of all mines found in 2011, yet they accounted for more than 37 percent of the mine casualties registered during the same year. Again, as in Sudan, an AV mine is more than 10 times more likely to cause death or injury than an AP mine.

In Angola, AV mines represented 11 percent of all mines found in 2010, yet they accounted for 31 percent of mine casualties during the same year. Each AV mine was four times more likely to cause death or injury than each AP mine.

In Cambodia the situation in 2010 appears to be the most dramatic. AV mines constituted only 2 percent of mines found during 2010, but accounted for more than 55 percent of all registered casualties across the country. The lethality ratio in Cambodia reveals that every 11th AV mine killed or maimed a person and that AV mines are 58 times more likely to cause a casualty than AP mines.

Observations

Most national and international mine action organizations have continued treating all mines and ERW as equally dangerous for those who live in mine/ERW-contaminated areas without necessarily giving a higher clearance priority to AP mines. Some believe AV mines create a greater problem to vulnerable populations as well as to humanitarian agencies delivering aid. Various sources indicate that the number of mine casualties resulting from AV mines is usually lower than casualties caused by AP mine incidents. For example, the Landmine and Cluster Munition Monitor reports that in 2010, out of 1,650 identified mine-related casualties worldwide, AV mines caused around 23 percent. The analysis of incident information in this article reiterates the magnitude of the problem that AV mines pose for mine-affected countries.

While most of the analyzed country data only covers a short period of time, three thoughts arise when examining the statistics produced by the lethality ratio method described previously.

First, mine clearance organizations should pay more attention to the causes of incidents in their areas of operation when prioritizing minefields for clearance. While theory in mine action does not always find a justified practical use, hypothetically, if some of the money and effort in clearing 103 AP mines in Sudan was used to clear the same number of

### Table 1. Blockage types caused by AT mines in Sudan.

<table>
<thead>
<tr>
<th>Types of Blockage</th>
<th>Number of Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>44</td>
</tr>
<tr>
<td>Pasture Land</td>
<td>37</td>
</tr>
<tr>
<td>Rain Fed Agricultural Land</td>
<td>11</td>
</tr>
<tr>
<td>Housing Area</td>
<td>7</td>
</tr>
<tr>
<td>Water Source</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>104</strong></td>
</tr>
</tbody>
</table>

### Table 2. Lethality ratios—number of devices found per number of incidents and casualties in Sudan between 2005–2011.

<table>
<thead>
<tr>
<th>Device</th>
<th>Devices found per 1 mine accident</th>
<th>Devices found per casualty</th>
<th>Devices found per death</th>
<th>Devices found per injured</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP mines</td>
<td>382:1</td>
<td>446:1</td>
<td>1606:1</td>
<td>618:1</td>
</tr>
<tr>
<td>AV mines</td>
<td>141:1</td>
<td>31:1</td>
<td>86:1</td>
<td>48:1</td>
</tr>
</tbody>
</table>

### Table 3. Lethality ratio of AP and AT mines in Afghanistan, 2011.

<table>
<thead>
<tr>
<th>Device</th>
<th>Casualties</th>
<th>Devices found</th>
<th>Devices per casualty</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP mines</td>
<td>17</td>
<td>24,317</td>
<td>1,430:1</td>
</tr>
<tr>
<td>AV mines</td>
<td>10</td>
<td>1,088</td>
<td>109:1</td>
</tr>
</tbody>
</table>

### Table 4. Lethality ratio of AP and AV mines in Angola, 2010.

<table>
<thead>
<tr>
<th>Device</th>
<th>Casualties</th>
<th>Devices found</th>
<th>Devices per casualty</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP mines</td>
<td>9</td>
<td>7,552</td>
<td>839:1</td>
</tr>
<tr>
<td>AV mines</td>
<td>4</td>
<td>857</td>
<td>214:1</td>
</tr>
</tbody>
</table>

### Table 5. Lethality ratio of AP and AV mines in Cambodia, 2010.

<table>
<thead>
<tr>
<th>Device</th>
<th>Casualties</th>
<th>Devices found</th>
<th>Devices per casualty</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP mines</td>
<td>63</td>
<td>40,320</td>
<td>640:1</td>
</tr>
<tr>
<td>AV mines</td>
<td>78</td>
<td>831</td>
<td>11:1</td>
</tr>
</tbody>
</table>
AV mines in Sudan, at least three people could have been saved from death or injury. It is usually easier and cheaper to clear AP mines than to clear AV mines.\(^\text{11}\) However, in some countries, getting rid of the majority of AV mines first might save more lives and prevent more injuries. Perhaps a Pareto-like rule could have a wider application within mine action when prioritizing which tasks to complete first.

Second, the absence of a prohibition on the use of AV mines in the APMBC downplays their humanitarian impact. The APMBC did not cover AV mines due to a debate at the time that military use of AV mines outweighs the potential humanitarian impact that they might cause.\(^\text{11}\) This debate continued in the CCW from 2000 to 2006 during negotiations to regulate mines other than anti-personnel landmines but failed because of similar disagreements. In 2011, CCW States Parties initiated expert talks on this issue again at which certain states continued to question the humanitarian impact of mines other than anti-personnel landmines. From 1999 to 2010 the Landmine and Cluster Munition Monitor identified more than 5,000 AV mine casualties; more than 75 percent were civilians.\(^\text{12}\) The available data leaves no doubt about the scale of the humanitarian impact of AV mines. The AV mine lethality ratio is more likely to increase if its use is not regulated or prohibited.

Third, the APMBC’s success might become overshadowed if the sides of different ongoing or possible future armed conflicts decide to use AV mines more frequently, as AP mines are becoming more difficult to obtain. While this is just a theoretical assumption without sufficient existing evidence, the possibility of this assumption becoming a reality is already being discussed.\(^\text{11}\)

**Conclusion**

Continuing to clear AP mines is important. However, when analyzing mine action-related information, consider that while the AV mines are laid in fewer numbers (as frequently indicated by the number of mines found during mine clearance worldwide), they cause multiple deaths and injuries per incident. As seen in the recent study by the Geneva International Centre for Humanitarian Demining, the average number of casualties per AV mine incident is twice the average number of victims per AP mine incident.\(^\text{13}\) Furthermore, as frequently taught during various ERW safety training sessions, the proximity of areas that could have been of strategic importance to one of the conflicting sides is one of the first things to be aware of when in recent combat areas. These are areas where AV mines are often laid, typically including routes, roads and bridges—vital infrastructure that people will use many years after a conflict ends. These two factors greatly contribute to the high lethality ratio of AV mines, which is certainly the case of AV mine lethality in Afghanistan, Angola, Cambodia and Sudan.\(^\text{11}\)

---

Armen Harutyunyan has worked in mine action for 12 years in operational and program-management positions in Afghanistan, Kosovo, Lebanon, Nagorno-Karabakh, Somalia, Sudan and Tajikistan. He holds a bachelor’s degree in humanities and studies from the University of Leicester’s School of Management in Leicester, U.K.

Armen Harutyunyan
Tel: +374 93 229688

---

See endnotes page 67
5D: A GIS-based Approach for Determining and Displaying the Degree of Operational Difficulty of Demining

Clearance operations highly depend on environmental, geographic and socioeconomic conditions. These conditions make demining easier, more difficult or nearly impossible. This article proposes an analytical method called 5D (Determining and Displaying the Degree of Operational Difficulty of Demining), which classifies degrees of difficulty as low, medium, high or extreme.

by Pierre Lacroix and Rocío Escobar [University of Geneva]

The Geneva International Centre for Humanitarian Demining is collaborating with the University of Geneva to explore the feasibility of displaying the impact of explosive remnants of war in contaminated countries through maps, without revealing the ERW’s exact locations. This project, Server for Explosive Remnants of War Information Systems, also aims to develop geographical information system tools and methods to identify where populations are most at risk. In addition, SERWIS endeavors to Determine and Display the Degree of Operational Difficulty of Demining (5D) on account of realistic and measurable terrain criteria, such as land cover, slope, distance to sensitive points of interest, distance to roads, hydrology, etc. By combining such geospatial datasets into a multi-criteria process at the macro level, this project is meant to refine the evaluation of a country or region’s demining capacity and help improve demining efficiency. Results provided by the model can act as a good starting point for operational teams that wish to prepare their intervention in the field. Decision-makers can use the model for determining the order in which contaminated areas are to be cleared and which tools should be used.

Figure 1. The GlobCover dataset.
Figure courtesy of ESA GlobCover Project/MEDIAS-France.

Objectives

Thanks to the human, financial and technological support of international organizations, an area of 52 sq km was cleared in Mozambique between 2002 and 2007, using 15 demining machines. Since 2005, the number of international collaborators and donors has declined, which has decreased Mozambique’s demining capacity. In late 2008, the overall mine-affected surface remained at an estimated 10 sq km, while the demining capacity was estimated at 2 sq km per year. According to these figures, clearance of all mine-affected areas would take approximately five years. This raises a number of challenges. How can this duration be reduced? Which method (mechanical, dog detection or manual) would be most suitable for a given area, and what would be the level of operational difficulty for a given type of machine?

As a hypothesis for our model, we assume that demining is strongly dependent on geographic, environmental and socioeconomic conditions.
Some of them, such as severe gradients and dense and/or high vegetation, may limit the use of certain demining tools. For example, hill-climbing capacity of demining machines is limited to a certain degree of slope. Tiller performance is reduced among dense vegetation and larger tree trunks and is highly dependent on ground softness, rock content and distance to paved roads. Human activity may also influence use of clearance machines. For example, human activity may facilitate mechanical demining, such as the development of roads and bridges providing better access to hazardous areas. When using animal detection methods, complicating factors include terrain, humidity, slope and scent contamination. All of these factors are also likely to affect the degree of difficulty in employing manual clearance methods, although to a lesser extent.

Geographical data that can act as a direct or indirect indicator of the degree of difficulty are available for most of these factors. This paper focuses on mechanical demining, but does not prevent a future focus on other tools or methods. For each tool, developing a model of operational difficulty requires involving both geographers and experts on the tool in question. This enables the identification of appropriate layers of geographical data and the individual role of those layers in the model. For instance, a geographic layer on the ferromagnetic qualities of the soil might be a good input into a model indicating the difficulty of using metal detectors, but that same layer is likely not useful when estimating the difficulty of using animal detection. Only an expert on manual demining can determine which layers a geographer proposes are relevant for manual demining. These models are also likely to depend on the local environment. The factors that make manual demining difficult in one country are likely not exactly the same in another country.

The primary objective of this article is to present an analytical method—a map—for the evaluation and visualization of the degree of operational difficulty for demining contaminated areas. By weighting various datasets, a new dataset is created and classified into four ordinal categories of demining difficulty: low, medium, high and extreme. From this dataset, macro statistics can be obtained and used in a first step. This first step aims to determine the percentage of land that may be cleared in a region or a country, with a given technique and a specific level of operational difficulty. The percentage of surface deemed extreme to demine is also estimated. In a second step, the interpretation of information regarding operational difficulty may contribute to improving decision-making to better target clearance operations in the field. This method is applicable for demining with machines, animals or human beings.
A model was developed in a geographical information system called ArcGIS\textsuperscript{5}, inputted with datasets obtained from different sources and applied to the entirety of Mozambique.\textsuperscript{1} This case study focuses on mechanical demining, on the basis of a fictive machine with medium class characteristics (length with flail approximately 4.7 m; weight approximately 8T; working capacity approximately 860 sq m/hr in topsoil, 900 sq m/hr in sand, 840 sq m/hr in gravel) commonly used in many countries.

The model does not aim to estimate financial cost, hence the use of the term operational difficulty. A cost assessment would require data collection and analysis on a local level, while the 5D model holds national and regional relevance. For the same reason, the model does not attempt to calculate physical risk.

Inputs
The model contains seven input layers, which can be found on the Internet in the form of free global datasets. These layers include land cover, slope, points of interest, roads, rivers, lakes and national boundaries.\textsuperscript{2,3,4,5,6,7,8} These datasets are described below.

GlobCover Database. GlobCover is a global land cover map available for two periods, December 2004–June 2006 and January–December 2009. Data is missing for only 1% of total land area. GlobCover has been used in many fields of work (e.g., crop mapping, assessment of global forest cover and estimations of biomass burning emissions) and is easy to apply to a country like Mozambique. In the present case, this dataset was used to identify human activity such as farming and urban settlement. GlobCover is freely available online for noncommercial use at a 300 m resolution (Figures 1 and 2, pages 52–53) in a raster format. Each pixel represents a 300 m x 300 m cell and holds a value indicating the category of land cover found at the position where it is located (see Figure 1, page 52). For instance, Category 14 corresponds to rain-fed croplands, Category 140 to sparse vegetation and Category 200 to bare areas (Figures 2 and 3, page 53). The data is in Tagged Image File Format (.tif), and the spatial reference is the World Geodetic System 1984 (WGS 1984).\textsuperscript{2}

The Slope Dataset. The slope dataset (Figure 3, page 53) was obtained from the digital elevation model provided by the NASA Shuttle Radar Topography Mission. The DEM data is available in raster format, with a 3 arc-second resolution (90 m approximately), where each pixel contains an elevation value. The DEM can be obtained online in the form of a 5\textdegree{} x 5\textdegree{} tile mosaic (1° is approximately 110 km), and its use
is restricted to noncommercial redistribution. It is provided in the WGS 1984 coordinate system. For an easier download, using the “Topo View” interface is recommended. Slopes are derived from the DEM. Each pixel contains a slope value in degrees or percentages.

**OpenStreetMap.** Composed of different datasets—infrastructure, water, forest cover, points of interest, administrative boundaries—this database, OpenStreetMap, is distributed under an open content license. Data is available at the global level in vector format and in WGS 1984. It can be downloaded by country. It was developed on the basis of government and commercial data sources and benefited from the contribution of volunteers worldwide. From this database, the case study on Mozambique uses the points of interest and roads layers. The POI layer stores information about the location of different features such as airports, train stations, schools, hospitals, post offices, shops, telephone boxes, car parks, etc. In the mine action framework, POI are likely to restrict demining activities, since they represent crowded locations or areas frequented by civilians. The roads layer is found as a line shapefile and contains various categories of roads, from footways to primary roads. Unlike POI, roads are likely to facilitate activities, since they increase the access of demining resources to hazardous areas.

**HydroSHEDS.** HydroSHEDS data is a hydrological dataset derived from the Shuttle Radar Topography Mission. This dataset includes vector and raster data such as river networks, watershed boundaries, drainage directions and flow accumulation. The HydroSHEDS dataset covers almost the entire globe, but it requires a manual download region by region. It can be used noncommercially. For this case study, the river network was used, provided in the form of river lines stored in shapefiles. The data resolution is 15 arc-seconds, approximately 500 m.

**GLWD.** The Global Lakes and Wetlands Database was developed on the basis of seven digital maps and attribute datasets for lakes and wetlands. The Conservation Science Program of the World Wildlife Fund publishes it globally. Three different datasets can be used, depending on the level of detail required: large lakes and reservoirs (GLWD-1), smaller water bodies (GLWD-2) and wetlands (GLWD-3). For this case study, a combination of Level 1 and Level 2 was used to include lakes with an area > 50 sq km, reservoirs with a storage capacity > 0.5 cu km and smaller water bodies with a surface > 0.1 sq km. All these datasets are provided in vector format (polygons) and for typical scales of use ranging from 1:1,000,000 to 1:3,000,000. The GLWD can be used for noncommercial, scientific, conservation and educational purposes.

All the databases presented above are available at the global level for free in high resolution in the WGS 1984 coordinate system and with a low percentage of missing values (less than 2%). Formats may vary from one dataset to another, but they are all well-known formats (e.g., shapefile, .tif, etc.), readable by many GIS. Table 1 (above) summarizes the main characteristics of these databases.
Figure 5. This output raster represents the operational difficulty of demining in Mozambique for a fictive demining machine with medium class characteristics, as is commonly used in many countries. Figure courtesy of the authors.
### Table 3. Classification of the input layers in four categories of operational difficulty.

<table>
<thead>
<tr>
<th>Description</th>
<th>Degree of Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Globcover</strong></td>
<td></td>
</tr>
<tr>
<td>11 Post-flooding or irrigated croplands (or aquatic)</td>
<td>High 1</td>
</tr>
<tr>
<td>14 Rainfed croplands</td>
<td>High 1</td>
</tr>
<tr>
<td>20 Mosaic cropland (50–70%) vegetation (grassland/shrubland/forest) (20–50%)</td>
<td>Medium 2</td>
</tr>
<tr>
<td>30 Mosaic vegetation (grassland/shrubland/forest) (50–70%) cropland (20–50%)</td>
<td>High 1</td>
</tr>
<tr>
<td>40 Closed to open (&gt;15%) broadleaved evergreen or semi-deciduous forest (&gt;5m)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>50 Closed (&gt;40%) broadleaved deciduous forest (&gt;5m)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>60 Open (15–40%) broadleaved deciduous forest/woodland (&gt;5m)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>70 Closed (&gt;40%) needleleaved evergreen forest (&gt;5m)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>90 Open (15–40%) needleleaved deciduous or evergreen forest (&gt;5m)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>100 Closed to open (&gt;15%) mixed broadleaved and needleleaved forest (&gt;5m)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>110 Mosaic forest or shrubland (50–70%) / grassland (20–50%)</td>
<td>High 1</td>
</tr>
<tr>
<td>120 Mosaic grassland (50–70%) / forest or shrubland (20–50%)</td>
<td>Medium 2</td>
</tr>
<tr>
<td>130 Closed to open (&gt;15%) (broadleaved or needleleaved, evergreen or deciduous) shrubland (&lt;5m)</td>
<td>Medium 2</td>
</tr>
<tr>
<td>140 Closed to open (&gt;15%) herbaceous vegetation (grassland, savannas or lichens/mosses)</td>
<td>Low 3</td>
</tr>
<tr>
<td>150 Sparse (&lt;15%) vegetation</td>
<td>Low 3</td>
</tr>
<tr>
<td>160 Closed to open (&gt;15%) broadleaved forest regularly flooded (semi-permanently or temporarily) — Fresh or brackish water</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>170 Closed (&gt;40%) broadleaved forest or shrubland permanently flooded — Saline or brackish water</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>180 Closed to open (&gt;15%) grassland or woody vegetation on regularly flooded or waterlogged soil — Fresh, brackish or saline water</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>190 Artificial surfaces and associated areas (Urban areas &gt;50%)</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>200 Bare areas</td>
<td>Low 3</td>
</tr>
<tr>
<td>210 Water bodies</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>220 Permanent snow and ice</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>230 No data (burnt areas, clouds, etc.)</td>
<td>Extreme 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Slope</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0° - 30°</td>
<td>Low 3</td>
</tr>
<tr>
<td>30° - 35°</td>
<td>High 1</td>
</tr>
<tr>
<td>&gt; 35°</td>
<td>Extreme 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rivers</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sites located &lt; 1 km away from a road</td>
<td>Low 3</td>
</tr>
<tr>
<td>Sites located &gt; 1 km away from a road</td>
<td>High 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Points of interest</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>POI</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>Sites not considered as a POI</td>
<td>Low 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lakes</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside lakes</td>
<td>Extreme 0</td>
</tr>
<tr>
<td>Land</td>
<td>Low 3</td>
</tr>
</tbody>
</table>

### Table 4. Weighting of the input layers. Weights provided in this table are fictive and will not reflect reality.

<table>
<thead>
<tr>
<th>Layer</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cover</td>
<td>30%</td>
</tr>
<tr>
<td>Slope</td>
<td>30%</td>
</tr>
<tr>
<td>Roads</td>
<td>20%</td>
</tr>
<tr>
<td>Points of interest</td>
<td>20%</td>
</tr>
</tbody>
</table>

Table courtesy of the authors.

---

rivers, dense vegetation, high degree of slope, etc.). Areas where demining is considered very difficult are colored in brown and assigned the value 1. A value of 2 indicates medium difficulty (in orange) and a value of 3 indicates low difficulty (e.g., buffers around roads in yellow).

In Figure 4 (pages 54–55), model parameters can be identified by the letter P above a blue or a green oval, offering the user the option of specifying the value before running the model. Administrative limits are placed into parameters, because the model is meant to be applied to any country and region in the world. Environmental, geographical and socioeconomic factors (land cover, slope, POI, roads and hydrology) are applied using parameters as well, because they may influence operational difficulty of demining in different ways for different study areas while using different demining techniques. It is possible to add further parameters to the model: other factors (e.g., human settlements, temperature gradients, conflict zones, etc.), the weights of Table 3, the weights of Table 4, and so on. The underlying complexity of the workflow (Figure 4, pages 54–55) is hidden from the users (e.g., decision-makers and operations) who only interact with the system through this set of parameters (Figure 6, page 58).

**Benefits of the Model**

The model is a powerful tool that can calculate in 30 minutes an operational difficulty layer of the entirety of Mozambique (about 800,000 sq km), with a 200 m resolution. In addition, the model is flexible, user-friendly and does not require advanced GIS skills from its users.

It holds national and regional relevance, and is potentially applicable to any mine-affected country. Since environmental, geographical and socioeconomic conditions vary from one country to another, the input data, the area of study and the weights can be set as the model’s parameters. Other parameters (e.g., human settlements, temperature gradients, soil types and characteristics, elevation, conflict zones, etc.) can be added as inputs according to data availability and user needs.

The main output of the model is a map. With it, users have an overview of the situation in their area of work at a glance. The map can also be overlaid with other information such as hazardous areas, population densities, internally displaced populations, etc.

Zonal statistics can easily be derived from the
output raster map for each degree of operational difficulty. For example, the overall surface with a low degree of difficulty is directly read into the output raster. This kind of information may be significant for decision-makers and operators, especially in financial terms. With further work, in fact, this model opens the possibility to estimate the financial implications of their operational choices.

Conclusion

The 5D model is a first approach for modeling an operational difficulty of demining at a macro level. The model was developed in ArcGIS® Desktop, which is readily available in most mine-affected countries. Users interact with the model via an intuitive and graphical interface by using a set of parameters that can be modified each time the program runs, especially the area of study and input factors. Even if the workflow may seem complex, using the model does not require intensive GIS skills.

The resulting map is a good starting point for decision-makers and operators to refine their evaluation of the degree of operational difficulty and improve efficiency in their work. However, this tool is intended as a guide, and real world political or economic factors may lead to or prevent demining activities in a way that may disagree with the tool. In addition, deminers should be aware that modification of one parameter could affect the outputs of the model significantly.

See endnotes page 67
Mine Detection Rats: Effects of Repeated Extinction on Detection Accuracy

This article describes the performance of Giant African Pouched Rats where reinforcement (reward) or extinction (no reward) conditions affected landmine identification. Accuracy deteriorated quickly in the absence of reinforcement, suggesting that reinforcement is essential.

by Amanda Mahoney, Amy Durgin, Alan Poling [Western Michigan University, APOPO], Bart Weetjens, Christophe Cox, Tess Tewelde, Tekimiti Gilbert [APOPO]

As a result of almost 30 years of war, landmines are a devastating problem in Mozambique. According to a United Nations’ report, an estimated 20 people step on landmines every month in Mozambique and, due in part to lack of adequate health care, 60% of those people die. Since the mid-1990s, efforts have been made to clear Mozambique of landmines, but millions are believed to still contaminate the country. Anti-Personnel Landmine Detection Product Development (Anti-Personsmijnen Ontmijnende Product Ontwikkeling) started using Giant African Pouched Rats (Cricetomys gambianus) for landmine detection in Mozambique in 2007. Details on how the rats are trained and used operationally are provided elsewhere. In brief, the rats are trained through operant conditioning in which food reinforces (rewards) appropriate indication responses (i.e., those that occur within 1 m of a mine). Incorrect indication responses are not reinforced.

Training begins in a controlled laboratory setting and proceeds through a series of steps to a large training field.

An early evaluation conducted in 2005 in which seven rats searched 20,234.28 sq m of land in Mozambique indicated that their detection accuracy exceeded 95%. In a more recent evaluation, teams of two rats searched 93,400 sq m of land in Mozambique, revealing 41 mines. This area was then searched with metal detectors, revealing a 100% detection rate by the rats. Such findings suggest that pouched rats are acceptably accurate in detecting landmines and, as a result, they are used operationally in Mozambique.

The mine detection rats in Mozambique work on training fields and actual minefields (operational sites). The training field comprises several 100 sq m, 200 sq m and 400 sq m boxes indicated by ropes along each side. Between zero and four deactivated landmines are buried within each box. The rats are attached to a rope (via a harness) held by two handlers on either side of the box. The rats walk across the box they are searching. When an indication response (pausing and digging) occurs within 1 m of a landmine, the trainer clicks to signal reinforcement and food is delivered.

When the rats are used operationally, the location of mines (and other explosive remnants of war) is unknown prior to clearance operations. Therefore, knowing whether an indication response is correct (i.e., within 1 m of a mine) or incorrect is impossible. To avoid the possibility of reinforcing incorrect responses and thereby potentially reducing the rat’s subsequent detection accuracy, no reinforcers are delivered when the rats are used operationally.

In technical terms, the rats work under extinction (no reinforcement) conditions when used operationally and under differential reinforcement (food reinforcement for correct responses, no reinforcement for incorrect responses) conditions during training. Extinction inevitably weakens previously reinforced responses. For this reason, the rats rotate between the training field and the operational site. The rationale for this arrangement is that reinforcement of correct responses on the training field will sufficiently strengthen such behavior to compensate for the response-weakening effects of extinction at the operational site. The rats’ performance at the operational site strongly suggests that this is the case, but we have not systematically evaluated the extinction effects, though studies...
are under way. In an effort to gain information of value to maximize the effectiveness of APOPO’s MDR team, the present study evaluated the effects of extinction on the detection accuracy of five rats performing under controlled conditions that allowed for accurate assessment of their performance.

Setting, Subjects and Materials

Trials took place in Morogoro, Tanzania on the APOPO training field, which contains approximately 1,200 landmines buried in a fenced 283,279.95 sq m site. In the portion of the training field used, one mine was buried in a marked 100 sq m box. Some of the boxes in APOPO’s training field have markings to indicate landmine locations and some do not. The boxes without markings were used in the present study to provide blind testing conditions, under which the trainers were unaware of mine locations. The tests used six boxes, each containing just the one mine. Each test took an average of 17.8 minutes with a range in time of 8 to 25 minutes.

Five rats participated in this test. Each rat had recently passed a blind test in which it located each of eight unmarked mines in a 400 sq m area with no more than one false alarm. The rats were distributed between two trainer teams; each team comprised two trainers and one notetaker. The notetakers were APOPO minefield supervisors. APOPO certified all trainers and selected them because they demonstrated good adherence to standard operating procedures. Materials included clickers to signal availability of the food rewards, data sheets, a banana (the food reinforcer) and mine detection training box materials.

Training box materials consisted of measuring tape stretched along one side of the box and a rope that stretched across the box between the two trainers and guided the rat as it walked in the box. The rats were attached to the rope via a harness and lead cord and could walk back and forth along the rope. The trainers held two measuring tapes between them. One end of each tape was attached to the rat’s harness at zero. Thus, the exact location of the rat’s indications could be determined through the coordinates of the measuring tape value in the trainer’s hand and the measuring tape value at the trainer’s feet. After the rat walked down the rope in one direction, the trainers took a 0.5 m step forward and the rat walked in the opposite direction across the box. In all tests, the rats were allowed to traverse the rope only once before they were moved forward.

Data were recorded on graph paper that depicted the box measurements. Each test box was displayed as a grid comprised of 0.5 m x 0.5 m squares. Shaded gray squares corresponded to the mine locations. The indication response was scratching the ground for any length of time within 1 m of the landmine. Upon a rat indication, the trainer informed the notetaker, who recorded the location of the response and whether or not the trainer should sound a click and deliver food to the rat. In the reinforcement condition, the trainer was instructed to sound a click and deliver food (i.e., provide a reinforcer or reward) each time an indication response within 1 m of a mine was emitted. Reinforcers were never provided in the extinction condition.

Experimental Design

A multiple baseline with reversal design evaluated detection accuracy under reinforcement and extinction conditions. In a multiple baseline design, different subjects are initially exposed to the conditions of interest on different days. This design demonstrates that the changes observed when conditions change are the result of the change in conditions and not the result of some other factor (e.g., weather conditions, day of the week, time of exposure to a condition). A reversal design calls for returning to a prior condition, which in this case was the reinforcement condition. Thus, all of the rats were exposed to a reinforcement condition, then extinction, reinforcement and finally extinction.

When performance remained at 100% accuracy under the reinforcement condition over at least four consecutive days, the extinction condition began. Since there was only one mine per box, if the rat found it, the detection accuracy was 100%; if it did not indicate a mine, the detection accuracy was 0%. The rat worked under the extinction condi-
tion until detection accuracy fell to 0% for at least two consecutive days. This sequence was then repeated.

All rats worked in one box per day, and sessions were conducted up to five days per week. Sessions were not conducted on weekends, holidays or days with heavy rain. Data recorded each day for each rat were the location of indications, the number of hits (indication responses within 1 m of a mine), the number of false alarms (indication responses further than 1 m from a mine) and the number of misses (mines with no indication response within 1 m).

**Reinforcement Condition.** In this condition, when an indication response occurred within 1 m of a mine, the trainer produced a click sound using a handheld clicker. If the rat began to approach the trainer within 3 seconds of the click, which usually occurred, the trainer delivered food. If the rat did not approach the trainer within 3 seconds of the click, the trainer did not present food. If a rat walked over a mine without indicating, the rat continued clearing the rest of the box. Each rat searched each area of the box only once.

**Extinction Condition.** Extinction sessions were the same as reinforcement sessions, with the exception that neither a click nor food was presented following either correct or incorrect identification responses.

**Second Reinforcement and Second Extinction Conditions.** The second reinforcement condition, which was identical to the first reinforcement condition, occurred after the first extinction condition. The second extinction condition was the same as the first one and was the last condition arranged for each rat. Figure 1 shows the number of days that each rat was exposed to each experimental condition.

**Independent-observer Agreement.** A second observer independently collected data during 21.3% of sessions. The second observer agreed with the primary data collector on 98.1% of rat indications.

**Results**

Figure 1 (page 62) shows the percentage of hits (correct identification responses) per day by individual rats during reinforcement and extinction conditions. Because each box had one mine, accuracy was either 0% or 100%. During the initial reinforcement condition, the rats identified all mines except for a single mine missed by Nijad in the third session. In general, because accuracy was 100% on the first day, the rats did not appear to learn from the use of the same six boxes. The trainers may have learned the location of the mines, and at some point they may not have been operating under blind conditions. However, a second observer was present during approximately 20% of the sessions to ensure that procedures were followed as written and that there was agreement in recording.

When extinction was introduced, accuracy declined for four of the five rats within three sessions. Enda’s performance did not fall until the seventh session but remained at 0% for six of the next seven sessions. Typically, the rats continued emitting an indication response over the mine on some days during extinction, but failed to indicate on about as many days as they indicated. Upon return to the reinforcement condition, detection accuracy for Toyota remained variable for six days while performance for Mar remained at 0% for eight out of nine days before improving to the initial reinforcement-condition level. Performance for Nijad and Bila recovered to 100% accuracy in two days, and Enda’s performance improved to this level after three days. Upon return to extinction, responding fell within two to four days for all rats. Performance again took several days to recover to prior reinforcement levels for Enda and Mar, although the performance of Bila, Toyota and Nijad recovered in zero to two days.

Figure 2 summarizes findings across the five rats. This figure clearly shows that overall the rats’ accuracy in detecting landmines was high during the first reinforcement condition and quickly declined when extinction was arranged. Accuracy remained inconsistent and relatively low after reinforcement was again arranged but eventually reached a high level. The rats’ accuracy again declined even more rapidly when extinction was introduced a second time. For this reason, these rats will not be used in actual future detection operations.

Few false alarms (incorrect identification responses) occurred under any condition, and the number of false alarms per session did not consistently differ under reinforcement and extinction conditions. None of the rats emitted more than three false alarms on any given day, and an individual rat typically emitted zero or one false alarm each day.

**Discussion**

This study evaluated the performance of APOPO’s MDRs under reinforcement and extinction conditions and found that, in general, the rats demonstrated high accuracy and stable performance after sufficient expo-
sure to the reinforcement condition and variable but substantially lower accuracy during the extinction condition. There was high carryover from the reinforcement condition in that performance remained variable after the reinforcement condition was reinstated. Sometimes several reinforcement sessions were necessary for performance to recover to 100% accuracy.

In APOPO’s operational setting, the rat does not receive reinforcers, because it is unknown where mines lay and, consequently, whether the rat’s indications are correct (i.e., within 1 m of a mine) while searching. The study’s aim was to determine how many days an MDR can work on a minefield, without reward, before performance degrades. Under the conditions of the present study, this period was conclusively determined to be quite short. The rats’ accuracy in detecting mines fell, on average, after 3.1 days of exposure to extinction, although their false alarm rates did not change systematically. Furthermore, recovery of the asymptotic accuracy level following extinction took up to nine days.

To maximize experimental control, the present study only used 100 sq m boxes containing a single mine. In operational demining in Mozambique, the overall density of landmines is substantially lower. For example, in one study the rats located 41 landmines in a 93,400 sq m area, which yields an average of 0.04 mines per 100 sq m box, although in some cases a rat may pass over two or more mines in a small area. The effects of extinction on the performance of MDRs under such conditions, where target density is highly variable but low overall, remain to be determined. Of course, performance in extinction depends on a number of environmental variables. These variables seemingly would include the number of responses emitted without reinforcement and the manner in which reinforcement was arranged prior to extinction.

Future research in this area might investigate the effects of training with intermittent reinforcement, which is well-known to prolong accurate performance under extinction. Though APOPO has not yet evaluated this methodology, it has used intermittent reinforcement, with trainers rewarding 85% of indications. APOPO plans to study intermittent reinforcement and evaluate optimal parameters and effectiveness.

APOPO is currently investigating the utility of exposure to reinforcement conditions, prior to or following the extinction condition. The success of this procedure depends largely upon how well the rats discriminate between training (reinforcement) and operational (extinction) conditions.

These tests were conducted for experimental purposes to provide relevant information to APOPO management. Prior research conducted under operational conditions indicates that APOPO’s rats are accurate in detecting landmines under the conditions arranged in Mozambique. APOPO draws upon several means of reinforcement delivery in operational conditions: frequent quality control checks, data collected regularly on individual rat performance and ample opportunity for reinforcement on the nearby training field. How the rats would perform under other conditions, for example, if they worked for longer periods each day or in areas with different landmine concentrations, is speculative. The present data strongly suggest, however, that their accuracy would decline significantly if they worked for periods during which several indication responses occurred and were not reinforced. This study and previous ones provide a research base that informs APOPO’s operating procedures in a way that continually optimizes operating procedures and ensures the rats’ performance is maintained at high levels under operational settings.

APOPO’s primary goal is using poached rats effectively and efficiently for humanitarian purposes, not conducting scent-detection research. Such research is, however, the best means to that end and for that reason is given high priority by the organization. Conducting research uses personnel, time and financial resources that could go directly toward mine clearance or land release. Therefore, we attempt to choose research topics carefully and to design studies in a way that minimizes cost. Small-N research strategies characteristic of behavior analysis have proven especially valuable in this regard, and we recommend them to the humanitarian demining community.
Tess Tewelde is the Program Manager for APOPO’s Mozambique Mine Action Program. Tewelde has 11 years of experience in mine action in Africa in humanitarian and commercial sectors.

Tess Tewelde
Mozambique Program Manager
SUA-APOPO
PO Box 3078
Maputo / Mozambique
Tel: +258 827 273 378
Email: tess.tewelde@apopo.org

TeKimiti Gilbert joined APOPO as the Head of Mine Action in March 2012. Prior to that time, he worked extensively with the United Nations and has worked in land clearance around the world.

TeKimiti Gilbert
Head of Mine Action
SUA-APOPO
PO Box 649
Maputo / Mozambique
Tel: +258 827 273 378
Email: Tekimiti.gilbert@apopo.org

Endnotes

The Need for Collaboration Between Ordnance Manufacturers and UXO Clean-up Personnel, Imber [from page 8]


Darfur: Baseline KAPB Survey, Winkler and Ragab [from page 11]


3. The Ordnance Disposal Office began its operations in El Fasher in 2005 and became an integral component of UNAMID in 2008. It works in direct support of UNAMID priorities to create a safe environment for the civilian population in Darfur. More information can be found at http://darfurudo.org.

4. Sudan’s National Mine Action Authority (NMAA) was established through Presidential Decree No. 299 in December 2005 and adopted the Sudan Mine Action Bill in 2010. In 2012, NMAC and UNAMID ODO signed a letter of cooperation, and NMAC started establishing offices in Darfur. More information can be found at http://su-mac.org.


9. Traditional community leaders

10. When discovering the use of UXO as school bells out of economic necessity, UNAMID ODO responded by including school bells as part of the risk education materials.


Grenade Blast Kills 25 in Turkey, Reitman [from page 15]


Mine/ERW Risk Education in Afghanistan, Hashimi [from page 20]


Healing the Wounds of War: Victim Assistance in Post-conflict Burundi, Macauley [from page 24]


CISR Donates 200 Mobile Phones to Peer-support Workers, Macauley [from page 27]


Victim Assistance and Disability Rights: Beyond the Rhetoric, Bailey [from page 28]


2. The more empowering term survivor is used to describe the individual who survived a landmine, cluster munition or other ERW incident.


Peer Programs Across Disability Groups: A Partnership for Human Rights, Nickels [from page 32]


HIV/AIDS Survey in Southern Angola, Chitsama, Dumba, Mahbiza-Berejena and Dimbu [from page 36]


Sri Lanka: A Photographic Essay, Sutton [from page 42]


Mine Detection Rats: Effects of Repeated Extinction on Detection Accuracy, Mahoney, Durgin, Poling, Weetjens, Cox, Tewelde and Gilbert [from page 61]


Intermittent reinforcement is when a behavior is reinforced sporadically. Intermittent reinforcement increases resistance to extinction, because it helps the animal become accustomed to periods of no reinforcement while encouraging the behavior to continue in hopes of future reward. For more information, please see: “Intermittent Reinforcement and Resistance to Extinction” Psychology, An Introduction. http://bit.ly/LrdgXs. Accessed 4 October 2012.


For a glossary of common terms used in many of our articles, please visit The Journal’s Common Terms and Definitions list at http://tinyurl.com/JournalTerms.
calls for papers

issue 17.2 (submission deadline 15 february 2013)
focus: prevention & clean-up of unplanned explosions
feature: asia and the pacific

issue 17.2’s focus section will look at unplanned explosions. unplanned explosions are one of the greatest threats to civilians around the world today. altogether, there have been 245 unplanned explosions reported since 1998. the journal is seeking articles concerning unplanned munitions explosions that explore where they occur, why they happen so frequently and what is currently or can be done to prevent them. the feature section is looking for articles about the clearance, survey, area reduction, ottawa convention requirements, munitions-risk education and creative solutions to the problem of explosive remnants of war in asia and the pacific.

issue 17.3 (submission deadline 15 july 2013)
focus: survivor assistance
feature: the middle east

issue 17.3’s focus section will look at services available to landmine/explosive remnants of war survivors, their families and communities after conflict ends, as well as methodologies and programs that help survivors deal with physical, psychosocial and/or socioeconomic problems resulting from munitions incidents. the feature section will address the erw problems resulting from the many recent political changes in the middle east. how has the threat of landmines/erw and the dangers of excess or abandoned weapons changed? what services are available to recent and legacy survivors of mines/erw in the middle east?

peer-reviewed research, technology and development section
each print issue contains a peer-reviewed research, technology and development section. all articles on current trends and developments in r&d will be considered for this section. topics will include but not be limited to detection and neutralization, manual or mechanical equipment, data fusion, biosensors (including dogs, rats and bees), gis, mapping and terrain analysis, personal protective equipment, demining tools, metal detectors, needs of users, lessons learned, test and evaluation, information technology, mine-detection test facilities, landmines, erw and ordnance. submissions are accepted on a rolling basis.

the journal of erw and mine action is sponsored by:

[ subscribed by logos]

read this:
the journal editorial staff reserves the right to reject submissions that include text copied from other sources in part or as a whole. works that have been published previously and for which the author retains publishing rights may be submitted, but the journal requires the author provide notification of this when submitting the article and give contact information for the original publisher so that reprint permission may be verified. reprint submissions for which this information is not provided up front may be rejected. please note that the journal reserves all rights to content published and requires notification and written approval before content is used again by another source or publication.

authors who submit articles to the journal are expected to do so in good faith and are solely responsible for the content therein, including the accuracy of all information and correct attribution for quotations and citations.

https://commons.lib.jmu.edu/cisr-journal/vol16/iss3/1