Mine Action Success Stories

Plus:
Non-state Actors
Physical Security &
Stockpile Management
A note about The Journal’s ISSN

Readers may have noticed that Issue 11.2 of The Journal of Mine Action (Spring 2008) and the subsequent issues had a different identification number (or ISSN) printed on the spine than previous issues. We would like to clarify the ISSN numbers for our publications. Despite what may have been printed on our publications, the ISSN numbers are as follows:


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If our publication is listed in a library catalog or other directory that you maintain, we urge you to update your records to reflect the correct ISSNs as appropriate. We apologize for any inconvenience.

Sincerely,

The Journal of Mine Action

The Journal of ERW and Mine Action

Upcoming Issues

Issue 14.3 | Fall 2010
Looking Beyond Mine Action | Development and Funding | Special Report: Update on National Programs

Issue 15.1 | Spring 2011
Middle East | Training/Capacity Development | Special Report: Legal Instruments

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Dear Readers,

One of the things I like to do in each issue of The Journal is let you know about some of the recent activities the Center for International Stabilization and Recovery has undertaken. Today, I share information about one of our most effective programs.

As I write this message, the 19 recent graduates of the 2010 Senior Managers’ Course in ERW and Mine Action are departing the campus of James Madison University. We at CISR are excited about their amazing work and exceedingly thankful to everyone who gave so much over the past five weeks to make the SMC a resounding success. I am especially thankful for the support of the Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA), which funded the course.

This marks our sixth course, with a total of 125 senior managers from 36 countries trained. The SMC is an internationally-recognized training course that taps into the knowledge and expertise of the finest faculty and subject-area experts available. The staff at CISR, faculty from various JMU departments and colleges (especially the nationally ranked College of Business), and global thought leaders worked with SMC participants representing 12 countries from 17 May to 17 June. According to one participant, Dorijan Maršič, Director of the International Trust Fund for Demining and Mine Victims Assistance, the SMC is “an incredibly valuable way of sharing best practices and experiences, as well as networking with the participants from different countries and backgrounds.”

The SMC would not be the achievement that it is without the support of PM/WRA, which identified a need for trained managers in host-nation mine-action organizations and chose CISR to deliver that training. The SMC provides a unique opportunity for leaders from around the world to unite and exchange information on post-conflict research, specifically addressing the safe and effective removal of landmines and other explosive remnants of war. The course is remarkable for its depth and breadth, a feat achieved only with the talented professors and subject-area experts who make it the most comprehensive senior-management training program in the field.

We look forward to sharing the successes of these most recent SMC graduates with you in future issues of The Journal. Our friends and partners join CISR in standing ready to address training needs and opportunities with the mine-action community in the months and years to come.

Thanks to all of the SMC supporters and participants for helping save countless lives from ERW and landmines for generations to come.

Sincerely,

Ken Rutherford

Published by JMU Scholarly Commons, 2010
Peer-to-Peer Support Vital to Survivors

by Kenneth R. Rutherford [Center for International Stabilization and Recovery]

Landmine victims suffer not only from physical trauma, but also from intense emotional, psychological and social difficulties. As a landmine survivor and person with a disability myself, I know the challenges of recovery firsthand. On a personal level, I feel I can better communicate challenges with other landmine survivors and people with disabilities rather than my doctors, family and friends; peer-to-peer support helped me face the difficulties I encountered following the loss of my legs.

Landmine Survivors Network
In order to help landmine victims and their families cope with and overcome similar struggles, I teamed with fellow landmine survivor Jerry White to create the Landmine Survivors Network in 1996. We founded LSN to help survivors encourage and assist one another via a peer-to-peer support system, which increases the likelihood of societal reintegration for victims. These programs involve connecting recent landmine victims with survivors who have had time to reflect, convalesce and reintegrate themselves as productive, contributing members of society. Recent victims share their stories, have their emotions validated, receive practical advice and, through their interaction with fellow survivors, realize that successful recuperation is possible.

In 2008, LSN became Survivor Corps, broadening its mission of helping landmine victims to all survivors of violence, while maintaining the system of peer support. In addition, as survivors can offer unrivaled perspectives into war’s devastating effects, SC has worked to encourage recent victims to use their self-confidence and empowerment to help break worldwide cycles of violence. For example, in Colombia, Survivor Corps has been training community leaders and volunteers in peer-to-peer support techniques. SC has facilitated a leading network of Colombian families who experienced family loss through kidnapping, disappearances and executions; the network is designed to memorialize their loved ones’ lives and facilitate family and community healing.

Among its programs that are designed to curb the spread of armed conflict, SC has developed a series of community-building programs and advocacy campaigns to help repair lives fractured by war. These programs allow former enemy combatants and other survivor groups to come together, creating an increased sense of forgiveness, peer validation and societal reintegration, while simultaneously furthering the reach of peaceful development exercises.

Survivor Corps Closing Doors
Before the year’s end, SC will close its doors, constituting a great loss to the landmine-action community. With the emergence of thousands of new landmine and ERW victims each year, however, the need for victim assistance and peer-to-peer support is as great as ever. Though landmine casualties are declining, the thousands of survivors require enduring and elastic health care, prosthetics, education, and emotional and financial support.

Being injured by a landmine is traumatic for anyone, but it becomes a lifelong problem when the victim is a child.

Photo courtesy of Charlotte Deisterang
Recognizing this fact, in the wake of its closing, SC will transfer its peer-support resources to the Center for International Stabilization and Recovery located at James Madison University.

CISR Ready for the Mission

In February of this year, I joined the JMU’s staff as the Director of CISR. Pulling from my experience at LSN/SC, and with support from CISR’s experienced staff, I am confident in our ability to successfully continue the effective activities started by LSN/SC. CISR has a long history of providing creative and prescient programming and initiatives to the humanitarian-demining community, and its outreach and engagement with war-affected and post-conflict communities is well-known.

The Center’s location on the JMU campus is also particularly felicitous, giving it the opportunity to tap world-class professors and thought leaders for collaboration and innovation. Two such leaders, trauma-recovery specialists Drs. Lennie Echterling and Anne Stewart of JMU’s graduate psychology department, have partnered with CISR to develop programs in Jordan and elsewhere. Their work with CISR stands apart as particularly important and pioneering for survivors and their communities. They will expand their work with the Center to incorporate its new peer-to-peer direction.

As a survivor and LSN cofounder, I was worried about the future of the peer-to-peer support for survivors. With encouragement from JMU and the Survivor Corps board of directors and staff, the CISR staff decided that peer-to-peer support provided a natural synergy to our current activities and fits within our Center’s goal to support individuals and organizations in post-conflict regions. We are preparing to accept the SC peer-to-peer resources in order to continue this important legacy. CISR is seeking support from the Office of Political-Military Affairs to assist with this peer-to-peer knowledge transfer. CISR looks forward to the opportunity of preserving and expanding the peer-to-peer support expertise and programming started by LSN more than a decade ago.

As we move forward, CISR will focus on the psychosocial rehabilitation of survivors of violent conflict. CISR is well-poised to assume leadership in this field, having conducted research and programming on a range of survivor-related issues. CISR is honored to continue LSN/SC’s program of peer-to-peer support and is committed to ensuring that peer-support programs around the world continue helping survivors as they recover from their trauma, reintegrate into society and rebuild their communities.

Kenneth R. Rutherford, Ph.D., is Director of the Center for International Stabilization and Recovery and Professor of Political Science at James Madison University. Cofounder of Landmine Survivors Network (now known as Survivor Corps), he has worked for the Peace Corps (Mauritania), U.N. High Commissioner for Refugees (Senegal), and International Rescue Committee (Kenya and Somalia) and as a Fulbright Professor (Jordan). He is a graduate of Georgetown University (’00 Ph.D.) and the University of Colorado (’85 BA, ’92 MBA). His latest book, Disarming States: The Global Movement to Ban Landmines, will be published by Praeger Press in February 2011.

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A Mine-free Central America: How Can We Improve on Success?

Since 1991, the Organization of American States has worked to eliminate the threat of anti-personnel landmines in the Americas. In 2010, the OAS Mine Action Program marked a major milestone toward that goal as Nicaragua completed its national demining plan to establish a once war-torn Central America as a mine-safe region. Notwithstanding the success of these efforts, it is important to understand what could have been done better to achieve mine-clearance goals more efficiently and effectively and how these lessons might be applied to other programs.

by Carl E. Case [Organization of American States]

After years of diplomatic, political and programmatic effort, Central America is finally considered mine-safe. Bearing in mind the instability and strife that wracked the region during the 1980s and the extensive use of landmines by military and insurgent forces, the elimination of the mine threat should be cause for celebration. However, to paraphrase Microsoft founder Bill Gates, success can be a poor teacher because it seduces smart people into thinking that they cannot lose. Setting aside the impulse for self-congratulation, the mine-action community ought to take a moment to reflect on how this achievement might have been brought about with a more efficient use of the considerable assets required or on how the final outcome could have been realized sooner. In reviewing the journey by which the Central American nations arrived at this milestone with the support of the OAS and the international donor community, there are some important lessons other mine-clearance programs can apply to ensure they achieve their clearance goals in the most effective way.

In the Beginning

Six years before the Ottawa Convention cemented a commitment to rid the world of anti-personnel landmines, the OAS had conceived a vision to help the governments of Central America emerge from a decade of conflict by clearing landmines from their national territories. In response to a 1991 request from the newly-installed democratic government in Nicaragua, the OAS called upon the Inter-American Defense Board, a rarely-used military adjunct of the OAS, to study the mine problem in Central America and recommend a plan of action. Although the IADB’s assessment focused primarily on Nicaragua, which was the most severely mine-affected nation in the region, its staff also studied the landmine problem in Costa Rica, El Salvador, Guatemala and Honduras, all of which had seen the use of anti-personnel mines to some extent throughout the 1980s and had requested similar assistance.

The IADB initially developed assistance plans for each country, with the exception of Guatemala, where the government was continuing to battle insurgent groups. Plans were based on the national military forces’ mine-contamination information, which in most cases was incomplete, if not wholly inaccurate. Moreover, planning focused primarily on providing initial training and equipment to launch mine-clearance work without the intention of sustaining operations for an extended period of time. Without any significant operational experience in mine-clearance programs, and with few recent examples of programs in...
the world from which to draw important lessons, the IADB lacked a strong example on which to base clearance timelines.

By 1997, the OAS effort to support mine clearance in Central America had begun to take on a more structured look. The General Assembly, the main political body of the OAS, endorsed the work initiated by the IADB and created a special fund to accept contributions from donor countries to support what became known as the Assistance Program for Demining in Central America. The concept of support used in this program evolved beyond only training and equipping deminers from national armed forces to providing teams of international military supervisors. These teams allowed for quality assurance and certification of clearance work, while the OAS established a logistical and administrative structure to support operations in each country, as well as to continue fundraising efforts. In June 1997, the OAS General Assembly approved a resolution to “adopt as goals the global elimination of anti-personnel landmines and conversion of the Western Hemisphere into an anti-personnel-land-mine-free zone,” aiming to complete mine clearance in Central America by the year 2000.¹

Defining the Problem
Despite having support from OAS political bodies and the Central American governments for an overall clearance goal, the magnitude of the task in Central America was never clearly established. The specific sizes and locations of mined areas as well as the mine densities in each of the affected countries varied widely. In Nicaragua, where the armed forces were responsible for planting the vast majority of mines, reasonably accurate records, including maps, were available. Although this information initially yielded a credible basis for clearance plans, military mine registries ultimately proved to be incomplete, as some installed minefields had never been recorded or their records had been lost.

In Costa Rica and Honduras, mines were believed to have been placed either by Nicaraguan insurgent forces operating from their territories or by the Nicaraguan military in areas where borders were poorly defined or unmarked. Most of the available information was based on national military or security force archives about confrontations between the Nicaraguan government and irregular forces along its borders. Limited mine-risk-education campaigns in Honduran and Costa Rican territories bordering Nicaragua later led to some reports from local civilians about possible mined areas, but this source of information was never exploited systematically, nor was much effort made to undertake extensive survey work in the suspected hazardous areas.

Defining the extent of contamination in Guatemala proved even more problematic because few mines were used during its 35-year conflict. The primary threat was the result of unexploded ordnance on former battlefields about which few, if any, records existed. Consequently, the approach to the problem in Guatemala emphasized risk-education campaigns and the focused response of a small clearance team to reports that campaign promoters received from people living in the affected areas.

In this context, planning assumptions were based on what later proved to be highly inaccurate and often inflated estimates of the number of mines and areas to be cleared. Table 1 on the following page shows national estimates compared to the number of mines and UXO items
actually cleared. Where no minefield records existed, estimates were more than 10 times higher than the actual number of mines. Initial Nicaraguan estimates were lower than the final tally because records on several known minefields were not taken into account when the original clearance plan was developed and had to be included in operational plans as the program advanced.

In retrospect, the planning process for mine clearance in Central America was significantly flawed by the lack of clarity concerning each country’s mine situation. However, planners at the time had few historical precedents and practically no doctrinal guidelines on how to develop mine assessments. Prior to the signing of the Ottawa Convention and the development of international standards, there was no clear roadmap for mine-action programs to follow. In subsequent years, this issue would come into greater focus as the OAS program—as well as other national, international and nongovernmental organizations—gained more practical experience in mine clearance.

### Developing and Implementing Clearance Plans

For the most part, planning decisions prior to 1998 were based more on resource constraints than on specific timelines or clearance projections. Although the OAS General Assembly had aimed to complete mine clearance in the region by the year 2000, this target was not based on a rigorous analysis of the situation or available capacity. By early 1998, Costa Rica had deployed 35 deminers, Honduras deployed 100 deminers and Nicaragua deployed or planned to deploy 400 deminers, but no serious programming had taken place to determine how long clearance work would actually take.

When Hurricane Mitch struck Central America in October 1998, the devastation it wrought and the uncertainty about its effect on mine contamination forced a more serious review of clearance plans, particularly in Nicaragua. Early in the review process it became clear that the goal of a mine-free Central America by 2000 was wholly unrealistic.

Post-Mitch planning, undertaken jointly by the Nicaraguan Army, the OAS program and the IADB took several previously neglected considerations into account. The overall number of mines and mined areas was revised as several large mined areas were added to the inventory of demining objectives. Increased interest on the part of international donors in helping

<table>
<thead>
<tr>
<th>Country</th>
<th>Initial Mine Estimate</th>
<th>Final Mine/UXO Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costa Rica</td>
<td>5,000 – 6,000</td>
<td>446</td>
</tr>
<tr>
<td>Guatemala</td>
<td>10,000 – 15,000</td>
<td>518</td>
</tr>
<tr>
<td>Honduras</td>
<td>15,000 – 20,000</td>
<td>2,405</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>115,000 – 120,000</td>
<td>179,623</td>
</tr>
</tbody>
</table>

Table 1: Perception versus reality: mine estimates for Central America

![Figure 1: Mines/UXO in Honduras and Costa Rica.](http://commons.lib.jmu.edu/cisr-journal/vol14/iss2/28)
the Central American countries recover from Hurricane Mitch translated into additional funding resources for clearance. A revised National Demining Plan for Nicaragua took shape, with an expansion in manpower to approximately 650 deminers supported by both mechanical and canine assets. The restructured plan contemplated the clearance of more than 135,000 mines in 991 mined areas throughout the country with completion projected by the end of 2004.

However, as Nicaraguan deminers began to concentrate efforts in Nueva Segovia and Jalapa departments, previously unrecorded mined areas were discovered in what proved to be the most contaminated areas along the Honduran border. Additional areas were identified primarily through community-liaison and risk-education campaigns carried out by the OAS or as a result of Technical Surveys of known minefields that identified previously unrecorded areas in the same vicinity. As clearance work began in remote zones with difficult access, the overall number of areas and the estimated number of mines to be cleared grew and the projected completion date for all operations was postponed from one year to the next. By the time the National Demining Plan was finally completed in April 2010, it encompassed some 1,023 mined areas containing 179,623 mines.

 Whereas the dimensions of the problem in Nicaragua were considerably underestimated, the extent of contamination in Honduras and Costa Rica was greatly overestimated. In both countries, initial clearance plans were based on the most reliable information available. Figure 1 (see opposite page) illustrates that the first half of the period from the beginning of clearance operations until their completion resulted in significantly higher numbers of mines cleared than during the second half of the period. Even as clearance rates per deminer remained stable, the per-mine cost of operations sharply increased.
These developments took place from early 2001 through 2003, a period when International Mine Action Standards were in their early stages of development and concepts such as Non-technical Survey and Land Release were not widely established. Nonetheless, the same principles described in the recently published IMAS 08.20 and 08.21 were applied in both Costa Rica and Honduras to clear numerous suspected hazardous areas and lend a methodology to support these programs in meeting their clearance goals. By mid-2002, joint OAS-IADB-Costa Rican survey work along the Nicaraguan border released the remaining SHAs, enabling Costa Rican authorities to declare their program complete in October of that year. In Honduras, Non-technical Surveys were complemented by Technical Survey using mechanical clearance equipment in an area of Choluteca department that had been flooded during Hurricane Mitch. After six months of Technical Survey and the discovery of only one nonfunctional, metallic mine at a depth of 1.5 meters (4.9 feet), Honduran authorities concluded that the remaining risk was tolerable enough to permit them to conclude their clearance effort.

The importance of these lessons is that they can be used in other programs where the lack of a clear picture on mine contamination can thwart planning efforts and discourage donor support. The OAS program, while proud of its role in supporting the achievement of the long-standing goal of a mine-safe Central America, has recognized the need for defining the extent of each affected country’s mine problem. The OAS is taking the lessons learned from its prior experience and broadly applying them in Colombia, where reports of mines placed by illegal armed groups are widespread but offer little focus for clearance operations. Working with national authorities, the OAS program in Colombia has made Non-technical Survey, Land Release, and overall mine assessment and planning primary points of focus. Based on the valuable experience gained in Central America, it is feasible to develop a coherent set of national priorities and plans that can reduce the time and the resources needed to address the problem in Colombia.

Applying the Lessons Learned

There is no doubt that initial planning assumptions for clearance programs throughout Central America were affected by poorly developed mine assessments and estimates. Even in Nicaragua, where minefield records were more reliable, the original clearance goals that envisioned completion in 2000 and then 2004 were not realistic. On the other hand, overestimation of the magnitude of the problem in the other Central American countries, and a lack of methodical survey and assessment, never brought the extent of the problem into focus so that clearance goals could be defined. In hindsight, extensive survey work should have been accomplished at least as early as 1999 following Hurricane Mitch, but it was not seriously considered until mine-clearance rates dropped dramatically and the continuing high cost of demining large areas to find few mines forced adoption of an improvised land-release process.

See Endnotes, Page 80

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Carl E. Case is Director of the Office of Humanitarian Mine Action at the Organization of American States. He has 15 years of experience working in mine action, including as the Senior Advisor for conventional weapons destruction in Iraq with the Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA) and as a demining Technical Advisor with the Inter-American Defense Board. Prior to joining the OAS in 2000, he served more than 26 years in the U.S. Army as an infantry officer.

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Community Empowerment and Leadership in Cambodia

Established in 2001 by the Cambodian Mine Action Centre in northwest Cambodia, the Community-Based Mine Risk Reduction project, through a network of local-level committees, aims to put village populations living with landmines and explosive remnants of war at the center of the mine-action process. Supporting the networks to define, analyze and address their contamination problems, CMAC also helps link them to mine-action and victim-assistance services and to community-development activities that could contribute to risk mitigation.

This article outlines the principles and implementation of the project and analyzes some of the lessons learned regarding the culture of volunteering and community mobilization in Cambodia. Finally, the article summarizes some of the new developments in the mine-action sector that draw on the CBMRR network, endorsing both its longevity and its key position as part of the local mine-action planning process. Today, the CBMRR project is cited internationally as a leading example of community-based planning and mine/ERW-risk reduction.

Background

The CBMRR project was developed at a time when Cambodia had reached a juncture in its mine-risk-education activities. Up until the end of the 1990s, MRE was generally aimed at audiences that CMAC was assumed would have limited knowledge of the landmine problem. The message-based approach focused on raising awareness and providing safety information, often through presentations by mobile teams. The participation of the local population in MRE activities was relatively cursory and there was commonly little integration between these activities and other mine-action components. While this approach had previously been necessary to disseminate information quickly to refugees and internally displaced persons returning to their homes after the cessation of conflict, by the end of the decade it became increasingly apparent that alternative methodologies were needed.

As Cambodia began to recover from the years of conflict and communities became more stable and less transitory, villagers developed good local knowledge of the contamination in their vicinity and began adapting to sustain their livelihoods. Poverty and the continuous struggle to meet life’s basic needs were now the primary factors forcing people into areas they knew to be mined, rather than a lack of education regarding the nature of the landmine threat. Individuals and communities were interacting with mines and ERW, including taking intentional risks to clear mines from agricultural and residential land. The traditional awareness approach for MRE was no longer adequate in addressing the issue.
Informative rather than participatory, it often failed to take into account local knowledge, existing coping strategies or the livelihood pressures that were driving some villagers to take risks.

In response to the changing nature of risk and accidents, CMAC and UNICEF requested Handicap International Belgium partner with them to develop a new project that would aim to be more responsive to the realities faced by the local people living in contaminated areas. It was believed that this goal could be achieved by broadening the approach of traditional risk education through increased community participation and better integration with mine action, community-development and victim-assistance services.

The CBMRR Concept and Implementation

Although initiated under the Mine Awareness Branch of CMAC, the CBMRR project was developed with much broader aims than purely the provision of MRE. The project developers believed that mine/ERW risk could be reduced through a combination of elements:

1. Supporting communities to play a greater role in determining the mine-action priorities in their villages
2. Providing ongoing risk education at a local level to civilians at high risk
3. Ensuring greater integration with victim-assistance services and community-development

projects that could assist with providing alternative income-generation activities for groups at risk.

The CBMRR Project was based on the premise that local people living in dangerous environments have already developed coping mechanisms and risk-reduction strategies, but often these are not formalized within the community, nor are they recognized by outside actors.

Studies on risk-taking in Cambodia highlighted the fact that communities often felt disempowered by agencies that acted to define the problem for them rather than working collectively to better understand the local complexities and to find solutions acceptable to both parties. It was believed that the greater involvement of mine-affected people in the mine-action process would allow for better identification of the risks they faced and their priorities in terms of clearance and risk education. This inclusion, in turn, would also help to mobilize and empower the communities to work together to find ways to implement their own local risk-reduction strategies and provide a longer-term solution to the mine problem.

The initial project design was developed in 2000 and piloted over a one-year period in six districts with an identified high level of threat in the northwestern provinces of Battambang and Pailin. The project has evolved over the years, but the basic design remains the same. It involves setting up a network of locally elected volunteer mine/unexploded ordnance committees
at the village, commune and district levels. The committee members become the focal points for all mine/UXO activities in their locality. The volunteers receive training from CMAC to facilitate meetings and participatory activities, organize fellow villagers to take action, and plan and provide MRE. Equipped with this training, the volunteers lead a series of Participatory Learning and Action activities at the village level to help local residents visualize and clearly define their mine/UXO problem, while identifying who is at risk. Based on the analysis, the villagers then develop an action plan that prioritizes the problems, outlines the solutions, identifies those who will lead the action and determines the expected timeframe for action. The action plan may involve outside interventions such as clearance and development assistance, but it should also include activities the communities will undertake themselves to address the identified problems (for example, ensuring newcomers to an area are informed about the dangerous areas, submitting requests for clearance of mines and UXO, providing specific MRE messages to local children, and marking or fencing visible ordnance).

The PLA activities are intended to get a comprehensive picture of the mine/UXO risk in the village as identified by a broad cross-section of people from all socioeconomic levels within the village, including women, girls, boys and men, long-term residents, new residents, former military personnel, people with disabilities, and the authorities. Mined areas, UXO and accident locations, and high-risk households are marked on village maps drawn by the villagers. Agricultural land and natural resources are indicated to show how these are impeded by contamination. Risk-taking is analyzed through seasonal calendars, and households and individuals are assessed according to levels of risk through risk-ranking matrices. Activities may be conducted with mixed groups or with single-sex groups to allow for a comparison of the concerns, roles, mobility levels and differing viewpoints of men and women. The activities help to act as a catalyst for community discussion and analysis of the contamination problems. A key principle of the CBMRR project is that CMAC acts purely as a support to the network, while the processes, materials and information generated through the activities are kept within the village. This approach means that other organizations working in the village can also make use of local-level resources and knowledge. Using plastic overlays, village maps depicting the mine/UXO threat are annually updated by the volunteers as clearance and other work progresses so as to provide a record of the change within the village. This information is useful not only for CMAC’s monitoring purposes, but more importantly provides a visual record for the villagers of what they have achieved since setting up the mine/UXO committees. All activities are also recorded by the volunteers in log books.

The CBMRR network provides an ongoing surveillance system regarding mine/UXO issues within local communities. The volunteers ensure mine/UXO accidents are recorded, contaminated areas are prioritized and clearance requests submitted, and spot UXO4 are quickly reported and removed. The network can also monitor post-clearance land use within the communities and ensure that MRE is provided on an as-needed basis.

Village activities are supported and monitored by a district focal point, a local person recruited as a salaried staff member of CMAC. The DFP is a mobile position that works with the volunteers at the village level to facilitate the participatory activities and to build up the village capacity to both interact with mine action and other services, and implement basic threat-reduction strategies themselves. There is also a CMAC provincial coordinator that is a salaried CMAC position at the provincial level. CMAC training and monitoring officers provide ongoing monitoring and regular refresher training to the networks of volunteers.

The CBMRR project has a gradual phase-out strategy, whereby the DFP is able to reduce input into villages once the mine/UXO committees are established and trained and have assumed responsibility for mine-action activities in their village. Follow-up visits are maintained to continue to show support to the committees and to help problem-solve, but the DFPs are then able to expand their work to other high-priority villages within the same district. As the mine/UXO threat diminishes in a village, input in terms of time and resources from the DFPs and volunteers decreases, although the committees remain the local focal point for mine action and continue to maintain the PLA materials and information in the village.

Discussion

The CBMRR Project, while “community based,” was conceived and designed by agencies at a central level rather than emerging organically from the communities themselves. In the early days, the network was often
referred to as the “CMAC network” and action plans developed by communities sometimes omitted any tasks to be carried out by the members of the community because they thought they were not important enough to include in the action plan. These problems were perhaps indicative of moving from a service-style approach to one that mobilizes local people to work on issues that have traditionally been dealt with by outsiders. However, the CBMRR project has found that local-level ownership has developed over time and the committees have taken on management responsibilities and decision-making while contributing a great deal of their own time and resources to the network. This dedication is perhaps for two interrelated reasons: the volunteers have, through their work with CBMRR, increased their own self-esteem and status within their communities, and the benefits to the community have been visible and proven relevant.

The mine/UXO committees comprise volunteers elected by their local communities. The volunteers are not remunerated but receive materials and training to enable them to do their work. While volunteering at local levels in the Cambodian context is a familiar development approach, it is often not successful. Villagers living in rural areas often lack the time and resources to volunteer, and individual and family needs maintain priority over community altruism. The CBMRR experience has shown that volunteerism is a fine balance between the wants and needs of the individuals and the desire to help their communities. Initially, people tend to volunteer for the role of the committee representatives because of the status the position brings to them through the association of working with an outside organization. The training and materials also serve as incentives. CMAC recognizes that this self-interest is important and emphasizes it by helping to promote the status of the volunteers in the community through the provision of signboards placed outside the volunteers’ houses. The work of volunteering in the mine/UXO committees helps to equip local residents with skills and knowledge they can use in other aspects of their lives, which also serves to motivate the volunteers. CMAC records show that 34 mine/UXO committee volunteers (20 male and 14 female) have been elected to other community leadership positions as a result of the respect they earned through their work with CBMRR. Volunteers have become Commune Council members, village authorities or community-development workers with international and local development organizations. Some have also accepted salaried DFP positions within CMAC, and in Pailin, one volunteer has become the CBMRR Provincial Coordinator, while another volunteer has set up his own community-development association.

A former Khmer Rouge soldier, Ros Sovan was a mine/UXO committee volunteer elected by his community in 2002 during the pilot phase of the CBMRR project. He has since set up a local community association, now known as the Agriculture Producing Association of Bortang Su Village. The association was started by Sovan as a self-help savings group within the village in 2004 with the aim of helping to generate income and livelihood alternatives for the poorest families in the village who were taking risks in landmine-affected areas. The initial membership comprised 35 families, including 22 female-headed households. In 2006 the association was registered by the Ministry of Agriculture, Forestry and Fisheries and provided with funds to help support agricultural development with the member families. In 2009 the association had 60 member families, 33 of which were female-headed households.
a recent mine-action conference in Cambodia, Sovan spoke of how his work with the CBMRR network had helped him to develop the skills and confidence to embark on his own development initiative.

The CBMRR volunteer network has been most successful and sustainable in those villages where the volunteers can see that their work has value and relevance.

In the heavily contaminated areas where there have been adequate mine-action resources to provide a timely response to the local-level requests, the villagers have been able to witness the benefits of their participation as clearance and development resources are brought into the village through the volunteer network.

The CBMRR approach relies heavily on the interaction between the mine-action agencies and the mine/UXO committees. This method is not just about establishing reporting systems, but also about building trust and effective working relationships between the different parties. Inequalities often exist between villagers and outsiders because of differences in wealth, status and education levels, resulting in hierarchical rather than mutually supportive relationships. The confidence and ability of the local volunteers has to be built so that they can liaise effectively with the mine-action personnel, people they would normally consider their superiors. At the same time, the network has to demonstrate its credibility and worth to the agencies to disprove the negative but often prevalent views that villagers have little to contribute because of their poverty and lack of education.

The CBMRR project was fortunate in that when the committees were first established, they were able to tap directly into CMAC clearance and ordnance disposal teams. As the CBMRR network has become increasingly well-known, other mine-action and development agencies have begun to work with the committees at the village level and to consult them as part of their data-collection processes. This cooperation has helped to endorse the value of the volunteer network and the quality of data maintained at the village level. A recent evaluation of the mine-risk-education sector in Cambodia noted "the CBMRR network is seen by external stakeholders as a source of good and reliable information regarding mine/UXO-related information." The mine/UXO committee representatives regularly participate in the annual provincial mine-action planning process, and a large proportion of the clearance requests that are included in the annual work plans are generated through the CBMRR networks. The clearance requests may be dealt with by any of the accredited mine-action organizations working in Cambodia, depending on the location of the task.

Currently the Cambodian Mine Action and Victim Assistance Authority and accredited operators are conducting a baseline survey in the 21 most affected districts in Cambodia. The survey aims to better define the remaining contamination problem so that a new national clearance plan can be developed. The Cambodian Mine Action Standards for Baseline Survey require the teams of all the operators working on the survey to consult with the CBMRR network at the local level. These developments have helped to bolster the network and to establish its place as an essential part of the mine-action process at the local level.
Conclusion

From relatively humble beginnings as a pilot project under the mine-awareness branch of CMAC, the CBMRR project has developed into a credible mine/UXO risk-reduction network, covering the majority of heavily contaminated districts and villages while maintaining a relatively high degree of community participation and ownership. There is currently an active network of more than 350 volunteers working in more than 100 villages in 18 of the 21 most mine-contaminated districts in the north and northwest regions of Cambodia. Through the CBMRR project, CMAC has demonstrated that it is possible to set up a network of volunteers at the local level at relatively low cost and to engage communities and individuals actively within the mine-action process. This close collaboration has helped to ensure that people are well-informed about the mine situation in their communities, that local clearance priorities are being addressed and that viable risk-free livelihood options are becoming a reality. The CBMRR network has contributed greatly to the process of mobilizing communities to deal with the mine threat and to empower individuals within villages, communes and districts to become proactive advocates for local-level development. The information generated by the committee regarding the mine problem has contributed to more effective prioritization and more efficient use of mine-action resources. These improvements, in turn, have contributed to an overall reduction in mine/UXO risk in many of the communities where the CBMRR network operates. The CMAC Deputy Director General notes, “The value that CBMRR has brought to Cambodia’s mine-action sector has been enormous and remarkable, not only in terms of risk education and reduction and mine-action planning, but also in terms of improving the social fabric, community structure and basic democracy, whereby individuals can stand up and exercise their right to define their roles in the larger community.”

As Cambodia enters the new decade with the fourth National Mine Action Strategic Plan (2010–19) in place, attention in the mine-action sector is focusing on dealing effectively with the most contaminated areas in the country, while simultaneously preparing for the eventual reduction in donor funding and the withdrawal of international assistance. This eventuality requires mine action to be more fully “mainstreamed” within local government systems and policies, and for the services to be transitioned to existing government and local structures. The CBMRR network may be taking on a more prominent role in community risk education and reduction as mine-action services are increasingly delivered through national and local entities as part of broader country safety strategies.19

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The authors would like to acknowledge CMAC to developing and supporting the CBMRR network. Thanks are also due to UNICEF, Handicap International Belgium and Norwegian People’s Aid, which have all supported the CMAC CBMRR Project and helped to make it the success it is today.
**Prioritization and Partnership in Lao PDR**

Explosive remnants of war continue to be a problem in the Lao People’s Democratic Republic, affecting children and schools in many communities. With funding provided by the Humpty Dumpty Institute, Mines Advisory Group and International Relief and Development have collaborated to combat the problem of unexploded ordnance and improve affected communities. This article focuses on UXO clearance and its impact in Khammouane province.

by Sean Sutton [ MAG ]

In a narrow valley surrounded by high mountains in Khammouane province, children laugh as they play football (soccer) at Phon Toum School. Until recently, the school playground was contaminated with deadly cluster bombs.

The Lao People’s Democratic Republic suffered from prolonged civil conflict between communist Pathet Lao and Royalist forces during the 1950s. In the mid-1960s, as neighboring Vietnam was engaged in conflict with the United States, North Vietnamese troops began channeling supplies through Lao PDR to South Vietnam along what was to become known as the Ho Chi Minh Trail.

In an effort to interdict these supply lines and target North Vietnamese enclaves, Lao PDR was subjected to intensive aerial bombardment by the United States from 1965 until 1974. Nearly two million tons (approximately 1.8 million metric tons) of bombs were dropped, including 250 million cluster bomb submunitions.
The unexploded remnants still cause scores of accidents annually and deny people the chance to develop land and prosper.

**MAG in Lao PDR**

MAG has been working in Lao PDR since 1994, enabling communities to live safer lives by developing an effective local capacity to clear unexploded ordnance. From October 2008 until September 2009, MAG teams cleared 7,349,733 square meters (1,816 acres) of land and destroyed 24,216 items of UXO, assisting 206 villages and benefiting 54,859 people. A key element to MAG’s success is prioritizing areas where its clearance work can have the most impact.

Partnership work, such as the projects outlined on the following pages, is vital to this success. MAG has also focused on improving the capacity of the country’s national clearance agency, UXO Lao, through technical support, and MAG handed over large parts of the program to UXO Lao in 1999 and 2001.

**Phon Toum School.** Khounsay Doungmamyvoung is a teacher at Phon Toum School, which has more than 200 pupils, aged 5 to 13. “Back in 1995, we decided we had to build a new school, as the one we had was far too small,” she says. “We cleared the vegetation from the new site and found a lot of unexploded bombs. We moved the ones we found and put them in a pile on one side,” she recalls. By sheer luck, none of the bombs detonated during the process. “[Moving the bombs] was a big problem. The bombs were very dangerous and the children were at risk. When MAG came here, we asked for their help to [remove] the bombs we had found and to check the area,” says Doungmamyvoung.

Under a US$12 million, three-year grant that The Humpty Dumpty Institute secured from the United States Department of Agriculture, MAG worked as an implementing partner and cleared more than 5,000 square meters (about 1.2 acre) around Phon Toum School. Altogether, however, over 2.6 million square meters (6,400 acres) have been cleared under this program by MAG in Lao PDR.

The MAG team found 10 BLU-26 bomblets in the Phon Toum School’s playground, each capable of causing injury or death. HDI’s other implementing partner, International Relief and Development, undertook post-clearance activities that improved health and increased

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Children wash and refresh themselves in the school playground. HDI and its two implementing partners, MAG and IRD, have cleared and developed 115 schools in Khamouane province and fed over 12,000 children daily over the last two years.
access to Phon Toum School, along with hospitals, schools and markets elsewhere in the province.1

UXO is not the only obstacle facing education in Khammouane. The province has some of the worst school enrollment and retention rates in the country, a problem that HDI and its two implementing partners, IRD and MAG, are working to improve. Under the recipient agreement between HDI and MAG, launched in 2006, MAG cleared UXO from school areas in 115 villages. Once the school grounds were cleared, IRD rehabilitated school buildings, constructed wells and toilets, and involved the community in maintenance and school support.

In addition, the project provides schoolchildren with highly nutritious mid-morning snacks distributed by IRD. These snacks, as well as take-home rations, provide a strong incentive to parents to allow their children to attend school, instead of helping farm the land or collect scrap metal. In addition to the food provided by USDA, HDI established a series of gardens at over 100 schools to provide students with supplemental vegetables. MAG cleared these as well. So far, 115 schools have received assistance since the project began, and enrollment in these schools has increased by 23 percent.

“I am very happy and very proud,” said Doungmamyvoung. “MAG and IRD have done amazing things here: The children are safe, [whereas] it was very dangerous before. Education is very important—our future depends on it.”

*Naweang farm.* The majority of people in Lao PDR are subsistence farmers and the impact of millions of unexploded cluster bombs has been catastrophic. On a farm in Naweang village in Khammouane province, in central Lao PDR, Air and his wife Mai have just started harvesting their rice crop. Like much of the province, this area was heavily bombed during the American-Vietnam War.

“Every year when I tried to plow the land I would find bombies,” recalls Air. “I would collect them in my T-shirt and put them at the edge of the field. It was dangerous and I was scared—but it was safer than hitting them with my trowel. The biggest issue for me was the children. I was worried that they would play with the bombies.”2

In 2008, MAG cleared the land and found an additional 300 bombies. Following this work, MAG’s partner Triangle, a nongovernmental
agencies focused on rural development, was able to build an irrigation channel and a pumping system to bring water from a nearby river. This equipment enables families in the area to grow two rice crops per year instead of one. Previously, there was insufficient water to grow rice during the dry season.

“This paddy field supports nine people including our two children, two orphans we look after and our parents,” says Air. “The land is safe to farm now, it is safe for my children and we get two rice crops a year. This means we get more rice and it is fresher, so it tastes delicious. We are in a much better situation and we are very grateful.”

**Conclusion**

This impact-driven focus to MAG’s clearance activities and the proactive engagement with other development agencies working in the heavily contaminated areas of Lao PDR ensure that MAG is able to benefit dozens of communities who have been living under the threat of UXO for more than three decades. Impact assessment surveys show the success of this approach: Of the households in areas where MAG has worked, 86 percent have shown an increase in income since the completion of MAG’s clearance activities. 

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MAG’s work in Lao PDR is made possible by its donors including AusAID, the European Commission, The Humpty Dumpty Institute, Jersey Overseas Aid Commission, MAG America, the Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA), U.K. AID from the U.K. Department of International Development; and the U.S. Department of Agriculture. The author’s book of photographs, titled Laos: Legacy of a Secret, will be published in November with funding from Irish Aid, MAG America, Nam Theun 2 Project, Novotel Hotel, Vientiane and PM/WRA.

**Sean Sutton** is an award-winning photojournalist, whose pictures showing the impact of landmines and ERW on communities are well-known and have been published and exhibited all over the world. His book documenting how UXO affects people in Lao PDR was runner-up for the Leica European Publisher’s Award. Sean is MAG’s Photographer and Audio Visual Coordinator and has worked for the charity since 1997.

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Demining Albania 2000–2009: Successes and Lessons Learned

Following the 1999 Kosovo conflict, Albania sought the most efficient method for demining its land. Mine-action efforts were effectively jump-started with the creation of the Albanian Mine Action Executive, as well as the ratification of the Ottawa Convention. Support from mine-clearance partners and international donors has significantly enhanced the demining effort. This article reviews lessons learned in the process of demining Albania that can be used in future mine-clearance operations.

by Gregor Sančanin [International Trust Fund for Demining and Mine Victims Assistance]

On 1 December 2009, at the Cartagena Summit on a Mine-Free World held in Colombia, Albania officially declared it had reached mine-free status and that it had met its Ottawa Convention Article 5 obligations. All three partners implementing the demining requirements for Albania, namely the International Trust Fund for Demining and Mine Victims Assistance, the Albanian Mine Action Executive and DanChurchAid, hosted a joint event, “Demining Albania 2000–2009,” to highlight Albania’s achievements, challenges and lessons learned over 10 years of operation.

During that time, ITF raised a total of US$25.6 million for mine-action work in Albania; $19.6 million of the money raised was used for clearance activities, with the rest of the money being used for mine-risk education, victim assistance, equipment, structures and operations support. The total land released for local use as a result of these actions was 16.6 square kilometers (6.4 square miles).

Contamination History

During the 1999 Kosovo conflict, mines were laid and submunitions released inside Albanian territory. Moreover, cluster strikes were conducted on military positions along the Albanian northeast border region, which added to the country’s contamination. Contaminated areas extended along the Albanian border, from Montenegro in the north to Macedonia in the south. At that time, approximately 25,500 residents inhabited 39 villages in northeast Albania, including the towns of Kukës, Has, and Tropojë.

Since 1999, 210 mine and unexploded ordnance accidents have occurred, with 238 persons injured and 34 killed. Many of the accidents happened while victims were performing daily activities such as farming, grazing cattle or walking to school. Mine/UXO contamination also obstructed the border police from effectively patrolling the area to prevent trafficking of drugs, weapons and people, as well as other criminal activities. Accidents were curtailed in 2003 when the ITF funded numerous mine-risk-education programs in the region, and there have been no mine/UXO accidents since 2005.

Identifying and Solving the Problem

After the Kosovo conflict ceased, the Albanian government tackled the problem of mine/UXO contamination by engaging the Albanian Armed Forces to conduct rapid surface clearance. However, as the clearance was not performed to International Mine Action Standards, the areas later had to be cleared again after Albania adopted IMAS in 1999. Initially, 15,250,000 square meters (3,768 acres) in 102 contaminated locations were identified along a 120-kilometer (74.6-mile) stretch of...
the border and up to 20 kilometers (12.4 miles) inside Albania.

Toward the end of 1999, the Albanian government adopted IMAS and established the Albanian Mine Action Committee. The AMAC was formed to engage in humanitarian-mine-action policies and oversee the full implementation of IMAS. Later, the Albanian government created the Albanian Mine Action Executive to carry out AMAC’s policies. The responsibilities of AMAE include coordinating and monitoring mine-action activities, as well as planning, prioritizing and accrediting mine-action implementing agencies in Albania. On 29 February 2000, the government of Albania (GoA) ratified the Ottawa Convention, and committed to destroying all stockpiles of anti-personnel mines by 2004 and to clearing all mine-contaminated areas by 2010. This action set the timeline for future clearance activities.

Clearance Implementation

During a national workshop in June 2002, the GoA joined with relevant stakeholders and participants—AMAC, AMAE, ITF, DanChurchAid, Fondation Suisse de Démitage, local mine-affected communities and mine victims—to lay the foundation for future cooperation and implementation of a national mine-action plan. Through the vision, mission and priorities established during this workshop, the GoA, in partnership with AMAC and AMAE, created a mine-action plan to clear all mine-contaminated areas in Albania by 2010. ITF, donors and implementing agencies (especially DCA) also helped coordinate the implementation of the plan.

National Capacity Support

In April 2002, the GoA reached an agreement with the United Nations Development Programme in Albania to provide support for mine action through direct financial and technical assistance to AMAE. Several UNDP Chief Technical Advisors, including Quality Management and Victim-assistance Advisors, provided assistance to help the national staff acquire the necessary technical knowledge. In addition, ITF conducted several management and technical trainings to enhance the managerial and technical skills of the AMAE staff.

Quality assurance and quality control are necessary components of all clearance activities; therefore,
AMAE established a Quality Management Team in June 2002 in the regional office in Kukës. It then trained and equipped the QM Team to conduct QA and QC of all ongoing mine-clearance activities. Subsequently, by applying all relevant procedures and standards, the AMAE QM Team certified the cleared land in the Kukës region as mine free and handed the land over to the affected community.

With support from the Geneva International Centre for Humanitarian Demining, the AMAE began using the Information Management System for Mine Action in 2003, through which it recorded residual threats and clearance-operation progress. AMAE has been instrumental in coordinating with government institutions and agencies involved in mine action, including other mine-action activities such as mine-risk education and assistance to mine/UXO victims.

Mine-clearance Partners

Since December 2002, AMAE has set mine/UXO clearance priorities in cooperation with implementing partners. AMAE applied a “bottom-up” consultation process in which consultation begins with local village leaders, community councils and border police, culminating with military and regional authorities. Final approval comes from AMAC and the GoA.

AMAE has also played an important role in accrediting demining operators and assigning task areas based on the operational plan for clearance activities. Four demining organizations and companies were involved in mine clearance in Albania.

From 2000–01, RONCO Consulting Corporation was primarily responsible for assessing the extent of mine contamination and performing clearance operations. The nongovernmental organization HELP conducted clearance operations from 2000–01, and from 2000–03 FSD conducted survey and clearance operations.

DCA also started survey and clearance operations in Albania in February 2002. Since 2004 it has been the only demining operator in Albania. Other operators gradually pulled out for various reasons, including lack of funding. Originally, DCA clearance assets consisted of manual teams, demining machines and mine-detection dogs; beginning in 2007, DCA operated solely with manual-demining teams and created a fully nationalized program utilizing only one expatriate Program Manager. DCA has been contributing to mine clearance in Albania longer than any other operators, and the valuable effects of its work have been recognized by many involved actors, such as the GoA, ITF and other donors.

Funding and Donors

One of ITF’s major roles is working with donors to create successful mine-action programs. In the area of donor support in mine action, according to our practical experience and GICHD theory, there are three important phases:

Phase 1. The first phase is the immediate emergency response, which involves establishing the framework for creating mine-action capacities. At this stage, it is crucial that sufficient donor funds are available for relatively immediate release. Funding was initially an issue for Albania as donors were not sufficiently aware of the humanitarian problems posed by mines and UXO in the country.

The ITF joined ongoing efforts by the Office of Humanitarian Demining Programs in the U.S. Department of State’s Bureau of Political-Military Affairs (now the Office of Weapons Removal and Abatement or PM/WRA), its main donor, and soon afterward, funds for the first demining project were provided by OHDP to ITF. In 2001, financial support more than doubled as Switzerland joined the donor base.

It is important that are created at an early stage. ITF, UNDP and other donors initiated this process in Albania. The needs in affected countries can only be addressed properly by creating and developing a well-balanced national mine-action program that enables the mine-
affected country to effectively confront and address its mine problem. Over the years most donations were provided through ITF, but AMAE also received direct support from several other international donors. The additional donors that contributed directly to AMAE (i.e., not via ITF) through UNDP were: the Delegation of the European Union to Albania, France, the International Committee of the Red Cross, PM/WRA, the Swedish International Development Cooperation Agency, Switzerland, Turkey, UNICEF and the United Kingdom’s Department for International Development.

Phase 2. The second phase is the period when the response structure and operational framework were established, and operations are underway. At this stage, significant efforts are still required to maintain the interest of current donors, as well as to attract new ones. For Albania the peak of this period was in the 2006 demining season when various donors contributed a total of $3.3 million, after which the majority of high-impact areas were cleared.

From 2005, the government of Albania, through the Ministry of Defence, supported and facilitated demining operations by providing the following in-kind donations: explosive materials for mine/UXO destruction and helicopter transport service for medical evacuation in the case of demining accidents. This level of assistance from the government sent a strong signal to donors that proved it was taking its obligations seriously.

Phase 3. The third and final phase is the most difficult as the results from Phases 1 and 2 become known. If operations from the first two phases prove unsuccessful, less time and resources are available to achieve the initial goals.

Despite the success of the 2006 demining season in which two-thirds of all affected land was cleared and released, mine-affected land remained. There was fear that following the achievements of the 2006 demining season, donors would shift their attention to other affected countries and there would not be sufficient funds to clear the remaining mine-affected land in Albania. ITF, AMAE, and DCA recognized the need for immediate action by creating another joint strategic plan, providing a concrete deadline to reach the declaration of a mine-free Albania. Based on the previous seven years of experience, the strategic plan outlined steps to maintain donor interest and assist with operational planning. The new strategic plan succeeded in securing continuous donor support until all mine-affected land was cleared and released.

There is no rigid system or method of operating that would guarantee the successful resolution of any particular country’s mine problem. In Albania’s case, the joint and coordinated efforts of all stakeholders led to its accomplishments. ITF worked with many donors to provide sufficient funding for the mine-free Albania program. It raised and distributed $25.6 million for mine action in Albania, including $19.6 million that was used solely for clearance activities. The following donors supported ITF: PM/WRA, Germany, UNDP-Albania, DCA, Switzerland, European Commission, UK/DFID, Handicap International, Canada, FSD, Luxembourg and the Czech Republic.

Completion

The final year of clearance operations in Albania was the most difficult. The plan for clearing all mine- and cluster-contaminated areas by the end of the 2009 demining season left no room for delays. Moreover, the remaining remote highland areas proved to be the most challenging because these areas were extremely difficult to access and the demining equip-

Dogs provide quality control of the demining site.
ment had to be transported by horses through the steep, harsh, remote terrain. Final completion activities required a strong focus on maintaining the deminers’ motivation while also maintaining productivity levels and ensuring safety.

In total, the government of Albania returned to use 16,608,055 square meters (4,104 acres) of land on 207 project locations through various methods of release including mine clearance, battle-area clearance, release by non-technical means (such as reduction by cancellation and IMSMA data correction) and technical means (such as Technical Survey and clearance).

According to AMAE’s final results, 17,569 explosive devices (12,452 anti-personnel mines, 152 anti-tank mines and 4,965 pieces of UXO) were cleared with the use of donor funds. ITF alone was responsible for funding the clearance of 15,970 items.

Upon completion of any such long-term program wherein national staff is employed, it is important to look beyond clearance deadlines and try to provide some sort of livelihood security for the ex-deminers. Therefore, DCA and ITF prepared projects and secured funding for vocational re-training of local demining staff to ensure that alternatives for employment would exist after mine-action operations ended. This vocational training played an important role in maintaining the local deminers’ motivation and secured their dedication to clearing their land from the scourge of landmines and cluster munitions.

Post-clearance Evaluation

A significant phase of the clearance process is conducting a post-clearance assessment and survey approximately nine to 18 months after an area has been cleared. The value of such an assessment is that the clearance-area-prioritization system, drawn from IMAS and IMSMA databases, can be validated. Thus, feedback from the local community regarding the confidence of the work performed is secured. Such information enables local and national authorities to make more focused and detailed decisions on future plans for infrastructure development or improvements in formerly mine-affected regions. At the same time, full transparency is provided to donors; they are able to see where their funding has been applied and how it has been used in the clearance process.

DCA’s post-clearance impact-survey activities are ongoing. Preliminary results indicate that the main obstacles caused by landmines have been removed as a result of clearance activities, and formerly contaminated areas have been returned to local residents, providing safe access to grazing land and natural resources, as well as allowing for the safe use of paths, roads and bridges. This outcome shows that the local residents have a high degree of trust in the clearance process, due to the fact that the land is being used for these purposes.

Program Experience

The valuable lessons and experiences listed below were gained through the engagement of stakeholders in the Albanian mine-action program. As the majority of mine-action programs cycle through three project phases—emergency, development and completion—the lessons learned through the Albanian demining program could be applied to other programs.

Lessons learned. This list encompasses some of the key lessons learned during the implementation of the Albanian demining program.

1. All stakeholders, including national authorities, mine-action centers, operators and donors must have a commonly defined vision and goal. Plans and results should be regularly assessed and discussed jointly.
2. There should be national ownership of the mine-action program, including a national capacity-building plan, time framework, clear benchmarks and sustainable funding, all clearly defined from the start, as well as full commitment from all parties.
3. The IMSMA database should be finalized before the clearance program closes and then transferred to
Vegetation must be removed before demining can begin.

the appropriate ministry or entity so it can be available if information from the database is required later.

4. All national staff should be informed of closure plans from the program’s beginning in a transparent manner (and also of any plans beyond completion, if applicable).

5. During the final phases, operations must remain tightly controlled and monitored to assure order, productivity and safety.

6. Close liaison with the local mine-action authority, operators and donors should be maintained to ensure common understanding of clearance processes and progress.

7. Liaisons should keep local communities fully informed during clearance operations and completion phases.

8. A post-clearance impact assessment/survey should be conducted to ensure the land cleared and handed over is used, proving that the local population has confidence in clearance operations.

9. Planning based on results must be transparently and constantly presented to donors. Such actions ensure continuous donor interest and reaffirm their belief in the joint vision and plan.

10. Advocacy efforts are crucial to ensuring that focus is maintained on remaining problems during the last years of clearance. If focus wavers, there is always a threat that donors will slowly lose interest and shift their priorities to other areas or regions in the final stage of contamination reduction.

11. Actual results achieved through the use of donor funds should be readily available during all phases of the mine-action program.

Conclusion
Passion, hard work, determination, and direct and frequent communication between all involved partners were key variables that contributed to a successful mine-action program in Albania. Unlike many programs, which close down because of inadequate funding, poorly run operations and insufficient output, the Albanian mine-action program terminated only when the job was completed and Albania could be declared mine free.

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Web site: www.itf-fund.si
The circumstances were challenging. How does one implement a two-year mine-clearance and agricultural-development project in the middle of a war zone, less than 10 miles away from the front lines? Daily curfews, nightly mortar fire, early morning patrols, heavy roadblocks, and food and water shortages were among the obstacles. But that didn’t stop Jeanne Samuel, The Humpty Dumpty Institute’s Country Director in Sri Lanka, and her two colleagues, Richard Gerhard of The HALO Trust, a British nonprofit demining organization, and Matt Krause of Land O’Lakes, an American member-owned cooperative, from moving ahead and completing a project in Sri Lanka’s Jaffna Peninsula. “No matter how difficult [the project was],” Samuel says, “the fact that we have touched the lives of over 2,000 farmers and improved the well-being of their families has made all the challenges in getting there very worthwhile.”

In May 2009, Asia’s longest running civil war finally came to an end. Since 1983, Sri Lanka had been in the throes of a war that raged through the north and the east of the country and at times spilled into the more populous parts of Sri Lanka, including some debilitating bombings in the capital city of Colombo. Tens of thousands of people fled their homes, and tens of thousands more were either injured or killed. Over the course of 27 years of fighting, both the Tamil separatists and the Sri Lankan military employed a multitude of weapons, including landmines used in a large-scale deployment.

While the conclusion of the war is relatively recent, various international nongovernmental organizations have been working for years in the Jaffna Peninsula and in Sri Lanka’s war-torn cities, including Trincomalee and Batticaloa. In 2003, during a rare ceasefire, HDI’s President, Ralph Cwereman, took part in a special delegation organized by the One Sri Lanka Foundation, a nongovernmental organization. After assessing the landmine situation in northern Sri Lanka, Cwereman resolved to initiate a special project that would not only focus on mine clearance but also provide an opportunity for Jaffna residents, particularly farmers, to start working the land again to regain their livelihoods.

The Reality

“It took HDI a bit of time to put together a sensible and innovative plan that combined mine clearance with dairy development, find the right implementing partners, and secure funding to cover the costs of a two-year program, but we never wavered,” Cwereman says. “Our commitment to help the people of Jaffna had finally fallen into place.” In 2006, HDI secured a US$4 million grant from the U.S. Department of Agriculture Food for Peace...
program and officially launched the program in January 2007. “This was a pioneering project for HDI and its implementing partners. The holistic methods used and the approach of viewing mine clearance as part of USDA’s agricultural development had not been attempted before under such unique circumstances,” Cwerman says.

HDI partnered with HALO and Land O’Lakes through a tripartite agreement. HALO demined areas earmarked by the Sri Lanka Army as land that could be given back to the civilians. Once demined, Land O’Lakes provided technical expertise to dairy farmers to improve livestock management and increase the volume of milk available on the Peninsula. HDI managed and administered the process from start to finish. Just as the project was to begin, the ceasefire agreement between the Liberation Tigers of Tamil Elam and the Sri Lankan government broke down and fighting intensified. All of a sudden, HDI found itself in the middle of a war zone. As the majority of other international NGOs operating in Jaffna were leaving, HDI was entering the city, making it the only American NGO operating in Sri Lanka’s Jaffna Peninsula during that timeframe.

HALO had been operating in Jaffna since 2002 with a mandate to remove war debris, in particular landmines,
unexploded ordnance, and weapons and ammunition from post-conflict zones. Employing more than 350 deminers in Sri Lanka and based largely in the north, HALO had cleared more than 36,000 landmines and thousands of UXO items from the country.

HALO in Sri Lanka took a special interest in this program. Richard Bowyer, one of HALO’s Program Managers at the time, recalls, “We were excited to be part of this project because it gave added impetus to the work we do. Although our primary aim is to get mines out of the ground so that communities can return to their land and use it in safety, we find the benefits are increased significantly when such clearance can be tied in with other development projects.”

On the dairy development side of the equation, HDI focused on about 2,000 small farmers, each owning a maximum of two cows, living on the Jaffna Peninsula. Although the area was heavily mined, the land was very suitable for dairy development. “The dairy industry in Jaffna was one of the most sustainable and lucrative industries for small farmers prior to the conflict,” explains HDI’s Sri Lankan Country Director, Jeanne Samuel, “but during the conflict, the industry was largely destroyed or disabled. In fact, there were hundreds of wild cattle roaming the causeway—all of which had been left behind by their owners years ago when fleeing the fighting. These cows were no longer productive—some grew too old to produce milk or became ill, and few were able to be reintroduced to the dairy market—but given their sheer numbers, one can only imagine how the industry thrived then.” With this knowledge in mind, HDI implemented a three-pronged humanitarian-relief action plan:

1. Reduce the number of mine casualties through mine clearance and mine-risk education
2. Declare mine-safe areas that could be used for the improvement of the dairy industry (grazing and crop cultivation)
3. Facilitate the resettlement of internally displaced persons

Two years later, despite encountering numerous difficulties, HDI met its goals. Approximately 128 acres of land were cleared of landmines and UXO, allowing former dairy farming areas to be returned to their original use. Following clearance, 2,000 dairy farmers regained access to land for grazing and crops, 334 local demining staff were trained and equipped with the specialized skills necessary for demining, and safe access to work, schools and farms was re-established for tens of thousands of Sri Lankans living on the Jaffna Peninsula.

“Our members have been able to gain more from their cattle than they ever imagined,” T. Thangavel, President of the Farmers’ Organization, says in awe. “We have also learned to grow glicheridia¹ and then mix straw, urea² and even the palmyra fruit into the feed to make the milk thicker. The technical training has been so helpful that all our members are doing extremely well because we [can sell our milk for more money], and we can also give our children milk—something we couldn’t afford earlier.”

This sentiment is echoed by S. Vasanthadevi, a farmer who owns three cows, and K. Thanagamani, who learned about dairy farming in order to support her two young children following her husband’s death. “I didn’t know anything about cows,” says Vasanthadevi, “but I thought if I go and learn about the industry, I will be able to earn better than a laborer.” Selling her jewelry, Thanagamani purchased two cows and learned the necessary skills from the dairy program. She not only is now able to provide her children with a better education but is also happy that she can spend time at home with them.

According to HALO’s Bowyer, anti-personnel mines identified during this project in Sri Lanka were the Pakistani-manufactured P4, the Chinese Type 72 and the commonly used VS 50 from Italy that the Sri Lanka

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¹ glicheridia
² urea
Army used. The Jony 95 and Jony 99 that planted the LTTE were also identified. HALO employed highly stringent safety practices and experienced no work-related casualties during the two-year program.

HALO deminer Mahalingam Jegatheevan reports, “We started our work by conducting a survey. While the Sri Lankan Army was able to give us an idea about areas it mined, we simply had no idea where LTTE may have mined. So we had to ask villagers about cattle or human accidents to figure out if that particular area was mined.”

Another obstacle was that the high mineral content in the ground caused detectors to give off false-alarm signals, forcing HALO to clear most areas manually, a painstaking and time-consuming process. In addition, while there was a definitive pattern in how the Sri Lanka Army laid the mines, leaving approximately a four-foot walking belt lined by mines laid in a 3+1 pattern on either side, the LTTE’s laying of mines was completely random, which made it harder to find and remove them.

Over the course of the two-year program, HALO covered the areas of Chavakachcheri, Kopay, Sandilipay, Tellippalai, clearing 520,000 square meters (128,000 acres) and removing 694 mines. With more than 2,000 dairy farmers and their families directly or indirectly benefiting from the cleared lands, HDI’s other implementing partner, Land O’Lakes, established a number of partnerships within the dairy farming industry in Jaffna, including the multi-purpose cooperatives and Jaffna District Development Cooperative Society (YARLCO), a previously stagnant dairy co-op that was on its last leg.

These partnerships within the Jaffna dairy industry ultimately ensured its sustainability and served as a major achievement for HDI and Land O’Lakes. Coordinating the project through the Ministry of Livestock Development and through HDI management, Land O’Lakes initiated a total collection of 29,000 gallons (110,000 liters) of milk per month, an increase in capacity of nearly 40 percent. “Although we have similar projects in Indonesia and Thailand, this is the first time Land O’Lakes was working in an insecure area like Jaffna,” says Country Director of Land O’Lakes Dairy Development, Matthew Krause. “We were working through curfews, which made milking cows early in the morning an impossible task. Our staff had to put in shorter days; there were road blocks, intense security and the closure of the A9 highway, [which] meant we couldn’t get our equipment and samples in time. At the same time, however, local authorities in Jaffna gave us immense support, especially in [helping us] obtain the necessary approvals.”

Given the farmers’ lack of knowledge in milk-production techniques, Land O’Lakes started with creating awareness and then disseminating technical skills and best practices. “Our project had three components—control, management and marketing,” explains Krause. “About 10 extension agents and a veterinary surgeon managed the first objective,
which was to increase milk production, and thereby income, at the farm level. By increasing the price from 121 rupees ($1.07 as of 7 June 2010) per gallon to 151 rupees ($1.33) per gallon on average, farmers earned more for their milk and thus began selling more.” Using the network of the Jaffna-based dairy cooperative, YARLCO, and the Livestock Breeders Co-operative Society, the program facilitated the collection and purchase of the milk, as well as production of additional dairy products.

“This [program] was aimed at capacity building,” says Krause, adding that milk production and collection increased by 45 percent per month, steadily rising over the entire 27-month project. The cooperative made a profit for the first time in 25 years with record sales. “None of this would have been of any use without a concerted marketing effort. So we recruited a senior marketing manager from the private sector and created a portfolio of about 12 different items which included yogurt, flavored milk, ice cream, paneer, ghee and curd, in addition to selling fresh milk, retail and wholesale. We opened up different market segments with new packaging and branding and [held] marketing events and launches.”

HDI also provided additional dairy equipment, including milk heaters, cold-storage facilities and ice-cream machines. “Twenty percent of the milk collected was converted into value-added products. We built the entire supply-and-demand chain—because otherwise, the farmers would not have had the wherewithal to market their milk. The entire project was conceptualized around building and bridging the [knowledge] gap, working with the existing farmers, the organizations and the [local] culture to give them incentives.”

Milk is now abundant in the Jaffna Peninsula. Not only have the farmers increased their income, but the children have benefited from better nutrition. Earlier, a farmer would produce just enough milk from a cow to sell to eke out an existence. Now, he can afford to share the milk with his children. “Indirectly, the project is also developing the mental and physical strength of these farmers’ children, which [bodes] well for creating a strong and healthy future generation,” Samuel states.

All in all, approximately 400,000 gallons (1.5 million liters) of milk were collected in the two years, with 35,000 gallons (132,486 liters) going into value-added products, such as yogurt. At the same time, nearly 5,000 farmers received initial training; one-on-one visits, workshops, meetings and discussions were held throughout the period to enhance productivity and capacity. Ten model farms and nine milk-collection centers were established, and 11 collection centers were renovated.

The farmers were introduced to proper milk-production methods, ensuring that milk was collected routinely every day. Young men collected milk from the outlying farms and transported it, primar-
ily on motor bikes, to the market in Jaffna. In addition, a series of smaller dairy cooperatives were linked to the main processing center, which allowed for quicker milk delivery to the market. This was of great importance because operating a milk business in a war zone created several obstacles, including that military checkpoints would keep runners from moving, sometimes resulting in the milk spoiling.

Together with its partner, the One Sri Lanka Foundation, HDI further augmented its program in the Jaffna Peninsula by developing an ongoing school feeding program in the remote island of Velanai, off the coast of the Peninsula. HDI purchases milk from 36 farmers through the Multi-Purpose Co-operative Society and provides fresh milk to five schools (with 10 more in the pipeline), serving nearly 500 children between the ages of 5 and 16. Fresh milk is collected from the farmers and distributed to the children at their morning break. General Manager P. Selvarani and Consumer Manager S. Thanabalasingham of the MPCS have supported the project enthusiastically and revealed that YARLCO began by collecting just over six gallons (22.7 liters) per day, and now has expanded to over 35 gallons (132 liters). “Of this total collection, we distribute about 16 gallons (60 liters) for the school feeding project,” says Selvarani. “The farm gate3 value is 37 rupees (US$0.33), and HDI purchases it from us at 173 rupees ($1.53) per gallon. The balance is sold to the public and also to the Samurdhi feeding project. Farmers could bring in anything from half a gallon to almost two gallons per day, and we purchase whatever milk each farmer brings, no matter how small the quantity.”

“We are very proud of this home-grown school feeding program,” says HDI’s Cwerman. The program uses HDI’s development approach, leveraging one development activity—mine clearance—into a second—dairy development—and finally into a third—school feeding. “This has become HDI’s signature approach to development.”

“The challenges have been many,” sums up Land O’Lakes’ Program Coordinator Mariathasan Elango, “but the rewards far surpass the downsides. The progressive thinking employed by HDI in uplifting an entire industry has seen manifold advantages in a highly marginalized society that has been traumatized, battle-scarred and reduced to poverty. This project has become a learning model for other countries—not only in gaining better yields and accentuating marketing avenues, but in how to build an entire industry in a post-conflict environment.”

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Milk is distributed in the schools.

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Mine-action Success Story: Nepal

After a decade of conflict in Nepal, the signing of the 2006 Comprehensive Peace Agreement initiated mine clearance. By December 2009, all explosives in the Maoist cantonment sites had been eliminated. This article examines the extent of Nepal’s mine-action successes, while offering a number of lessons for mine-afflicted states to consider in their programs.

by Stephen Robinson [ United Nations Mine Action Team ]

The name Nepal conjures up images of huge mountains and fearless warriors, but few realize that a fierce insurgency and subsequent “people’s war” claimed more than 13,000 lives and disrupted the entire country’s development between 1996 and 2006. The conflict officially came to an end in November 2006, when the Communist Party of Nepal (Maoists) and the government of Nepal signed the Comprehensive Peace Agreement. However, the war left behind a violent legacy of landmines and explosive remnants of war.

The war was fought with government security forces holding key points and using minefields and booby-trapped munitions to disrupt Maoist Army attacks and the Maoist Army using handmade explosive devices such as socket bombs, as well as other improvised explosive devices in place of rifles. Consequently, the insurgency left behind ERW and the retained knowledge of how to design, produce and use IEDs, which various armed factions use to this day.

The CPA contains the provision that both sides mark and clear minefields and other ERW within 60 days of the signing. While this timeline was far too ambitious for the parties to keep, it did demand mine-action and other ERW issues be addressed. The CPA also contains the provision that the Maoist Army’s weapons be secured in cantonments, including IEDs and their components.

The U.N.’s Role

Upon deployment of the U.N. Mission in Nepal to support the parties in bringing the peace process to a logical conclusion, the U.N. Department of Political Affairs asked the U.N. Mine Action Service to provide a small project to support them. As a result, UNMAS established the UNMIN Mine Action Unit to assist in the management and destruction of IEDs and explosive components.

The UNMIN MAU engaged ArmorGroup, a commercial company, to implement IED management and destruction held in the seven Maoist cantonment sites and satellite camps. ArmorGroup then conducted an audit of the items held in these military camps, dividing them into “safe” and “unsafe” and proceeding with the immediate destruction of the unsafe items. These operations were coordinated through the Joint Military Coordination Committee, a body chaired by UNMIN that hears grievances and discusses possible issues involving the CPA.

The first phase of IED destruction was completed in 2008, destroying 18,642 items. During this time, the Nepal Army asked the UNMIN MAU to provide training and advice to its demining teams. Therefore, UNMIN MAU started a small mine-action project to train the Nepal Army in demining techniques and provide international advisers as team managers.

At the time, UNMIN and UNMIN MAU were due to close in 2008. However, the government of Nepal requested that UNMAS remain to continue supporting the Nepal Army’s demining efforts.

This work is not the first U.N.-supported mine-action activity in Nepal, however, as UNICEF has been involved in the area since 2005, providing risk education and developing globally recognized emergency resources...
that have since been exported to other mine-action programs. UNICEF has also taken great initiatives to further public awareness in the identification and differentiation of IEDs and landmines.

After consultation with other U.N. agencies, UNMAS implemented the United Nations Mine Action Team concept currently used with the Inter-agency Standing Committee for Mine Action at the field level. As a result, UNMAS and UNICEF in Nepal joined forces, forming UNMAT Nepal.

With the establishment of UNMAT, the clearance focus shifted from employing international staff in management roles to training the Nepal Army to run all aspects of minefield clearance. This vision is embodied in a two-year Capacity Development Plan, jointly developed by the Nepal Army and UNMAT, that details the capacity-development requirements of a company-sized group within the Nepal Army to complete the clearance of all the minefields within Nepal.

The development of UNMAT–Nepal included joint planning and strategies for U.N. support. UNMAT has successfully been addressing mine, IED and other ERW challenges, including risk education, advocacy for the Anti-Personnel Mine Ban Convention and clearance since then. Although clearance operations have been restricted to minefields, there are plans to expand the quality-management role of UNMAT for the IEDs/booby traps laid around security posts and other key points. Nepal expects to have all its minefields cleared in 2011 and a government body established to address residual issues.

Is This a Success?

For a number of reasons, Nepal’s mine-action program has indeed been a success. First and foremost, its minefields will be cleared within a short time frame, thus freeing the country from the impact of mines. The government is engaged in addressing the issues and provides a number of resources to achieve its mine-action objectives, such as the in-kind contribution of army personnel for demining. Mine and ERW issues are being

Final demolition of explosives stockpiled at Maoist Cantonment Site 6.

PHOTO COURTESY OF UNITED NATIONS MISSION IN NEPAL–PUBLIC INFORMATION OFFICE

What Made it a Success?

Nepal provides an excellent environment for mine action. The government is supportive, and highly educated staff members run a number of potential partner organizations.
The CPA provides a strong legal basis for mine action to be conducted, while the Joint Monitoring Coordination Committee acts as a conduit to solve problems between the military parties. ArmorGroup, under contract with UNMIN, destroyed all unsafe explosive items held in the Maoist cantonment sites in 2008, with the rest being destroyed in December 2009. While the eradication of explosives in the Maoist cantonment was not technically difficult, UNMIN and ArmorGroup spent a great deal of time in negotiations with the Maoist Army. The ultimate destruction of more than 52,600 items of unexploded ordnance was a landmark event in the peace process, illustrating a positive development during a time when the peace process was stalling.

Furthermore, Nepal’s minefields are marked and mostly recorded, and the areas with IEDs and booby-traps are also largely known, although not to the same extent as the minefields. The United Nations, through the UNMAT concept, is addressing the issue in a coordinated and supportive fashion. The commercial company used for the initial operations was successful in addressing the emergency needs and establishing a baseline of mine-action knowledge that UNMAT later utilized. Finally, funding for these activities was available in a timely and consistent manner.

Lessons Learned

UNMAS learned a number of lessons throughout the course of the mine-action program in Nepal:

Planning: There is a need to plan for the end of mine-action programs, and Program Managers should have an idea of how the program will evolve from its initial establishment to its completion.

Organizational involvement: Research should be conducted to determine the right organizations to use in the clearance process, as non-governmental organizations and U.N. staff exhibit diverse strengths and weaknesses. In the case of Nepal, it was vital to employ commercial companies at the program’s start, while utilizing U.N. Technical Advisors from the middle to end of the project’s clearance component proved successful.

Funding: Funding should be secured in the early stages of the project. The Nepal program was able to obtain funding to achieve its end state early as donors were willing to fund the project’s short time frame.

Coordination: U.N. agencies need to coordinate and work together, and it is important to recognize and accept the differences in processes and capacities.

Conclusion

Nepal’s mine-action success and lessons serve as a framework for other mine-affected countries to follow, demonstrating the triumph of combined military, NGO, U.N. and commercial efforts. The CPA and a supportive government further facilitated Nepal’s resolution of its mine problem. 

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What is success? How is it measured, what indicators are used to determine it and who determines it? The traditional focus in mine action has been on the clearance of landmines, with the subsequent success determined, to a large extent, by the quantitative outputs of square meters cleared. In the past, landmine-clearance activities were commonly carried out by all-male survey and clearance teams with very little or no interaction with affected women, girls, boys and men living and working in the contaminated areas. Similarly, until fairly recently the success of risk-reduction activities like mine-risk education was measured by the number of targeted beneficiaries, with little consideration of the actual impact of the MRE and its potential to positively change people’s behavior and risk-taking activities.

Donors and implementing organizations, however, increasingly recognize the necessity to critically assess long-term impacts, in addition to immediate quantitative outputs. Numerous mine-action practitioners have started taking into consideration the socioeconom-ic aspects of affected communities and have highlighted the need for doing so in order to be able to allocate mine-action resources where the need is the greatest, and to prioritize areas where the anticipated long-term impact is likely to be the most significant.

How mine-action success is defined and measured depends on numerous factors, such as the country-specific context (for example if the project is implemented in a conflict or post-conflict setting), the type of project activities and the specific project goals of those activities. However, generally speaking, it can be argued that “because the true measure of success of mine action is based on its impact on the local population, mine-action planners and managers must verify that what their projects are producing is reaching, and is useful to, intended beneficiaries.”

Hence, it is the positive impact on women, girls, boys and men af-
fected by landmines that should determine success. An important question to consider, however, is: **Who** determines if a project is successful or not? Is it the donor? Is it the implementing organization? Or is it the affected communities and the beneficiaries themselves? Surely, if the indicator of success is the extent of positive impact on affected communities, the beneficiaries themselves should have a say in determining if the project has been a success.

**Community Participation**

The English academic and development practitioner Robert Chambers focuses on the importance of community participation in his groundbreaking work on participatory rural appraisal. Chambers places emphasis on the need to ask the question of whose reality counts, and underlines the necessity for the “uppers” (the powerful and dominant) to take a step back, enabling the “lowers” (the “weak” and subordinated) to be at the center of all activities. PRA is a highly regarded tool in the development field, and its potential to empower marginalized community members has been well-documented. As expressed by Chambers: “The essence of PRA is changes and reversals—of role, behavior, relationship and learning. Outsiders do not dominate and lecture; they facilitate, sit down, listen and learn. Outsiders do not impose their own reality; they encourage and enable local people to express their own.” As the Linking Mine Action and Development approach is gaining momentum, more focus needs to be placed on methods along the lines of Chambers’ ideas of PRA to ensure that affected communities participate in the planning, implementation and evaluation of activities.

The importance of involving affected communities in mine-action projects from the start of the project cycle has increasingly gained recognition. Numerous publications, such as the Geneva International Centre for Humanitarian Demining’s *A Guide to Land Release: Non-technical Methods* and *Mine and ERW Risk Education—A Project Management Guide* highlight the significance of community participation to achieve positive project goals. As stated in the latter publication: “There is a growing body of evidence since the late 1980s that community participation leads to more positive project outcomes.” Likewise, the GICHD’s *LMAD Guidelines for Policy and Programme* underlines the necessity to “empower mine-affected communities to identify their own development needs as well as plan and implement activities. Unless the capacity of affected communities is strengthened, development investments will not be sustainable.” Community participation is a precondition for measuring positive impact on affected communities. However, simply adopting a socio-economic perspective is not necessarily sufficient. It is imperative to adopt a gender perspective from the initiation of the project cycle. This perspective needs to concretely influence all actions to ensure that the specific, often diverse and sometimes conflicting capabilities, needs and priorities of all affected persons are recognized and taken into consideration. The ultimate aim of adopting a gender perspective should be the maximization of positive impacts on all community members in an equitable way.

**MAG and Impact Assessment in Southern Sudan**

MAG is well-known for having pioneered community liaison, which essentially is a participatory, community-focused approach, placing community needs and priorities at the center of all mine-action activities while enhancing their developmental impacts. As an extension of this approach, MAG developed an impact-assessment tool, which has been implemented in the organization’s southern Sudan program since 2008. The detailed, age- and sex-disaggregated data obtained from the household surveys provide MAG with valuable information in terms of the present impact of landmine contamination on livelihoods, the various land uses, and the anticipated future impact of any potential clearance activities, all from household perspectives.
The IA is implemented by multi-skilled, mobile, gender-balanced CL and MRE teams with previous cultural and linguistic knowledge of the operational areas. What is unique about the IA tool is its household focus, rather than simply a community focus. Donors and implementing organizations often have a tendency to approach a community in a romanticized manner, assuming it to be a unified entity that represents the same capabilities, needs and priorities. However, communities consist of highly diverse groups of people, and deeply embedded power relations influence their structures and decision-making processes. Age, gender, tribe, social and economic status, and religion are a few factors that greatly influence power relations between people in communities. The household focus enables MAG to more effectively reach out to all the affected people living in contaminated communities and to take into consideration the needs and priorities of community members that might be easily neglected or marginalized in “standard” community meetings. In order to ensure a gender-sensitive approach, MAG takes special care to interview an equal number of women and men to the extent possible. Particular attention is also paid to the importance of including female-headed households, as they often face particular challenges related to livelihood activities.

MAG was funded by the Canadian Department of Foreign Affairs and International Trade in 2009 to conduct surveys (Non-technical or Technical, depending on the need) of all high- and medium-impacted suspected hazardous areas as identified by the Landmine Impact Survey in two states of southern Sudan. The organization surveyed 23 out of 36 confirmed hazardous areas during the course of eight months, with the remaining 13 to be surveyed during 2010. A total of 923 households were interviewed: 48 percent of the respondents were female and the remaining 52 percent were male. The pre-clearance household surveys revealed the following land uses to be the most severely affected by the contamination:

- Fertile agriculture land
- Access to water
- Housing
- Education (school buildings)

Gender-sensitive Approach

The significance of letting the IA process be guided by a gender approach was very obvious during the IA trial period. One initial consultation meeting with an impacted community, attended by men only, clearly illustrated the need to adopt a gender approach. The male village chief called on other influential male community members to attend the meeting and to share their views on the contamination impact in the village with MAG. These community members shared substantial information and highlighted a number of land uses they believed were the most severely affected by the minefield. However, it was all from the perspective of influential, senior, male community members. No women were present. Can this correctly be referred to as “community participation?”

Once this drawback was recognized, MAG revisited the village and held a second meeting with a number of women, during which additional land uses not previously identified by the men were brought to light. This new information had huge implications for prioritization processes, as these additional land uses meant that the impact level of that particular village was considerably higher than the initial data obtained from what the men had suggested. Even though this meeting represented only the first component of the IA process, it is still vital to ensure the participation of women and men throughout the process. This example hopefully sheds light on how important it is to actively include and con-
sult with both women and men in affected communities. MAG found that its gender-balanced teams greatly facilitated the access to both women and men, and it was clear that these teams also encouraged the active participation of female community members. The identification of additional land uses by the women in this example was an outcome of the distinct responsibilities and activities they were involved in as daughters, mothers, sisters and wives. In other words, their responsibilities led to very gender-specific roles. In other words, their responsibilities led to very gender-specific tasks and activities, which resulted in unique knowledge and distinct information related to the minefield’s impact on specific land uses.

**IA Measures Success**

The benefits of implementing the IA tool have been very clear to MAG. The most obvious advantages identified so far are the following:

- Prioritizing clearance based on impact and future land uses
- Being able to prove the link between mine action and development to donors
- Integrating CL and clearance operations
- Enabling a clear gender perspective in its community work
- Identifying challenges and implementing strategies to increase the positive impact on the community

In April 2010, MAG began conducting the post-clearance household surveys. When the surveys are completed, it will be possible to assess the actual impact that can be attributed to clearance activities and to analyze if the anticipated impacts, as identified by the households themselves, have been achieved. The IA process has proven to be more time-consuming than initially anticipated. Recognizing the significance of being clear and transparent to avoid creating misunderstandings and/or false expectations in the communities, MAG staff members had to dedicate more time to explain the purpose of the surveys to leaders and households in affected communities. MAG has developed a system of electronically recording all the pre-clearance data to be used for prioritization purposes and subsequently in the post-clearance phase to assess the impact. Ensuring that the data is correctly managed and analyzed so the information from the various phases can be accurately evaluated and compared in order to gauge the intended and actual impact is essential for the success of the entire process. Once the post-clearance data is available, it will be possible for MAG to determine if the activities have been successful in the sense that the anticipated impacts have been achieved. The IA tool will also enable MAG to identify challenges and to understand any negative impacts that its activities might have on communities. Lessons learned will be highlighted and adequately dealt with throughout the process, and necessary changes will be made to the tool in order to make sure that the data that is obtained adequately reflects the reality in the communities.

**Conclusion**

In essence, the notion of success in mine action needs to be questioned and more effort needs to be made to critically assess how success is determined and against what indicators it is measured. Organizations should refer to the positive impacts on communities when talking about mine-action success stories, and the processes and procedures that result in project outcomes must be scrutinized and appropriately adjusted in order to maximize the benefits for affected communities. The diverse capabilities, needs and realities of women, girls, boys and men living in mine-affected areas need to be recognized, and their voices must be heard throughout the different phases of the project cycle. Only then can organizations really claim to have taken a socioeconomic perspective, and only then can the extent to which activities have led to positive impacts be measured in a credible manner.

*See Endnotes, Page 81*
The HALO Trust Activities in Kuando Kubango, Angola

The HALO Trust employs over 900 national staff with eight expatriate managers in Angola. In 2008 HALO was responsible for 47 percent of the mined area cleared and 87 percent of the mines cleared in Angola. Its recent focus has been Kuando Kubango province—one of the most heavily mined areas of Angola and also one of the least economically developed provinces. This article begins with a case study to demonstrate the local mine problem, elaborates upon the full scope of HALO’s activities, analyzes HALO’s statistical achievements toward mine reduction, and concludes with HALO’s recent successes and future prospects.

by Rory Forbes, Marie Demulier and Andrew Genung [The HALO Trust]

On a recent Thursday afternoon, while his little sister Tina held her mother’s hand and hid shyly behind a tall white stick, Daniel Antonio posed proudly with his family on their farm. The result is no typical family picture, however, and if you look closely, you can see that the entire family is standing in a rather large crater with a single stalk of corn growing in the middle. Zoom in even closer, and you’ll notice that the white stick in front of Tina has writing on it that says, “1 x MON-200.” Daniel knows exactly what this means.

“HALO destroyed several MON-200s here,” Daniel says, referring to the large Soviet directional fragmentation mines, each of which contains over 12 kilograms (26 pounds) of high explosives. “The Cubans laid them underneath anti-personnel mines, and linked them to boxes of TNT buried a few meters away.” The reason Daniel is so familiar with the mine clearance on this particular piece of ground is that he works as a local paramedic for The HALO Trust demining team and was part of the effort here that removed over 2,400 mines from 10 hectares (25 acres) before the task was completed in late 2009.

When the mines were laid in 1986 as part of a Cold War proxy battle that turned this small, remote Angolan village into one of the most heavily mined areas in the world, Daniel’s grandfather was told to leave the land and was given a smaller plot in a crowded area closer to town. Now, with a growing extended family and a desire to start moving beyond their current subsistence farming and begin selling their extra produce in the local market, Daniel’s family is incredibly grateful to both him and HALO for the safe return of their land. With
his own family plot secure, Daniel continues working with HALO’s demining team less than one kilometer (0.62 miles) away, clearing ground for his neighbors in Cuito Cuanavale.

Angola’s Mine Problem

To understand Daniel’s family’s situation in Kuando Kubango province, it is important to understand the broader context of Angola’s mine legacy. Mines were laid in Angola during 27 years of bitter conflict that followed independence from Portugal in 1975. Government and Cuban forces laid extensive minefields around their bases in and around towns. Mines were laid around infrastructure such as airports, pylons, water sources and bridges. During the course of the war, positions were often taken and re-taken, and more mines were laid at each stage. União Nacional para a Independência Total de Angola, known locally as UNITA, and other factions laid mines when they took a permanent position or before withdrawing from a captured post. Both sides laid mines on roads, in low density, and in locations that years later no longer look significant. The conflict ended in 2002, and to this day anti-tank mines on roads are a significant problem.

Even though Angola is a large country with wide-open spaces, the vast majority of mines were laid in or around towns and villages that are now growing economically and in population; thus, there are concentrations of mines where there are concentrations of people. HALO has conducted surveys of the four provinces in which it operates and has found there are 840 confirmed minefields remaining to clear.

Seven Years of Local Clearance

Since its initial entrance into Angola in 1995, HALO worked primarily in the Planalto provinces of Benguela, Bié and Huambo. After the fighting ended in 2002, the program expanded into the previously inaccessible province of Kuando Kubango and HALO started clearance there in 2003. HALO’s clearance priorities are the towns of Caiundo and Cuito Cuanavale, where it is actively supporting the return of refugees and internally displaced persons.

Due to the scope of required mine clearance and the 199,049 square kilometers (76,853 square miles) of Kuando Kubango province—or about the same size as the U.S. state of South Dakota—HALO built a base in Menongue, the provincial capital, to support opera-
tions, as well as a smaller base farther south in Cuito Cuanavale. Then, in 2009, the Vice-Governor of Huila province requested HALO’s help to conduct surveys and clear mines in the province. HALO’s area of operations in Angola now covers five provinces, with a total area of 1,246,700 square kilometers (481,353 square miles). HALO works with both the national mine-action authority, Comissão Nacional Intersectorial de Desminagem e Assistência Humanitária, and the provincial government to formulate yearly work plans that ensure HALO assets are working on tasks of the highest priority and according to the development plans of the local authorities and other nongovernmental associations.

HALO is currently demining around the city of Cuito Cuanavale, site of the “turning point” battle between the Movimento Popular de Libertação de Angola and UNITA. It is one of the few areas in Angola where you can find what the layperson thinks of as a true minefield—organized parallel lines of mines originally laid to protect a military position. There are multiple rings of minefields and within each mine belt you can find between one and 10 rows of anti-tank and anti-personnel mines spaced scant meters from each other. The minefields present a huge humanitarian problem, because as the population has grown and IDPs have returned to the area, and the need for farmland, access to water and timber have pushed people near and through the mine belts ringing the city of Cuito Cuanavale.

Kuando Kubango Statistics

Kuando Kubango is the province where HALO removes the greatest number of AP and AT mines in Angola. Table 1 below shows the number of AP and AT mines, pieces of unexploded ordnance, stray ammunition destroyed and small arms ammunition items removed, as well as the total area cleared in square meters from 2003 to March 2010.

The Office of Weapons Removal and Abatement in the U.S. Department of States’ Bureau of Political-Military Affairs (PM/WRA), the U.S. Department of Defense, and private U.S. donors provide strong support to HALO, both globally and in Angola. Table 1 also shows the results of mine clearance funded by PM/WRA in the province of Kuando Kubango.

Figure 1 (above left) shows the number of AP and AT mines HALO removed in Angola in 2009.

Figure 2: The area cleared in 2009 in square meters in the provinces of Huambo, Bié, Benguela, and Kuando Kubango.
mines remaining here not only is due to the high degree of mine contamination in the area, but also reflects the fact that HALO has been performing clearance in the provinces of Benguela, Bié and Huambo for over a decade while operating in Kuando Kubango for a relatively short period.

Figure 2 on the previous page shows the area cleared in square meters in 2009 in the four provinces. The figure from Kuando Kubango is significantly higher mainly due to the fact that almost half of HALO Angola’s mine-clearance assets are deployed in that province.

The latest Kuando Kubango minefield status is as follows:

- 9 active
- 7 cancelled
- 62 completed
- 272 surveyed
- 11 suspended

The 62 completed minefields consisted of 154 hectares (381 acres) while the 272 minefields remaining for future clearance total 2,291 hectares (5,661 acres). The 11 suspended minefields are awaiting assistance in manual mine clearance from HALO mechanical assets.

Opening the Roads in Kuando Kubango

During the civil war AT mines were used extensively to close roads to military and civilian traffic. The presence of AT mines on roads, or even their suspected presence, has a crippling effect on the local economy, transport of produce to and from farms, movement of people, and ability of NGOs and the government to implement development projects.

One of HALO’s highest priorities since the end of hostilities has been to make roads safe for travel. Since 2002, HALO has opened 804 kilometers (500 miles) of road in Kuando Kubango (see Figure 3, next page) and 4,922 kilometers (3,058 miles) nationwide.

The opening of roads has been achieved mainly through the deployment of HALO’s Road Threat Reduction system. HALO uses a trailer to reduce road threats following a check using a metal detector since the metal detector will not be able to locate minimum-metal or
plastic anti-tank mines. The weights on the trailer simulate a heavy vehicle so HALO can be sure the road is safe for trucks and buses. The cab for the operator is armored for protection in case of an uncontrolled explosion. RTR has two parts: a metal detector and “sacrificial wheels.”

On the sandy roads of Kuando Kubango province, detonation trailers are not viable since they quickly get bogged down. In addition, the presence of plastic AT mines renders the front-mounted metal detector useless. As a result, HALO is testing two new systems—both developed and funded by the Humanitarian Demining Research and Development Program in the U.S. Department of Defense’s Night Vision and Electronic Sensors Directorate—the Rotary Mine Comb and the Minestalker. The Rotary Mine Comb has two metal rotors that plow and

Figure 3: Since 2002, The HALO Trust has opened 804 kilometers (499.6 miles) of road in Kuando Kubango and 4,922 kilometers (3058.4 miles) nationwide.
excavate the soil in front of the machine, bringing the AT mines to the surface. It can clear 1 kilometer (0.62 mile) of road every two days. The Minestalker is a ground-penetrating radar system that can find anomalies, including plastic AT mines, under the soil. HALO and HD R&D carried out field trials in Cuito Cuanavale from May to June 2009. Trials will continue during 2010. 1

Much humanitarian mine-clearance work remains to be done in Angola as a whole and within Kuan do Kubango in particular. With the generous support of PM/WRA and other donors, The HALO Trust is working toward helping Angola achieve mine-free status as soon as practically possible. ♦

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Using a front-mounted metal detector, an armored tractor locates metal-bodied anti-tank mines.
The Roots of Peace Model: Demine-Replant-Rebuild

Roots of Peace is an organization dedicated to the demining and redevelopment of mine-affected regions. It believes that it is not enough for organizations to just clear land of explosive remnants of war but that the land must be made livable and productive again. ROP suggests that the Demine-Replant-Rebuild model may be a good model for other organizations as well.

by Gary Kühn [Roots of Peace]

Restoring a post-conflict community to productivity is a lengthy and costly venture. The act of mine clearance is a major step and the most costly one in the process. Clearing the land of explosive remnants of war, however, does not automatically create the catalyst for follow-on development or agricultural tasks. In fact, there is no guarantee that clearance will lead directly to such activities and the return to effective use of the land.

Typically, donors expect to see development and agricultural enterprises spontaneously occur following clearance. They are looking to see real impacts from their contributions, such as farmers once again harvesting their fields or children returning to school. However, these activities do not tend to happen naturally in a war-torn or post-conflict environment. In countries ravaged by war, investors are limited and basic survival is often the focus—unlike countries with thriving economies, where investors quickly realize value from their investments.

History and Mission

Roots of Peace, a California-based non-profit, began in 1998 with a vision of clearing minefields following the cessation of war to allow inhabitants to return to their productive pre-conflict livelihoods. Early on, the organization sought private donations to clear ERW in affected countries; Californians were sympathetic to the cause, especially in Napa Valley, where winemakers were the first to answer the call. With these funds, ROP set out to clear minefields in Croatia. The Office of Humanitarian Demining Programs in the U.S. Department of State’s Bureau of Political-Military Affairs (now the Office of Weapons Removal and Abatement) supported the program through the International Trust Fund for Demining and Mine Victims Assistance, agreeing to match the private donations dollar for dollar.

These Afghans are harvesting grapes in a once heavily mined area in Mir Bacha Kot. ROP has been working with the grape farmers in this region since 2004. In 2004, the average annual farm income was US$500; it is now more than US$4,400.

PHOTO COURTESY OF SHARIF GHANIM
ROP-funded mine clearance in Croatia began in 2001 with the clearance of vineyards and orchards in Dragalić. Clearance projects soon encompassed other villages in Croatia, and on a 2002 trip to the region with some ROP donors, Founder Heidi Kühn toured the villages that ROP funds had helped clear. The group came upon overgrown vineyards that were part of the clearance by ROP, but there was no apparent follow-on activity. The vineyards were unused.

"Why were the vines still in a state of disarray? Why was the farmer not in his fields?” Kühn wondered. After speaking with a local farmer, she learned that the farmer could not leave his current job to restart his vineyard; it would take two years to bring the vineyard back into full production and the farmer could not afford the reduced income during the interim. The initial vision ROP had of a productive farmer again working his land following clearance was fading.

The Demine-Replant-Rebuild Model

Cambodia. Chevron became a new donor, allowing ROP to conduct a mine-clearance project in Battambang province in western Cambodia beginning in August 2002. In light of its experience in Croatia, ROP decided to organize the Battambang project differently. The majority of the funds went to mine clearance, but ROP reserved some funds to ensure that farmers returning to their cleared land would be able to farm again. ROP contracted with Mines Advisory Group to clear three villages and engaged Lutheran World Foundation to set up a well, provide initial stock to replant rice, and train the farmers on how to grow rice. Although it seemed a bit odd to have to train Cambodians to grow rice, ROP learned that after losing a generation of Cambodian farmers to conflicts, no one was able to pass the tradition of farming along to the next generation.

The Battambang project was a success, and with it, ROP launched its Demine-Replant-Rebuild model. This approach includes the integration of mine clearance along with follow-on activities that are essential to rebuilding the lives and livelihoods of internally displaced persons. ROP has developed and continues to improve this model of Demine-Replant-Rebuild to conduct its programs in post-conflict countries. For all projects, its aim is to lock in the positive results of demining by ensuring funding for the replanting and rebuilding efforts.

Afghanistan. With this new model in effect, The HALO Trust asked ROP to apply the Demine-Replant-Rebuild program to its work in Afghanistan. ROP agreed—Afghanistan had an urgent need for assistance and it would be a good test for the model. The country was filled with mines laid not only by the Soviets, but also by the quarreling mujahideen groups and by Ahmad Shah Masood’s forces fighting the Taliban, making much of the land uninhabitable.

The challenge in Afghanistan, however, goes far beyond the mines and UXO. Agricultural development was and is in a ruinous state as Afghanistan has been fighting conflicts since 1978.

ROP looked at implementing its program in Afghanistan’s Shomali Plains region, an area just north of Kabul, which had been a major grape-producing region until the war between Afghanistan and the Soviet Union, when millions of mines and pieces of UXO prevented cultivation. In the early 2000s, the standard shelter for the rural Afghans in the Shomali was a tent provided by the United Nations High Commission for Refugees. With refugees living in or next to minefields, the mine incident rate was atrocious. Explosives, such as shells and mines, were the cause of approximately 33 percent of refugee deaths,¹ and some years saw as many as 50 incidents a week.²

With private financing led by donations from Diane Disney Miller, ROP funded equipment and mine-clearance teams for HALO from 2003 to 2005. Unlike MAG in Cambodia, HALO had no connections with development organizations, so the task fell to ROP to organize the follow-on activities. ROP submitted a proposal to the United States Agency for International Develop-
ment and other donors to help the grape farmers of the Shomali. USAID awarded a US$6 million contract to support ROP’s development activities in Afghanistan. This project launched ROP’s new direct participation efforts. Previously, the organization had always contracted with others to perform fieldwork; it now began to implement its Demine-Replant-Rebuild model directly in Afghanistan.

ROP worked closely with the HALO team to identify the mine-clearance tasks, focusing first on the irrigation canals, then on the village/vineyard combinations. Once clearance of the chosen communities was completed, the ROP teams followed with agricultural extension support for the vineyards, partnering with University of California-Davis for extension services. This “one-two punch” was a success, as was ROP’s initial foray into the world of agricultural development. ROP followed this first development program in Afghanistan with 17 more programs that now cover 26 of the country’s 34 provinces. ROP currently employs 426 people in Afghanistan who perform agribusiness development activities and school
ROP’s experience in Afghanistan has solidified the organization’s commitment to the Demine-Replant-Rebuild approach. ROP has built a school and a fresh-fruit packing facility on land in the Mir Bacha Kot district of Afghanistan that HALO cleared and ROP continues to work closely with the farmers of this former battle area. The farmers ROP has worked with in Mir Bacha Kot district are now earning in excess of $10,000 per year, much more than the $1,054 per year per person average for the country.3

Looking Toward the Future

ROP’s follow-on projects are diverse and span the globe, but they all continue to have the same focus: improving the economic and social livelihood of the rural population who return to their land following clearance. Examples of ROP’s follow-on projects include supporting agricultural activities—which is a primary focus for all the rural areas of countries where the nonprofit works—and furthering the impact of its outreach by extending its work to agricultural processing, export programs, trade policy, irrigation, the building of schools and to support local sporting organizations.

ROP exclusively uses the Demine-Replant-Rebuild approach and is now applying this model to the Vietnam highlands, where the focus will be on UXO removal, followed by the planting of cacao groves. It expects the effort to lift the highland farmers from poverty and allow them to live in a safe setting. Cambodia and Vietnam remain severely affected by UXO that remains from the American-Vietnam War. For most rural-development efforts in these countries, organizations must precede the development work with clearance projects.

The experiences in Cambodia and Afghanistan, as well as similar work in Croatia, have convinced ROP that this model is the best approach to achieve its initial vision to restore rural farmers on their land and helping re-establish peace and stability in war-torn countries. By not only clearing contaminated land but helping farmers return to their livelihoods, ROP gives hope to the people for a brighter future. In a majority of the countries where ROP works, it is not following the aftermath of a single conflict, but rather a series of conflicts, making this work essential to the community healing process.

With a grant provided by USAID in 2010, ROP embarked on a $35 million program in the restive southern region of Afghanistan to work with over 20,000 farmers. ROP advocates the integration of both clearance and development work and suggests that others follow its lead. 

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Non-state Actors and Mine Action: Complications and Solutions

The role of non-state actors in mine action is an important and complicated issue to consider. While the United Nations does not recognize NSAs as official representatives of countries or governments, NSAs can still play an active part in reducing landmine and weapons proliferation around the globe. This article discusses the complications surrounding NSAs and the efforts being taken to include them in mine-action discussions.

by Cory Kuklick and Zach Wall [Center for International Stabilization and Recovery]

As defined by Geneva Call, an armed non-state actor is “any armed actor operating outside state control that uses force to achieve its political/quasi-political objective. Such actors include armed groups, rebel groups, liberation movements and de facto governments.” Many of the wars and conflicts being fought in the post-Cold-War environment involve actors outside of state control, and a rise in globalization has made financial and technical resources more available to these entities. Because the majority of conflicts today are fought with at least one party that does not acknowledge the legitimacy of the recognized government, complications arise with international humanitarian law on how to effectively engage and monitor these groups, as they are not bound by international treaties.

NSAs and Landmines

Due to their widespread availability and cheap cost, anti-personnel mines were the weapon of choice for many NSAs throughout the latter part of the last century. However, due to stockpile destruction and the provisions against the production and trade of AP mines included in the Ottawa Convention, the availability of factory-made landmines has been drastically reduced over the past decade. Nevertheless, from 2003–2005, at least 60 NSAs used AP mines, including victim-activated improvised explosive devices. The use of victim-activated IEDs, which are considered AP mines and prohibited by the Convention, account for most NSA mine use in recent years. (While NSAs frequently use command-detected IEDs as well, these IEDs are not considered AP mines under the criteria of the Convention.) Only a handful of non-state actors, notably the Taliban in Afghanistan and the Liberation Tigers of Tamil Eelam in Sri Lanka, emplaced new factory-made or self-produced AP mines during the past two years.

Anti-personnel mine.
PHOTO COURTESY OF MATT BOLTON

http://commons.lib.jmu.edu/cisr-journal/vol14/iss2/28
While landmine use has been decreasing overall, the use of AP mines by NSAs still occurs more frequently than by government forces. During 2008 and 2009, for instance, NSAs used AP mines in at least seven countries, three of which are States Parties to the Ottawa Convention. By contrast, the government forces of only two nations did so during the same period.4 When states deploy landmines, they generally do so to defend an area or disrupt an enemy. On the other hand, NSAs usually deploy them indiscriminately. They are also more likely than states to lay landmines near civilian-dense areas, such as schools or well-traveled roads, to cause as much disruption and terror among the population as possible. NSAs often lay landmines without conventional patterns, and maps or indicators that specify landmine locations following the conclusion of combat generally do not exist.

The purpose for mine use varies among these armed groups: factors including whether or not the group controls an area or terrain and the group’s access to various mine types affect how NSAs use landmines. One constant, however, is that the mines used are usually cheap and easy to operate and modify (allowing them to be used as victim-activated IEDs). Over the past decade, due to the moratoria on mine transfers imposed by the Ottawa Convention and other export bans, the global trade of AP mines has consisted mostly of low-level, illicit trafficking. As a result, AP mines have become less accessible to NSAs by traditional means, such as purchasing them from neighboring states. In some cases, NSAs will acquire landmines from the state in which they are fighting, whether through looting weapons caches or by removing landmines already laid by the state.2 The black market is another source where NSAs can obtain landmines, as these mines are not under effective state control. A large black market began in Iraq following the start of the Iraq War (2003–present), with landmines belonging to the former Iraqi state now being sold and transferred throughout the country to insurgents.2
In most conflict zones today, however, NSAs are less likely to emplace factory-manufactured AP mines than they are to deploy victim-activated or command-detonated IEDs. IEDs are common among NSAs because the materials used to make the devices are readily available. For instance, NSAs can modify AP mines and other conventional ordnance to construct these devices. Due to the unpredictable nature of these weapons, and the way they can be easily disguised as commonly found items—such as piles of rocks or even as bags of candy—IED use can be harder to control. Because non-state armed groups use landmines and IEDs in unconventional ways that frequently target or endanger civilian populations, the necessity for monitoring and preventing their use is that much more pressing.

Engaging NSAs through Geneva Call

Because they are not recognized as states, NSAs cannot become signatories to international legal instruments such as the Ottawa Convention, even if they choose to adhere to the ban’s principles and initiatives. In order to bring NSAs to the mine-ban table, Geneva Call established the Deed of Commitment for Adherence to a Total Ban on Anti-Personnel Mines and for Cooperation in Mine Action, which encourages NSAs to follow the guidelines put forth in the Ottawa Convention. The Deed of Commitment also enables NSAs to declare adherence to a set of humanitarian principles and in turn project themselves in a more positive light within the international community for not using AP mines. Furthermore, including NSAs in disarmament discourse also encourages them to pursue legitimate avenues for reaching their political goals, rather than organized violence. By promoting dialogue and transparency, Geneva Call ultimately hopes to persuade these groups to adhere to the same basic humanitarian standards expected of states.

Since 2001, 41 NSAs from Burma/Myanmar, Burundi, India, Iran, Iraq, the Philippines, Somalia, Sudan, Turkey and Western Sahara have signed the Deed of Commitment. Signatory actors commit themselves to 10 pillars of mine action, including banning AP mine use, cooperating and taking part in stockpile destruction, allowing the monitoring and verification of their commitment by Geneva Call, and treating the commitment as a step toward international humanitarian law.

Last year four new members signed the Deed of Commitment, and 40 signatories met in June 2009 at Geneva Call’s Second Meeting of Signatories to the Deed of Commitment, where participants discussed landmine issues as well as other topics such as protection of women and children in armed conflict. Geneva Call continues to reach out to nonsignatories in the hopes of persuading them to join the Deed of Commitment and plans to continue following up with signatories to guarantee their commitment to ban AP mine use.

In April 2010, two new actors—the Kurdistan Democratic Party–Iran and the Free Life Party of Kurdistan/Liberation Forces of Eastern Kurdistan—added their signatures to the Deed of Commitment. As a result, all Iranian and Kurdish armed NSAs have banned AP mine use.

However, one downside to negotiating with NSAs is that it potentially lends legitimacy to insurgent and terrorist organizations that they do not necessarily warrant. In effect, these groups may capitalize on that credibility and transform it into popular support and new recruitment. When international organizations recognize and engage with NSAs, the latter may enjoy a new bargaining position that they may in turn use to advance their international standing. NSAs can
then use that momentum to their advantage by recruiting new members or securing new resources from interested sponsors. Furthermore, just because NSA’s have abandoned the use of AP mines does not guarantee that they will not continue campaigns of violence against government and civilian targets using other tactics and different varieties of lethal force. In fact, they may substitute their former weapons of choice with innovative, more effective alternatives.

Conclusion

The complications surrounding NSAs and including them in a mine ban, mine clearance initiatives or disarmament campaigns illustrate the need to continue engaging NSAs in dialogue. Over the past decade Geneva Call has shown the possibility to successfully include NSAs in such activities, although much work remains. Many NSAs still do not adhere to international humanitarian law and continue to indiscriminately place landmines and deploy IEDs, illustrating that their continued use remains a major obstacle in mine action and weapons mitigation.

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Aging or unstable stockpiles pose the dual threats of illicit proliferation and accidental explosion. Poorly secured weapons and munitions stockpiles are often attractive targets for terrorists, criminals and insurgent groups. The weapons may spread rapidly, destabilizing individual countries or even an entire region. The munitions can sometimes explode, causing humanitarian disasters that serve as major public-safety hazards in populated areas, as well as creating an environmental threat. The world has watched stockpiles detonate, at times due to poor handling practices, causing large numbers of casualties and significant damage that has displaced many civilians. In one recent example, 26 people were killed and many more were injured and displaced when a stockpile exploded at an ammunition dismantling factory in Gërdec, Albania, in March 2008.
To help prevent illicit proliferation and accidental explosion, governments must maintain high standards of security and management for state-controlled stockpiles of man-portable air-defense systems (MANPADS), other small arms/light weapons and related ammunition. Governments must see PSSM as an ongoing effort that requires frequent monitoring, regular training of qualified experts, and long-term planning for factors like infrastructure and resources. Implementing such standards helps ensure security, enhance stability and enable prosperity.

The Office of Weapons Removal and Abatement in the U.S. Department of State’s Bureau of Political-Military Affairs (PM/WRA) assists countries with essential pieces of the PSSM puzzle: safely reducing excess stockpiles of weapons and munitions, and improving security and safety infrastructure for retained stocks. Coordinating with the U.S. Embassy in the host country and the United States Defense Threat Reduction Agency, PM/WRA works with governments to assess needs and devise a comprehensive and efficient plan that addresses both the destruction of excess stocks and projects to improve PSSM infrastructure.

While the United States is one of several countries that provides assistance with stockpile reduction and security infrastructure, numerous multilateral organizations have established mechanisms to help governments implement these commitments. The United Nations, NATO, and the Organization for Security and Co-operation in Europe are among the organizations that have established venues where states can collaborate to improve PSSM procedures.

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Consolidating Peace through PSSM Projects in Burundi

Small arms and light weapons have been a problem in Burundi due to the Burundi Civil War. This article focuses on the programs that (MAG) Mines Advisory Group and the Burundian police have instituted to reduce stockpiles and improve physical security and stockpile management in the country.

by Julie Claveau [Mines Advisory Group]

One consequence of Burundi’s 10-year civil war has been the widespread proliferation of small arms and light weapons throughout the country. In 2007, nearly 100,000 households in Burundi were thought to possess at least one weapon. This estimate is a major concern, not only due to heightened levels of violent crime, but also because the availability of arms at a time of ongoing political insecurity increases the risk of a return to conflict. In addition, the civil war, compounded by a lack of human and financial resources, has led to the weak management of weapons and ammunition by the Burundian state. The police and the army have recognized the problem of pilferage of their stocks, which is feeding the black market, as well as the threat of explosions posed by unsecured stockpiles.

This situation led Mines Advisory Group to start a Physical Security and Stockpile Management Project in Burundi in 2007. MAG first became involved in the destruction of SA/LW during the 1990s through its support of demobilization/disarmament/reintegration activities in Angola and Cambodia. In 2006, a large-scale PSSM project was set up in the Democratic Republic of the Congo to reduce the risks posed by the SA/LW in the Congolese Army stocks. Building on the lessons learned from this project, MAG has chosen to expand its PSSM activities to neighboring countries that need its services.

MAG started operations in Burundi to support the Force de Defense Nationale (the Burundian Army) in destroying a stock of man-portable air-defense systems (MANPADS) and other SA/LW. MAG set up a weapons-destruction workshop and trained a team of 15 military staff to destroy all types of firearms using disk cutters and hydraulic shears. It trained another team in the safe transport and destruction of ammunition.

MAG Burundi’s PSSM Activities

Through numerous PSSM activities during this short-term project, MAG learned how best to support the Burundian state to reduce the
risks posed by SA/LW. Burundi is a signatory of the Nairobi Protocol for the Prevention, Control and Reduction of SALW in the Great Lakes Region and the Horn of Africa, a regional protocol to fight the proliferation of SA/LW. MAG’s experience meant the organization could be of great assistance in the implementation of Articles 6, 7, 8 and 9 of the Protocol:

- Article 6: Control and Accountability of State-owned Small Arms and Light Weapons
- Article 7: Marking and Tracing of Small Arms and Light Weapons and Record-keeping
- Article 8: Disposal of State-owned Small Arms and Light Weapons
- Article 9: Disposal of Confiscated or Unlicensed Small Arms and Light Weapons

However, the key to starting large-scale PSSM activities was the willingness of the Burundian authorities to see it happen. Following a request from the Executive Director of the Police Nationale du Burundi, a MAG-PNB mobile team was set up in early 2008 to collect and destroy SA/LW seized by the police or voluntarily handed over by the population at police stations. Eight police officers were detached to MAG and were trained and supervised by a MAG Technical Field Manager for a full year to conduct the work nationwide.

Shortly after this project began, the PNB requested further support from MAG to conduct a survey of PNB SA/LW. The objective was to gather sufficient information to draft a strategy to implement Articles 6, 7 and 8 of the Nairobi Protocol. Two joint MAG-PNB teams conducted the five-month survey, assessing the type, quantity and state of PNB-owned SA/LW and how they were stored and managed. MAG officially presented the results of this survey to the PNB in June 2009, which led to a comprehensive PSSM project with the PNB. The main conclusions of the survey were:

- Large quantities of SA/LW in storage are obsolete, not fit for use or surplus to requirements.
- Retention of this surplus SA/LW puts unnecessary pressure on limited storage facilities and gives rise to dangerous storage methods.
- Physical storage facilities are poor; the lack of security poses risks, including unauthorized access.
- Armors lack the skills and knowledge to safely store and manage SA/LW under their charge.

**MAG and PNB Solutions for SA/LW**

In collaboration with the PNB, MAG proposed a set of countrywide solutions that it could rapidly implement at limited cost while significantly improving the SA/LW situation. The need was urgent because many were afraid that the 2010 elections could lead to an increase in violence, including large-scale organized violence. The international community and the police considered reduced access to unsecure stockpiles an essential measure to secure the elections.

Due to the quick responses of the Dutch and Swiss governments, who immediately contributed funds for the initiative, MAG and the PNB were able to start working immediately. With a plan to complete the project by December 2010, MAG and the PNB are implementing solutions to do the following:

1. Destroy obsolete and surplus SA/LW
2. Improve the physical security of PNB armories
3. Train the PNB armorers to safely store and manage SA/LW

The international community recognizes the destruction of surplus stocks as a necessary measure to prevent weapons from illegally moving to other countries or falling into subversive hands through theft, mismanagement or corruption. Moreover, the police are removing all hand grenades—a weapon unfit for police purposes—from armories, which is a significant step toward improving security in Burundi. Grenades are used daily as weapons in petty crimes, family issues, and land disputes and were responsible for almost a quarter of all violent deaths in Burundi in 2008. In 2009 alone, MAG Burundi destroyed over 14,000 hand grenades; about 8,500 grenades were part of police-owned stocks and the other 5,500 were grenades that had been collected from the population during the civilian disarmament campaign.
The improvement of the physical security of armories aims to reduce the ease of access to weapons and facilitate a more professional approach from the armorers in terms of their management of the inventory. The main element is the installation of gun racks, which means that by the end of the project all weapons will be under lock and key, including all magazines and handguns that are stored in specially designed drawers. Before the project, the best armories were equipped with artisanal wooden gun racks without any cables or locks, and the worst ones had no form of weapons storage.

In secure storage sites where the police keep large quantities of weapons, they reinforce the windows and doors and install hatches to limit access to authorized personnel only. Heavy metal doors replace wooden doors and stronger padlock hinges replace the weaker ones. A monitoring visit in the southern region of Burundi demonstrated that the improvement of armories also positively affected the morale of the armorers and made the police officers more willing to implement safety measures. It is also one more step that contributes to developing a peacetime mindset within the new security forces.

The success of the PSSM project with the PNB made the Force de Defense Nationale interested in a similar project. Consequently, a nationwide survey of FDN SA/LW by a mixed FDN-MAG team is ongoing and is likely to lead to actions similar to those implemented with the PNB in order to reduce the risks of diversion and unplanned detonations.

Finally, MAG is also supporting the civilian disarmament campaign by destroying SA/LW that the population handed over during the weapons amnesty period that ended in October 2009. This campaign was implemented by the Commission Nationale de Désarmement Civil et de lutte contre la Prolifération des Armes Légères et de Petit Calibre, which encouraged the population to voluntarily hand over their weapons in exchange for material compensation such as bicycles, cement or cloth.
Conclusion

The PSSM and SA/LW destruction activities are taking place simultaneously in the three sectors where SA/LW are present—the civilian population, the police, and the army. These projects are implemented with strong support from the authorities, and are expected to have a strong impact on the proliferation of SA/LW in Burundi. Moreover, MAG is thinking about the future and is working to build a resilient and sustainable capacity with the local authorities through training, mentoring and advising so it can continue managing SA/LW after the Burundi program completes its work. MAG’s work in Burundi has shown that PSSM projects have their place within the Security Sector Reform agenda. MAG’s staff is doing much more than simply destroying weapons: They are supporting the transition of security forces from a conflict to peacetime mentality, reducing the risks posed by SA/LW to civilians and eliminating the availability of weapons as a potential stimulant of renewed conflict.

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In Remembrance: Dominique “Momo” Morin

by Allison Bartlett [Center for International Stabilization and Recovery]

Dominique “Momo” Morin, a deminer, trainer and supervisor for Fondation Suisse de Déménage, was killed in an accidental mine blast on 10 May 2010. Morin, 54, was working in the northern town of Vavuniya, 254 kilometers (158 miles) north of Colombo, Sri Lanka. Formerly with the French military, Morin had been working in mine action for the past 10 years, training and supervising hundreds of national deminers. Morin dedicated his life to demining and was widely respected throughout the demining community.

A fellow deminer, Roger Hess, said, “He was an excellent EOD operator whose only complaint, even under the worst circumstances, was generally about the restrictions imposed on him by the national authorities that prevented him from fully doing his job … He could be described as a very selfless man and was always objective and team focused. He had a ton of patience and was just so easy to work with.”

In a statement made following his death, FSD recalled, “[Dominique] has trained hundreds of national deminers and protected them from accidents by his very professional training and supervision. It therefore is … tragic that Dominique died from injuries sustained from the accidental detonation of an explosive device.” The French Embassy also made a statement: “We were deeply grieved to hear about the death of Dominique Morin … . We would like to pay tribute to the commitment and the courage of our compatriot for helping Sri Lankans to regain a normal life. In these difficult circumstances, we would like to express our deepest sympathy to his family, to his relatives and his colleagues.”
In Remembrance:
Afghan Deminners Killed by Roadside Bomb

by Cory Kuklick [Center for International Stabilization and Recovery]

Five Afghan deminers working for the Demining Agency for Afghanistan were killed when the bus they were traveling in was struck by a roadside bomb in Kandahar province on 14 April 2010. Thirteen others were injured. It is unclear whether the explosion was random or targeted against DAFA, a U.S.-supported demining group.

Following the attack, Afghan President Hamid Karzai called on Taliban insurgents to voice their grievances instead of resorting to violence, and reiterated his standing invitation to meet with any insurgent who renounces terrorism. Roadside bombs are common instruments of violence used by the Taliban in a country that has experienced near-continuous warfare for the past 25 years.

DAFA is a non-governmental agency, founded in 1990 and specializing in landmine clearance in the southern and western regions of Afghanistan. Following the explosion, the Special Representative to the Secretary-General of the United Nations issued a statement condemning the incident. "I deplore this attack on these courageous people who for years have devoted their lives to making Afghanistan safer for all," he said in a news release, stressing the fact that mine action is a neutral humanitarian activity.

In Remembrance:
HALO Staff Killed by AT Mine

by Eric Wuestewald [Center for International Stabilization and Recovery]

Hussein Abdi Muhumed, driver for The HALO Trust, and HALO deminer Yousuf Xirsi Bashe were killed when their vehicle detonated an anti-tank mine while returning from work in the Dabogoroyaale minefield of Somaliland on 12 April 2010. Two other HALO staff, Section Commander Abdirahman Ismail Aden and deminer Hassan Dol Ali, were also injured in the accident. The explosion is HALO’s first mine-related death in their 10 years of clearance in Somaliland.

The incident occurred along a well-traveled stretch of road previously declared mine-safe. As a result, it is unclear who emplaced the landmine or how it went unnoticed. HALO, the police and the Somaliland Mine Action Centre are all currently undergoing investigations into the accident, and HALO stressed that no further statements can be made until these investigations are over.

In another incident, one landmine clearance expert was killed and another seriously injured while clearing mines at Mt. Igman in Bosnia in April. Police said the wounded man suffered from pieces of shrapnel in his neck and face but was hospitalized with non-life-threatening injuries.
Many consider a landmine to be a buried device triggered by the weight of its intended target, but this perception overlooks a crucial component of the mine threat. While it is true that the vast majority of the world’s legacy mines are actuated by pressure, several other forms of initiation are also used, including tripwires, electrical command wires, magnetic influence and tilt-rod fuzes. Most of these methods are rare among the aging mines that threaten communities in contaminated regions; however, tripwire-operated mines are relatively common and have been used extensively.

Tripwire initiation was developed to exploit the range and lethality of fragmentation warheads and therefore has a disproportionate significance for clearance operations. With a blast mine, you have to be unlucky enough to step on it directly, whereas a tripwire can be encountered anywhere over an area of several meters. This fact massively increases the likelihood of an encounter with a single mine within a given area.

The consequences are also disproportionate. If an adult treads on an anti-personnel blast mine, the chances are that he or she will lose part of a limb, but will probably survive. In contrast, when a fragmentation mine detonates, not only is the person who triggered it likely to die, but anyone else within a radius of about 10 meters (33 feet) will most likely be seriously injured or killed as well. With some “bounding” (jumping) mines, the radius may exceed 30 meters (98 feet).

All of these characteristics make the identification and location of tripwires a key priority for clearance teams, with both military engineers and civilian deminers using similar procedures for “tripwire feeling.” Yet, little has been done to analyze the nature of the tripwire threat or how the threat changes with time.

Types of Tripwire and Mines

The vast majority of tripwire is made from soft iron or steel; it has no protective coating other than a thin layer of paint and is therefore vulnerable to rusting. In the hot, wet climates of Southeast Asia and sub-Saharan Africa, tripwire is unlikely to last more than a few seasons. One notable exception is the tripwire manufactured for former-Yugoslav mines, which is made from multi-strand stainless steel and is plastic coated; this material is likely to survive for many years.

The two mine categories most likely to employ tripwires are bounding fragmentation mines and stake mines, the latter being the more widespread. In order to avoid initiation by falling branches, small animals and other environmental influences, the actuation of a tripwire fuze typically requires several kilograms of force. This fact is one of the reasons why metal wires are used instead of, for example, nylon filament, which has too much stretch to function reliably.

Implications for Clearance

In areas covered by dense undergrowth, the potential presence of tripwires means that great care is needed when cutting vegetation by
hand. This level of attention makes progress extremely slow, with programs in some regions estimating that they have spent around 80 percent of their operational time on manual vegetation clearance. Coupled with this issue is the knowledge that, even among well-equipped deminers, the detonation of a tripwire-actuated mine is almost certain to cause casualties; few items of conventional personal protective equipment will stop the high-velocity fragments from a stake or bounding mine.

This dual consequence to manual mine clearance makes accurate assessment of the tripwire threat crucial. It has also been an important consideration in the development of mechanized techniques for vegetation clearance, since these procedures virtually eliminate the possibility of tripwires remaining in a “processed” area.

Failure Mechanisms

With stake mines, the degradation of the tripwire is concurrent with rotting of the wooden stake; when the stake gives way, the mine body falls to the ground. At this point, if the wire—still intact and above ground—is tripped, there is a good chance the mine body will be dragged across the surface without initiating. This malfunction occurs because the mine is no longer anchored and the drag of the mine body will alter the direction of pull. Instead of the force being applied axially along the striker retaining pin, it becomes almost perpendicular, substantially increasing the effort required to extract the pin and cause initiation.

As time progresses, both the wire and the mine body tend to become incorporated into the ground (as dirt and successive generations of foliage cover them), then decompose into the soil; eventually, this process once again “anchors” the mine body. In wet environments, most tripwires will rust away before this point and the threat will be minimal. However, under certain circumstances (such as dry desert conditions and where the tripwire is impervious to water), the likelihood of accidental initiation may actually increase again as the mine becomes lodged into position.

Bounding mines have different degradation mechanisms and are prone to failure in the long term simply because the buried mine body is constantly exposed to water and silt. However, those that rely on tripwires are effectively “neutralized” once the tripwire has rusted away (although some have optional pressure-actuated fuzes).

Hot/Wet Climates

Vegetation tends to grow fastest in hot, wet climates, so these regions are often the ones of greatest concern for tripwires among dense undergrowth. However, the very conditions that encourage rapid plant growth also promote the rotting of wooden stakes and the rusting of tripwires. In other words, in most situations where
undergrowth has covered a minefield over a period of several years, it is unlikely that rust-prone tripwires will survive.

In Cambodia, where no tripwires have been found for many years, the realization of the changing threat has allowed a substantial increase in productivity. Sensible precautions are taken, of course, but the change has enabled the adoption of procedures that would have been completely unacceptable in the presence of tripwires, such as using manually operated brush cutters.

Conclusion

A tripwire greatly increases the “catchment area” of a stake mine or bounding mine, while detonation of the fragmentation warhead tends to inflict multiple casualties at substantial ranges. The unacceptably high threat from tripwire actuation therefore imposes serious limitations on clearance operations. Conversely, the ability to eliminate that threat offers clear benefits in most programs, with the potential to substantially increase clearance rates and reduce costs.

In most matters relating to mine clearance, building an accurate threat assessment allows a more “surgical” approach to the task. The characteristics of tripwires—a subject somewhat neglected by the mine-action community—form an important component of the intelligence picture. Right now, in many clearance programs, that picture is incomplete; the price is wasted resources and severely reduced production.

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Landmine removal and post-conflict recovery are necessary conditions in order to provide prosperity to communities that were affected. Generally, additional funds are needed to implement small socioeconomic initiatives, or micro-projects, that can provide a first step to a community’s recovery after clearance.

Nevertheless, some claim mine-action programs should remain separate from development activities. As the Organization of American States demonstrates, however, mine-action programs routinely provide an effective and expedited route to sustainable national development. By creating these programs around micro-projects, the OAS has been able to assist national development efforts in fostering security and promoting socioeconomic improvements.

Objectives of Mine Action

The subject of linking mine action and development has been a topic of frequent discussion. IMAS 04.10 Glossary of Terms defines mine action as the “activities which aim to reduce the social, economic and environmental impact of mines and ERW [explosive remnants of war] including cluster munitions.” It also notes that “mine action is not just about demining; it is also about people and societies, and how they are affected by landmine and ERW contamination. The objective of mine action is to reduce the risk from landmines and ERW to a level where people can live safely; in which economic, social and health development can occur free from the constraints imposed by landmine and ERW contamination, and in which the victims’ different needs can be addressed.”

Following the IMAS line of thinking, the objectives of mine action go beyond security issues and into supporting national development...
efforts as well. Consequently, it is widely accepted that the best indicator of results achieved from the resources invested in mine-clearance operations no longer comes directly from the count of destroyed mines or cleared areas. Instead, most results are now measured by the increase in well-being provided to families, communities and the other beneficiaries of the cleared land.

The above premise has been widely accepted and recognized in international instruments such as United Nations resolutions and Ending the Suffering Caused by Anti-personnel Mines: Nairobi Action Plan 2005–2009, which invites states, as well as national and international agencies, to integrate mine action with wider development aid programs. These international instruments also recognize that mine action is indispensable in reaching the United Nations Millennium Development Goals. Many organizations, including the OAS, seek diverse socioeconomic solutions and recognize the importance of lending continuing support for the socioeconomic recovery of cleared land.

Nicaragua

Nicaragua’s reconstruction phase prioritized the use of cleared areas with infrastructure such as bridges, communication towers and electrical power pylons. However, the OAS mine-action program in Nicaragua estimates that 54 percent of cleared area is predominantly rural, situated next to international borders and has great agricultural potential. Consequently, a 2007 impact study on the effects of demining operations in Nicaragua concluded that it is necessary to develop financial and technical aid initiatives for landmine and ERW-cleared communities so that their lands may be more efficiently utilized. The same impact study surveyed 297 minefields that had been cleared and found 64 percent of the cleared land was agricultural in nature or had productive potential for agricultural products.4 Years later, the amount of cleared area remained relatively the same, and so it became imperative to channel financial and technical aid toward the rehabilitation of areas with productive potential.

Taking into account that Nicaragua is one of the most impoverished countries in the Western Hemisphere, the optimal use of cleared areas, particularly those with agricultural potential, has had its limits. The inefficient use of cleared land is...
At Las Cochas, Colombia, an area is cleared and beneficiaries receive aid through AICMA-CO.

due largely to the insufficient financial and technical aid provided for its socioeconomic rehabilitation.

Colombia

In Colombia, mine action is conducted to assist communities; however, some communities were abandoned during armed conflict. Therefore, the clearance process is developed taking into account the physical, psychological and economic conditions of the returning civilians.

Once clearance is complete, the permanent return of displaced civilians is facilitated through two mechanisms:

1. Support by the central or local governments, development agencies and other entities to establish basic infrastructure such as electricity, water, roads, education and health

2. Assistance from the OAS and aid organizations through micro-projects that involve the planting of basic grains and pastures, and other initiatives leading to the rehabilitation of cleared areas

In one instance, the OAS program was working in El Chocó in the municipality of San Carlos, Antioquia department. During the initial survey, personnel discovered that the community school needed a garden for the school activities to return to normal. Therefore, the OAS program incorporated a small project to bring seeds, fertilizer and some tools to plant vegetables in the school garden.

The Influence of Micro-projects

Based on U.N. resolutions, The Nairobi Action Plan 2005–2009, and numerous national and international agencies, there is a growing desire to rehabilitate cleared areas through socioeconomic development. This development is sponsored and supported by the central and local governments, development agencies, and other organizations predominantly through national development plans. The OAS experiences in Colombia and Nicaragua have proven that the need to support modest initiatives in the process of rehabilitating of cleared areas is vital. In Colombia, this support is crucial for the returning populations’ survival. In Nicaragua, this support is necessary to strengthen poverty-eradication strategies.

While national processes of socioeconomic development are ambitious, they are not enough to cover the numerous vulnerable areas in countries like Nicaragua. Therefore, it becomes necessary to develop other initiatives,
which, in spite of being small and modest, have a profound impact on these communities. The activities included in the national development plans usually take a long time to reach the affected communities.

Recently in Nicaragua, the OAS initiated 15 individual and 10 community micro-projects, thanks to a contribution by the Netherlands. The projects directly benefited 634 families, 17 communities and three municipalities in the Nueva Segovia department. The micro-projects included support to the activities in Table 1 distributed among individual projects oriented toward women proprietors of small cleared parcels and community projects for the benefit of all members of various communities. The projects focus on reducing poverty and hunger, promoting gender equality, and providing environmental sustainability. In doing so, the projects bring national governments closer to the Millennium Development Goals.

Land Rehabilitation

The OAS experience in supporting the rehabilitation of cleared land in Nicaragua has identified the two phases described below as necessary for success.

Diagnosis Phase: Throughout this phase, three fundamental aspects are developed:

1. Identification of potential mined areas: Tools such as the Information Management System for Mine Action are of great assistance in this preliminary phase.
2. Verification of the areas: Activities include developing field information, conducting consultations with potential beneficiaries and analyzing the information.
3. Technical Orientation: This aspect consists of prioritization of the identified objectives, decision-making, proposal elaboration and aid mechanisms.

### Table 1: Micro-projects initiated in Nicaragua during 2009.

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of Productive Micro-projects</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction of children’s dining areas</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Construction of bridge supports</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Construction of a community hall</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Construction of a communal home</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Reforestation of fruit trees</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Planting of basic grains</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Coffee planting and improvement</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Planting of sugar cane</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Livestock breeding</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Planting of pastures</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Identification of potential mined areas: Tools such as the Information Management System for Mine Action are of great assistance in this preliminary phase.
2. Verification of the areas: Activities include developing field information, conducting consultations with potential beneficiaries and analyzing the information.
3. Technical Orientation: This aspect consists of prioritization of the identified objectives, decision-making, proposal elaboration and aid mechanisms.

**Figure 1: OAS micro-projects and their contribution to development.**
The Diagnosis Phase is of particular importance because it has been shown to be a determinant for the level of success in clearing mined areas.

Execution Phase: During the execution phase, aid mechanisms that were agreed to during the technical orientation are adopted. The beneficiaries directly execute the project under supervision of the entity or entities in charge of the technical orientation.

Conclusion

There is little doubt that macro-projects within national plans are fundamental to promoting community development. However, it is equally important to develop parallel micro-projects as they serve to secure full participation of the beneficiaries by promoting decision-making, decrease or eliminate frustration levels within affected communities, and allow beneficiaries to execute their own projects. Furthermore, the micro-projects are developed within the community, allowing for cost-effective, direct impact that improves the country’s development and promotes the Millennium Development Goals.

It is evident that small projects do not merely facilitate certain development activities, but make their implementation possible. These projects have a positive and substantial domino effect on landmine-affected communities. The results of these small initiatives can be measured by the help they provide to affected communities.

Mine action is not only confined to security-related measures of the communities at risk, but also aims to support national development efforts with the ultimate goal of reaching a full and speedy recovery. Continuing support and lending financial and technical aid to those communities that have been cleared is a common denominator that must always be present to implement diverse socioeconomic resolutions. These resolutions that support the return of cleared lands to productivity also serve to bolster poverty-eradication strategies.

The OAS welcomes contributions from all donors, no matter how modest, as donors are the engines that propel national governments toward reaching the Millennium Development Goals. Donor contributions help reduce poverty and hunger, promote gender equality, and provide environmental awareness. All of these efforts, coupled with the rest of the OAS mine-action program, have proven to be integral and necessary in clearing the path for a brighter and safer future for these countries.

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Carlos José Orozco is the Regional Coordinator of the Organization of American States Mine Action Program for Central America. In 1998, he began as National Coordinator of the program in Nicaragua. Currently he coordinates mine-action assistance to Nicaragua; a regional effort to assist the recovery of survivors and their communities in economically sustainable ways; and regional projects to address destruction of obsolete munitions and explosive remnants of war.

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Every year since 1999, the Mine Action Information Center has awarded one or more students or recent graduates of James Madison University the Frasure-Kruzel-Drew Memorial Fellowship for Humanitarian Demining, which is funded by the (PM/WRA). The Fellowship was created in honor of Ambassador Robert C. Frasure, Dr. Joseph J. Kruzel and Colonel Samuel Nelson Drew who lost their lives to a landmine in 1995 while on a mission to negotiate an end to the conflict in the war-torn country of Bosnia and Herzegovina. The Fellowship was established to raise awareness about landmine contamination around the world and U.S. government efforts to address the problem. It first began as a semester-long position, but soon expanded to one full year. This extension enabled each Fellow to have a more substantial work experience, granting him or her additional time to complete projects and take on greater responsibilities, while providing day-to-day assistance to PM/WRA.

PM/WRA, then called the Office of Humanitarian Demining Programs, was established in 1998 and supports the mission of the U.S. Conventional Weapons Destruction Program. The program has assisted almost 50 countries since its inception and works closely with other U.S. government agencies such as the U.S. Department of Defense, U.S. Agency for International Development and the Centers for Disease Control and Prevention. PM/WRA also develops, implements and monitors U.S. policy on anti-personnel landmines, small arms/light weapons and man-portable air defense systems (also known as MANPADS, or shoulder-launched missiles).

The JMU Fellow assists PM/WRA’s Program Managers with mine-action and conventional-weapons-destruction programs for one or more countries. Working with staff on current projects and traveling on policy-assessment visits are a major part of the Fellow’s responsibilities. The Fellow also drafts press releases, conducts research on landmine issues for special projects, and prepares speeches and presentations. Past Fellows have traveled to Afghanistan, Azerbaijan, Cambodia, Djibouti, Peru, Senegal, Sudan and other countries where PM/WRA has programs.

Colonel Yori Escalante, a combat engineer in the U.S. Marine Corps and former Deputy Director of Mine Action Programs at PM/WRA, worked closely with the Fellows from June 2007 to May 2010. He says he has seen the caliber of candidates increase year after year. “As an active-duty Marine, it is good to see that the same level of patriotism and enthusiasm that I see in junior Marines is also evident in the young Americans who want to serve their country outside the military,” says Escalante.
Past Fellows Grateful for Experience

Many of the 18 past Fellows have credited the opportunity for educating them in the mine-action field and for preparation in their careers upon completion of their Fellowship. After serving as the Fellow in 2006–2007, Elise Becker joined The Marshall Legacy Institute in July 2007 as Program Manager. MLI is a nonprofit organization based in Arlington, Virginia, that supports landmine-clearance operations around the world. Becker’s duties primarily entail managing MLI’s Mine Detection Dog Partnership Program, which provides highly trained minesniffing dogs and integration training to indigenous organizations within landmine-affected countries. MLI’s current MDDPP focus countries are Afghanistan, Bosnia and Herzegovina, Iraq and Lebanon, with plans to expand to Angola and Sri Lanka in 2010. Becker has also implemented several survivors’ assistance programs in Azerbaijan, and will launch new programs in Bosnia and Herzegovina, and Iraq in 2010. While at PM/WRA, she conducted onsite assessment visits to Afghanistan, Angola, Azerbaijan, Bosnia and Herzegovina, and Iraq. Becker says that her work is both rewarding and challenging. Setting up programs in unfriendly environments such as northern Iraq and Afghanistan can be difficult, but she recognizes that the PM/WRA Fellowship provided her with an early window into mine issues and challenges that she would later encounter in her career. “I am very grateful to WRA and JMU for providing me with the opportunity to serve as the JMU Fellow,” she says. She also feels good knowing that she has assisted MLI in helping people in the mine-affected world since she came on board.

Anthony Morin began working with Harding Security Associates, a government contractor with the U.S. Department of State when his year-long Fellowship ended in 2009. Within the Office of Overseas Protective Operations in the U.S. Department of State’s Bureau of Diplomatic Security, he now works as Security Program Officer and is responsible for providing management oversight, operational guidance and budget supervision necessary to establish and maintain effective security forces at U.S. diplomatic and consular facilities. continued on page 72
JMU Fellows: Where are they now?

Stacy Smith
Stacy Smith, summer 2001 Fellow, was employed by RONCO from June 2002 to January 2010. She worked as a Program Manager for mine-clearance operations and has managed security and training contracts in Afghanistan and Peru. During her tenure at RONCO, Smith had the opportunity to travel to Afghanistan, Angola, Azerbaijan, Peru and Sri Lanka. Smith is currently doing consulting work in the United States for Exploration Logistics, Inc., a subsidiary of Exploration Logistics Group, which provides specialized medical and safety assistance to organizations working in challenging or dangerous environments.

Kurt Chesko
Since the end of Kurt Chesko’s spring-semester fellowship in 2001, he has been working for The HALO Trust, the world’s largest humanitarian landmine-clearance organization. Currently, he serves as Vice President at HALO USA. Chesko’s office works closely with PM/WRA, as well as HALO’s American private donors and colleagues in mine-affected countries around the world. Since joining HALO in 2002, he has worked in Afghanistan, Cambodia, Georgia, Mozambique, the Nagorno-Karabakh region of the South Caucasus, Somaliland, Sri Lanka and Sudan.

Jennifer Lachman
Jennifer Lachman completed her Fellowship with PM/WRA in December 2005 and immediately began working at Mines Advisory Group America in 2006. MAG is an international non-governmental organization operating in conflict-affected countries to clear the remnants of those conflicts, enabling economic recovery and assisting the development of mine-affected populations. In 2000, MAG started a U.S.-based partner organization, MAG America, to raise awareness and funding in the United States to support MAG’s global conflict-recovery programs. In 2006, Lachman started working as MAG America’s Development and Communications Manager in Washington, D.C., and became the organization’s first full-time staff member. During her time with MAG America, Lachman has helped the NGO grow to a staff of four, and her team now raises nearly US$20 million a year for MAG America’s programs. Her career with the company has allowed her to travel to Cambodia, Iraq, Lebanon and Sudan.
He works to ensure a safe and secure environment for conducting foreign policy. Morin has plans to travel to Barbados, Bolivia, Canada, Costa Rica, and Trinidad and Tobago for program reviews in the near future. The decision to leave the field of mine action was the only challenge that he faced when choosing his career following the completion of his Fellowship. He says he felt attached to the field of mine action after his fellowship experience and his work at the MAIC for over three years prior to that.

Increased Responsibilities

Recent Fellows have become more involved in the daily operations of the PM/WRA office. In the past two years, PM/WRA has teamed the current Fellow with a Program Manager in the office so he or she can assist with more complex operations; in addition, the Fellow has recently been given the title of “Assistant Program Manager.” When unforeseen personnel issues resulted in a vacancy in the office a few times, the Fellow was able to step in and keep a program going for PM/WRA. For instance, several years ago Jennifer Lachman, 2005–2006...
Fellow, was asked to take over the Sudan program for a short period when the Program Manager had a medical emergency. PM/WRA’s current Fellow, Emma Smith, has served as the day-to-day Program Manager for Afghanistan since January 2010 when the Afghanistan Program Manager left the office for a new job opportunity. She will continuing at PM/WRA as a contractor during 2010–2011.

Kate McFarland is PM/WRA’s 19th Fellow; she will begin her Fellowship in July 2010. “I am very excited for even this small part in the humanitarian-demining effort; I am honored to be a part of this program because it creates a safer environment for people all over the world.” McFarland has worked at CISR for a little over a year, and she recently helped facilitate the 2010 Senior Managers’ Course in ERW and Mine Action at JMU to help her prepare for her new responsibilities at PM/WRA. During the course, she interacted with 19 participants from 12 countries and many presenters from various international organizations. She feels this opportunity was a good way to begin engaging with managers from mine-action programs she will deal with on a daily basis. McFarland is interested in pursuing a career in the field of human rights, so this fellowship will be a step in the right direction. The Fellowship continues to provide JMU students and alumni with valuable experiences and has proven to be invaluable in their careers. The Fellow provides substantial support to the PM/WRA office as well.

Jim Lawrence, PM/WRA’s Acting Director, says, “The Frasure-Kruzel-Drew Fellowship provides an incredible opportunity for recent college graduates to learn about the Department of State and its foreign-assistance programs. Fellows work side by side with Program Managers and participate in program assessment visits. In return, the office gets some of the best young talent available. It is a great program and everyone benefits. The Fellows are professional, capable, and promising examples of future leaders in the mine-action, humanitarian assistance, and government communities. The fellowship has helped many of them launch successful careers in government service as well as the private sector. It is an amazing program.”

Lauren Nicole Hill worked for the Center for International Stabilization and Recovery team as an Editorial Assistant/Public Relations Assistant from August 2008 to May 2010. She obtained a Bachelor of Arts in communication studies from James Madison University in May 2010. She now works for Haymarket Media Group in New York City.

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Mine Action Information Center
Center for International Stabilization and Recovery
James Madison University
E-mail: maic@jmu.edu
Trial of Ground-penetrating Radar, Neutron and Magnetometry Methods in Arid Soil in Egypt

Metal detection and digging are somewhat unsatisfactory approaches to locating landmines. This report presents and examines alternative detection solutions, such as ground-penetrating radar as well as neutron and magnetometry methods. A case study of these techniques in a laboratory setting and in Egyptian soil reveals their effectiveness.

by John F. Crawford

The Problem

Current methods of finding landmines, based largely on metal detection and careful digging, are not completely satisfactory. Various other techniques are being used or under study—notably ground-penetrating-radar, neutron and magnetometry methods. As discussed below, soil moisture has an adverse effect on the first two techniques.

Ground-penetrating radar. Unlike pulsed radar, continuous-wave radars work by transmitting at a certain frequency (typically for a mil-
lisecond) and then stepping to the next frequency. The reflected signal is measured in amplitude and phase at each frequency and stored. After the specified frequencies (typically 256) have been scanned, a fast Fourier transform is carried out on a laptop. This converts from frequency information to time (i.e., space) information, which is displayed to the operator on a laptop screen. GPRs detect discontinuities in the soil's dielectric constant, such as a landmine. In nonmagnetic soil, radio frequency energy penetrates a distance set by the “skin depth” $\sqrt{\mu \lambda / 2\pi}$.
where \( \rho \) is the soil resistivity, \( \lambda \) is the RF wavelength and \( Z \) is the impedance of free space (about \( 120\pi \, \Omega \)). With increasing soil moisture, both \( \rho \) and \( \delta \) diminish, and the RF does not penetrate the ground very well.

**Neutron methods.** Explosives contain significant amounts of hydrogen; for example, TNT contains 2.2% hydrogen by weight, or, more meaningfully, 24% by number. Therefore explosives moderate neutrons effectively. This effect can be exploited for explosive detection as follows: Fast neutrons from a suitable source, such as Californium or Americium-Beryllium, are moderated by the soil, and then detected by slow neutron counters (usually \(^{3}\)He proportional counters). An excess of hydrogen, e.g., in a mine’s explosive, will yield an enhanced count rate. However, this effect depends on the soil not containing too much hydrogen, the presence of which will prevent the neutrons from penetrating and will moderate them, weakening and obscuring the signal. Thus in soil containing the same amount of hydrogen as the explosive, e.g., as water, there will be no signal.

**Magnetometry.** Magnetometry is an established technique in archaeology. In addition to finding very small amounts of iron, a magnetometer is sensitive to rust. Thus even heavily corroded steel mines, such as those commonly found in North Africa, should be detectable.

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
<th>Charge weight</th>
<th>Total weight</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>APM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VS-50</td>
<td>2</td>
<td>43 g</td>
<td>185 g</td>
<td>w/o 18 g metal plate</td>
</tr>
<tr>
<td>PMN</td>
<td>2</td>
<td>240 g</td>
<td>600 g</td>
<td></td>
</tr>
<tr>
<td>Box</td>
<td>2</td>
<td>ca 200 g</td>
<td>N/A</td>
<td>1 wood, 1 plastic</td>
</tr>
<tr>
<td>ATM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-80</td>
<td>2</td>
<td>4.5 kg</td>
<td>N/A</td>
<td>plastic</td>
</tr>
<tr>
<td>TM-46</td>
<td>1</td>
<td>5.7 kg</td>
<td>8.6 kg</td>
<td>steel</td>
</tr>
<tr>
<td>Israel</td>
<td>1</td>
<td>10.5 kg</td>
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<td>steel</td>
</tr>
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<td>M-71</td>
<td>1</td>
<td>6.25 kg</td>
<td>9.8 kg</td>
<td>steel</td>
</tr>
<tr>
<td>Mk-7</td>
<td>1</td>
<td>8.89 kg</td>
<td>13.6 kg</td>
<td>steel</td>
</tr>
</tbody>
</table>

**Table 1: Available anti-personnel and anti-tank mines.**

**Table 2: APM lane results.** Column 3 shows the cover depth; Column 6 the depth estimated by PRIS.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object</th>
<th>Depth (cm)</th>
<th>HYDAD-D</th>
<th>PRIS GPR</th>
<th>Depth (cm)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>DLM-2</td>
<td>0</td>
<td>False Positive</td>
<td>False Positive</td>
<td>See note 0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Scrap</td>
<td>0</td>
<td>True Positive</td>
<td>True Positive</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PMN</td>
<td>20</td>
<td>True Negative</td>
<td>True Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PMN</td>
<td>10</td>
<td>True Positive</td>
<td>True Positive</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>VS-50</td>
<td>20</td>
<td>True Positive</td>
<td>False Negative</td>
<td>See note 5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Scrap</td>
<td>20</td>
<td>True Negative</td>
<td>False Positive</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Empty</td>
<td>False Positive</td>
<td>True Negative</td>
<td>See note 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Empty</td>
<td>True Negative</td>
<td>False Positive</td>
<td>See note 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Scrap</td>
<td>10</td>
<td>True Negative</td>
<td>False Positive</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Box</td>
<td>0</td>
<td>True Positive</td>
<td>True Positive</td>
<td>5-10 Wood</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>VS-50</td>
<td>10</td>
<td>True Negative</td>
<td>True Positive</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

5. See second bullet under Comments and Conclusions.

8. Although this position was nominally empty, three soft-drink ring-pulls were buried here

12. HYDAD-D was misbehaving during this measurement, the last of the trial; on its return to Cape Town it turned out to have a fault that might have caused it to miss this mine.
Egypt as a Test Area

Both GPR and neutron methods should perform better where the soil is dry, as is the case in North Africa for most of the year. Beyond that, magnetometry should be effective against the steel-cased mines that are common there. Given the successful tests of these techniques in the laboratory, a natural next step appeared to be to organize a combined test in Egypt of as many devices as possible, especially GPR and neutron methods. The idea was first discussed at the International Atomic Energy Agency’s Technical Meeting on Combined Devices for Humanitarian Demining and Explosives Detection in Padova, Italy, in November 2006, where many of the laboratory tests were reported.

Three stepped-frequency continuous-wave GHz GPRs were available. A team from Raumfahrt Systemtechnik in Salem, Germany, brought two such devices, both of which they had designed and built: the Handheld Operational Demining System (HOPE) and Potash Roof Inspection System. HOPE works from 2 to 6 GHz and PRIS from 0.55 to 3.8 GHz. Beyond that, the Egyptian National Research Institute of Astronomy and Geophysics provided a Geophysical Survey Systems, Inc. MF20 GPR working at 0.1 to 0.8 GHz and 1 to 2 GHz, and a fluxgate magnetometer. Two neutron detectors were available: the Hydrogen Density Anomaly Detector-D3 from the University of Cape Town, South Africa, and the Egyptian Scanning Landmine Detector (ESCALAD), built by a collaboration of Dutch and Egyptian institutes.

Methodology

In a convenient part of the Inshas Centre of the Egyptian Atomic Energy Authority, two test lanes were marked out in flat, dry, sandy soil by means of strings stretched between pegs. Every 2 m, a position was marked with a knot. At each position an object could be buried (either a mine or scrap metal) or else nothing was buried there; selection among these three options was done at random. Objects were covered to depths of 0, 10 or 20 cm, again at random. Surface objects were covered by just enough soil to conceal them. The soil at empty positions was disturbed enough to avoid providing a visual clue. The trials were “single blind” in the sense that the testees were not told which objects were in which positions. Five anti-personnel mines and five anti-tank mines (see Table 1 on previous page) were buried in the test lanes; two additional mines were required for simultaneous tests with other equipment. The two photos on the previous page show HYDAD-D and PRIS with their operators.

Test Lane Results

Table 2 (previous page), and 3 (above) show the results of the above tests. Neither HYDAD-D nor PRIS detects landmines as such; rather they detect proxies in the form of hydrogen anomalies and radar reflections, respectively. Accordingly, the statements “Positive” and “Negative” in the Tables refer to the apparent presence or absence of these proxies. “True” and “False,” on the other hand, refer to the presence or absence of a mine.

The following are remarks on the ATM test lane results:

- The Dimension Laser Metrology-2 calibrator was 4 m away from Position 1; the other positions were 2 m apart. HYDAD-D took about 30 minutes to measure each position on the ATM lane; this can be improved to only a few minutes. PRIS took less than 60 minutes to measure all 12 positions in a lane; these results are more fully described elsewhere.
- The MF20 GPR made a scan of the whole lane in only a few minutes. The following are remarks on the ATM test lane results:

- In a separate test, HYDAD-D saw such a strong signal from some of these mines that the signal confused part of the software.
- In a separate test in a different area of the test field, PRIS missed one of the T-80 mines, apparently because a cover plate was missing.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object</th>
<th>Depth (cm)</th>
<th>PRIS GPR</th>
<th>Depth (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M-71</td>
<td>21</td>
<td>True Positive</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>T-80</td>
<td>21</td>
<td>True Positive</td>
<td>20</td>
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<tr>
<td>3</td>
<td>Empty</td>
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<td>True Negative</td>
<td></td>
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<tr>
<td>4</td>
<td>Empty</td>
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<td>6</td>
<td>Mk-7</td>
<td>27</td>
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<td>20-25</td>
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<td>Empty</td>
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<td></td>
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<tr>
<td>8</td>
<td>Empty</td>
<td></td>
<td>True Negative</td>
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</tr>
<tr>
<td>9</td>
<td>Empty</td>
<td></td>
<td>True Negative</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Israel</td>
<td>30</td>
<td>True Positive</td>
<td>25</td>
</tr>
<tr>
<td>11</td>
<td>Empty</td>
<td></td>
<td>True Negative</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Empty</td>
<td></td>
<td>True Negative</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: ATM lane results. Column 3 shows the cover depth: Column 5 the depth estimated by PRIS. Because of the size of these mines, there were no false results and PRIS was able to estimate their depths fairly well. Time did not permit HYDAD-D to be tested on this lane.
Extra Results
Although the trial concentrated on the test lanes, some further useful results were obtained:

- As an exercise, a PMN was buried 15 cm deep. The PRIS GPR was used to scan the area in the manner of a metal detector. The PMN was found with no difficulty.
- A fluxgate magnetometer belonging to the National Research Institute of Astronomy and Geophysics could detect steel ATMs at several meters. A caesium magnetometer—some orders of magnitude more sensitive—is on order.

Comments and Conclusions
A number of conclusions came out of this testing, including the following:

- As expected, the dry Egyptian soil made it easier to detect the mines.
- A VS-50, well-known as a difficult mine for conventional metal detectors, was seen at a depth of at least 20 cm by HYDAD-D. Those involved in this work believe this to be a record. Given that the VS-50s provided were not fitted with optional metal plates, this result may be competitive with what conventional metal detectors would have been able to do.
- Because Egyptian soil is drier than even a comparable sandy European soil, PRIS was able to see about 0.7 m into the ground—about twice as deep as in Europe.
- The University of Cape Town’s HYDAD-D device and the RST GPRs were transported as normal airline luggage—not even as excess baggage in the HYDAD-D case, because some standard electronic units that the device needed were available in Cairo. However, a few small obstacles were encountered. The equipment brought in from Europe and South Africa was held up overnight by customs at Cairo Airport, because the official on duty lacked the authority to clear the equipment. On release the next morning, the RST radars—HOPE and PRIS—had to be unpacked, reassembled and switched on. HYDAD-D had to be unpacked, reassembled, connected to equipment supplied in Cairo, and switched on. After minor problems were overcome, the equipment was assembled and worked more or less nominally. This indicates the equipment’s state of development. HOPE and PRIS worked as expected; their antennas have since been redesigned, partly as a result of this test.
- The weather during our test (4–8 November 2007) was excellent for our purposes: sunny, not hot by local standards, with light winds.
- ESCALAD gave a great deal of trouble, apparently due to interference from a nearby radio transmitter, to dust in electrical connectors, and to a mismatch between the strength of its neutron source and its minimum practicable speed. ESCALAD is the first device of its kind, and this was its first field trial after satisfactory laboratory tests. In part because of this work, improvements have been made to the equipment. A further test, also involving γ backscattering and Superconducting Quantum Interference Device magnetometry is planned for November 2010.

Acknowledgments
This work relies heavily on the contributions of many people, in particular the following:

Visiting teams:
- Ms. Yvonne Krellmann and Mr. Gunnar Triltzsch, RST, Salem, Germany: HOPE and PRIS GPRs
- Professor Frank Brooks, University of Cape Town, South Africa: HYDAD-D neutron detector
- Dr. Victor Bom, Delft University of Technology, Netherlands, in collaboration with the Egyptian Atomic Energy Authority’s ESCALAD neutron detector

Local participants:
- Professor Riad Megahid and Mr. Salah Sendiony fromAEA, Cairo
- Professor Wagdy Ahmed Kansouh, Dr. Ali Mostafa Ali, Messrs Ahmed Osman Abdo, Ashraf Mostafa Abdel-Monem, Ibrahim Soliman Yousef, and Mr. Saad Ahmed Atawy from the Inshas Nuclear Research Centre
- Professor Magdy Atya, Professor Ibrahim Al-Hemali, Dr. Ashraf Khozayem, Dr. Ahmed El Kotb and Dr. Mamdouh Soliman from NRIAG
- Dr. Fawzia El-Bakkoush and Ms. Karima Shoshan from the Tajoura Centre, Tripoli, Libya
- Gen. Ihab Mohamed Helal from the Egyptian Army

See Endnotes, Page 82
A Mine-free Central America: How Can We Improve on Success? Case [from page 6]


3. Note: The final clearance number for Nicaragua includes mines reported by the Nicaraguan Army as “certified,” which refers to the number of mines in military records for minefields that have been cleared.


Community Empowerment and Leadership in Cambodia, Bottomley and Sambath [from page 11]


3. The CBMRR Project is targeted in the districts and villages where landmines and UXO cause high casualty rates. Data from the Cambodian Mine Victim Information System is used to initially target high-priority villages in which the networks will be set up.

4. An isolated UXO that can be quickly cleared by an explosive ordnance disposal team.

5. CMAC list of CBMRR volunteers elected to other community leadership positions, 2009.


7. The Mines Advisory Group (MAG) Community Liaison teams regularly work with the CBMRR network as part of their data-collection activities.


9. CMAC data compiled by the Provincial Coordinators shows that in 2009, 131 CBMRR requests were submitted to MAPU, and 69 of these requests were included in the 2010 annual work plan.

10. The three largest accredited humanitarian mine-clearance organizations in Cambodia are the Cambodian Mine Action Centre, Mines Advisory Group and The HALO Trust.


Prioritization and Partnership in Lao PDR, Sutton [from page 17]

1. Documentation of grants provided by HDI to The Journal. Not available for public viewing. 21 June 2010.

2. Bomble is the local name for cluster-bomb submunitions.

Demining Albania 2000–2009: Successes and Lessons Learned, Sančanin [from page 21]


The Humpty Dumpty Institute: Sri Lanka, Rodrigo [from page 27]

1. The leaves of the gliricidia tree, rich in protein, are often


3. The farm gate value is the net value of the product when it leaves the farm.

Mine-action Success Story: Nepal, Robinson [ from page 33 ]


Redefining Success: Whose Reality Counts? Massleberg [ from page 36 ]


7. The term CHA refers to an area identified by a Non-technical Survey in which the necessity for further intervention through either Technical Survey or clearance has been confirmed.

8. E-mail correspondence with MAG southern Sudan Programme Manager, Hannah Bryce, 26 January 2010.

The HALO Trust Activities in Kuando Kubango, Angola, Forbes [ from page 40 ]

1. Different colored sticks mean different things in different countries. In Angola the white sticks mark locations where mines were found and destroyed. The sticks are placed after mine destruction simply to show the mine-laying patterns and allow clearance tactics to be adapted accordingly.

2. E-mail interview with Darren Manning, Program Manager, Office of Weapons Removal and Abatement in the United States Department of State’s Bureau of Political-Military Affairs. 6 April 2010.

The Roots of Peace Model: Demine-Replant-Rebuild, Kühn [ from page 46 ]


Non-state Actors and Mine Action: Complications and Solutions, Kuklick and Wall [ from page 50 ]


3. International Campaign to Ban Landmines. “Key


Physical Security and Stockpile Management, Diaz [ from page 54 ]


Consolidating Peace through PSSM Projects in Burundi, Claveau [ from page 56]


Tripwires: An Invisible Component?, King [ from page 62 ]

1. Tripwire feeling is the act of carefully searching for tripwires using a long, flexible rod and following the proper procedures outlined by the United Nations.

2. 1 kilogram = 2.2 pounds

Micro-projects Help Socioeconomic Recovery of Cleared Areas, Orozco [ from page 65 ]


Trial of Ground-penetrating Radar, Neutron and Magnetometry Methods in Arid Soil in Egypt, Crawford [ from page 76 ]


6. RST Report GPR-RST-RP-0022, available from RST, Bahnhofstrasse 108, D-88682 Salem (Germany); E-mail: rst@w-4.de

7. This mine can be supplied with an 18-g metal plate to make it easier to find.

8. V.R. Bom, e-mail message to author. 27 April 2010.

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**FOCUS**

**Middle East**

Issue 15.1 of The Journal will focus on landmines/ERW and other conventional weapons in the Middle East. Countries of particular interest include Afghanistan, Egypt, Iraq, Israel, Jordan, Lebanon, Pakistan, the Palestinian Territories and Yemen. We will also accept articles on other countries in the region such as Cyprus, Iran, Saudi Arabia and Syria. Topics of interest include all aspects of conventional-weapons-destruction programs, including mine/ERW-clearance progress, use of surveys and area reduction, destruction of excess munitions or small arms/light weapons, mine-risk-education projects, victim-assistance efforts, socioeconomic impact of mines or other conventional weapons, and technology being produced or tested in any of the target countries. Article submissions from national programs are also highly desired. Stories on regional projects covering multiple countries from those listed are also strongly encouraged. Articles about effective train-the-trainer programs are also encouraged. Are train-the-trainer programs effective in developing capacity? Why or why not?

**RESEARCH, TECHNOLOGY AND DEVELOPMENT IN MINE ACTION**

*The Journal of ERW & Mine Action* is soliciting articles for its peer-reviewed Research, Technology and Development section, which appears in most issues of *The Journal*. All articles on current trends and developments in R&D will be considered for this section.

**SUBMISSION GUIDELINES:**

**Article length:** 1,000–2,000 words submitted in digital format (i.e., Microsoft Word). R&D articles can be up to 3,000 words.

**Images/photos:** Photos must be scanned at 300 dpi or better. Line art, graphics and charts should be scanned at 600 dpi or better. Submit all graphics by e-mail or CD. When submitting photos, you are giving *The Journal* permission to use the photos, with proper credit, in any media or publication under CISR’s control now and in the future.

**Important:** Please do not include images in your documents. The quality is too poor for printing.

**Contact information/bio:** Articles must contain each author’s name and full contact information at the end of the article (i.e., phone, e-mail and mailing address). Please include a headshot photo and biography (up to 60 words) of each author for inclusion at the end of the article. Consider including credentials, books authored and other biographical information.

**For complete submission guidelines, please visit:**


**Submit all materials to:**

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**REVIEWERS:**

*The Journal* is seeking reviewers for this section. If you are interested in reviewing for this section, please contact the Reviewing Editor at: mailaicyj@hotmail.com.