



# Humanitarian Mine Action Technology in Thailand

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## ❖ Landmine problem in Thailand

Thailand has experienced numerous conflicts along all four of its borders over the past 50 years, resulting in contamination by landmines (anti-personnel, anti-tank), booby-traps and unexploded ordnance (UXO). This contamination retards the growth and development of Thai communities.

The Norwegian People's Aid (NPA) conducted the Level I Impact Survey on landmines countrywide with assistance from the UN Trust Fund, USA, UK, and Norway (September 2000-31 May 2001). It reveals that there are high levels of contamination in all four borders areas with the heaviest concentration on the Thai-Cambodian border, particularly in 7 provinces: Buriram, Chantaburi, Sa Kaeo, Si Saket, Surin, Trad, and Ubon Ratchathani. Landmines and UXO affect 295 communities, located in 457 identified areas covering 1,823 square kilometers. However new minefields have been located in Sa Kaeo since the completion of the landmine Impact Survey, demonstrating the need for continued survey activity and the management of mine information.

Thai-Malaysian border has two provinces moderately affected by mines. The total surface area contaminated totals 1.1 square kilometers, which is located primarily in jungle terrain with little on local inhabitants.

Thai-Laos border has eight mine-impacted provinces, affecting 90 communities. The total surface area contaminated is 212 square kilometers in 213 mined areas. However, most of the affected areas are remote and considered low impact.

Thai-Myanmar border has nine provinces affected by landmines. The situation on this border is tense. Ongoing problems regarding illegal migrants, refugees, smuggling and drug trafficking make it difficult to extend humanitarian mine action efforts beyond mine victim assistance and mine awareness activities. Currently, landmines affect 139 communities. The total surface area affected is 400 square kilometers encompassing 240 mined areas.

As a whole, Thailand has 27 provinces directly affecting 530 communities and having a negative impact on the daily lives of over 500,000. These communities are subdivided into 69 high impacted communities, 232 medium-impacted communities, and 229 low-impacted communities. Approximately 933 contaminated areas covering more than 2,560 square kilometers of Thai territory is excluded from productive use due to fear of landmine contamination.

In addition, the comprehensive survey captured casualty figures for mine victims using data from the Thai provinces which have reasonably accurate hospital records dating back 5 years. The total is 3,468 victims as follows:

- Thai-Cambodian border 2,605 victims (Cambodian citizens who have fallen victim to mines on Thai soil are not recorded)
- Thai-Malaysian border 10 victims
- Thai-Laos border 316 victims
- Thai-Myanmar border 541 victims

During the last 2 years, 346 people were reported injured or killed by mines (around 170 new mine-related casualties each year). Most victims were adult men, mostly farmers. The high incident rates and the recorded impacts show that a major concern for civilians leaving and working in the border areas is the risk for accidents created by landmines.

## ❖ Humanitarian Mine Action in Thailand

For many years, Thailand addressed its landmine problem through tactical demining carried out by the Royal Thai Armed Forces. The military carried out modest clearance tasks, marked minefields, and built roads along the border using tactical demining methods. The military also performed limited mine awareness campaigns due to lack of resources or skills necessary to implement effective humanitarian mine action.

After Thailand ratified the Ottawa Convention on the prohibition of the use, stockpiling, production and transfer of anti-personnel mines and on their destruction on 27 November 1998 which came into effect on 1<sup>st</sup> May 1999, the Royal Thai government has to fulfill their obligations by establishing the focal point for all humanitarian and development mine action related activities. A National Mine Action Committee (NAMC) and Thailand Mine Action Center (TMAC) or Joint Operations Center-107 (JOC-107), under the command of Supreme Command Headquarters, were officially established and began operating mine action on 18 January 1999.

Early assistance was provided by the United States through an assistance programme that officially began in August 1999 with the establishment of the Deming Training Center in Ratchaburi province, and the training of Thai deminers by US Special Forces. The programme has developed a comprehensive, though limited, capability however additional project specific assistance is now essential in order to expedite progress.

TMAC has set up 3 Humanitarian Mine Action Units (HMAUs) along the Thai-Cambodian border in 2001 by coordinating with the Thai Army to set up HMAU-1 and HMAU-3 as well as with the Thai Navy to set up HMAU-2. Much has been accomplished since the establishment of TMAC and HMAUs and also the extensive support provided by the US assistance programme through RONCO to equip and train key military units in humanitarian mine clearance. In addition equipment provided by the US, Canada, and Japan have added the beginning of a strong technology component.

TMAC plans to establish two more HMAUs: one for along the Thai-Myanmar and Laos borders, and the other one for supporting the Border Patrol Police throughout Thailand.

**TMAC's policy on humanitarian mine action** can be summarized as follows:

1. Pursue the Ottawa Convention.
2. Implement humanitarian mine action plan in accordance with national security and socioeconomic policies.
3. Establish five Humanitarian Mine Action Units (HMAUs) along the borders (three HMAUs already exist).
4. Implement 20 mine action projects.
5. Train the local civilian volunteers for long-term humanitarian mine action.
6. Set up subcommittees consisting of representatives from concerned organizations.
7. Review the concerned Acts to cover the Ottawa Convention obligations.
8. Prepare to host the 5<sup>th</sup> Meeting of States Parties in 2003.
9. Increase international cooperation and capability on humanitarian mine action operation and technology.

To fulfil the above policy, TMAC coordinates with other related governmental organizations and non-governmental organizations to provide the following activities to solve landmine problem and to fulfill the Ottawa Convention obligations:

**1. Mine Awareness** to reduce the incidents of mined-related injuries or death by providing basic knowledge of mine awareness and mine education to local people in order for them to be aware of and avoid existing mines.

**2. Mine Victims Assistance** to help reintegrate mine victims as an effective part of the community by helping them adapt to their physical and mental changes in order to live as a normal life as possible.

**3. Mine Detection and Clearance** to search for and destroy mines in mine contaminated areas. The operation can be divided into 3 levels:

3.1 Level I Impact Survey had been conducted as the above mention and its result has been used for implementing mine awareness and mine victim assistance.

3.2 Level II Technical Survey is a process of developing database received from the 1<sup>st</sup> Level Survey to differentiate the areas actually affected by mines from those areas merely suspected of being mines. This is operated through mapping, marking minefields, and examining mine-contaminated areas to get the clear picture of mine areas.

3.3 Level III Completion Survey involves with the cooperating of mine detection and clearance teams, mine dog detection teams, and mine equipment teams to render the affected areas free of mines and UXO. This also includes the handover of safe areas cleared from landmines to local people for making a living.

### ❖ **Humanitarian Mine Action Technology Challenges in Thailand**

Although the military is responsible for landmines clearance in Thailand, it is clear that task ahead is daunting particularly as the mines are on the border areas in difficult terrain with heavy jungle vegetation. Mechanical-demining technology is not an option but an absolute necessity. Thailand needs donor supports to complement existing capacities and to utilize advanced technologies in order to effectively address the landmine problem.

TMAC realizes that demining is an expensive operation because it requires several kinds of technology's involvement and also takes a long time to accomplish mine-free goal. It can be one of the most obstacles, particularly for mine-affected developing countries like Thailand, who does not have enough capacity and capability to effectively solve landmine problem remaining for decades due to the environment along the border in terms of difficulty of ground, ill-defined locations of mines and the difficulty of clearance even using a comprehensive toolkit. Therefore, our approach has to focus on very specific areas that result in high impact, immediate benefits and effective land use as well as careful rationalization of all tasks to minimize immediate clearance. Donors should be requested to support a programme not to remove all landmines from Thailand but to assist in removing the immediate threat of landmines to the innocent civilian population who must work in the area to carve out a living.

The challenge of removing landmines from Thailand is summarized as follows:

- Jungle Terrain
- Difficult undulating ground
- Large areas to clear or identify mined areas
- Limited resources requiring mechanical as a force multiplier

For another challenge to tackle the above problem, TMAC needs to sustain clear plans and projects to build upon its strengths: the political commitment, the institutional support, and the effective mobilization of human and financial resources. These will help TMAC keep attention from outside donors. The TMAC's role is vital in this effort to meet those challenges as the main organization that has responsibility on mine action in Thailand.

TMAC has developed a Corporate Plan (5- year Plan) to suggest a way ahead to assist the Royal Thai Government to address the landmine problem using primarily its own resources supplemented by focused assistance from the international community to remove the threat in key, carefully selected, areas. In addition, the aim is to provide the additional training and technical advice to provide TMAC the strong foundation required to address the landmine problem on its borders.

Cost benefit of operating mine action is also the TMAC's major concern; thus, integrated mine action technology needs to be used appropriately and

effectively to reach the maximum benefits. Presently, TMAC follows the procedure of operating mine detection and clearance as follows:

1. Assessing the suspected mine areas specified from Level I Impact Survey
2. Mapping, fencing, and marking minefield
3. Assessing mined areas, regarding the factors of terrain, weather, and other limitations etc. before choosing the appropriate methodologies to do the task
4. Ground preparation and vegetation clearance by using mechanical equipment, e.g. TEMPEST, PEARSON, or BDM-48 if needed
5. Identifying working lane for mine detections
6. Operating mine detections by using mine dogs for the area reduction before applying with mine detectors, or manual operations in accordance with the related factors mentioned above
7. Operating mine clearance by using BDM-48, FIXOR Explosives
8. Re-examining in accordance with the international standard to ensure the areas cleared safely from mines before handing over to local people for making a living

**Summary of the capacity of integrated mine action technology used in TMAC are as follows:**

Mine detectors & equipment	Purpose of Use	Strengths	Limitations	Remarks
1. Mine detection dogs	Establish minefield for area reduction	1.low density mined area with heavy metal 2.hard ground terrain 3.do many times if needed	1.rough areas with water or heavy vegetation 2.adverse weather conditions (too humid/ hot) 3.high density of mines 4.cost expenses higher than mine detectors	US Support
2.Mine detectors: Vallon (VMH-1)	locating mines, UXO, and other ordnance items	1.work on very uneven surface/ extreme weather conditions 2.locate small targets within 2-3 cm. and very large metallic items to a depth of 100 cm.	1.might be out of order if used for a long time (electronic equipment, signal's volume, joints)	Japanese Support
3.TEMPEST	a remote-controlled lightweight vegetation cutter and trip-wire clearance system.	1.effective use on flat area with slop < 30% 2.remove vegetation and tripwire 3.guide for safety lane of	1.limit for hydraulic and heat systems-overheat when working above 38° C 2.not used in areas of AT mines 3.limit the steel	US Support

Mine detectors & equipment	Purpose of Use	Strengths	Limitations	Remarks
		technical survey team 4.destroy small mines and booby-trap	wheels' traction in muddy conditions	
4.PEARSON or SDTT	area reduction to assist manual demining operations, or for mechanical clearance	1. multi-equipment with highly effective use on flat area 2.ground preparation for quicker mine clearance	1. not used on soft or high slop areas with large rocks as on hills 2.no spare parts available in the market 3.lack of mechanical expert 4.not used in areas of AT mines	US Support
5.BDM-48	vegetation cutter and tiller in one machine for use in mine clearance	1.useful tool that combines bush cutting with the ability to "spot" clear AP mines. 2.cut all kinds of vegetation, tree, bamboo as long as the arm of the equipment can reach and to a depth of 20 cm. 3.destroy AP mines by grinding a bite in the soil 30 cm. Wide, 120 cm. Long and 20 cm. Deep.	1.not designed for clearance of AT mines 2.not used on soft areas 3.unable to transport over long distance 4.clearance depth limited to 20 cm. 5.take a long time for repairing when machine is out of order	Canadian Support
6.Fixor Explosives	destroying AP mines	1.unlimited use for destroying mines and UXO 2convenience for transportation and storage 3.safety for use and economy	1.not used for destroying a very large AP mines or AT mines	Canadian Support

So far, the humanitarian demining operations have been carried out by HMAUs as shown at the below table:

**Summary of Mine action operations of HMAUs  
(The beginning of operation – 31 May 02)**

Mine Action Operations	HMAU-1 Sa Kaeo (Feb 01-31 May 02)	HMAU-2 Chanthaburi and Trat (Apr 01-31 May 02)	HMAU-3 Surin, Buri Ram, & Si Sa Ket (Aug 01-31 May 02)
<b>1. NPA's Level I Impact Survey</b>	31,221 villagers in 63 villages were affected by mines planted in 181.6 sq.km. patches.	55,386 villagers in 72 villages were affected by mines planted in 412.2 sq.km. patches.	129,427 villagers in 162 villages were affected by mines planted in 1,349.8 sq.km. patches.
<b>2. Casualty</b>	155 villagers were injured and 2 villagers were dead.	86 villagers were injured.	<u>Surin</u> has 72 mine victims, <u>Buri Ram</u> has 34 mine victims, and <u>Si Sa Ket</u> has 50 mine victims.
<b>3. Mine Awareness</b>	- Providing mine awareness programs to 37,301 villagers in 65 villages. -Posting warning signs over mined areas of 65 villages	- Providing mine awareness programs to 23,306 villagers in 29 villages. -Posting warning signs signs over mined areas of 29 villages	-Educating and Providing mine awareness programs to 82,182 villagers in 126 villages.
<b>4. Mine Victim Assistance</b>	- 8 mine victims referred to medical centers without medical fees. - 152 mine victims and families received vocational training.	- 26 mine victims referred to medical centers without medical fees. - 173 mine victims and families received vocational training.	-
<b>5. Mine clearance</b>	Mines clearance of 175,379 sq.m.	Mines detection and clearance of 40,688 sq.m.	Mines detection and clearance of 1,028 sq.m.
<b>6. Number of mines Detected</b>	65 APMs, 1 ATMs and 38 UXO wires were detected.	411 APMs, 9 ATMs and 784 UXO were detected.	13 APMs were detected.
<b>7. Rehabilitated mine areas</b>	44,800 sq.m. out of 172,779 sq.m. of cleared mined areas were handed	39,062 sq.m. of cleared mined areas have not been handed	-

Mine Action Operations	HMAU-1 Sa Kaeo (Feb 01-31 May 02)	HMAU-2 Chanthaburi and Trat (Apr 01-31 May 02)	HMAU-3 Surin, Buri Ram, & Si Sa Ket (Aug 01-31 May 02)
	over to local government to pass over to the villagers for making a living.	over to local government.	
<b>8. Support the other Units</b>	1. Support mine detection and clearance at Pak Chong district (26 Sep-26 Dec 01) 2. Support demining at 3 <sup>rd</sup> Battalion, 12 <sup>th</sup> Infantry Regiment, Royal Guard, Aranyaprathet (29 March 02).	<u>Team 1 &amp; 2</u> Support mine detection and clearance at Pak Chong on 965,000 sq.m. 6,045 APMs were detected (27 Oct- 26 Dec 01).	-

**Remark** As of 31 May 2002

In summary, Thailand required the use of technology for the long term. It is extremely suitable for the testing and development of new technology and ideas. Therefore the need to retain this technology to allow the work to be carried out in the long-term is absolutely essential.

**TMAC's Requirements for Humanitarian Mine Action Technology**

TMAC requires supporting technologies that enhance and speed up mine action and associate productively. In particular:

- Heavy vegetation clearing mechanical equipment capable of high production rates that also have the ability to detonate landmines and allow area reduction.
- Mechanical equipment suited for difficult terrain but able to cover large areas.
- Equipment that will detect landmines and reduce the false alarm rate associated with conventional mine detectors.
- Better protective gear for deminers to reduce stress and increase safely
- Training aids to assist training deminers.

In addition, safety, cost, reliability, easy maintenance, and time are to be the considering factors for TMAC's options for using mine action technologies.

**TMAC's Recommendations for the Most Benefits of Using Mine Action Technology**

1. Analyze cost-benefit before making decision to use any types or methodologies of mine action technology.
2. Provide education and training programs to personnel for the best use and maintenance of available equipment and resources.
3. Provide the maintenance programs for every available machines and equipment.
4. Increase the regional cooperation and sharing of mine action technology resources, particularly the countries that share the common borders together in order to better address landmine problems.
  - Set up regularly meetings through workshop or seminar.
  - Establish centralized training facilities in order to overcome finding's problem.
  - Allow easy access by neighbors to reach their minefield along common border.

❖ **TMAC's Future Plan**

- Provide 20 projects on the Way Ahead in accordance with a 5-year Plan.
- Focus on training local civilians of the 7 mentioned provinces along the Thai-Cambodian border to work on Humanitarian Demining.
- Re-engineer TMAC both structure and personnel management to support mine action effectiveness.
- Establish the National Mine Action Center under the direct command of the Prime Minister Office. Now the Prime Minister has already signed the approval of setting up the National Mine Action Committee whose Chairman will be the appointed Minister and Deputy Chairman are the Minister of Defence and Supreme Commander
- Destroy stockpiles of 200,000 anti-personnel landmines (APL) by this year; completely destroy over 100,168 APLs by next April 2003. Thailand will retain 4,970 APLs for training and research purposes in accordance with the Ottawa Convention under control of TMAC
- Amend all concerned legislations regarding APL to support the Ottawa treaty's commitment
- Be ready to host the 5<sup>th</sup> Meeting of States Parties (5MSP) in September 2003 if appointed, which the 4MSP Chairman will make an announcement on the last day of the meeting.

**"Landmines : No Brotherhood Even the Owner not Recognized"**

Thank You Very Much  
 Maj.Gen. Gitti Suksomstarn  
 Director General of TMAC  
 23 August 2002

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