

KEY DATA

CLUSTER MUNITION CONTAMINATION: HEAVY

NATIONAL ESTIMATE

730 km²

SUBMUNITION CLEARANCE IN 2022

30.36 km²

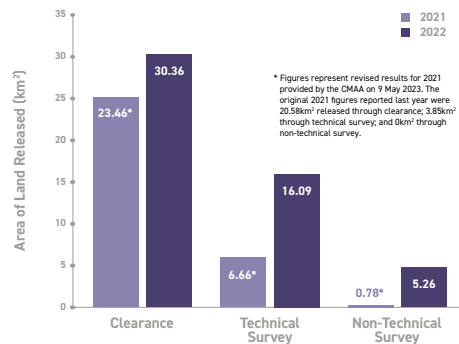
OFFICIAL DATA

SUBMUNITIONS DESTROYED IN 2022

5,254

(INCLUDING 324 DESTROYED IN SPOT TASKS)

LAND RELEASE OUTPUT



RECOMMENDATIONS FOR ACTION

- Cambodia should accede to the Convention on Cluster Munitions (CCM) as a matter of priority.
- Cambodia should comply with its obligations under international human rights law to clear cluster munition remnants (CMR) on territory under its jurisdiction or control as soon as possible.
- The Cambodia Mine Action and Victim Assistance Authority (CMAA) should work with operators to elaborate a dedicated strategy for CMR survey and clearance, with realistic annual targets for land release and an accompanying resource mobilisation plan.

CLUSTER MUNITION SURVEY AND CLEARANCE CAPACITY

MANAGEMENT

- Cambodian Mine Action Authority (CMAA)

NATIONAL OPERATORS

- Cambodian Mine Action Centre (CMAC)
- Cambodia Self Help Demining (CSHD)

INTERNATIONAL OPERATORS

- APOPO
- Mines Advisory Group (MAG)
- Norwegian People's Aid (NPA)

OTHER ACTORS

- United Nations Development Programme (UNDP)
- Geneva International Centre for Humanitarian Demining (GICHD)

UNDERSTANDING OF CMR CONTAMINATION

Cambodia has extensive CMR contamination and is still working to establish an accurate determination of the extent. At the end of 2022, it reported 2,514 hazardous areas in 18 of Cambodia's 25 provinces¹ covering nearly 730km² (see Table 1).² After years of fluctuating estimates, this represented a 4% rise over the end-2021 estimate.

Cambodia's CMR contamination results from intensive bombing by the United States (US) during the Vietnam War and was concentrated in north-eastern provinces along the borders with the Lao People's Democratic Republic and Vietnam. The US Air Force dropped at least 26 million explosive submunitions, between 1.9 million and 5.8 million of which are estimated to have not exploded on landing.³ Assessment of the resulting contamination, however, remains a work in progress.⁴

Pinpointing the size of Cambodia's CMR contamination is complicated by the evolution of CMR survey methodologies. Close to 80% of the total CMR contamination data is made up of suspected hazardous areas (SHAs) identified in a baseline survey of explosive ordnance conducted between 2009 and 2020 that used a mine survey methodology ill-suited to CMR hazards. The survey produced inflated polygons that included large amounts of land with no CMR but also missed areas of CMR contamination. From 2015, Cambodia adopted cluster munition remnant survey (CMRS) and cluster munition

technical survey identifying confirmed hazardous areas (CHAs). Continuing survey and resurvey of some Baseline Survey (BLS) polygons applying technical survey (TS) methods is producing more accurate, evidence-based data.⁵ CHAs made up 21% of the overall contamination estimate at the end of 2022, compared with 13% two years earlier.⁶

Eight eastern provinces⁷ account for 479km² or two-thirds of the total estimated area of CMR contamination.⁸ Operators have calculated that around one quarter of the polygons in these eight provinces were identified before 2015 and the evidence-based survey now applied by operators is achieving significant cancellation and area reduction.⁹ However, in Rattanakiri province, where survey is being conducted by Norwegian People's Aid (NPA) and Mines Advisory Group (MAG), the end-2021 estimate of CMR contamination of 43km² was nearly 40% lower than a year earlier but by the end of 2022 had increased again to 72km² (see Table 1).¹⁰ The remaining 251km² is located in the 10 other provinces located further from Cambodia's borders in the centre, south, and west of the country. The polygons in these areas are believed to be mainly derived from less accurate survey dating back to 2011–12 and are likely to be significantly reduced in size through resurvey, applying updated non-technical survey (NTS), or through dedicated TS.¹¹

Table 1: Cluster munition-contaminated area by province or region (at end 2022)¹²

Province	CHAs	Area of CHAs (m ²)	SHAs	Area of SHA (m ²)	Total area (m ²)
Battambang	0	0	1	26,872	26,872
Kampong Cham	121	22,478,726	100	21,237,978	43,716,704
Kampong Chhnang	0	0	30	3,231,476	3,231,476
Kampong Speu	0	0	85	12,366,578	12,366,578
Kampong Thom	1	81,860	328	57,207,934	57,289,794
Kampot	0	0	2	103,392	103,392
Kandal	0	0	58	5,494,016	5,494,016
Kratie	95	26,023,657	154	51,197,164	77,220,821
Mondul Kiri	0	0	88	30,065,453	30,065,453
Phnom Penh	0	0	17	1,505,640	1,505,640
Preah Sihanouk	0	0	14	2,984,350	2,984,350
Preah Vihear	0	0	115	178,357,740	178,357,740

1 Including the autonomous municipality of Phnom Penh.

2 Email from Tep Kallyan, Deputy Secretary General, CMAA, 9 May 2023.

3 South East Asia Air Sortie Database, cited in D. McCracken, "National Explosive Remnants of War Study, Cambodia", NPA in collaboration with CMAA, Phnom Penh, March 2006, p. 15; Human Rights Watch, "Cluster Munitions in the Asia-Pacific Region", April 2008; and Handicap International (HI), "Fatal Footprint: The Global Human Impact of Cluster Munitions", HI, Brussels, November 2006, p. 11.

4 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022.

5 Email from Portia Stratton, Programme Manager, Norwegian People's Aid (NPA), 19 April 2022, and online interview, 13 May 2022; email from Alexey Kruk, Country Manager, Mines Advisory Group (MAG), 6 May 2022; and online interview with Tony Fernandes, Technical Operations Manager, MAG, 16 May 2022.

6 Emails from Tep Kallyan, CMAA, 9 May 2023; and Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 14 May 2021.

7 Kampong Cham, Kratie, Mondulkiri, Prey Veng, Rattanakiri, Stung Treng, Svay Rieng, and Tbung Khmum.

8 Email from Tep Kallyan, CMAA, 9 May 2023.

9 Email from Portia Stratton, NPA, 19 April 2022.

10 Emails from Tep Kallyan, CMAA, 9 May 2023; and Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022.

11 Email from Portia Stratton, NPA, 19 April 2022.

12 Email from Tep Kallyan, CMAA, 9 May 2023.

Prey Veng	123	20,445,657	142	23,485,847	43,931,504
Rattanakiri	240	33,651,881	207	38,464,531	72,116,412
Stung Treng	23	4,871,161	168	121,930,778	126,801,939
Svay Rieng	145	28,926,313	69	15,717,879	44,644,192
Takeo	0	0	9	1,675,366	1,675,366
Tbung Khmum	101	17,942,892	78	10,404,151	28,347,043
Totals	849	154,422,147	1,665	575,457,145	729,879,292

OTHER EXPLOSIVE REMNANTS OF WAR AND LANDMINES

Cambodia has extensive contamination by landmines and explosive remnants of war (ERW) other than CMR. The contamination consists mainly of anti-personnel and anti-vehicle mines estimated to cover 563km² at the end of 2022¹³ (see Mine Action Review's *Clearing the Mines* report on Cambodia for further information) and extensive unexploded ordnance (UXO) reported in 2022 to amount to 333km².¹⁴

NATIONAL OWNERSHIP AND PROGRAMME MANAGEMENT

The CMAA was established by royal decree in 2000 with the mandate to regulate, monitor, and coordinate the mine action sector in Cambodia. The CMAA has Prime Minister Hun Sen as its President and a government minister, Ly Thuch, as first vice president. Its Secretary General, Ly Panharith, who was appointed in January 2023, manages CMAA's planning and operations.¹⁵ CMAC, which was established in 1992, had previously been responsible for regulating and coordinating the sector in addition to undertaking clearance. Since 2000, CMAC has concentrated on conducting demining, risk education, and training.¹⁶ CMAC, which conducts both humanitarian and commercial survey and clearance, is Cambodia's largest mine action operator.¹⁷

Since 2004, Cambodia has established Provincial Mine Action Committees (PMACs) and Mine Action Planning Units (MAPUs) in mine- and CMR-affected areas tasked with establishing clearance priorities in consultation with affected communities to ensure that clearance addresses their housing, agricultural, and infrastructure needs.¹⁸ MAPUs meet regularly with all mine action operators to plan annual mine action activities.¹⁹

The Cambodian government established a Technical Working Group on Mine Action (TWG-MA) as a consultative mechanism facilitating coordination between the government and implementing partners.²⁰ TWG meetings were suspended in

2020 due to the COVID-19 pandemic²¹ but resumed online in 2021 and in-person in 2022.²² The Mine Action Coordination Committee (MACC) and seven Technical Reference Groups (TRGs) have been established by the CMAA to facilitate coordination and feedback at a strategic and technical level in areas such as survey and clearance, risk education, victim assistance, information management, gender, cluster munitions, and capacity development.²³ A TRG for the survey and clearance of CMR set up by the CMAA in 2020 to share best practice among operators and address challenges did not meet in 2021 due to COVID-19.²⁴ It resumed meeting in 2022 and agreed to a number of amendments to national standards to expedite and accelerate land release.²⁵

The operating environment for mine action in Cambodia is permissive, with the government open to the presence of international operators and supportive in administrative actions such as the granting of visas, approval of Memoranda of Understanding (MoUs), tax exemptions on demining equipment, and facilitating the importation of equipment.²⁶ The CMAA is open to the trialling and use of innovative survey and clearance methods and tools to improve efficiency.²⁷

The CMAA receives technical support from a range of international organisations. The Geneva International Centre for Humanitarian Demining (GICHD) has supported the

13 Email from Tep Kallyan, CMAA, 29 April 2023.

14 Anti-Personnel Mine Ban Convention (APMBC) Article 7 Report (covering 2021), Annex B.

15 CMAA, "Legal framework and mandate", at: <http://bit.ly/2W7r3dJ>.

16 CMAC, "20 Years' Achievement in Mine Action 1998-2018 and Path Ahead", 2018.

17 Interview with Heng Rattana, Director General, CMAC, Phnom Penh, 25 April 2019.

18 Geneva International Centre for Humanitarian Demining (GICHD), "Landmines and Land Rights in Cambodia", December 2010, pp. 9 and 13.

19 Email from Zlatko Vezilic, Programme Manager, NPA, 5 May 2020.

20 CMAA, National Mine Action Strategy 2018-2025, p. 24; and email from Tong Try, National Mine Action Adviser, UNDP, 18 June 2019.

21 Email from Matthew Hovell, Head of Region SE Asia, HALO, 9 April 2021.

22 Emails from HALO, 25 March 2022 and 16 May 2023; phone interview with Portia Stratton, NPA, 13 May 2022.

23 CMAA, National Mine Action Strategy 2018-2025, p. 24; and emails from Tong Try, UNDP, 18 June 2019 and 27 July 2021.

24 Emails from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 6 September 2020 and 14 May 2021; and Alexey Kruk, MAG, 6 May 2022; and telephone interview with Portia Stratton, NPA, 13 May 2022.

25 Email from Sron Samrithea, Deputy Programme Manager, NPA, 6 May 2023.

26 Emails from Prum Sophakmonkol, CMAA, 11 September 2019; Rebecca Letven, MAG, 7 April 2020; and Lasha Lomidze, Programme Manager, HALO, 15 May 2020.

27 Emails from Zlatko Vezilic, NPA, 4 April 2019; Rebecca Letven, MAG, 9 May and 28 June 2019; and Damian O'Brien, HALO, 10 April 2019.

upgrade of the CMAA's information management system, gender mainstreaming and the development of Cambodian national mine action standards (CMAS).²⁸ NPA, with funding from the Norwegian Ministry of Foreign Affairs, provided financial and technical support for the CMAA database unit, including paying the salaries of seven its employees, and it supported the CMAA's quality management (QM) department, providing refresher training and funding one of the CMAA's QM teams.²⁹

The Cambodian government contributes funding for management of the mine action sector,³⁰ which has included covering some of the expenses of the CMAA, and supporting a range of activities including planning and prioritisation, quality assurance/quality control (QA/QC),

information management, Cambodia mine/ERW victim information system (CMVIS), and risk education.³¹ The cost of the database unit is, however, shared by NPA and the United Nations Development Programme (UNDP).³² In 2022 Cambodia also provided financial support to mine and ERW survey and clearance by CMAC and the National Centre for Peacekeeping Forces Management, Mines and Explosive Remnants of War Clearance (NPMEC).³³ Cambodia has estimated it will need almost \$119 million for CMR clearance in 2020–25.³⁴ The CMAA reported that in 2022 the government supported survey and clearance through expenditure of US\$4.5 million on developing public infrastructure.³⁵

ENVIRONMENTAL POLICIES AND ACTION

The CMAA issued a national Cambodian standard, CMAS 20, on "Environmental Management in Mine Action" in 2022. This requires operators to minimise the adverse impact of their operations on the environment, identify steps necessary to mitigate harm, and ensure that land is left in a suitable condition for its intended use. Operators are required to take account of: erosion or soil degradation; possible pollution of air, water, or soil; and damage to infrastructure, wildlife, and vegetation, while also dealing with litter, debris, and

other waste as well as damage to heritage sites or objects.³⁶ Operators noted that a workshop held by the GICHD in November 2022 had proposed amendments to the standard,³⁷ but the CMAA said it did not foresee any changes to the CMAS in 2023.³⁸ In the meantime, operators already apply their own environmental standing operating procedures (SOPs). MAG rolled out its Global Technical Standards in 2022, including a chapter on environment, which set out an IMAS-compliant, minimum baseline for all programmes to update their SOPs.³⁹

GENDER AND DIVERSITY

The CMAA established a Gender Mainstreaming Team (GMT) in 2019 to coordinate with the Technical Reference Group on Gender (TRG-G), one of seven TRGs ensuring coordination of the sector. The TRG-G is composed of representatives from UNDP, Ministry of Women's Affairs (MoWA), Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY), MAPU, operators, and international and national organisations working in mine risk education (MRE) and victim assistance (VA).⁴⁰

The CMAA is implementing a Gender Mainstreaming in Mine Action Plan (GMMAP) in line with the objectives of the National Mine Action Strategy 2018–2025. Two earlier GMMAPs covered the periods 2013–15 and 2018–22. The latest version, covering the years 2021–25, was approved at the end of 2021 and launched by CMAA First Vice-President Ly Thuch at a workshop in March 2022.⁴¹ It sets out three strategies building on the earlier plans:

developing implementation of GMMAP guidelines through monitoring and evaluation of the performance of MAPUs and operators; building capacity of CMAA gender teams, MAPUs, and operators, and collecting data on the mine action needs of women; promoting inclusive participation in mine action, including through collecting sex, age and disability disaggregated data (SADDD); developing a CMAS on gender mainstreaming; and advocating for more women in decision-making positions.⁴²

The CMAA followed up in 2022 by drafting revised gender mainstreaming guidelines to promote equal and inclusive participation of women, men, girls, boys, and persons with disabilities and by drafting a national standard gender mainstreaming with support from GICHD, UNDP and NPA. It conducted a workshop on GMMAP for mine action stakeholders and organised two courses conducted by the GICHD for CMAA staff and for MAPUs and operators

28 Email from GICHD, 1 July 2020.

29 Email from Sron Samritha, NPA, 6 May 2023.

30 APMBC Article 5 deadline Extension Request, 27 March 2019, p. 12.

31 Email from Prum Sophakmonkol, CMAA, 1 July 2020.

32 Emails from Rune Dale-Andresen, Country Director, NPA, 26 September 2020; and Portia Stratton, NPA, 21 June 2021.

33 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 14 May 2021.

34 APMBC Article 5 deadline Extension Request, 27 March 2019, p. 55.

35 Email from Tep Kallyan, CMAA, 9 May 2023.

36 Ibid.; and CMAS 20.

37 Emails from Tony Fernandes, MAG, 31 March 2023; Miles Hawthorn, HALO, 16 May 2023; and Sron Rithea, NPA, 6 May 2023.

38 Email from Tep Kallyan, CMAA, 9 May 2023.

39 Email from Tony Fernandes, MAG, 31 March 2023.

40 CMAA, National Mine Action Strategy 2018–2025, p. 22; and email from Tong Try, UNDP, 27 July 2021.

41 Voun Dara, "CMAA lauds female deminers," *Phnom Penh Post*, 10 March 2022.

42 Gender Mainstreaming in Mine Action Plan 2021–25, December 2021, pp. 6–7.

in August 2022.⁴³ The CMAA also convened a Technical Reference Group meeting on gender mainstreaming with participation by operators and MAPUs. With support from UNDP and NPA the CMAA made a video, "Women are the catalyst for success in Mine Action in Cambodia", which was based on a number of case studies and released in December 2022.⁴⁴

Women represented a little over a quarter of the CMAA's 157 employees at the end of 2022, up from 20% a year earlier, and made up 18 of the CMAA's 75 management staff (19%) as well as 20 of the 25 office staff (44%). But women occupied only 4 of the 57 field staff (6%) working on QM and VA. MAPUs also employed a low number of women (10 of 83 posts: 11%).

Among operators, The Halo Trust (HALO) employed the most female deminers, who comprised more than 440 of its roughly 1,000 operations staff.⁴⁵ HALO said it aims to maintain a 50:50 balance among its operations staff and in 2023 aimed to increase the number of women in managerial positions. CMAC, Cambodia's biggest operator, employed 204 women of a total of 1,276 deminers and explosive ordnance disposal (EOD) staff (16%) while women accounted for 5% of its management and 20% of office staff. MAG introduced a gender and inclusion action plan for 2023-2028 and at the end of 2022 female staff represented 38% of MAG's total employees, including over half (57%) of office management and one-third of the senior management in technical and field roles.⁴⁶ NPA reported women made up about half of its total staff (including management) and 28 of 52 field jobs (54%), but it acknowledged a lower proportion of female staff in senior technical positions.⁴⁷ The Royal Cambodian Armed Forces (RCAF) and NPMEC did not employ any women deminers.⁴⁸

INFORMATION MANAGEMENT AND REPORTING

The CMAA's database unit (DBU) is responsible for collecting, storing, analysing, and disseminating data in support of planning and prioritisation.⁴⁹ The DBU previously used the Information Management System for Mine Action New Generation (IMSMA-NG) but in 2022 continued the installation and migration of data to IMSMA Core,⁵⁰ a process that was expected to be completed in 2023. Explosive ordnance risk education (EORE) and EOD reports were reportedly uploaded to IMSMA Core in 2022 but operators said land release reports were still submitted in IMSMA NG.⁵¹ The DBU receives financial and technical support from Norway through NPA, which pays the salaries of seven of the DBU staff.⁵²

The CMAA convenes meetings of its Technical Reference Group on information management discussing issues and solutions for data reporting and sharing. These were conducted online in 2021 in accordance with COVID-19 regulations but in 2022 CMAA organised an in-person meeting which agreed on action to improve data quality. This included CMAA distributing a data verification check list and arranging a quarterly call with operators to verify data and resolve any issues.⁵³ Operators said the need for QM team field visits and checks resulted in delays uploading results to the database.⁵⁴

PLANNING AND TASKING

Cambodia's National Mine Action Strategy 2018–2025, officially launched in May 2018, sets out eight goals for the mine action sector, including clearance of mines, CMR, and other ERW. The second of these goals calls for release of prioritised cluster munition-contaminated areas by 2025. The strategy set a target of releasing 80% of known CMR contamination or 499km² by 2025.⁵⁵ The strategy expressed confidence that 30% of estimated CMR contamination would be released through land reclamation and cancellation. The strategy concluded that the remaining 70% of contamination would require TS and full clearance, calling for release of 44km² a year by these means to achieve the strategy's targets.⁵⁶

43 Email from Tep Kallyan, CMAA, 9 May 2023; and UNDP Clearing for Results Phase IV (CfRIV), Annual Project Progress Report 2022, p. 16.

44 Ibid.

45 HALO reported it employed 450 women deminers among 939 operations staff (48%). Email from Miles Hawthorn, HALO, 16 May 2023. SADD statistics reported by UNDP CfRIV showed HALO had 441 female deminers among 1,029 field staff (43%); UNDP CfRIV, Annual Project Progress Report 2022, p. 15.

46 Emails from Tony Fernandes, MAG, 31 March 2023 and Alexey Kruk, MAG, 20 June 2023.

47 Emails from Sron Samrithea, NPA, 6 May 2023; and Rune Dale-Andresen, NPA, 2 July 2023. SADD data showed NPA employed 17 women among 32 office staff (52%) and women held 22 of 47 deminer/EOD positions (47%). UNDP CfRIV, Annual Project Progress Report 2022, p. 15.

48 UNDP CfRIV, Annual Project Progress Report 2022, p. 16.

49 Email from Ros Sopha, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022.

50 Email from Tep Kallyan, CMAA, 9 May 2023.

51 Email from Miles Hawthorn, HALO, 16 May 2023.

52 Email from Sron Samrithea, NPA, 6 May 2023.

53 Email from Tep Kallyan, CMAA, 9 May 2023.

54 Email from Tony Fernandes, MAG, 31 March 2023.

55 CMAA, National Mine Action Strategy 2018–2025, p. 9.

56 Ibid., p. 10.

The CMAA compiles the annual national clearance work plan for mines and CMR, which comprises all the provincial clearance work plans. The MAPUs use the provincial work plan to monitor clearance performance and report progress to the PMAC and the CMAA.⁵⁷ The current planning and prioritisation practices in Cambodia follow a combination of top-down and bottom-up approaches. The top-down approach involves CMAA establishing a list of priority villages based on agreed criteria. The bottom-up approach involves MAPUs developing their work plans in accordance with the planning and prioritisation guidelines and in consultation with operators and local authorities.⁵⁸ The PMACs approve the MAPU's workplans, which are then endorsed by the CMAA.

The prioritisation process for the selection of CMR tasks is not as well established as is the process for releasing mined areas, largely due to the absence of comprehensive, verifiable CMR data.⁵⁹ The end use for most clearance tasks is agriculture and often the land is already being cultivated regardless of CMR contamination. This makes it difficult to produce clear prioritisation criteria, so the survey and the clearance plan is based on village-by-village, commune-by-commune, and district-by-district approaches.⁶⁰

LAND RELEASE SYSTEM

STANDARDS AND LAND RELEASE EFFICIENCY

Mine action is conducted according to the Cambodian standards (CMAS), which are broadly consistent with the International Mine Action Standards (IMAS).⁶¹ The CMAA approved the CMRS methodology in principle in 2017 and signed a national mine action standard for CMRS (CMAS 16) in November 2018, which is being implemented by operators.⁶² CMAS 16 is largely based on the experience of other programmes in the region implementing the CMRS method, which combines NTS and TS.⁶³ However, the CMAA and operators continued to debate criteria for releasing areas of BLS polygons not confirmed as hazardous by TS so as to accelerate land release.⁶⁴

A Technical Reference Group meeting attended by all operators in Kratie province in August 2022 agreed that areas of BLS polygons may be cancelled after clearance of CHAs and after TS has found no further direct or indirect evidence of contamination. The meeting also agreed to adopt the use of a full BLU submunition as the target for calibrating detectors instead of the half submunition previously used. The changes to operating practice were approved by the CMAA Secretary General with effect from October 2022 although CMAS 16 had yet to be formally amended at the time of writing.⁶⁵

Since 2019, the CMAA, with support from NPA with United Kingdom Foreign, Commonwealth & Development Office (FCDO) funding and in consultation with other mine clearance operators, has been developing a number of new standards on animal detection, mechanical demining, information management, and the environment.⁶⁶ CMAS chapters on mechanical clearance and on animal detection systems were finalised by the middle of 2022 and awaiting approval by the CMAA. In addition, the CMAS on EORE has also been revised and updated to bring it in line with IMAS.⁶⁷

OPERATORS AND OPERATIONAL TOOLS

Survey and clearance of CMR in 2022 was conducted by two national operators CMAC and CSHD, and three international operators, APOPO, MAG, and NPA.

57 APMBC Article 5 deadline Extension Request, 27 March 2019, p. 5.

58 Ibid.; and interview with Prum Sophakmonkol, CMAA, Geneva, 11 February 2020.

59 Emails from Rebecca Letven, MAG, 7 April and 4 September 2020.

60 Email from Zlatko Vezilic, NPA, 4 April 2019.

61 Emails from Rebecca Letven, MAG, 7 April 2020; and Zlatko Vezilic, NPA, 19 March 2020.

62 Emails from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 6 September 2020; and Portia Stratton, NPA, 4 September 2020.

63 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 14 May 2021.

64 Online interview with Tony Fernandes, MAG, 16 May 2022; and email from Sron Samrithea, NPA, 5 July 2022.

65 Emails from Tony Fernandes, MAG, 31 March 2023; and from Sron Samrithea, NPA, 6 May 2023.

66 Emails from Zlatko Vezilic, NPA, 5 May 2020; and Lasha Lomidze, HALO, 15 May 2020.

67 Emails from Sron Samrithea, NPA, 5 and 11 July 2022.

Table 2: Operational clearance capacities deployed in 2022⁶⁸

Operator	Manual clearance teams	Total deminers*	Animal detection capacity (dogs and handlers)	Mechanical assets/machines**	Comments
APOPO (in partnership with MAG)	1	4	APOPO, in partnership with MAG, had 1 technical survey dog (TSD) team with 5 dogs and 5 handlers using Garmin trackers for CMTS in Rattanakiri province.	0	
CMAC ⁶⁹	4 BAT; 4 BAC-TS; 5 BAC-FC; and 4 BAC-MTT	140	2 teams, totalling 4 explosive detection dogs (EDDs), 4 handlers	N/A	
CSHD	1	12	0	0	
MAG Cambodia	10 BAC teams	85	0	4 drones	MAG also deployed 3 CMTS teams with 30 staff who do not release land. Drones are used for mapping.
NPA ⁷⁰	1	8	3 teams totalling 6 dogs and 6 dog handlers	1	NPA deployed 2 Multi-Tasking Teams (MTTs) trained for CMTS, BAC, and EOD. One team mostly deployed on CMTS, the other mostly on BAC. Both teams can do EOD call-out as requested by MAPU.
Totals		249	15 dogs		

* Excluding team leaders, medics, drivers. ** Excluding vegetation cutters and sifters.
EOD = Explosive ordnance disposal

APOPO employed technical survey dogs (TSDs) working on a long leash and focused exclusively on survey in 2022.⁷¹ The dogs carry the Garmin track-and-trace system, which allows remote monitoring and generates IMSMA-compatible data.⁷² APOPO tested the system working with CMAC in Preah Vihear province in 2021 and in 2022 worked with MAG deploying a TSD team with five dogs and five handlers in Rattanakiri province.⁷³

CMAC, much the biggest operator, worked in 2021 with 153 operators said to be split between 17 teams conducting TS and clearance and supported by two explosive detection dogs (EDDs).⁷⁴ CMAC's release of CMR-affected land sharply increased in 2022 (see *Land Release Outputs* below) but it did not provide any information on capacity deployed in 2022.

MAG has operations in western Cambodia focused on minefield survey and clearance and an operations base in Ratanak Kiri province concentrating on CMR survey and clearance. In 2022, MAG's 10 battle area clearance (BAC)

teams included two teams working with the Scorpion detection system which uses DGPS as a global positioning platform and advanced detection software on a manually pushed detection platform. It also had one team conducting a field evaluation of VMX10 detectors for the US Humanitarian Demining Research and Development programme.⁷⁵ MAG uses Evidence Point Polygon (EPP) mapping pioneered in the Lao People's Democratic Republic which takes the data from EOD tasks to plot initial CHAs. MAG also continues to use drones to conduct NTS, task planning, and post-impact monitoring.⁷⁶

NPA reduced its CMR clearance capacity from three teams with 15 deminers in 2021 to two teams with a total of eight deminers in 2022 who worked alongside three EDD teams employing a total of six handlers and six dogs. NPA looked forward to receiving funding to support a significant increase in capacity in 2023.⁷⁷

68 Emails from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022; Michael Raine, Programme Manager, APOPO, 24 and 30 May 2023; Thoeun Theap, Deputy Programme Manager, APOPO, 30 May 2023; Tony Fernandes, MAG, 31 March 2023; and Sron Samritha, NPA, 6 May 2023.

69 Email from Sron Samritha, NPA, 15 June 2023.

70 Email from Rune Dale-Andresen, NPA, 2 July 2023.

71 Interview with Michael Raine, APOPO, in Siem Reap, 6 December 2022.

72 GICHD, "Field Trials of the SMART System and Technical Survey Dogs in Cambodia, Final Report", December 2021, pp. 6–7.

73 Emails from Michael Raine, APOPO, 24 and 30 May 2023; and Thoeun Theap, APOPO, 30 May 2023.

74 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022.

75 Email from Tony Fernandes, MAG, 31 March 2023.

76 Emails from Rebecca Letven, MAG, 9 May 2019 and 4 September 2020; and Alexey Kruk, MAG, 29 March 2021.

77 Emails from Sron Samritha, NPA, 6 May 2023; and Rune Dale-Andresen, NPA, 2 July 2023.

LAND RELEASE OUTPUTS AND PROGRESS TOWARDS COMPLETION

LAND RELEASE OUTPUTS IN 2022

Cambodia said it released a total of almost 51.68km² of cluster munition-contaminated area through survey and clearance in 2022, a sharp increase on operating results in 2021 which the CMAA attributed primarily to operating without COVID-19 constraints.⁷⁸ Official data may understate the actual amount of land released in 2022. The CMAA initially recorded release of 24.43km² in 2021⁷⁹ but later revised the figure upwards to 30.9km².⁸⁰ However, the amount of land released in both years was still well below the nearly 59km² released in 2020.

Most land release resulted from clearance, which topped 30km² in 2022 (see Table 5) and led to destruction of 4,930 submunitions, improving on the 4,268 items destroyed through clearance in 2021. The number of items destroyed in the course of EOD spot tasks, however, dropped from 2,375 in 2021 to just 324 in 2022.⁸¹

SURVEY IN 2022

Cambodia released a total of 21.35km² through survey in 2022,⁸² also a significant increase on the previous year's results for 2021 despite another upward revision of the 2021 data. The CMAA initially reported that no cancellation occurred in 2021 and 3.85km² was reduced through TS.⁸³ It subsequently reported cancellation through NTS of 0.78km² and reduction through TS of 6.66km².⁸⁴

In 2022, the CMAA reported cancellation by NPA amounting to 5.26km² (see Table 3), more than five times the area cancelled in 2021. However, MAG also reported cancelling 125,632m², suggesting cancellation totalled 5.38km².⁸⁵

Table 3: Cancellation through NTS in 2022⁸⁶

Operator	Province	Area cancelled through NTS (m ²)
NPA	Rattanakiri	5,257,533
Total		5,257,533

Similar discrepancies occur in reporting on the results of TS in 2022. Official data reports CMAC, working in eight provinces, reduced almost 10km² and NPA reduced 3.6km², giving a total figure for release through TS of 13.64km² (see Table 4).⁸⁷

Table 4: Reduction through TS in 2022⁸⁸

Operator	Province	Area (m ²)
CMAC ⁸⁹	Kampong Cham, Kampong Thom, Kratie, Mondulki, Prey Veng, Rattanakiri, Stung Treng, and Svay Rieng	9,978,683
NPA	Rattanakiri	6,116,156
Totals		16,094,839

Official data makes no mention of area reduction by MAG, which reported releasing 5,974,365m² through TS in 2022.⁹⁰ NPA recorded reduction amounting to 6,116,156m² in 2022 and reported area reduction through TS by CMAC amounting to 10,638,889m².⁹¹ The results reported by the three operators suggest a total of more than 22km² may have been reduced through TS in 2022, 61% more than in the official data.

CLEARANCE IN 2022

Clearance data shows similar but much smaller discrepancies between official and operator results. The CMAA reported clearance of 30.36km² in 2022 led by CMAC which almost doubled its clearance from 12.7km² in 2021 to 24.1km² in 2022 (see Table 5).⁹² CMAC reported clearing 24.25km²,⁹³ MAG reported clearing 5.57km² in 2022,⁹⁴ and NPA recorded clearing 917,393m².⁹⁵

78 Emails from Tep Kallyan, CMAA, 9 May 2023; and Ros Sophal, CMAA, 18 June 2023.

79 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022.

80 Email from Tep Kallyan, CMAA, 9 May 2023.

81 Ibid.

82 Emails from Tep Kallyan, CMAA, 9 May 2023; and Ros Sophal, CMAA 18 June 2023.

83 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022.

84 Email from Tep Kallyan, CMAA, 9 May 2023.

85 Emails from Tony Fernandes, MAG, 31 March 2023; and Sron Samrithea, NPA, 6 May 2023.

86 Emails from Tep Kallyan, CMAA, 9 May 2023; and Ros Sophal, CMAA, 18 June 2023.

87 Ibid.

88 Emails from Tep Kallyan, CMAA, 9 May 2023; and Ros Sophal, CMAA, 18 June 2023.

89 NPA, which quality assures CMAC's CMR operations, recorded reduction by CMAC of 10,638,889m². Email from Sron Samrithea, NPA, 15 June 2023.

90 Email from Tony Fernandes, MAG, 31 March 2023.

91 Emails from Sron Samrithea, NPA, 6 and 15 May 2023.

92 Email from Tep Kallyan, CMAA, 9 May 2023.

93 Email from Sron Samrithea, NPA, 15 May 2023.

94 Email from Tony Fernandes, MAG, 31 March 2023.

95 Email from Sron Samrithea, NPA, 6 May 2023.

Table 5: CMR clearance in 2022⁹⁶

Operator	Province	Area cleared (m ²)	Submunitions destroyed	Other UXO destroyed
CMAC ⁹⁷	Kampong Cham, Kampong Chhnang, Kampong Thom, Kratie, Mondulakiri, Preah Vihear, Prey Veng, Rattanakiri, Stung Treng, Svay Rieng, Tboung Khmum	24,130,169	4,187	866
MAG ⁹⁸	Rattanakiri	5,278,562	584	13
NPA	Rattanakiri	917,393	159	41
Spot tasks		N/A	324	
Totals		30,326,124	5,254	920

PROGRESS TOWARDS COMPLETION

Cambodia's mine action priority is to complete clearance of anti-personnel mines by 2025 but the National Mine Action Strategy 2018–2025 also set a target of releasing 80% of its known CMR contamination by 2025. The remaining 20% would be considered as residual. At the time it estimated CMR contamination at 645km² and aimed to release 499km² by 2025. Cambodia is not on track to achieve that goal.

Cambodia believed 30% could be released through cancellation or land reclamation and called for release of 44km² a year through TS or clearance in order to release the rest. Operations since 2018 have not achieved that annual

land release target. In the five years from 2018 Cambodia released a total of around 190km² through TS and clearance instead of the required 220km². In the meantime, estimates of contamination have fluctuated with the progress of survey, dipping from 744km² at the end of 2020 to 698km² a year later before rising to 729km² at a little under the end of 2022. An agreement reached by CMAA and operators in August 2022 that areas of BLS polygons may be cancelled after clearance of CHAs and after TS has found no further direct or indirect evidence of contamination⁹⁹ is expected to expedite and accelerate land release going forward.

PLANNING FOR MANAGEMENT OF RESIDUAL CONTAMINATION

Goal Seven of Cambodia's National Mine Action Strategy 2018–2025 is to establish a sustainable national capacity to address residual threats after 2025. Reference to the issue is also included in the foreword to the Strategy signed by the Cambodian Prime Minister and noted throughout the document. The CMAA worked with the GICHD in 2022 drafting a paper on the legal and institutional framework required for a comprehensive response to residual contamination identified after completion.¹⁰⁰

Table 6: Five-year summary of CMR clearance

Year	Area cleared (m ²)
2022	30.36
2021	*23.46
2020	30.99
2019	25.33
2018	39.60
Total	149.64

* Previously reported as 20.58km², but subsequently revised by the CMAA on 9 May 2023.

96 Email from Tep Kallyan, CMAA, 9 May 2023.

97 NPA recorded clearance by CMAC of 24,245,895m². Email from Sron Samrithea, NPA, 15 June 2023.

98 MAG reported clearance of 5,570,030m² of CMR-affected land in 2022. Email from Tony Fernandes, MAG, 31 March 2023.

99 Emails from Tony Fernandes, MAG, 31 March 2023; and Sron Samrithea, NPA, 6 May 2023.

100 UNDP CfRIV, Annual Project Progress Report 2022, p. 18.