

KEY DATA

CLUSTER MUNITION CONTAMINATION: HEAVY

NATIONAL ESTIMATE

745 KM²

SUBMUNITION
CLEARANCE IN 2021

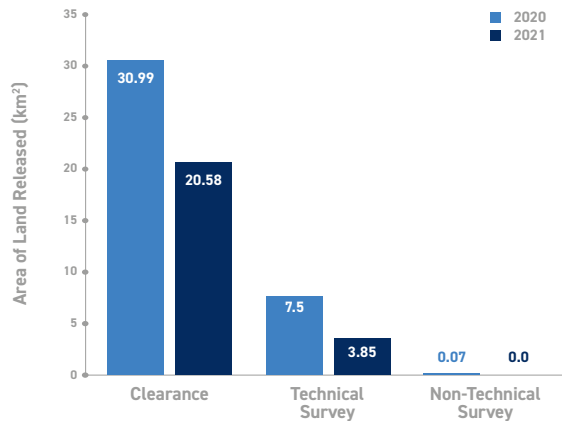
20.58 KM²

SUBMUNITIONS
DESTROYED IN 2021

4,268

(INCLUDING 2,375 THROUGH
EOD 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.
- Cambodia should more accurately establish the extent of CMR contamination, through further systematic and comprehensive evidence-based survey of suspected hazardous areas (SHAs) generated by the national baseline survey (BLS).
- 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.
- The CMAA should work with operators to develop criteria for cancellation of areas identified by CMRS as having no evidence of contamination.
- The CMAA should improve CMR planning and prioritisation guidelines and implement a more targeted systematic clearance prioritisation process for confirmed hazardous areas (CHAs).
- The CMAA should work with operators to eliminate persistent discrepancies in operating results.

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)

UNDERSTANDING OF CMR CONTAMINATION

Cambodia has very extensive CMR contamination but is still trying to reach an accurate determination of the extent. Estimates of total contamination have fluctuated in recent years but at the end of 2021, the CMAA said Cambodia had 2,364 CMR polygons spread across 18 provinces and covering 698.7km² (see Table 1), a small (6%) dip from the 744km² reported a year earlier.¹ The CMAA and its implementing partners believe the total will be significantly reduced through technical and non-technical survey.²

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.³ Assessment of the resulting contamination, however, remains a work in progress.⁴

Estimates of the extent are complicated by the evolution of CMR survey methodologies. CMR contamination data is derived from a baseline survey of explosive ordnance conducted between 2009 and 2020. Until the adoption of cluster munition remnant survey (CMRS) and cluster munition technical survey rolled out after 2015, initial results were based on a mine survey methodology that produced

inflated polygons that included large amounts of land with no CMR but also missed areas of CMR contamination. Continuing survey and resurvey of some BLS polygons applying technical survey methods is producing more accurate, evidence-based data for the national database.⁵

In the CMAA's latest estimate, eight eastern provinces⁶ account for 1,745 polygons, nearly three-quarters of the total, and (437km²) 63% of total CMR-affected area (9% less than the 2020 estimate).⁷ 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.⁸ 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 province was nearly 40% lower than the 60km² reported a year earlier (see Table 1).⁹ A further 619 polygons affecting an estimated 261km² are located in the 10 other provinces located further from the border in the centre, south, and west of Cambodia. These 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 dedicated technical survey.¹⁰

OTHER EXPLOSIVE REMNANTS OF WAR AND LANDMINES

Cambodia has extensive contamination by other explosive remnants of war. This consists mainly of anti-personnel landmines which it estimated to cover 715km² at the end of 2021.¹¹ The Anti-Personnel Mine Ban Convention (APMBC) Article 5 deadline extension request submitted in 2019 estimated contamination by other unexploded ordnance (UXO) affected another 468km², but Cambodia's latest APMBC Article 7 report showed the estimate had since fallen to 333km².¹²

1 Email from Ros Sophal, Database Unit Manager, on behalf of Prum Sophakmonkol, Director, CMAA, 10 May 2022.

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

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 The eight eastern provinces are: Kampong Cham, Kratie, Mondulkiri, Prey Veng, Rattanakiri, Stung Treng, Svay Rieng and Tbung Khmum.

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

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

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

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

11 APMBC Article 7 Report (covering 2021), pp. 4–5.

12 APMBC Article 5 deadline Extension Request, 27 March 2019, p. 6; and APMBC Article 7 Report (covering 2021), Annex B.

Table 1: Cluster munition-contaminated area (at end 2021)¹³

Province	BLS polygons	Area (m ²)	Total area at end 2021 (m ²)
Battambang	1	26,872	26,872
Kampong Cham	211	42,146,965	46,451,999
Kampong Chhnang	19	2,039,894	2,046,122
Kampong Speu	85	12,366,578	12,366,578
Kampong Thom	340	58,718,840	62,612,902
Kampot	2	103,392	103,392
Kandal	58	5,494,016	5,511,202
Kratie	256	77,106,486	83,538,685
Mondulkiri	74	27,209,769	27,412,322
Phnom Penh	17	1,505,640	1,512,696
Preah Sihanouk	14	2,984,350	2,984,350
Preah Vihear	74	176,452,684	177,087,266
Prey Veng	291	48,946,921	50,135,371
Rattanakiri	338	43,306,969	60,270,478
Stung Treng	179	124,474,717	127,134,100
Svay Rieng	216	45,133,159	49,825,559
Takeo	9	1,675,366	1,973,835
Tbung Khmum	180	29,002,751	33,360,645
Totals	2,364	698,695,369	744,354,374

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, Prum Sophakmonkol, manages CMAA's planning and operations.¹⁴ The CMAA has noticeably strengthened in recent years, and its roles and responsibilities have become more clearly defined.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's activities have been limited to 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

13 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022. Data represent the total of contamination estimates previously disaggregated by CMAA as CHAs and SHAs.

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

15 Interviews with Su Yeon Yang, Project Coordination Officer, and Tong Try, UNDP, 23 April 2019; and Rebecca Letven, Programme Manager, MAG, Phnom Penh, 25 April 2019.

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.

The Cambodian government established a Technical Working Group on Mine Action (TWG-MA) as a consultative mechanism between the government and implementing partners.²⁰ It meets on a bi-annual basis and is attended by the CMAA, relevant ministries, operators, and donors.²¹ TWG meetings were suspended in 2020 due to the COVID-19 pandemic²² but resumed online in 2021 and were scheduled to be held in-person in 2022.²³ 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.²⁴ The CMAA set up a separate TRG for the survey and clearance of CMR in 2020 to share best practice among operators and address challenges. It met first in October 2020 and was due to meet twice a year but also did not meet in 2021 due to COVID-19 and was similarly due to resume meetings in 2022.²⁵

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 mine action sector receives technical support from a range of international organisations. The Geneva International Centre for Humanitarian Demining (GICHD)

supported the upgrading of the CMAA's information management system as well as gender mainstreaming and the development of Cambodian national mine action standards.²⁸ NPA, as part of a United Kingdom-funded partnership that includes MAG and The HALO Trust, conducts capacity development activities in support of the CMAA on gender equity and mainstreaming, information management, knowledge management, planning and prioritisation, quality management (QM), revision and development of the Cambodian Mine Action Standards, and strategic planning.²⁹

The Cambodian government contributes funding for clearance and management of the sector.³⁰ This support includes covering the expenses of the CMAA and providing funds to support planning and prioritisation, quality assurance/quality control (QA/QC), database management, Cambodia mine/ERW victim information system (CMVIS), and risk education.³¹ The cost of the database unit is, however, shared by NPA and UNDP.³²

The Cambodian government also provides a 10% in-kind contribution to any new donor funding.³³ The Cambodian government has reported contributing just under 30% of the total funding to the mine action sector (US\$99.49 million of US\$340.2 million) in 2010–18.³⁴ Cambodia funds mine and ERW survey and clearance by CMAC and the National Centre for Peacekeeping Forces Management, Mines and Explosive Remnants of War Clearance (NPMEC).³⁵ Local authorities coordinate and provide security support to survey and clearance operations on the ground.³⁶ Cambodia has estimated it will need almost \$119 million for CMR clearance in 2020–25.³⁷

ENVIRONMENTAL POLICIES AND ACTION

In 2021, Cambodia introduced a national mine action standard on environmental management (CMAS 20), and discussions continue on further amendments or additions to the standards. As of June 2022, the CMAS was being translated from Khmer into English. In the meantime, most operators reported following internal environmental policies and SOPs. APOPO updated its in-house environment policy in 2020, which has three main chapters on "Know", "Protect", and "Act", with recommendations carried over into an SOP on environment.³⁸ MAG said it followed the IMAS on environmental management and protection and had its own SOPs to minimise environmental damage.³⁹

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

21 Emails from Prum Sophakmonkol, CMAA, 1 July 2020; Oum Phumro, CMAC, 9 June 2021; Rebecca Letven, MAG, 7 April 2020; and Zlatko Vezilic, NPA, 5 May 2020.

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

23 Email from HALO Trust, 25 March 2022; phone interview with Portia Stratton, NPA, 13 May 2022.

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

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

26 Emails from Prum Sophakmonkol, CMAA, 11 September 2019; Rebecca Letven, MAG, 7 April 2020; and Lasha Lomidze, Programme Manager, HALO Trust, 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 Trust, 10 April 2019

28 Email from GICHD, 1 July 2020.

29 Email from Portia Stratton, NPA, 21 April 2021.

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, 6 September 2020.

34 APMBC Article 5 deadline Extension Request, 27 March 2019, p. 6.

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

36 Ibid.

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

38 Email from Michael Heiman, APOPO, 1 April 2022.

39 Email from Alexey Kruk, MAG, 6 May 2022.

GENDER AND DIVERSITY

The CMAA has developed 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, approved at the end of 2021 and covering the years 2021–25, sets out three strategies building on the earlier plans. These include: 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.⁴⁰

The latest National Mine Action Strategy three-year Implementation Plan (2021–23) sets out activities in support of these goals.⁴¹ NPA, as part of its capacity development, is supporting the CMAA with training on gender mainstreaming in mine action, on implementation of the GMMAP and the development of associated guidelines, and on how to use gender- and age-disaggregated data in planning and prioritisation.⁴² GMMAP guidelines require 26 forms to collect data fully disaggregated by sex, age, and disability (SADDD).⁴³

GICHD's Gender and Mine Action Programme continues to support CMAA on the development and implementation of the GMMAP, guidelines and CMAS on gender mainstreaming, as well as training for CMAA staff, MAPUs, and operators, under the framework of a joint capacity development action plan.⁴⁴

A CMAA Gender Mainstreaming Team (GMT) was established to coordinate with the TRG 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 risk education (MRE) and victim assistance (VA).⁴⁵ Of the CMAA's 216 employees in 2021, (20%) were female, with women in 12 of 49 (24%) managerial level positions and 28 of the 104 (27%) office staff but only four of 63 field positions (6%).⁴⁶

As at April 2021, women made up 30% of Cambodian Self Help Demining (CSHD)'s workforce, with women in 5% of managerial/supervisory roles and 33% of operational positions.⁴⁷ APOPO finished the year with a similar proportion of women employees who accounted for 23 of its 72 staff, but they also made up more than one-third of the staff holding managerial positions and nearly half of its operations.⁴⁸

MAG started developing an action plan to promote gender and inclusion to follow up the findings of an assessment conducted in 2021. It operates mixed gender community liaison teams gathering information on the location of CMR and doing pre-clearance assessment of their impact. Women made up 37% of MAG's 525-strong team in Cambodia at the end of 2021, including 40% of its deminers and a majority (61%) of its medics. Women held 25 of the 93 staff in managerial or supervisor positions, including the heads of finance, human resources, and procurement.⁴⁹

Women were less than half (45%) of NPA's total employees in Cambodia in 2021, but close to two-thirds (64%) of its operations personnel, including its operations supervisor and an operations officer. It said it recruited local staff from different ethnic communities to ensure teams could communicate effectively with minorities. Its main office staff included female managers for its support service department and finance.⁵⁰

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.⁵¹ The DBU has taken a range of actions in the past two years to increase the accuracy of data and the efficiency of information management, working closely with international partners. The CMAA has used the Information Management System for Mine Action New Generation (IMSMA-NG) since 2014 and in 2020 started the process of upgrading the system to IMSMA Core, working with the GICHD.

A Virtual Private Network set up by the DBU in 2018 enables operators to submit daily operating data directly to the IMSMA database.⁵² The CMAA has also worked closely with the GICHD on the development of an application for daily data collection, a web application for QA/QC, and a dashboard to view the output summary in order to assist planning and decision making, to allow for mobile data collection in the field and allow MAPUs and QMTs to enter data online, and to verify the data submitted by operators.⁵³

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

41 CMAA, Three-Year Implementation Plan 2018–2020, Phnom Penh, undated, but 2018, p. 14.

42 DFID Capacity Development Report, Activity Detail Extract, 18 September 2018.

43 Emails from Portia Stratton, NPA, 21 April 2021; and Tong Try, UNDP, 27 July 2021.

44 Email from GICHD, 20 July 2022.

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

46 WhatsApp message from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 1 June 2022.

47 Email from Chhun Bora, Training and Monitor Officer, CSHD, 19 April 2021.

48 Email from Michael Heiman, Regional Manager, APOPO, 1 April 2022.

49 Emails from Alexey Kruk, MAG, 29 March and 28 May 2021 and 6 May 2022.

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

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

52 Email from Rebecca Letven, MAG, 9 May 2019; and interview with Prum Sophakmonkol, CMAA, Phnom Penh, 24 April 2019.

53 Emails from Prum Sophakmonkol, CMAA, 1 July 2020; and Ros Sophal, CMAA, 16 August 2021; and interview with Ros Sophal, CMAA, 30 June 2021.

The CMAA has introduced a new reporting form following endorsement of the national standard on CMRS in November 2018. The new Cluster Munition Technical Survey (CMTS) reporting form, in conjunction with the standard, has improved both the effectiveness of the CMRS and the quality of reporting of survey results to the national database as it enables operators to submit the actual CHA after completing technical survey, which has improved the quality of clearance work plans.⁵⁴

The CMAA continued to hold regular 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 line with COVID-19 regulations but were due to resume in-person in 2022. The CMAA database unit said it also had regular meetings with operators once or twice a month to sort out any data issues.⁵⁵ Despite the increased contacts between CMAA and operators on data, operating results continued to show significant discrepancies.

PLANNING AND TASKING

Cambodia's National Mine Action Strategy 2018–2025 was officially launched in May 2018 with eight goals for clearance of mines, CMR, and other ERW, setting the direction for the mine action sector in Cambodia. It includes targets for tackling CMR contamination as the second of its eight goals. It called for "release of prioritised cluster munition-contaminated areas of 43.4km² out of a total 130.2km² by 2025" and specified two broad CMR-related objectives:⁵⁶

- Plan and prioritise CMR-contaminated areas to be released; and
- Conduct survey and release confirmed areas of CMR contamination, develop national standards for survey and clearance, implement the cluster munition remnant survey (CMRS) methodology and increase survey and clearance capacity.

The accompanying Three-Year Implementation Plan 2018–20 has now been replaced by a new Implementation Plan 2021–23, which sets out activities and indicators to implement the strategy.⁵⁷

The CMAA compiles the annual national clearance work plan for mines and CMR, which comprises all the provincial clearance work plans. MAPUs are responsible for developing their own work plans in accordance with the planning and prioritisation guidelines. The PMACs approve the MAPU's work plans, which are then endorsed by the CMAA. The

MAPUs use the provincial work plan to monitor clearance performance and report progress to the PMAC and the CMAA.⁵⁸ 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 coordinating at the provincial level to develop a clearance list, again, using agreed criteria.⁵⁹

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. Task prioritisation begins with the MAPU as part of the annual work plan development process. Although the exact prioritisation criteria are not as well defined for CMR clearance as they are for mine clearance, the process at present typically works as follows: consultation with village leaders then a commune workshop then SHA "reconnaissance" then SHA prioritisation then a district workshop then a provincial workshop and then work plan finalisation.⁶⁰ 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.⁶¹

LAND RELEASE SYSTEM

STANDARDS AND LAND RELEASE EFFICIENCY

Mine action is conducted according to Cambodian Mine Action Standards (CMAS), which are broadly consistent with the International Mine Action Standards (IMAS).⁶²

54 Email from Portia Stratton, NPA, 21 April 2021.

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

56 CMAA, National Mine Action Strategy 2018–2025, pp. 11–12.

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

58 APMBBC Article 5 deadline Extension Request, 27 March 2019, p. 5.

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

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

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

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

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.⁶³ CMAS-16 is largely based on the experience of other programmes in the region implementing the CMRS method, which combines non-technical and technical survey.⁶⁴ However, the CMAA and operators continue to debate criteria for releasing areas of BLS polygons not confirmed as hazardous by technical survey.⁶⁵ Initial discussions on land release and CMAS 16 took place in a TRG meeting held in Rattanakiri in October 2020 and agreed that further work was needed to amend the standard over the course of 2021.⁶⁶ No further discussion took place in 2021 but CMAA planned to hold one or two TRG meetings in 2022 providing the possibility for follow-up discussion.⁶⁷

Since 2019, the CMAA, with support from NPA with FCDO funding and in consultation with other mine clearance operators, has been developing a number of new standards. These included new standards on animal detection, mechanical demining, information management, and the environment were elaborated in 2019.⁶⁸ As at June 2022, the CMAA had approved new standards for information management and the environment. The CMAS chapters on mechanical clearance and on animal detection systems were finalised and awaiting approval by the CMAA. In addition, the CMAS on explosive ordnance risk education (EORE) has also been revised and updated to bring it in line with IMAS.⁶⁹

OPERATORS AND OPERATIONAL TOOLS

Survey and clearance of CMR in 2021 was conducted by two national operators (CMAC, the biggest operator in Cambodia, and CSHD, the smallest), and three international operators (APOPO, MAG, and NPA). The total number of clearance personnel declined from 287 in 2020 to 257 in 2021 but the programme added animal detection capacity and two more mechanical assets.

Table 2: Operational clearance capacities deployed in 2021⁷⁰

Operator	Manual clearance teams	Total deminers*	Animal detection capacity (dogs and handlers)	Mechanical assets/machines**	Comments
APOPO (in partnership with CMAC)	1	4	APOPO, in partnership with CMAC, had 4 TSDs using SMART systems, used for CMRS in Preah Vihear province (Jan–Aug 2021)	0	
CMAC	4 BAT; 4 BAC-TS; 5 BAC-FC; and 4 BAC-MTT	153	2 teams, totalling 4 explosive detection dogs (EDDs), 4 handlers	N/A	
CSHD	1	12	0	0	
MAG Cambodia	10 teams (BAC1, 2, 3, 4, 5, 7, 8, 11, 12, 13)	83	None	1	Mechanical assets include 1 drone and 7 machines for vegetation removal
NPA	3	15	6 dogs and 6 dog handlers	0	1 MTT conducts EOD and battle area clearance
Totals		267	14 dogs	1	

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

APOPO had previously only undertaken anti-personnel mine operations in Cambodia, but in November 2020 it began CMRS operations in partnership with CMAC in the east of Preah Vihear province. APOPO uses technical survey dog (TSD) teams on cluster munition-contaminated areas to reduce areas found not to contain CMR and identify the perimeters of CHAs. These are then cleared by APOPO's manual clearance operators.⁷¹

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

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

65 Online interview with Tony Fernandes, Technical Operations Manager, MAG, 16 May 2022; and email from Sron Samrithea, Deputy Programme Manager, NPA, 5 July 2022.

66 Emails from Portia Stratton, NPA, 21 April 2021; and Alexey Kruk, MAG, 29 March 2021.

67 Emails from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022; Portia Stratton, NPA, 19 April 2022 and online interview with Tony Fernandes, MAG, 16 May 2022.

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

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

70 Emails from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022; Michael Heiman, Regional Manager, APOPO, 1 April 2022; Alexey Kruk, MAG, 6 May 2022; and Portia Stratton, NPA, 19 April 2022.

71 Emails from Michael Heiman, APOPO, 4 May 2020; 22 March, 8 June, and 28 July 2021; and 1 April 2022.

APOPO started CMRS operations as the second phase of a GICHD SMART TSD Evaluation Project, having been deployed for 18 months in mined areas in Preah Vihear. The methodology employs long-range search dogs carrying the Swiss Mine Action Reduction Tool (SMART), an electronic track and trace systems carried in a harness, which allows remote monitoring and generates IMSMA compatible data.⁷² The pilot project in November-December 2020 found that TSDs achieved productivity of 2,136m² a day.⁷³ Based on the promising productivity and cost-efficiency gains seen during the project, APOPO continued operating one survey team with six personnel and four TSD units in partnership with CMAC in January through August 2021. APOPO and MAG started a TSD deployment in Rattanakiri province in the third quarter of 2021, training a team of four handlers and five dogs. The teams became operational in February 2022.⁷⁴

CMAA data showed that CMAC operated with 17 survey and clearance teams comprising 153 personnel in 2021.⁷⁵ This was much the same capacity as the previous year when CMAC reported working with 14 non-technical survey teams, totalling 70 survey personnel and 4 technical survey teams totalling 20 personnel.⁷⁶ MAG increased the number of non-technical survey teams from two to three in 2021, totalling six survey personnel and also operated three technical survey teams (including two new teams from Q3), totalling thirty survey personnel.⁷⁷ NPA had three survey teams (also referred to in Table 2), totalling 15 survey personnel, who conduct survey, clearance, and explosive ordnance disposal (EOD) as required.⁷⁸

CMAC and NPA continued a partnership that started in 2014 under which CMAC's Demining Unit 5 conducts survey

and clearance mentored and monitored by NPA. Its initial objective—to complete the baseline survey—was achieved by the end of 2020. The partnership subsequently focused on building DU5's capacity to conduct CMRS in targeted provinces in north-eastern Cambodia. CMAC has also had one EOD team based in Takeo province (mainly working around Takeo and Kandal provinces around Phnom Penh, but sometimes further afield).⁷⁹

MAG has its main operations in western Cambodia focused on minefield survey and clearance but also has an operations base in Rattanakiri province concentrating on CMR survey and clearance. 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 trial advanced detection systems for CMR survey and clearance, provided by the US Humanitarian Demining Research and Development programme, and uses drones to conduct non-technical survey, task planning, and post-impact monitoring.⁸⁰

NPA operated with the same survey and clearance capacity in 2021 as in the previous year. This consisted of a total of 29 operations personnel, including three multi-task teams with eight searchers assigned to non-technical survey and CMRS but also conducting EOD spot tasks as required and three multi-task teams with a total of 15 people, similarly able to conduct non-technical survey, battle area clearance, and EOD. NPA additionally had three animal detection system teams with six handlers and six explosive detection dogs.⁸¹ NPA deploys drones for aerial mapping of both technical survey and battle area clearance (BAC) tasks.⁸²

LAND RELEASE OUTPUTS AND PROGRESS TOWARDS COMPLETION

LAND RELEASE OUTPUTS IN 2021

The CMAA reported release of a total of 24.43km² through survey and clearance in 2021, less than half the 58.56km² it recorded the previous year. Clearance accounted for almost 20.6km² of the total but survey operations in 2021 confirmed more hazardous area than operators released.⁸³

The CMAA also reported a sharp fall in the number of CMR destroyed from 8,181 in 2020 to a total of 4,268 in 2021, of which 1,893 was attributed to technical survey and clearance and 2,375 to EOD spot tasks.⁸⁴

SURVEY IN 2021

CMAC, MAG, and NPA surveyed a total of nearly 30km² in 2021 (see Table 3), an increase of one third of the previous year. In the process, they confirmed almost 28km² as hazardous area, 35% more than the area confirmed in 2020 but also more than the amount of land released in 2021.

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

73 Ibid., pp. 40-41. The dogs worked four hours a day in the morning while in the afternoon their handlers continued manual survey. A team of four dogs and four handlers on average cleared around twelve survey boxes a day, of which nine to ten boxes were surveyed by the dogs and the remaining two to three by the handlers.

74 Email from Michael Heiman, APOPO, 1 April 2022; and online interview with Tony Fernandes, MAG, 16 May 2022.

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

76 Emails from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 14 May 2021; and Oum Phumro, CMAC, 9 June 2021.

77 Emails from Alexey Kruk, MAG, 29 March 2021 and 16 May 2022.

78 Emails from Portia Stratton, NPA, 21 April 2021 and 19 April 2022.

79 Emails from Rune Dale-Andresen, NPA, 29 September 2020; and Oum Phumro, CMAC, 9 June 2021.

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

81 Emails from Portia Stratton, NPA, 19 April 2022 and from Sorn Samrithea, NPA 5 July 2022.

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

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

84 Ibid.

The CMAA recorded declines in all areas of land release but data suffered some inconsistencies with results reported by operators. The CMAA said no land was cancelled through non-technical survey in 2021 but operators reported cancelling 2.16km². MAG, which did not cancel any area in 2020 said it cancelled 0.61km² in 2021⁸⁵ and NPA said it cancelled 1.69km² in 2021, up from 0.07km² the previous year.⁸⁶ Persistently low levels of cancellation underscore the need for further discussion of national standards and criteria for cancellation. Current CMAS do not permit operators to cancel areas of polygons in which CMRS/CMTS has found no evidence of contamination.⁸⁷

The amount of area reduced through technical survey also fell by almost half in 2021, according to official data, dropping to 3.85km² from 7.5km² the previous year.⁸⁸ MAG confirmed it did not reduce any area in 2021 but NPA reported reducing almost 2.5km² in 2021 and said CMAC's Demining Unit 5 reduced 13.07km² through technical survey in 2021, which would raise the total reduced area for the year to nearly 16km².⁸⁹

Table 3: Cluster munition-contaminated area confirmed through technical survey in 2021 (CMAA data)⁹⁰

Operator	Area surveyed (m ²)	Area confirmed (m ²)
CMAC	25,385,444	23,845,164
MAG	2,858,364	2,858,364
NPA	1,210,976	1,210,976
Totals	29,454,784	27,914,504

Table 4: Cluster munition-contaminated area reduced through technical survey in 2021 (CMAA data)⁹¹

Operator	Area reduced through TS (m ²)
CMAC	3,251,782
NPA	598,339
Total	3,850,121

CLEARANCE IN 2021

Official data shows clearance of 20.58km² of cluster munition-contaminated area in 2021 (see Table 5), 33% less than the previous year and the lowest figure recorded in at least the last six years (see Table 6). Official data shows the biggest single factor in the downturn was that clearance by CMAC dropped by more than half to 12.69km² in 2021 from 26.16km² the previous year. The CMAA also recorded a slight drop in NPA's results to 0.57km² in 2021 from 1.11km² in 2020. Significant inconsistencies between official data and results reported by operators, however, suggest those figures may be subject to later revision.

NPA reported that the operations by CMAC's Demining Unit 5, which are mentored by NPA, cleared 16,573,882m² in 2021.⁹² MAG and NPA both reported higher levels of clearance in 2021 than the amount reported by the CMAA. MAG said it cleared 5,022,936m² in Rattanakiri province in 2021, 44% more than the previous year, and destroyed 942 submunitions. NPA reported that its teams cleared 1,033,778m² and destroyed 224 submunitions.⁹³

APOPO, working with the GICHD, conducted a two-month trial using technical survey dogs in CMRS in November and December 2020. In 2021, APOPO continued operating in Chaeb district of Preah Vihear province working for a period of eight months from January to August with a six-strong team, including four handlers with four dogs. In that time, the team surveyed 23 areas covering 3.4km², finding 328 submunitions and 98 other UXO. The CHAs the team created were subsequently cleared by CMAC manual teams.⁹⁴

85 Email from Alexey Kruk, MAG, 16 May 2022.

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

87 Emails from Tony Fernandes, MAG, 20 May 2022; and from Sron Samrithea, NPA, 5 July 2022.

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

89 Emails from Tony Fernandes, MAG, 22 May 2022, Portia Stratton, NPA, 19 April 2022 and from Sron Samrithea, NPA, and Daniel Dobb, Operations Manager, NPA, 5 July 2022.

90 Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022. MAG said it surveyed an area of 13.39km² and confirmed a total of 16.15km² as CMR-affected. The addition of fade-out boxes to the area physically surveyed accounted for the higher amount of area confirmed. Email from Tony Fernandes, MAG, 20 May 2022. NPA reported surveying an area of 4.07km² and confirming 3km². Email from Portia Stratton, NPA, 19 April 2022.

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

92 Email from Sron Samrithea and Daniel Dobb, NPA, 5 July 2022.

93 Emails from Tony Fernandes, MAG, 22 May 2022; and Portia Stratton, NPA, 19 April 2022.

94 Email from Michael Heiman, APOPO, 1 April 2022.

Table 5: CMR clearance in 2021 (CMAA data)⁹⁵

Operator	Area cleared (m ²)	Submunitions destroyed	Other UXO destroyed
CMAC	12,688,467	1,397	3,765
CSDH	807,437	23	41
MAG	4,001,699	406	804
NPA	566,023	67	84
NPMEC	2,513,769	0	1,804
EOD spot tasks (various operators)	0	2,375	N/A
Totals	20,577,395	4,268	6,498

N/A = Not applicable

PROGRESS TOWARDS COMPLETION

Cambodia gives priority to clearing anti-personnel mines but has committed in its National Mine Action Strategy to tackling 80% of its known CMR contamination by 2025. The remaining 20% would be considered as residual. At the time the strategy was released, that meant releasing 499km² or 62km² every year. The strategy expected to release 30% of this through cancellation and land reclamation and the remaining 70%, or 44km², through technical survey and clearance.⁹⁶ By the end of 2021, the 80% target meant releasing 559km² as a result of previously unrecorded CMR contamination that continues to be added to the database. To meet that target, Cambodia would have to release at least 140km² each year from 2022 to 2025, six times the amount of land released in 2021, and more than that if operators continue to identify more unrecorded hazardous areas.

Table 6: Five-year summary of CMR clearance

Year	Area cleared (km ²)
2021	20.58
2020	30.99
2019	25.23
2018	39.60
2017	23.50
Total	139.90

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. By the end of 2022, Cambodia planned to have developed a comprehensive strategy for dealing with residual threats, developed a legal and institutional framework and put in place a regulatory and operational framework, including planning and prioritisation procedures and arrangements for sustained information management. By 2025, Cambodia aimed to have prepared the capacity for residual threat management and developed resource mobilisation strategies.⁹⁷

Cambodia's 2019 APMB Article 5 deadline extension request said it is likely that the Royal Cambodian Army will be tasked with addressing explosive threats after 2025.⁹⁸ In February 2021, the CMAA and the GICHD began interviewing national and international operators and other relevant stakeholders, to discuss the topic of institutional and operational frameworks and capacity for addressing residual threat.⁹⁹

⁹⁵ Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 10 May 2022. MAG reported clearing 5.02km² and destroying 946 CMR as well as 136 other UXO. Email from Alexey Kruk, MAG, 16 May 2022. NPA reported an increase in its clearance from 0.95km² in 2020 to 1.03km² in 2021, when it recorded destroying 958 submunitions. Email from Portia Stratton, NPA, 19 April 2022.

⁹⁶ National Mine Action Strategy 2018–2025, pp. 9–10.

⁹⁷ *Ibid.*, p. 16.

⁹⁸ APMB Article 5 deadline Extension Request, Additional Information, undated but August 2019, p. 5.

⁹⁹ Email from Ros Sophal, on behalf of Prum Sophakmonkol, CMAA, 14 May 2021.