



CMAA

Organisational briefs on lessons learned in survey

**Cluster Munition Remnant Survey Workshop
Washington D.C, 09 June 2017**



Presentation Outline

I. Mine/ERW History in Cambodia

II. Operational Intervention

1. CMAA key role
2. Baseline Survey
3. Land Release
4. Quality Management (QA+QC)
5. Planning and Prioritization
6. Information Management

III. Challenges

IV. Lessons learned

V. How we address



I. Mine/ERW History in Cambodia

Cambodia's landmine problem is the result of a protracted sequence of internal end of 1998. The nature of landmine and explosive remnants of war (ERW) contamination in Cambodia is highly complex.

The north-western regions bordering Thailand are heavily affected by landmines, while other parts of the country (mainly the East) are considered moderate to low impact, affected mainly by ERW.

From 1979 to Feb 2017, a total of 64,681 mine/ERW casualties were recorded in IMSMAng



1940's	1950's	1960's	1970's	1980's	1990's
World War II Colonial rule and struggle for independence	Peace and independence	US-Indochina wars and heavy bombing started	Heavy bombing continued	Ground battles and use of Landmines	Limited ground battles and use of landmines
ERW		ERW (heavy) Some landmines	ERW (heavy) Some landmines	Heavy use of landmines Scattered ERW	Use of landmines Scattered ERW ₃



I. Mine/ERW History in Cambodia

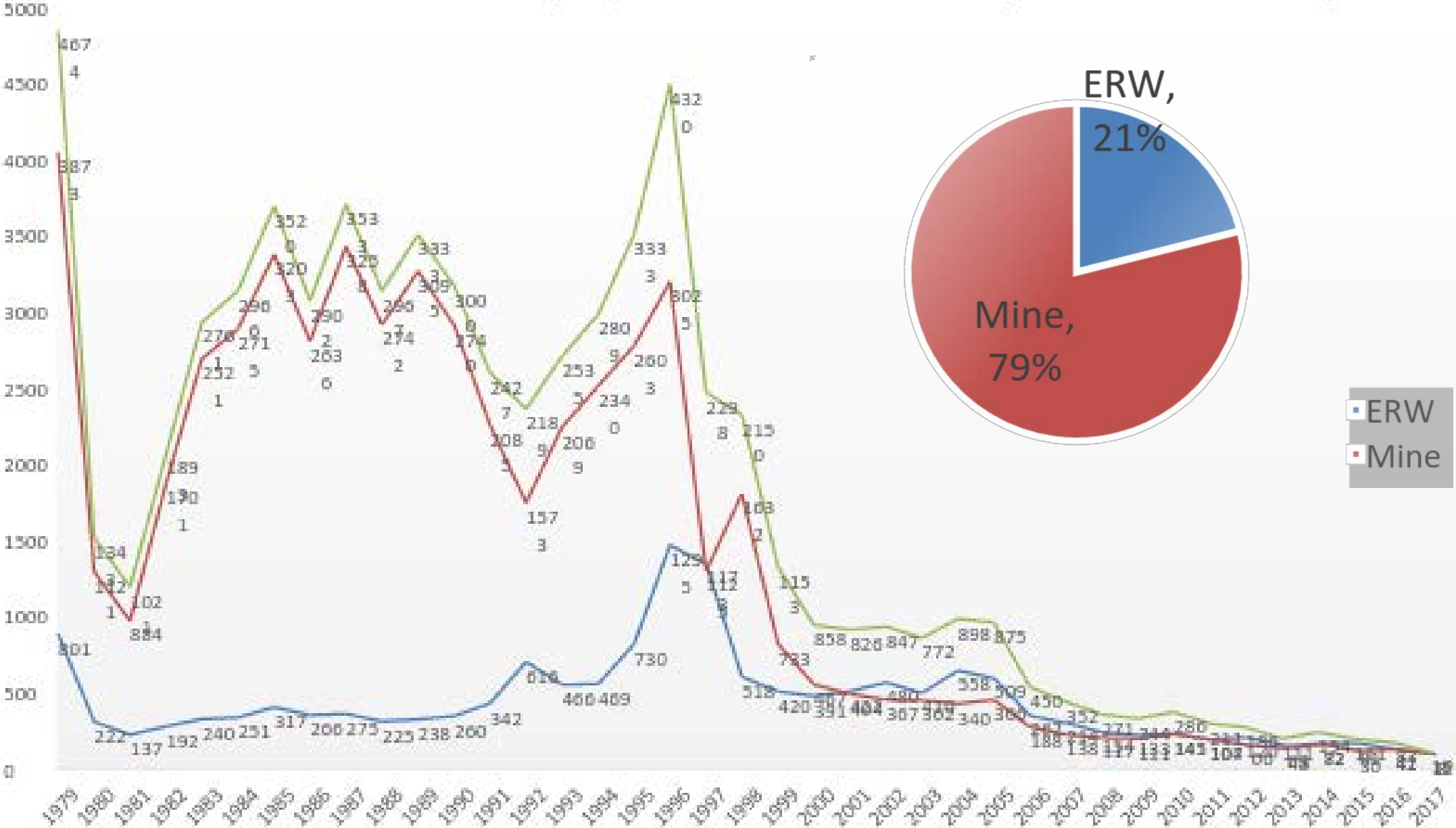
During these conflicts, many kind of landmines were laid year after year to establish their respective defensive bases and offensive tactic & ERW left.





I. Mine/ERW History in Cambodia

Mine/ERW Casualty by Years 1979-Feb2017 (64,681 casualties)

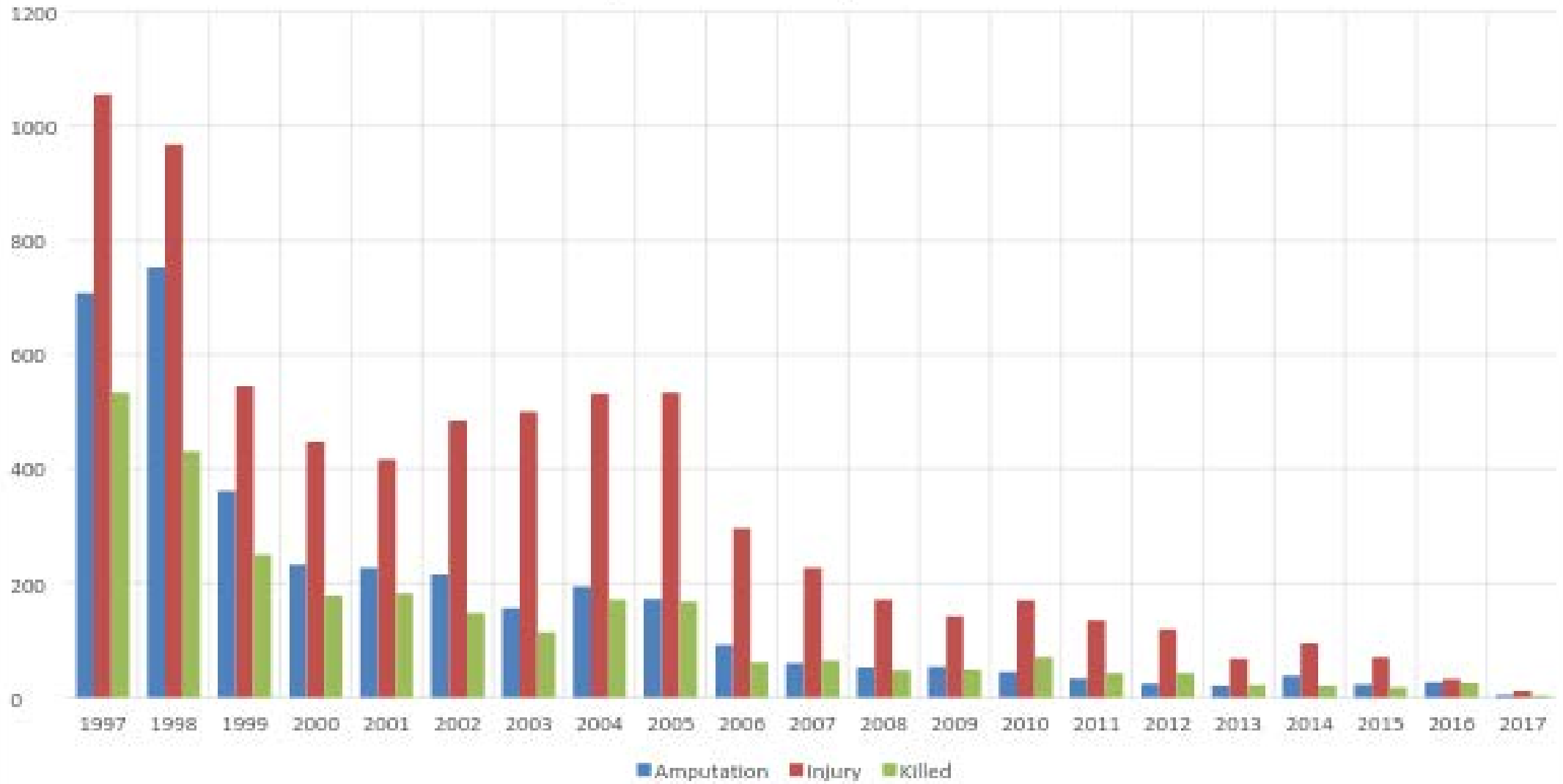




I. Mine/ERW History in Cambodia

គណៈកម្មាធិការ
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Mine/ERW Casualty 1997-2017





II. OPERATIONAL INTERVENTION

1. CMAA key roles

- The Cambodian Mine Action and Victim Assistance Authority (CMAA) is responsible for coordinating, monitoring and regulating the mine action sector in Cambodia.
- It was established in 2000, and continues to play a critical role in combatting the negative impact of landmines and ERW in Cambodia.
- The CMAA work across all four pillars of mine action (clearance, mine risk education, victim assistance and advocacy)
- The CMAA has a long history of successful work in all areas of mine action, including victim assistance, clearance, mine risk education and advocacy.



II. OPERATIONAL INTERVENTION

2. Baseline Survey

CMAA department of Regulation and Monitoring (R&M) is an indispensable component of quality management in landmine and ERW clearance through adopting the Cambodian Mine Action Standard (CMAS) for guiding international and national operators to comply with accordingly towards land safety assurance.

Why we need BLS?

- Identifying priority tasks of clearance for MA actors.
- Easing mine clearance planning & prioritization process.
- Superseding the 2002's L1S results no longer present the real situation of its mine/ERW problems.
- Providing the real situation to donors for its ER
- Responding to NSDP & CMDGs
- Allowing better targeting mine action resources.



Under Clearing For Results Project, BLS started in August 2009 and completed 124 targeted districts by the end of 2012 which was divided and conducted in 3 phases:

1. The 23 most mine affected districts
2. The 42 mine affected districts
3. The 59 lower mine/ERW affected districts.





Land Classification Standard (result of BLS)

CLASSIFICATION	SUB-CLASSIFICATION
A: Mined Area Land that presents evidence of mines	A1 Land containing dense concentration of AP mines
	A2.1 Land containing mixed dense AP and AT mines
	A2.2 Land containing mixed scattered AP and AT mines
	A3 Land containing AT mines
	A4 Land containing scattered or nuisance presence of AP mines
B: Residual Threat Land Land that presents evidence of ERW or an indeterminate presence of mines	B1 Land containing ERW (not including mines)
	B1.1 Land containing aircraft bomb
	B1.2 Land containing cluster munitions/bombies
	B1.3 Location of Ground Battles
	B1.4 Land containing stockpiles/caches
	B1.5 Abandoned military compounds
B2 Land with no verifiable mine threat	
C: End State Land Land that presents no obvious threat	C1 Cancelled / Reclaimed Land
	C2 Land Reduced through Technical Survey
	C3 Cleared Land



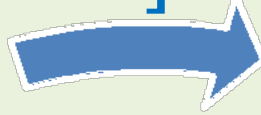
II. OPERATIONAL INTERVENTION

2. Baseline Survey

S ឆ្នាំ បំផុត ប្រតិបត្តិ BLS



Move to next village



Desk Survey - Information gathering



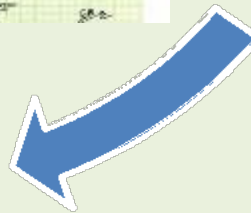
Complete survey of all identified target areas within village boundaries



Meet with village chiefs or representatives



Field Survey - Conduct of survey



Phase of BLS Districts



ព្រះរាជាណាចក្រកម្ពុជា
C.M.A.A



Capacity Building and Technical Assistance
of CMAA DBU, Funded by Ministry of Foreign
Affairs of Norway through Norwegian People's Aid (NPA)



Scale 1:650,000



LEGEND

- Province Centres
- Phase I
- Phase II
- Phase III
- District Boundary
- Province Boundary
- National Boundary

Disclaimer

This map was produced at the CMAA Office in Phnom Penh.
The map is not to be used for navigation.
If you have any questions, please contact:
CMAA, general assistance in Phnom Penh

Address: Corner Street 273 & 275, Boeung Kerk Village,
Toul Sangkar Quarter, Pnony Penh District,
Phnom Penh

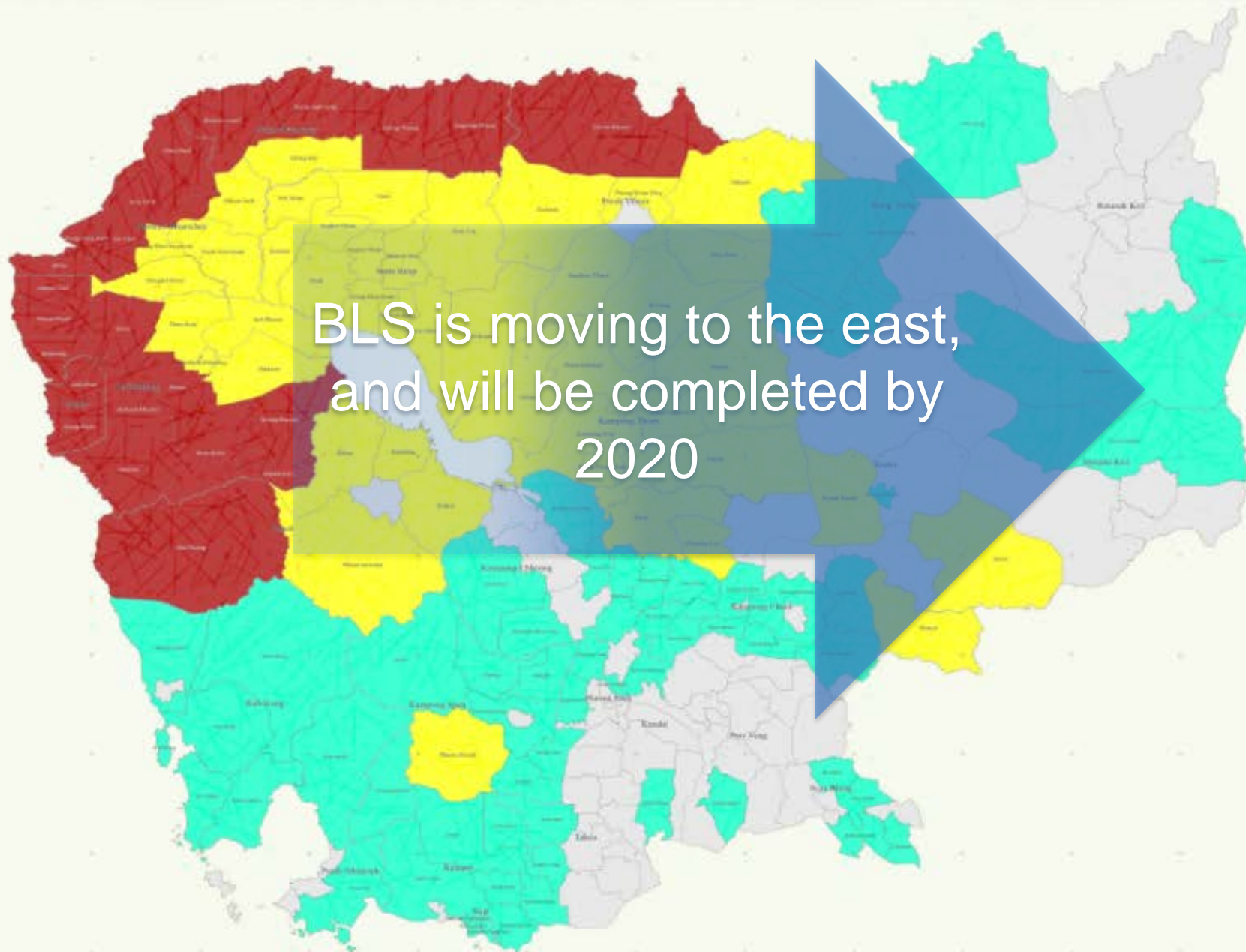
Phone: +855 23 880 482
Email: info@cmacps.org.kh

April 2015

Cambodia



BLS is moving to the east,
and will be completed by
2020





II. OPERATIONAL INTERVENTION

3. Land Release

• From Area Reduction Policy → Land Release Policy

Why?

- To **accelerate** the release of land in support of Extension Request targets
- To **increase** the release of land in support of development
- To use resources more **efficiently** onto hazard areas

What?

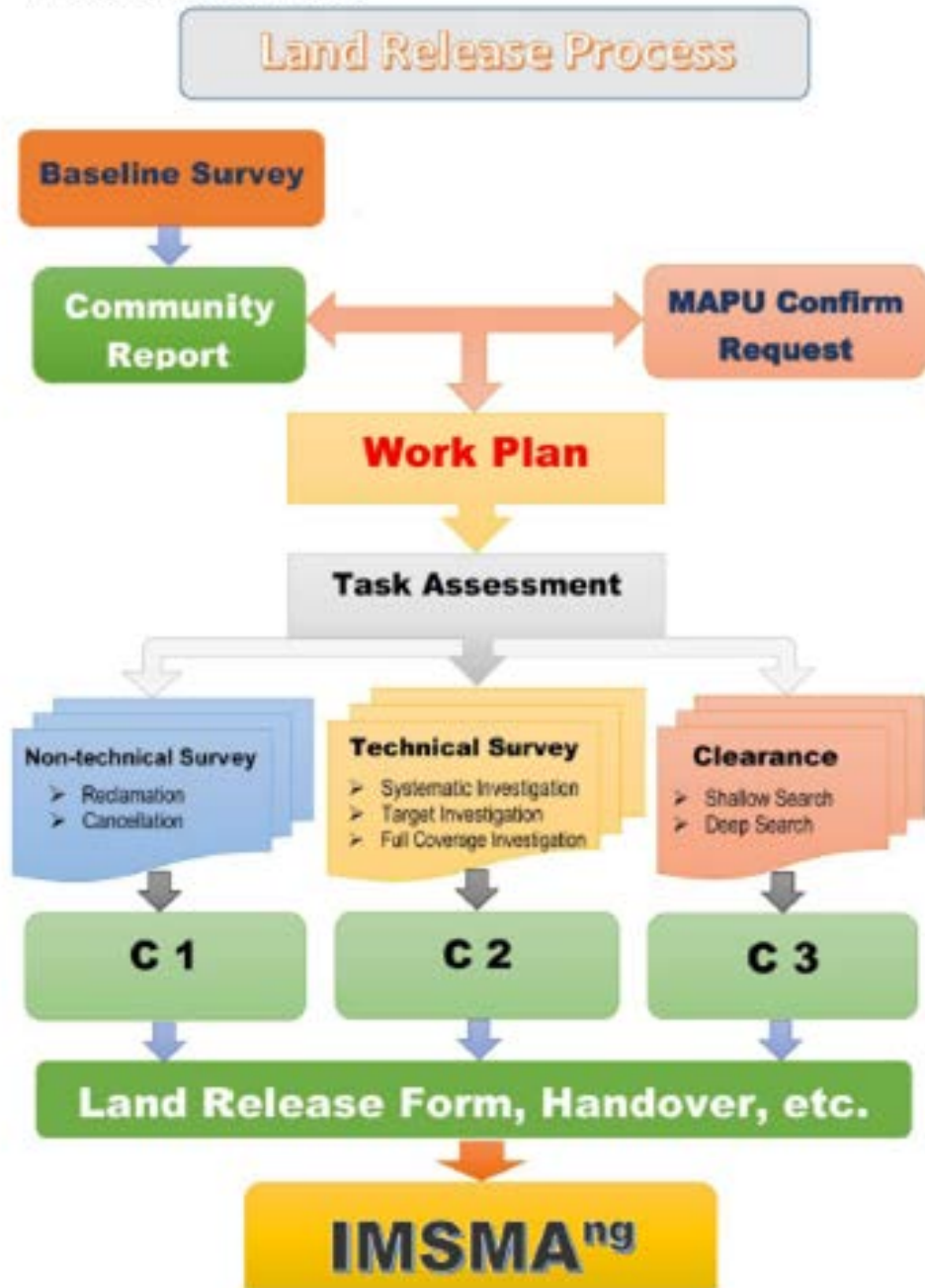
- Process of reclassifying the status of known or suspected mined areas to end state land.

How?

- Land is released from the suspicion of mines/ERW through:
 - 1- Non-Technical Survey
 - 2- Technical Survey
 - 3- Clearance

Annex B: Land Release Process

Annex B: Land Release Process



Note: If during clearance demining assets are failing to identify mines, the methodology shall be reviewed and the polygon subjected to further technical survey in order to confirm the presence of any further hazard or release land as appropriate. As a guide fade out should be 25 meters from the last identified mine.

Annex I "Guide on Application of ERW Land Release Techniques"

BLS Land Classification	LR Methodology	LR Technique	Criteria	End State Land
B1.1 (Land containing aircraft bomb)	NTS	Land cancellation	Applicable to areas where subsequent non-technical survey established that there is no evidence of a hazard. Wrong survey	C1
	TS	Targeted Investigation / EOD Spot Task	Applicable to area where subsequent non-technical survey/task assessment established that there is evidence of a hazard. (Size of hazardous area should be captured and cleared 25m X 25m), but if air craft bombs were dropped as pattern/berries and repeated then it shall be captured as polygon	C2
	Clearance	Clearance	Applicable to areas where aircraft bombs were dropped as pattern and repeated. Clearance refer to CMAS 07	C3
B1.2 (Land containing cluster munitions/ bombs)	NTS	Land cancellation	Cancelled land is previously suspected land that has been incorrectly surveyed and where subsequent non technical survey has established that there is no evidence of a hazard	C1
		Land reclamation	Applicable to area that has been ploughed by rotator/ iron buffalo for at least 3 times without any accident or evidence of submunition presence.	
	TS	Systematic investigation	Applicable to areas where submunition presence cannot be determined by non-technical survey/task assessment.	C2
	Clearance	Clearance	Applicable to area where C-IA is determined. Clearance refer to CMAS 07.	C3
B1.3 (Location of Ground Battles)	NTS	Land cancellation	Applicable to areas where subsequent non-technical survey established that there is no evidence of a hazard.	C1
		Land reclamation	Applicable to areas that have been ploughed by heavy tractors for at least 3 times without accident or evidence of ERW presence	
	TS	Target investigation	Applicable to areas where likely be ERW in some spots are discovered by non-technical survey/task assessment.	C2
		Systematic investigation	Applicable to areas where some concerns on submunitions presence are discovered by non-technical survey/task assessment.	
	Clearance	Clearance	Applicable to area where the evidence of ERW presence can be determined. Clearance refer to CMAS 07.	C3
B1.4 (Land containing stockpiles/caches)	Clearance	Clearance	Applicable to area where the land containing stockpiles/caches can be determined.	C3
B1.5 (Abandoned military compounds)	NTS	Land cancellation	Applicable to areas where subsequent non-technical survey established that there is no evidence of a hazard.	C1
		Land reclamation	Applicable to areas that have been ploughed by rotator/heavy tractors for at least 3 times without accident or evidence of ERW presence	
	TS	Systematic investigation	Not applicable	
	Clearance	Clearance	Applicable to area where the evidence of ERW presence can be determined. Clearance refer to CMAS 07.	C3

Definitions of technical terms used in this Guide:

Terms	Suggestion
Cancelled Land	Cancelled land is previously suspected land that has been incorrectly surveyed and where subsequent non-technical survey has established that there is no evidence of a hazard
Reclaimed Land	Reclaimed land is previously suspected land that has been put back into productive use involving ground-intrusive activity and ploughed a minimum of three times without accident or evidence of ERW.

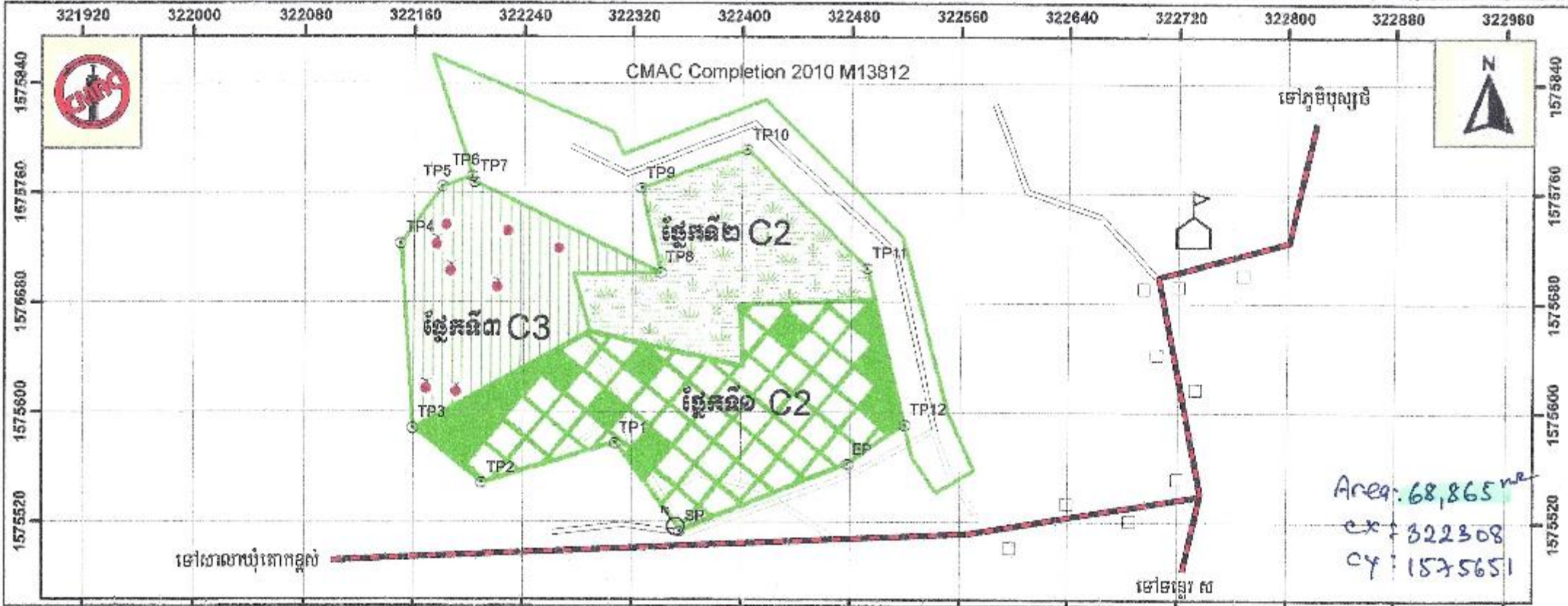
B1.2 (Land containing cluster munitions/ bombs)	NTS	Land Cancellation	Cancelled land is previously suspected land that has been incorrectly surveyed and where subsequent non-technical survey has established that there is no evidence of a hazard.	C1
		Land Reclamation	Applicable to area that has been ploughed by rotivator/ iron buffalo for at least 3 times without any accident or evidence of submunition presence.	
	TS	Systematic investigation	Applicable to areas where submunition presence cannot be determined by non-technical survey/task assessment.	C2
	Clearance	Clearance	Applicable to area where CHA is determined. Clearance refer to CMAS 07.	C3

National technical directive

- ERW as polygon (B1.2), the size is not over 30 ha (Repeated and pattern drops of bombs)
- ERW as point (B1.1), the size is by 25m x 25m (One spot/single target of bomb)



ប្លង់បញ្ជូនការកាត់បន្ថយដីបង្ការមីន BS/CMAA/01413 ភូមិត្រពាំងស្នួន ឃុំគោកខ្ពស់



ផ្នែកទី១

ព័ត៌មានសង្ខេប:
 ភូមិសាស្ត្រ: ព្រៃរាបរាង
 កម្លាំង: កង ១៤៧
 ផ្ទៃដីសរុប: ៣៣៤០០ ម^២
 រយៈពេលប្រតិបត្តិការ: ៧ ខែ
 កំរិតគ្រោះកម្លាំង: NM2
 វិធីសាស្ត្រកាត់បន្ថយ:
 ប្រព័ន្ធបញ្ជាត្រួតពិនិត្យ:
 ៣០០៣៧៧ = ១០០២០ ម^២
 បើកផ្លូវប្រកប = ៥៧៧២៦ ម^២
 ចោលសំអាតប្រកប = ៤២៨៤៦ ម^២

ផ្នែកទី២

ព័ត៌មានសង្ខេប:
 ភូមិសាស្ត្រ: កណ្តាប់
 កម្លាំង: កង ១៤៧
 ផ្ទៃដីសរុប: ១៧៧៩៣ ម^២
 រយៈពេលប្រតិបត្តិការ: ៥ ខែ
 កំរិតគ្រោះកម្លាំង: PM3
 វិធីសាស្ត្រកាត់បន្ថយ:
 ពិនិត្យរដ្ឋធានាស្រុក

ផ្នែកទី៣

ព័ត៌មានសង្ខេប:
 ភូមិសាស្ត្រ: ព្រៃរាបរាង
 កម្លាំង: កង ១៤៧
 ផ្ទៃដីសរុប: ១៧៦៣៤ ម^២
 រយៈពេលប្រតិបត្តិការ: ៧ ខែ
 កំរិតគ្រោះកម្លាំង: PM1
 វិធីសាស្ត្រកាត់បន្ថយ:
 ចោលសំអាតប្រកប ១០០៣៧៧

Start point

UTX: 322355E

UTM: 1575514N

Full Clearance;

Full Coverage inspection;

Systematic;

CMAC Completion;

Found Mine; 4

Found UXO: 3

SCALE:

1/ 4000 1mm-4m. 1cm = 40 m

Date : 26 /08 /2014

Area: 6,8864 m²

Position: TSO

Map sheet; 5637-2

Prepare By;

UTM/UPS Zone 48P

INDIAN 1960

Name: Im sara



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II. OPERATIONAL INTERVENTION

3. Land Release

Land Release Methodology

NON TECHNICAL SURVEY



Area cancelled in
Sqm

TECHNICAL SURVEY

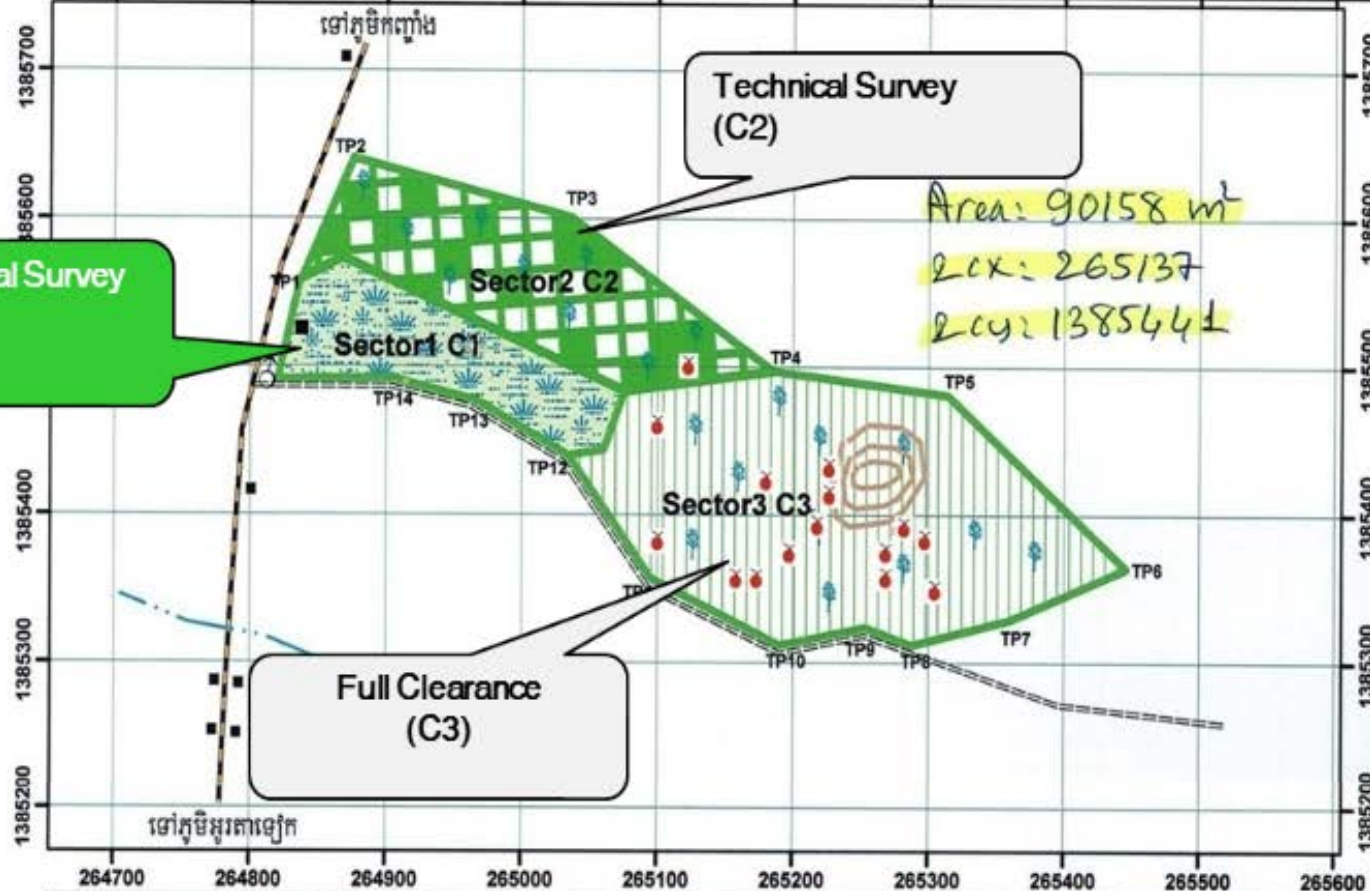


Area reduced in
Sqm

CLEARANCE



Area cleared in
Sqm



និមិត្តសញ្ញា

- ដីកាត់បន្ថយរួច
- ចំនុចចាប់ផ្តើម
- មិន និង ក្រាប់
- ជួរវែងក្រហម
- ជួរវែងខ្មៅ
- ផ្ទះ
- រោង
- ដើមឈើ
- ចំការដំណាំ
- អូរ

ផ្ទៃដីរួប = 90158 m²

Non- Technical Survey (C1)

Technical Survey (C2)

Full Clearance (C3)

Area: 90158 m²
 Lox: 265137
 Lcy: 1385441

ផ្នែកទី១	ផ្នែកទី២	ផ្នែកទី៣	លក្ខណៈទូទៅ
ភូមិសាស្ត្រ ចំការដំណាំ ផ្ទៃដីសរុប = 14843 m ² ពង្រាយកម្លាំង QA/QC រយៈពេលប្រតិបត្តិការ 01 ថ្ងៃ ចំណាត់ប្រភេទមិនបច្ចេកទេស NM1 វិភាគបច្ចេកទេស ពិនិត្យអង្កេតទាំងស្រុង 100%	ភូមិសាស្ត្រ ព្រៃនិងព្រិច ផ្ទៃដីសរុប = 24245 m ² ពង្រាយកម្លាំង BC # 23 រយៈពេលប្រតិបត្តិការ 05 ថ្ងៃ ចំណាត់ប្រភេទមិនបច្ចេកទេស PM3 វិភាគបច្ចេកទេស ច្រូតពិនិត្យជាប្រព័ន្ធ 45% = 10910 m ² ផែកផ្ទុវ = 5494 m ² ផែកប្រអប់ = 5416 m ²	ភូមិសាស្ត្រ ព្រៃនិងព្រិច ផ្ទៃដីសរុប = 51070 m ² ពង្រាយកម្លាំង BC # 23 រយៈពេលប្រតិបត្តិការ 20 ថ្ងៃ ចំណាត់ប្រភេទមិនបច្ចេកទេស PM1 វិភាគបច្ចេកទេស ចោលសំអាតទាំងស្រុង 100% ផ្ទៃដីដោះ = 51070 m ²	លក្ខណៈទូទៅ 1 / 5000 Map sheet 5534 II SP Gr : 264820E/1385491N Indean 60/Zone 48N 31-08-2012 រៀបចំដោយ DU 2 TSO ថេន ថេន



Land Release Implementation



Land Release in Cambodia shall be applied:

- A formal well documented and recorded process for investigation;
- Well defined and objective criteria for the reclassification of land;
- An external Quality Management process implemented by CMAA
- A high degree of community involvement and acceptance of decision making;
- A formal process of handover of land prior to the release of land;
- An on-going monitoring mechanism after the handover has taken place.



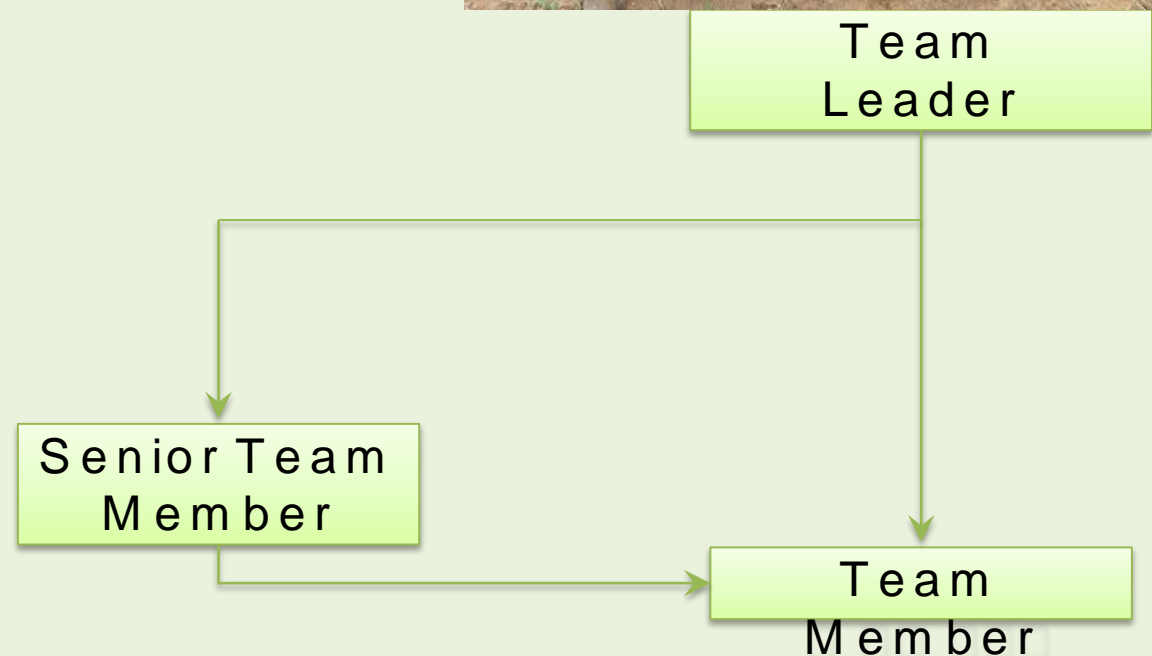
II. OPERATIONAL INTERVENTION

4. Quality Management (QA+Q)



Role and Responsibility of QM Teams

- Monitor NTS/TS implemented by operators
- Monitor all mine/UXO clearances by all operators
- Monitor land after cleared
- Investigate mine/UXO accident
- Attend Handover process





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II. OPERATIONAL INTERVENTION

4. Quality Management (QA+QC)

Quality Management = Quality Assurance + Quality Control
Equipment of QM Team





QMT-04

QMT-05

QMT-06

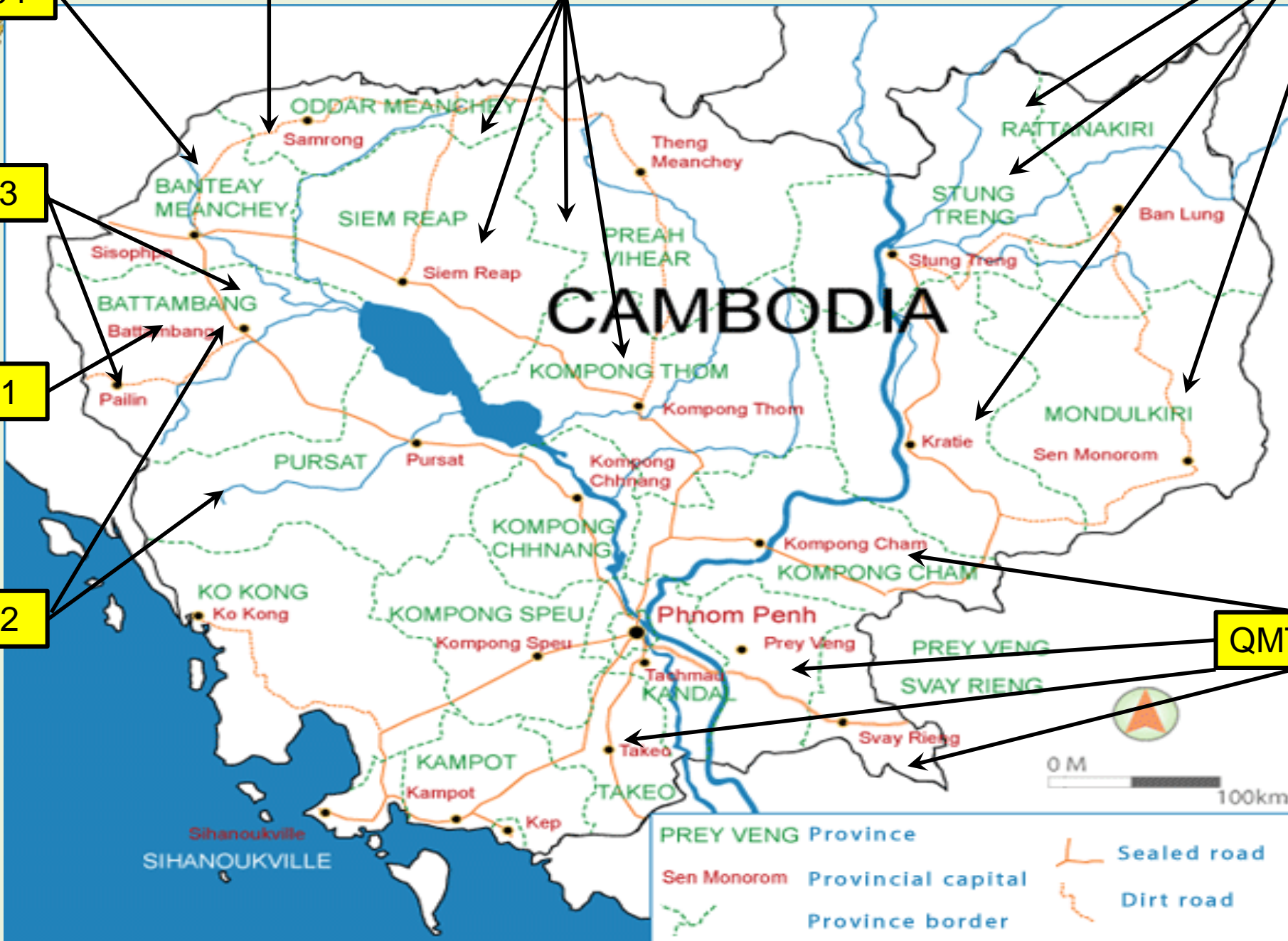
QMT-08

QMT-03

QMT-01

QMT-02

QMT-07



CAMBODIA

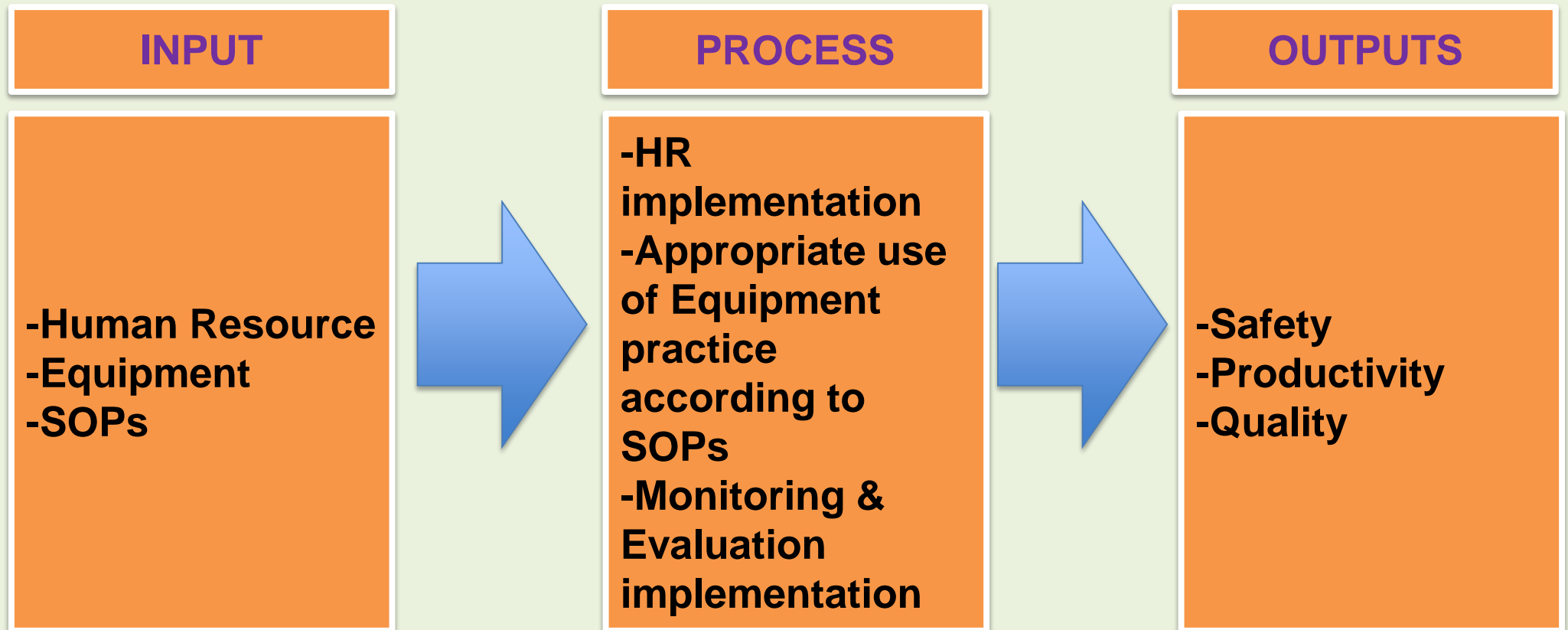
	Province border		Sealed road
	Provincial capital		Dirt road



II. OPERATIONAL INTERVENTION

4. Quality Management (QA+QC)

The process of quality assurance inspection





II. OPERATIONAL INTERVENTION

4. Quality Management (QA+QC)

Why we need QM Teams?

- To ensure that all mine/UXO clearances performed safety
- To ensure that the lands cleared were safety
- Build more confident for land user
- Build more confident for donors

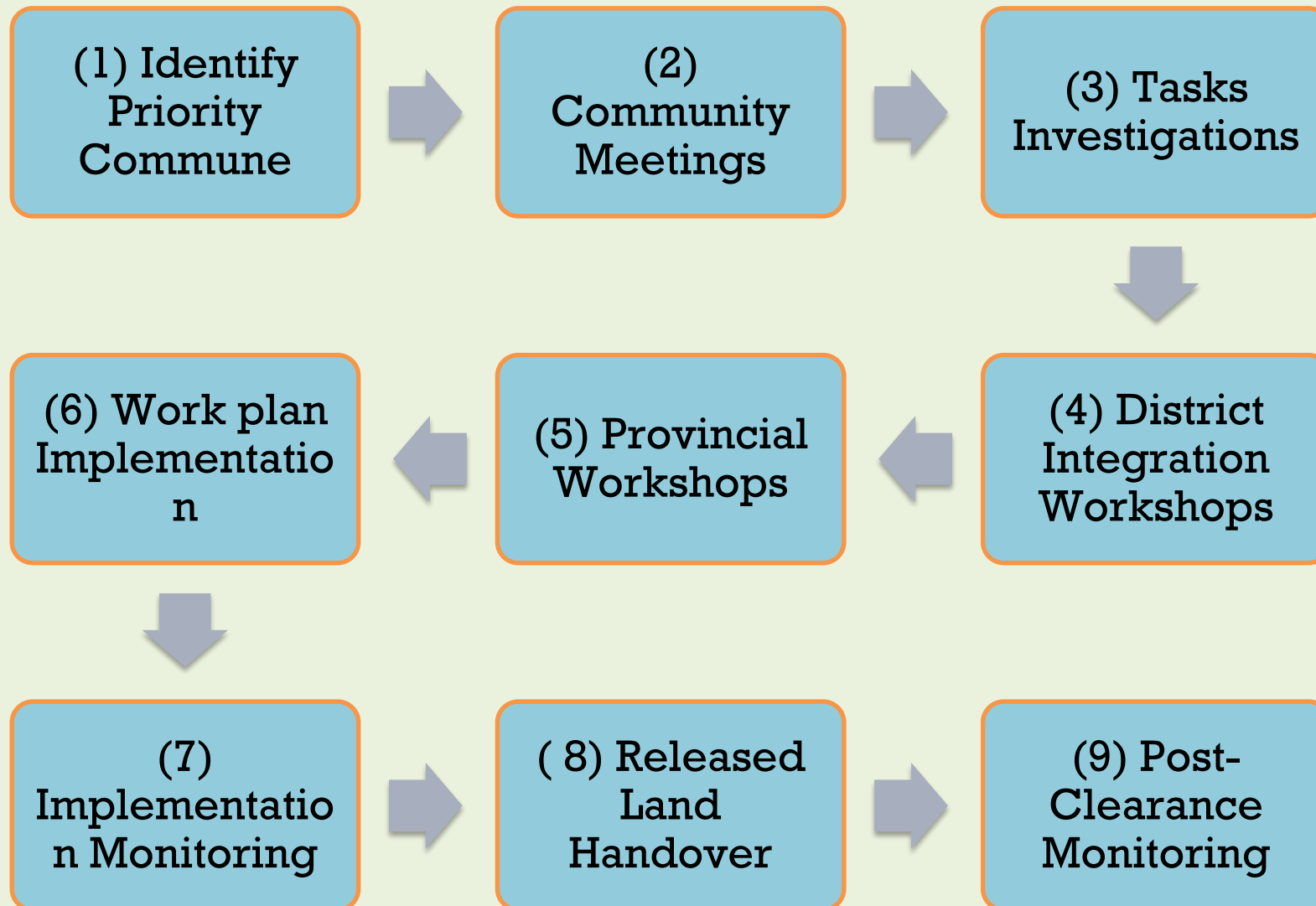




II. OPERATIONAL INTERVENTION

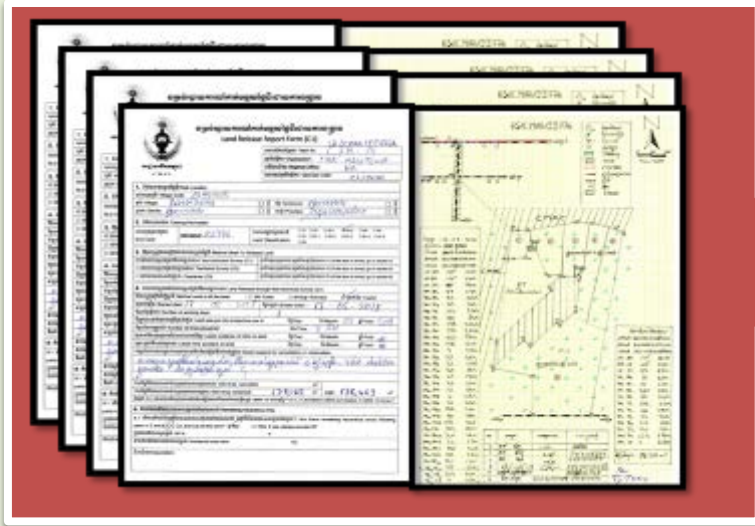
5. Planning and Prioritization

Policy Guidelines and Operation Guidelines on Socio-Economic Management of Mine Clearance Operations (Planning & Prioritization Guidelines)





The Baseline Survey results are the effective tools for the planning and prioritization of clearance.



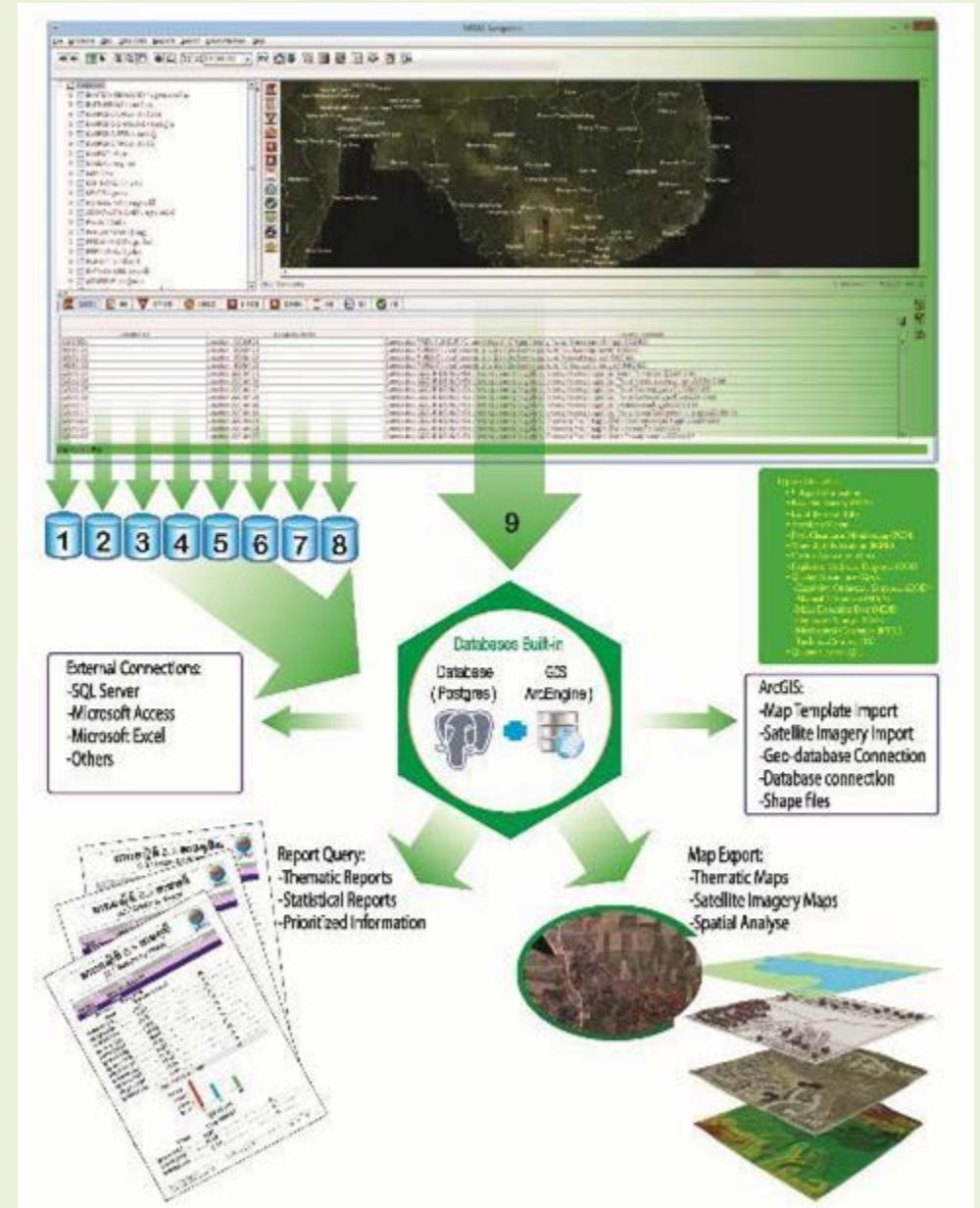


II. OPERATIONAL INTERVENTION

6. Information Management (IM)

IMSMA system is considered as the National Database System For Mine Action since the successful testing and implementing fully in 2015.

CMAA DBU is tasked to collect, store, maintain, and analyse data for supporting to planning and periodization, operational strategy, decision making, especially reporting to government and international report obligation.





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II. OPERATIONAL INTERVENTION

6. Information Management (IM)

Types of datasets:

- Village Information
- Baseline Survey (BLS)
- Land Release (LR)
- Accident/Victim
- Post Clearance Monitoring (PCM)
- Mine Risk Education (MRE)
- Victim Assistance (VA)
- Explosive Ordnance Disposal (EOD)
- Quality Assurance (QA):
 - Explosive Ordnance Disposal (EOD)
 - Manual Clearance (MAN)
 - Mine Detecting Dog (MDD)
 - Explosive Storage (EXS)
 - Mechanical Clearance (MEC)
 - Technical Survey (TS)
- Quality Check (QC)

Location ID	Location Name	Location Description	Entry Date	Last Updated Date
LOC-02	LOC-02 BMC		2008/02/14 04:24	2008/02/14 03:39
LOC-01	BMC-01		2008/02/14 22:32	2008/02/14 22:21
LOC-001	Vyat Chas (BTM)		2008/02/10 20:32	2008/02/10 20:50
LOC-Completion-KH-103914	LOC-Completion-KH-103914		2004/03/03 12:23	2008/01/11 20:48
LOC-Accident-KH-1121	LOC-Accident-KH-1121		2007/09/20 09:16	2008/01/11 20:48
Naka Chhs-MF-2540	LOC-MF-KH-2540		2004/02/06 16:18	2008/01/11 20:48
Yeang Dangkou-DA-100080	LOC-DA-KH-100080		2004/01/20 14:12	2008/01/11 20:48
LOC-Completion-KH-104356	LOC-Completion-KH-104356		2004/03/03 12:23	2008/01/11 20:48
LOC-Completion-KH-103384	LOC-Completion-KH-103384		2004/03/03 12:23	2008/01/11 20:48
LOC-Accident-KH-3097	LOC-Accident-KH-3097		2008/01/11 20:48	2008/01/11 20:48

IMSMA Accident Summary Report 03/22/2008

Grouped by Country Structure
Area: Country: Cambodia
Province: Banteay Mean Chey

Time Frame
Total Accidents: 226
Total Victims: 1003

Map Summary

By Country Structure

Banteay Mean Chey/Serei Saophoan/Tuek Thla/Tuek Thla

Location ID	Accident ID	Date	Victim	Killed	Injured	Unknown
LOC-Accident-KH-150	INCAC-KH-150	27 Apr 2000	1	0	1	0
LOC-Accident-KH-151	INCAC-KH-151	27 Apr 2000	1	0	1	0
LOC-Accident-KH-295	INCAC-KH-295	16 Mar 2000	1	0	1	0
LOC-Accident-KH-298	INCAC-KH-298	16 Mar 2000	1	0	1	0
Total			4	0	4	0

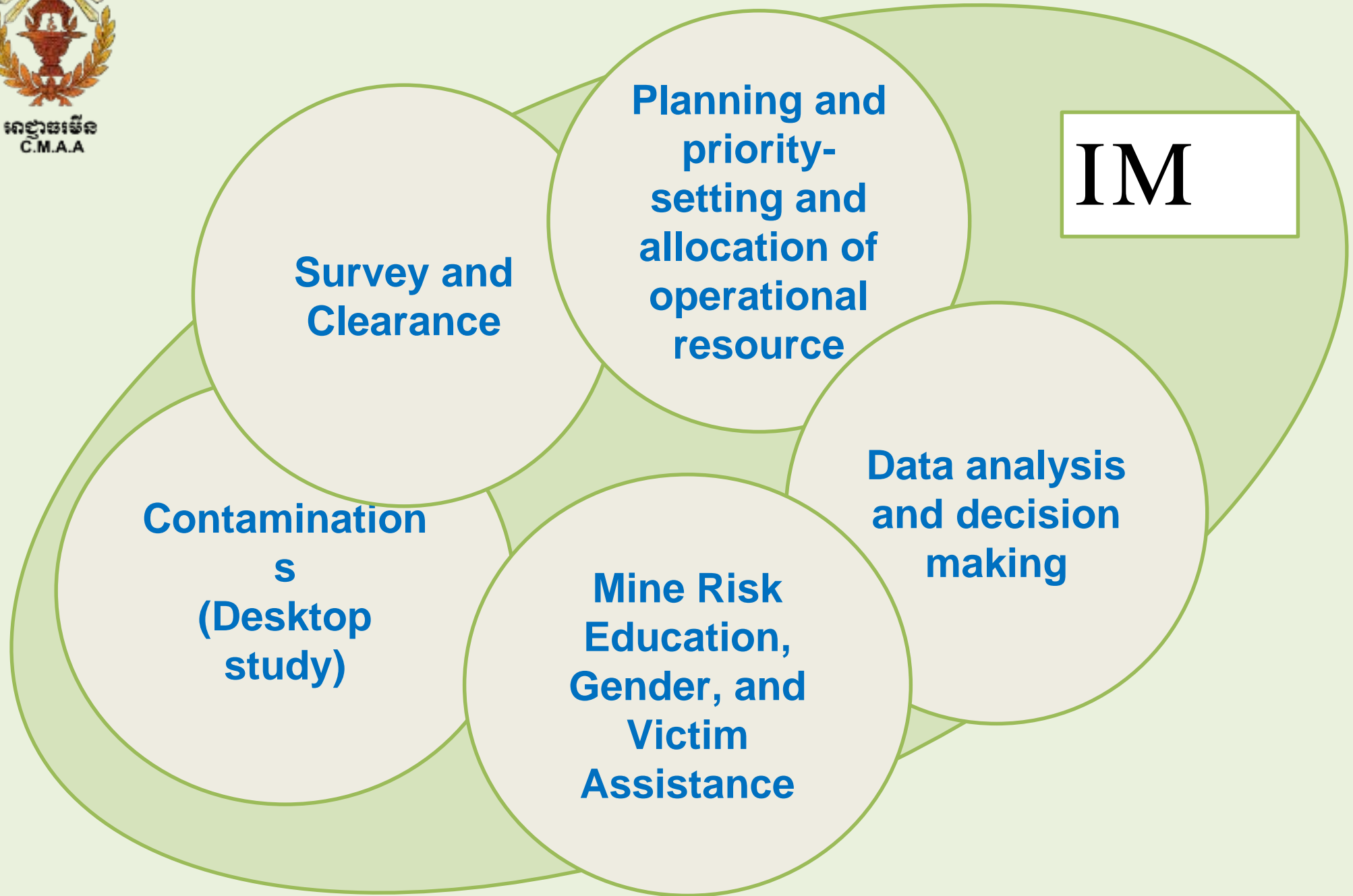
Banteay Mean Chey/Preah Netr Preah/Phnum Lieb/Tro Louk Tboung

Location ID	Accident ID	Date	Victim	Killed	Injured	Unknown
LOC-Accident-KH-3445	INCAC-KH-3445	29 Apr 2005	1	0	1	0
Total			1	0	1	0

Banteay Mean Chey/Preah Netr Preah/Tuek Chour/Svay La

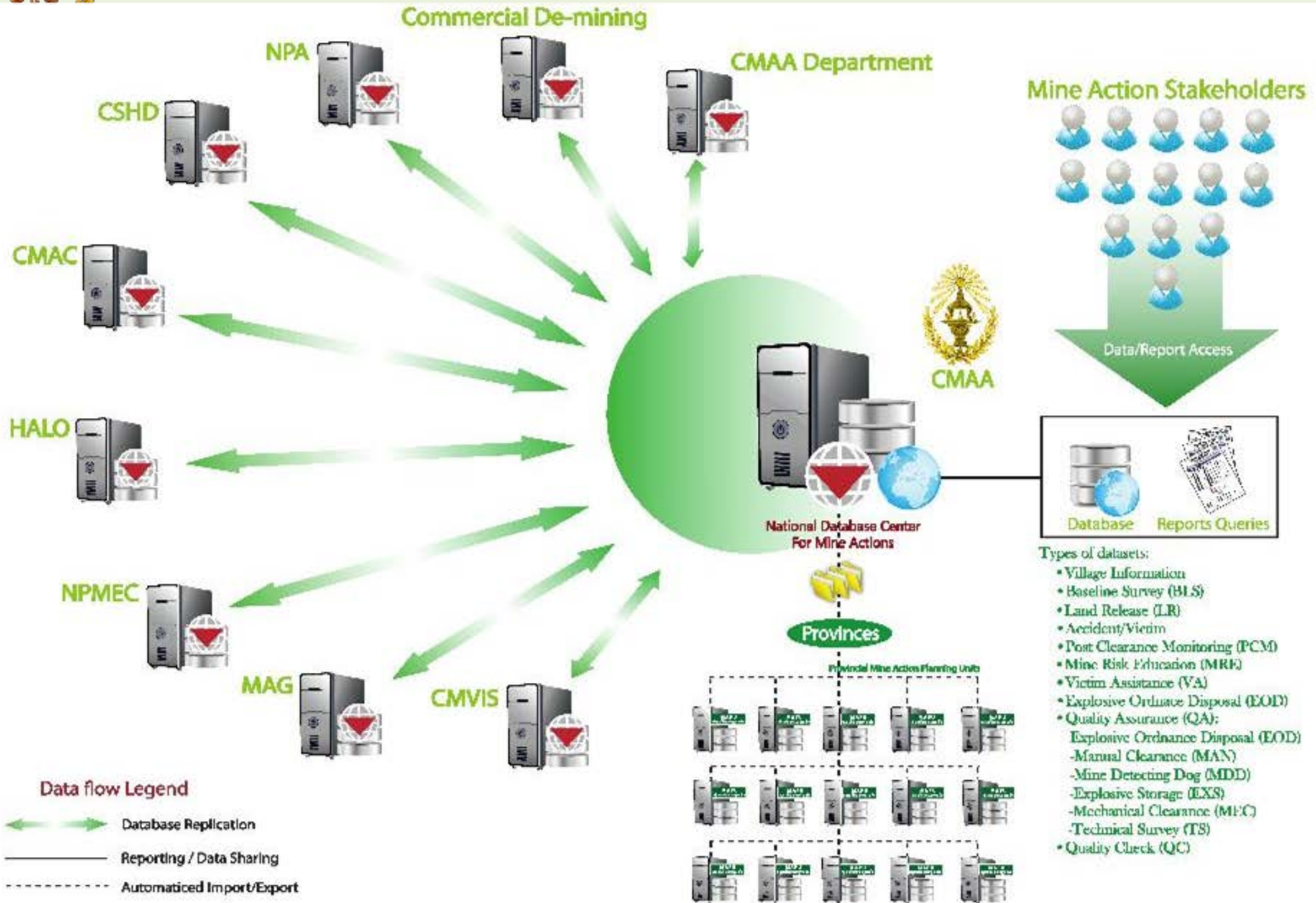
Location ID	Accident ID	Date	Victim	Killed	Injured	Unknown
LOC-Accident-KH-1144	INCAC-KH-1144	22 Jun 2001	2	0	2	0
Total			2	0	2	0

Why IM is important for Mine Action in Cambodia?





Current Data Flow Structure



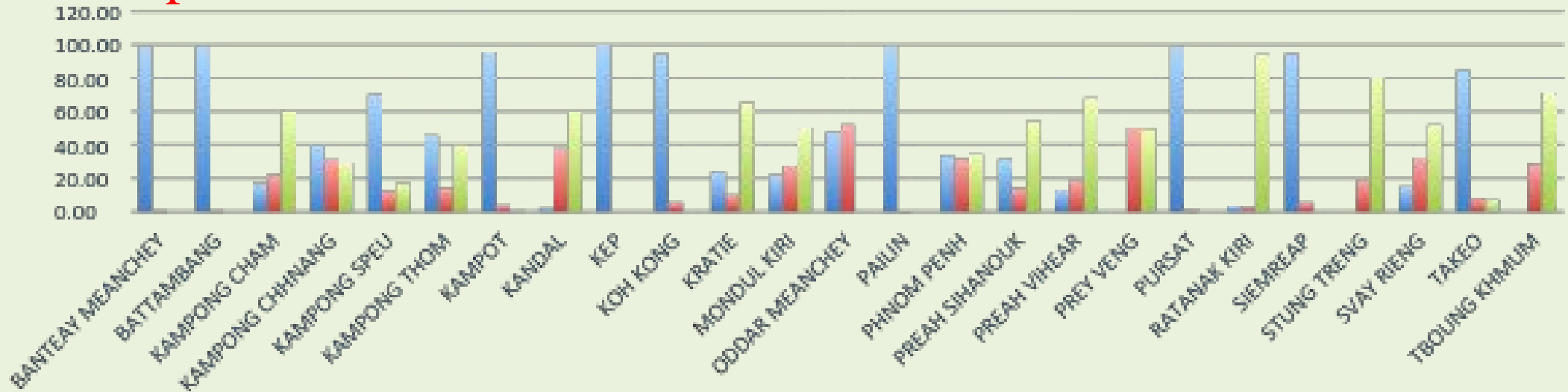


II. OPERATIONAL INTERVENTION

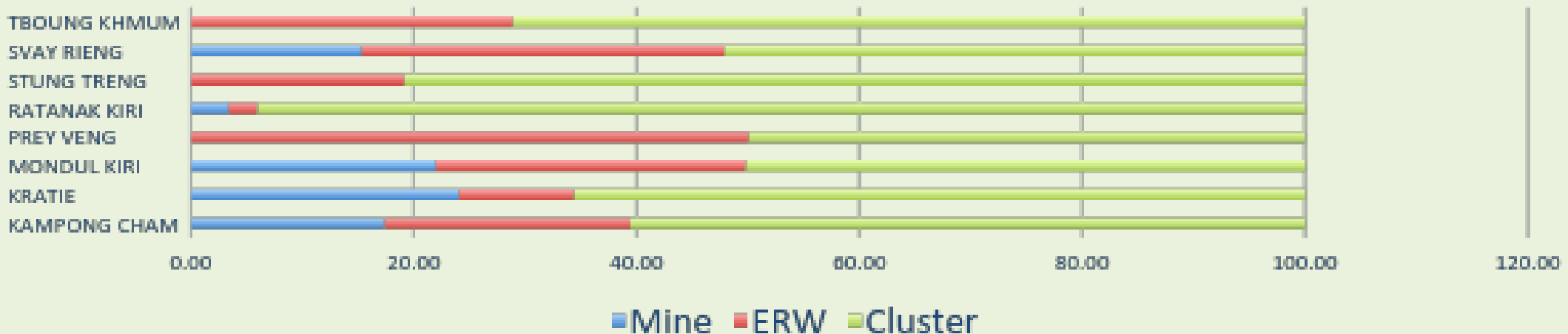
6. Information Management (IM)

IM Products showing type of contamination by provinces.

Percentage of Current Contamination (2009-Apr2017)



Percentage of Current Contamination (2009-Apr2017)

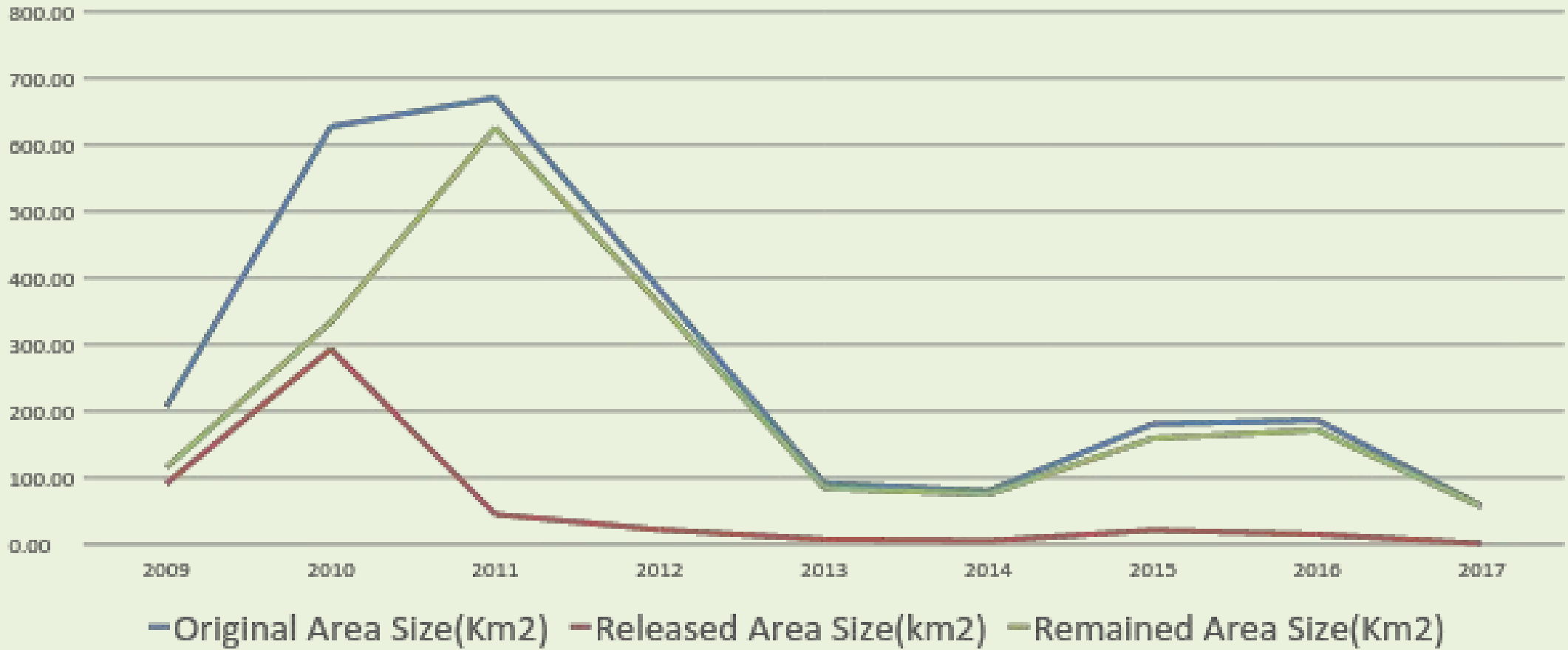




II. OPERATIONAL INTERVENTION

6. Information Management (IM)

IM Products showing BLS progress by years
(contamination)
Baseline Survey By Years (2009-Apr2017)



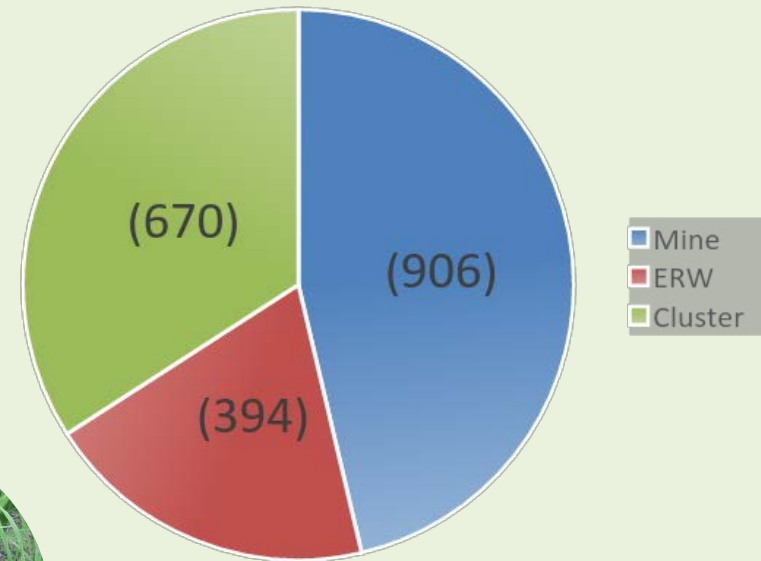


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C.M.A.A

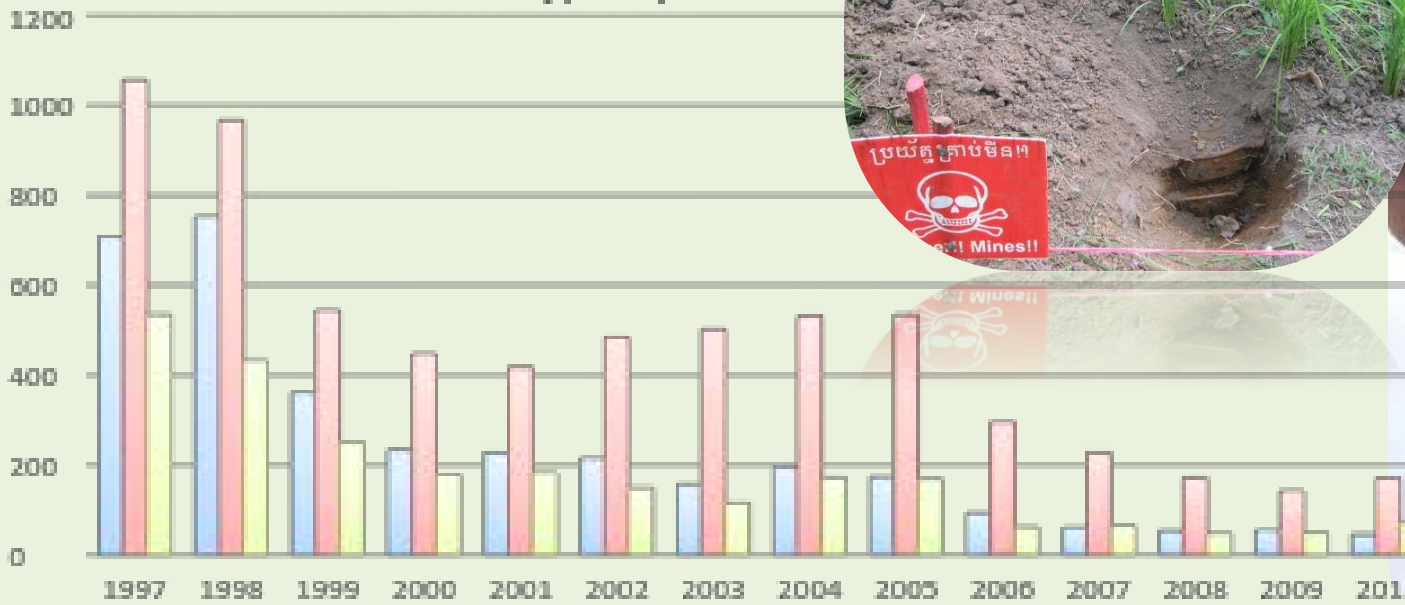
III. CHALLENGES

- Huge contamination to address 1,970km² (BLS is still going on in the east by 2020)
- Mine/ERW Incident still occurring
- Level of funding scaling down...

Current Contamination (2009-Apr2017)



Mine/ERW Accident Type by Year



Amputation Injury Killed



Challenges:

- Limited support of Quality Management (QM) on CM clearance in the eastern part of the country
- Limited EOD response support and to address the requests of the community and lack of comprehensive reporting and response system
- Mine/ERW/CM Coordination mechanism is yet fully functioned.

Contamination in Cambodia



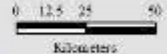
Ministry of the Royal Palace
C.M.A.A



Capacity Building and Technical Assistance of
CMAA DBU



Scale 1:1,000,000



LEGEND

- US Bombing
- Accident Location
- District Centers
- Province Centres
- Railroad
- National Road
- Province Boundary
- District Boundary
- Water Surface

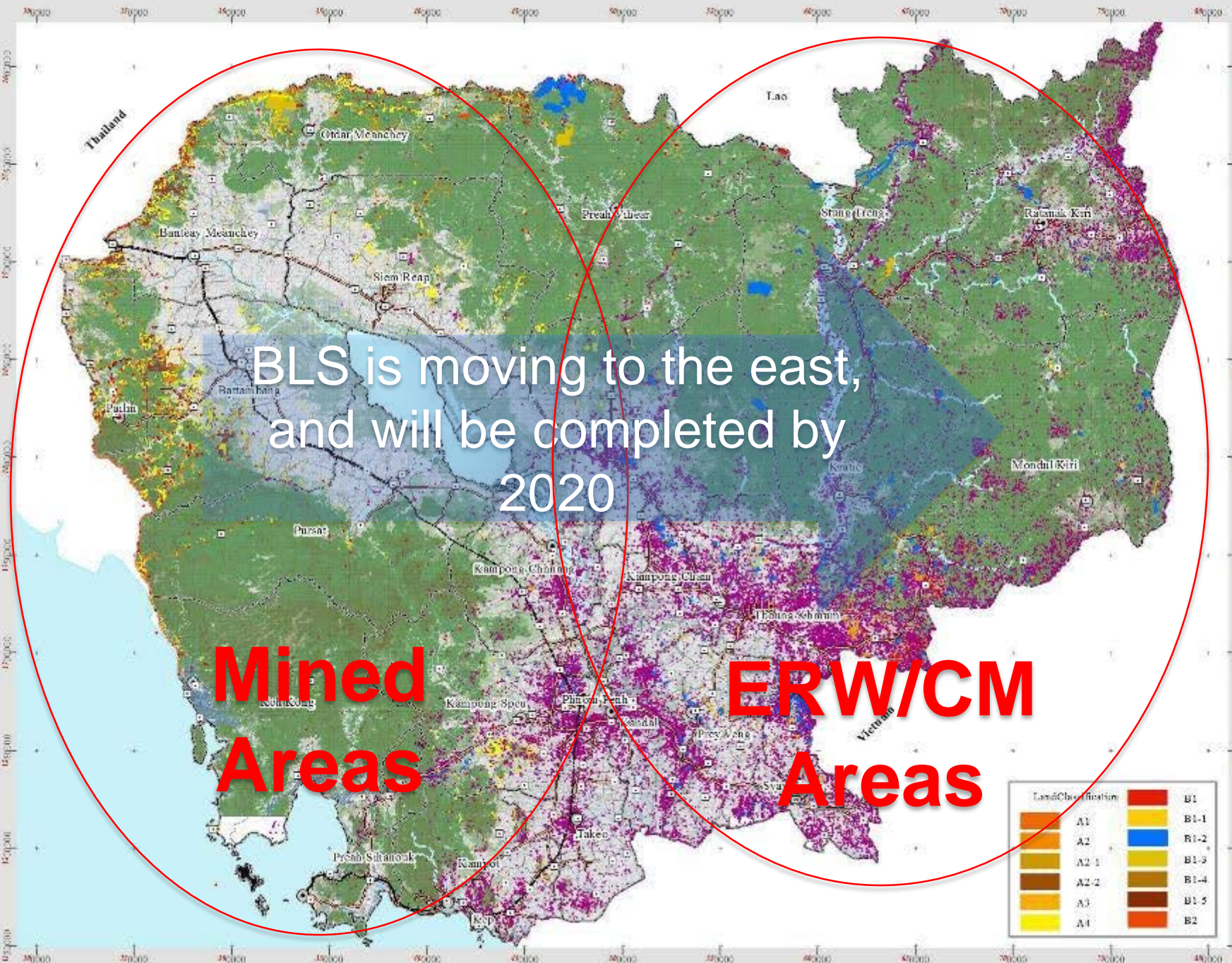
Disclaimer

The map was produced at the CMAA Office in Phnom Penh.
The map is not to be used for navigation.
If you have any questions, please contact
CMAA general Secretariat in Phnom Penh.

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Toul Sanghar Quarter, Russey Keo District,
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May, 2017

South East Asia



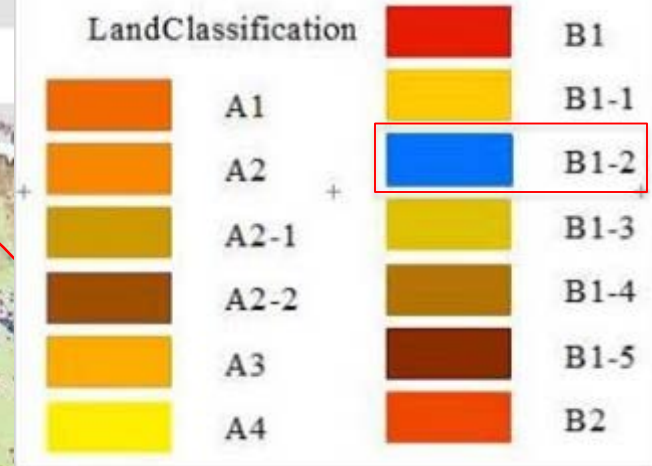
BLS is moving to the east,
and will be completed by
2020

**Mined
Areas**

**ERW/CM
Areas**

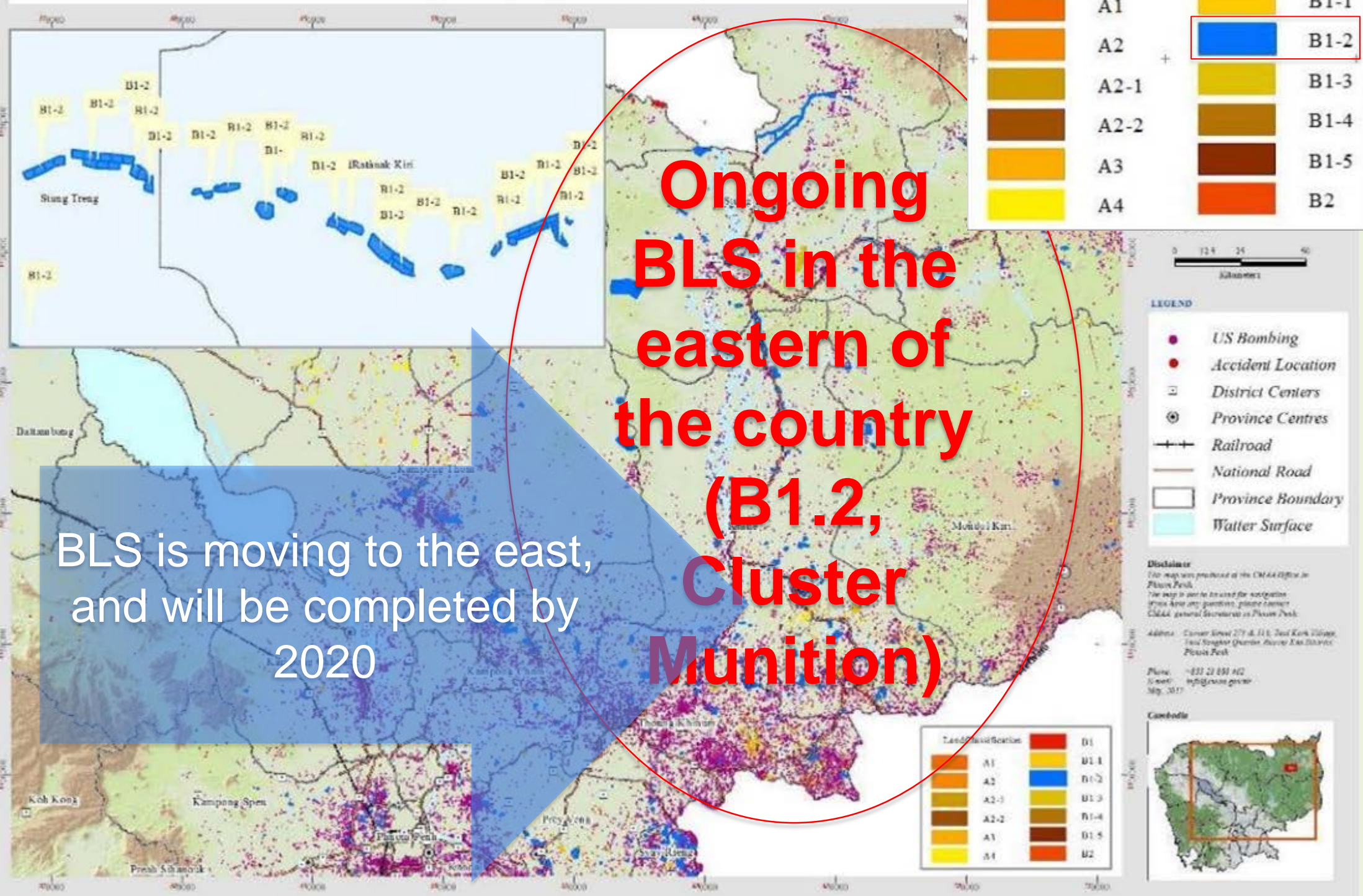
Land Classification	
■	A1
■	A2
■	A2.1
■	A2.2
■	A3
■	A4
■	B1
■	B1-1
■	B1-2
■	B1-3
■	B1-4
■	B1-5
■	B2

Contamination in Cambodia



**Ongoing
BLS in the
eastern of
the country
(B1.2,
Cluster
Munition)**

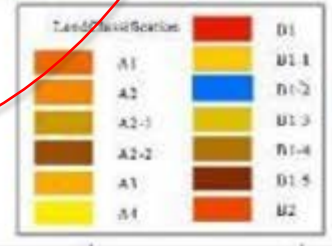
BLS is moving to the east,
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2020



Disclaimer
This map was produced by the CMAA Office in Phnom Penh.
The map is made to assist in the collection of data for the purpose of the project.
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Map: 2017





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C.M.A.A

IV. LESSONS LEARNT



❖ **Baseline Survey Methodology:**

- ❖ Define the boundary of suspected mine/ ERW
- ❖ Avoid overlapping surveys by operators
- ❖ Classify land contamination
- ❖ Have one system for recording all BLS by operators via IMSMA

❖ **Land Release Methodology:**

Speed up releasing lands efficiency and effectiveness (C1, C2, C3)

❖ **Quality Management**

- ❖ Ensure appropriate tools applied upon the following SOPs
- ❖ Ensure safety land return to local communities

❖ **Planning & Prioritization**

❖ Respond to real communities needs by engaging operators, stakeholders, local people and authority under leadership of MAPU

❖ **Information Management**

- ❖ Support up-to-date mine action information as well as reporting to government, MAPU, operators, and mine action stakeholders
- ❖ National database system (IMSMA) is able to record more info.



V. HOW WE ADDRESS

- 5 Goals of NMAS 2018-2025 (1st draft)**
 - Strategy to address Mined areas, Cluster Munition areas, ERW
 - Operational Arrangement
 -
- Coordination Mechanisms**
 - Technical Working Group
 - Mine Action Coordination
 - Technical Reference Group
- National Technical Directive**
 - Directive on ERW/CM release
 - Directive on planning and prioritization
- **Cambodian Mine Action Standard (CMAS)**
 - Review chapters in reflecting newly approaches or technology as identified or deemed
- **National Information Management**
 - Sustain and improve the National IM System (operators' involvement and newly technology upgrade)



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C.M.A.A



Thank you for your attention!

Questions?