The Success Story Using Space Data and the Issues of Recovery Phase in Cambodia

Chharom Chin,

Deputy Director, Geography Department, Ministry of Land Management, Urban Planning and Construction

Outline

- Natural Disasters in Cambodia
- Institutional Arrangement for DRR
- Sentinel Asia Activities
- Cambodia Flood in 2013

Major Natural Disasters

Major natural disasters in Cambodia are flood and drought.

About 80 percent of the Cambodia's territory lies within the Mekong River, which is known to have large fluctuations of water levels between the dry and wet seasons.

Flood in Cambodia

- The Mekong river basin is under the influence of the monsoon regime which is characterized by great spatial and temporal variability in rainfall distribution.
- Flood water in Cambodia comes mainly from the upper and middle reaches of the Mekong.
- While the river reaches its highest peak, local rainfall also intensified adding more water to the swelling river.

Drought Disasters

- In recent years, there has been an imbalance in the distribution of monsoon rainfall which has resulted in drought in some parts of the country

- A short dry spell of 20 to 30 days during the rainy season (May – November) can result to extensive damage to crops

- Prolonged drought was experienced in almost every years. And in 2001, while still recovering from the effects of the flood of 2000, Cambodia was also affected by severe drought

Typhoons in Cambodia

Occasionally happened and not severely damaged, except in 2009, following the destruction wreaked across the Philippines and Viet Nam, Typhoon Ketsana continued towards the northwest, subsequently striking Cambodia and Lao PDR. The typhoon hit the northern and eastern parts of Cambodia on the evening of Tuesday, 29 September, causing havoc.

Institutional Arrangement for DRR

National Mapping Agency

- The Ministry of Land Management, Urban Planning and Construction, particularly the General Department of Cadastre and Geography has nominated as the National Mapping Agency (NMA) and many others space related agencies including SCOSA, APRSAF, Sentinel Asia, UN-PCGIAP, etc.
- The NMA is the principal and key partner to provide all necessary, particularly space related information to the National Committee for Disaster Management for their operation of disaster response and management.

Disaster Management Agency

- The National Committee for Disaster Management (NCDM) is the National Disaster Response and Management in Cambodia. It has offices in commune, district and national level.
- It coordinate with all Ministries, UN agencies, IOs, NGOs, International Communities, National Associations, and Local Donors in order to appeal for aid for Emergency Response and Rehabilitation.

Other Key Disaster Management Agencies

- Ministry of Water Resources and Meteorology (MOWRAM) is the key ministry responsible in flood and drought.
- MOWRAM provides weather forecast, flood warning, and other disasters related to public.
- Cambodian Red Cross has offices in all provinces and it play very important roles in disaster responses and emergency relief assistances.

Other Key Disaster Management Agencies

- Ministry of Health provides health supports.
- Ministry of Rural Development provides water sanitation and hygiene supports
- Ministry of Agriculture, Forestry and Fisheries provides seeds and food supplies.
- Cambodia Mine Action Center provides protection
- And many others

The Disaster Responses

- In the event of disaster, NCDM will inform the location and extend of the disaster to National Mapping Agency.
- NMA liases with other space agencies/projects to provide spatial related information, for example, such as map, satellite imagery, aerial photo of the disaster areas.

The Disaster Responses (Cont'n)

- The provided disaster information shall be compiled by NMA in a form that can be easily understood and use by NCDM and other agencies for the purpose of disaster response and management.

The Disaster Responses (Cont'n)

- At the same time, NMA will closely working with NCDM to update their spatial data as the work has been progressed.
- Lesson learned from each activity or disaster event were documented for future references and improvement.

SENTINEL ASIA ACTIVITIES

The 1st Joint Project Team Meeting for Sentinel Asia Step 3, Nov 27-29, 2013,
Bangkok, Thailand

Sentinel Asia Project

- Cambodia Join APRSAF since 2001
- Cambodia is a member of Asia Disaster Reduction Center (ADRC)
- Has participated with Sentinel Asia project since it was started
- On regular basis, attend all project activities and meetings.

ASEAN Cooperation Project on Utilization of Space Technologies for Disaster Risks Management

- Successfully completed all five modules including:
  - Identified and developed drought risk model for Cambodia;
  - Conducted one-day seminar and five-day hand-on training with all relevant disaster related agencies;
  - Translated the basic GIS, RS and GPS text books into Khmer language and being utilized by University and others institutions
  - Attended the Regional workshop.

ASEAN-ADRC Seminar and Training

The 1st Joint Project Team Meeting for Centir
Bangkok, Thailand

JAXA-AIT Mini Projects

- Cambodia has been participated in development and implementation of mini-projects every year since it has been started in 2006.

Most of mini-projects were flood and drought related subject in various flood prone areas in Cambodia.

So far, it has been a most successful training program contributing to development of human resources.

Sentinel Asia System Operation Training

- Cambodia has competed the SAS operation training in September 2008 (Thailand) and October 2012 (Indonesia).

In 2010, we have requested Emergency Observation for flash flood in Pursat province and Poipet city.

- In 2011,

EOR Data reception and training

- Lecturers: AIT and ADRC
- Host: Geography Dept.
- Participants: NCDM, MAFF, MoWRAM, MLMUPC, MoE, MoP, CARD.

Cambodia Flood in 2013

The 1st Joint Project Team Meeting for Sentinel Asia Step 3, Nov 27-29, 2013,
Bangkok, Thailand

Cambodia flood 2013 as of 8 Nov 2013

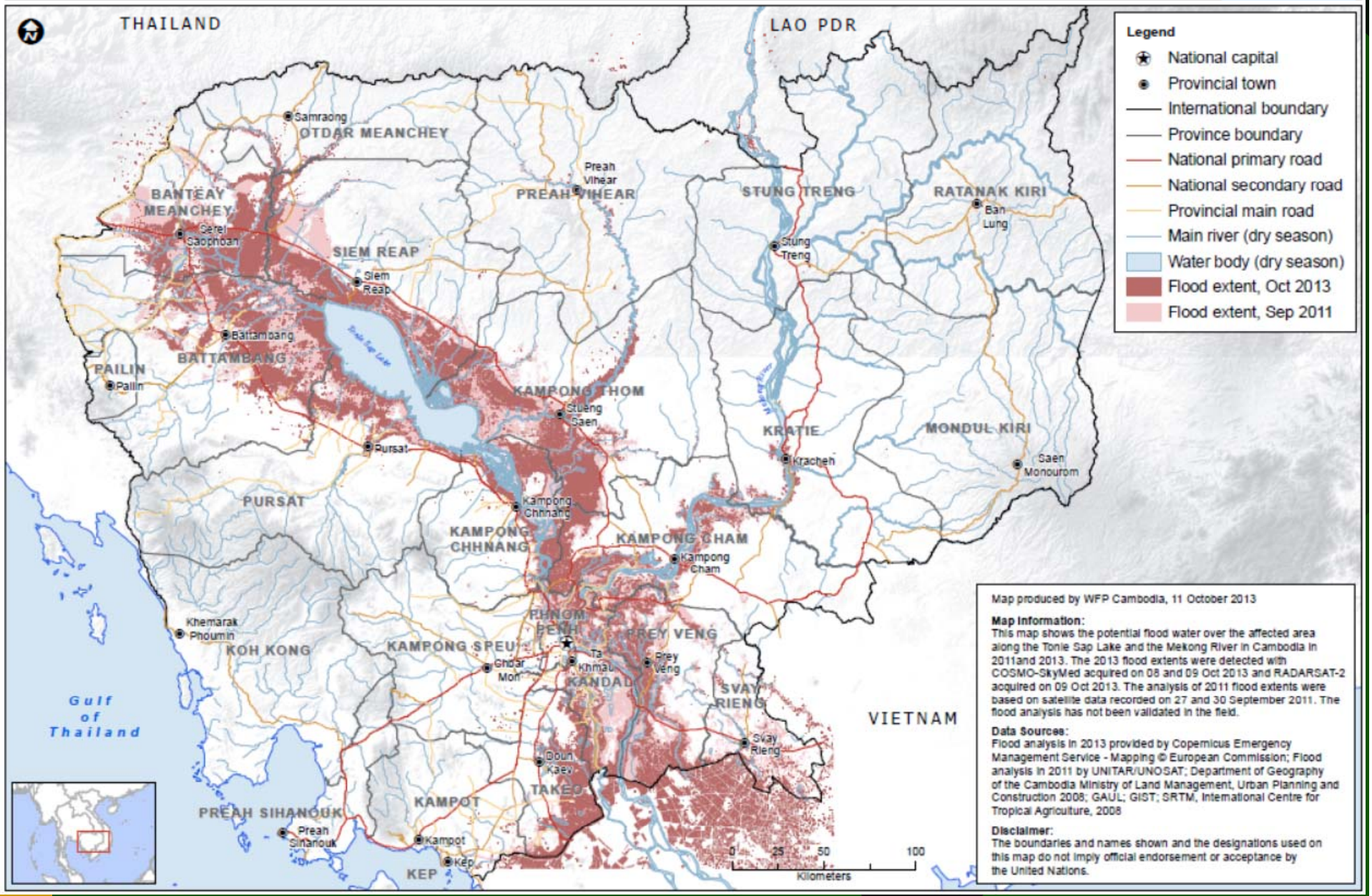
- Affected Province: 20
- Affected Households: 377,354
- Affected People: 1,735,828
- Evacuated Households: 31,314
- Evacuated people: 144,044
- Deaths: 188
- *Source: Humanitarian Response Forum Situation Report No. 6*

Flood in Cambodia

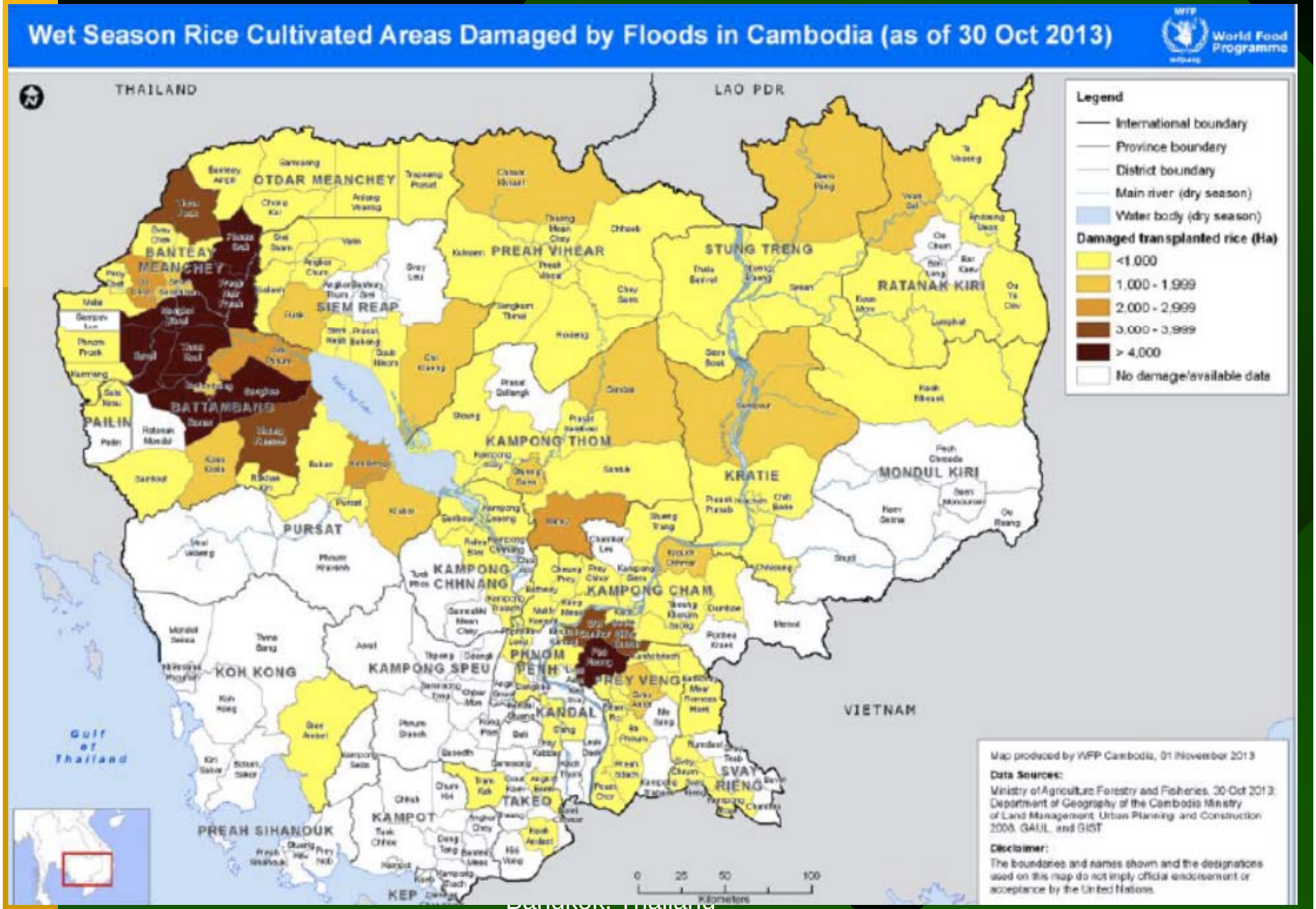
Flood in Cambodia

Flood in Cambodia

Overview of Flood Extent in Cambodia, Sep 2011 and Oct 2013



Bangkok, Thailand



Bangkok, Thailand

Major Support Activities

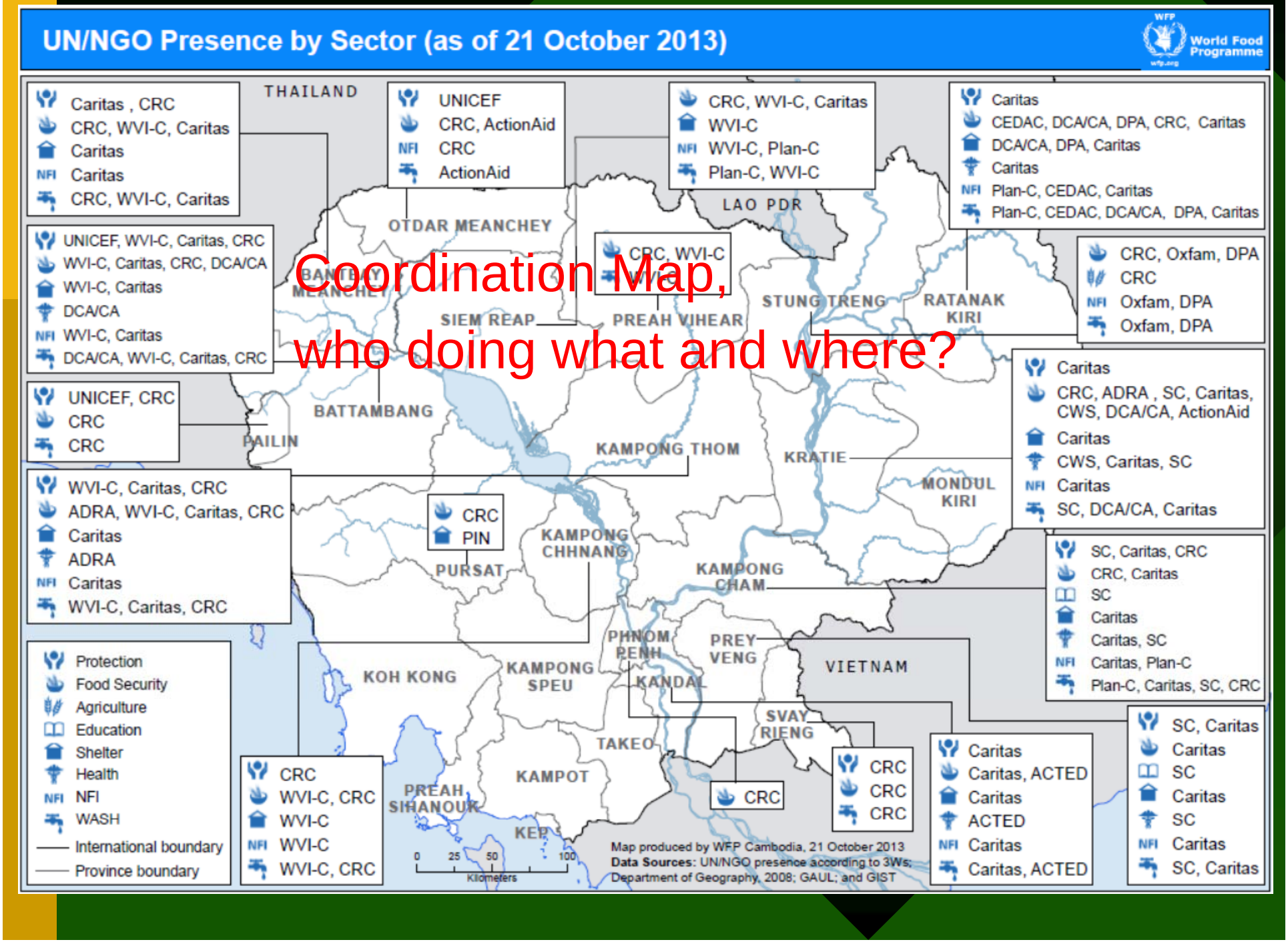
- Protection
- Food Security
- Agriculture
- Education
- Shelter
- Health
- Water Sanitation and Hygiene

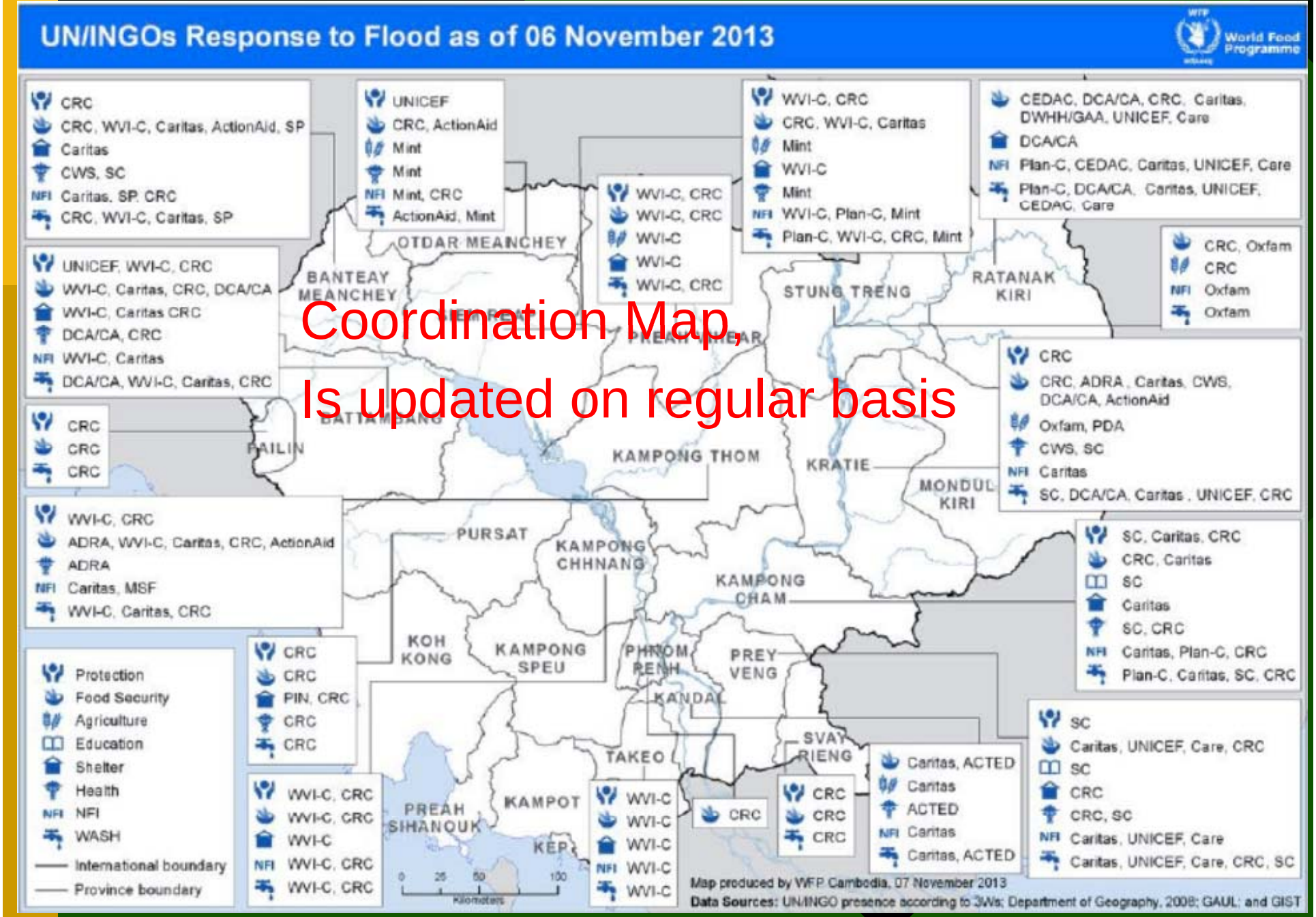
Major International Organizations

- World Food Programme (WFP)
- UNICEF
- UNOCHA
- UNOSAT
- IOM
- World Vision, and
- Many others

National Organizations

- National Committee for Disaster Management (NCDM)
- Cambodian Red Cross
- Action Aid
- ADRA
- CARITAS
- MSF
- PLAN Cambodia
- CARE
- Cambodia Mine Action Center (CMAC), and
- Many others


UN/NGO Presence by Sector (as of 21 October 2013)
World Food Programme
Coordination Map,
who doing what and where?
THAILAND
LAO PDR
VIETNAM
Caritas , CRC
CRC, WVI-C, Caritas
Caritas
NFI Caritas
CRC, WVI-C, Caritas
UNICEF
CRC, ActionAid
NFI CRC
ActionAid
CRC, WVI-C, Caritas
WVI-C
NFI WVI-C, Plan-C
Plan-C, WVI-C
Caritas
CEDAC, DCA/CA, DPA, CRC, Caritas
DCA/CA, DPA, Caritas
Caritas
NFI Plan-C, CEDAC, Caritas
Plan-C, CEDAC, DCA/CA, DPA, Caritas
UNICEF, WVI-C, Caritas, CRC
WVI-C, Caritas, CRC, DCA/CA
WVI-C, Caritas
DCA/CA
NFI WVI-C, Caritas
DCA/CA, WVI-C, Caritas, CRC
CRC, WVI-C
WVI-C
CRC, Oxfam, DPA
CRC
NFI Oxfam, DPA
Oxfam, DPA
UNICEF, CRC
CRC
CRC
Caritas
CRC, ADRA , SC, Caritas, CWS, DCA/CA, ActionAid
Caritas
CWS, Caritas, SC
NFI Caritas
SC, DCA/CA, Caritas
WVI-C, Caritas, CRC
ADRA, WVI-C, Caritas, CRC
Caritas
ADRA
NFI Caritas
WVI-C, Caritas, CRC
CRC
PIN
SC, Caritas, CRC
CRC, Caritas
SC
Caritas
Caritas, SC
NFI Caritas, Plan-C
Plan-C, Caritas, SC, CRC
Protection
Food Security
Agriculture
Education
Shelter
Health
NFI
WASH
International boundary
Province boundary
CRC
WVI-C, CRC
WVI-C
NFI WVI-C
WVI-C, CRC
CRC
CRC
CRC
CRC
Caritas
Caritas, ACTED
Caritas
ACTED
NFI Caritas
Caritas, ACTED
SC, Caritas
Caritas
SC
Caritas
SC
NFI Caritas
SC, Caritas
OTDAR MEANCHEY
BANTEAY MEANCHEY
SIEM REAP
PREAH VIHEAR
STUNG TRENG
RATANAK KIRI
BATTAMBANG
PAILIN
KAMPONG THOM
KRATIE
MONDUL KIRI
PURSAT
KAMPONG CHHNANG
KAMPONG CHAM
PHNOM PENH
PREY VENG
KOH KONG
KAMPONG SPEU
KANDAL
SVAY RIENG
TAKEO
KAMPOT
PREAH SIHANOUK
KEP
0 25 50 100
Kilometers
Map produced by WFP Cambodia, 21 October 2013
Data Sources: UN/NGO presence according to 3Ws; Department of Geography, 2008; GAUL; and GIST


UN/INGOs Response to Flood as of 06 November 2013
World Food Programme
Coordination Map,
Is updated on regular basis
CRC
CRC, WVI-C, Caritas, ActionAid, SP
Caritas
CWS, SC
NFI Caritas, SP, CRC
CRC, WVI-C, Caritas, SP
UNICEF
CRC, ActionAid
Mint
Mint
NFI Mint, CRC
ActionAid, Mint
WVI-C, CRC
CRC, WVI-C, Caritas
Mint
WVI-C
Mint
NFI WVI-C, Plan-C, Mint
Plan-C, WVI-C, CRC, Mint
CEDAC, DCA/CA, CRC, Caritas, DWHH/GAA, UNICEF, Care
DCA/CA
NFI Plan-C, CEDAC, Caritas, UNICEF, Care
Plan-C, DCA/CA, Caritas, UNICEF, CEDAC, Care
UNICEF, WVI-C, CRC
WVI-C, Caritas, CRC, DCA/CA
WVI-C, Caritas CRC
DCA/CA, CRC
NFI WVI-C, Caritas
DCA/CA, WVI-C, Caritas, CRC
WVI-C, CRC
WVI-C, CRC
WVI-C
WVI-C
WVI-C, CRC
CRC, Oxfam
CRC
NFI Oxfam
Oxfam
CRC
CRC
CRC
CRC
CRC, ADRA, Caritas, CWS, DCA/CA, ActionAid
Oxfam, PDA
CWS, SC
NFI Caritas
SC, DCA/CA, Caritas, UNICEF, CRC
WVI-C, CRC
ADRA, WVI-C, Caritas, CRC, ActionAid
ADRA
NFI Caritas, MSF
WVI-C, Caritas, CRC
SC, Caritas, CRC
CRC, Caritas
SC
Caritas
SC, CRC
NFI Caritas, Plan-C, CRC
Plan-C, Caritas, SC, CRC
CRC
CRC
PIN, CRC
CRC
CRC
WVI-C, CRC
WVI-C, CRC
WVI-C
NFI WVI-C, CRC
WVI-C, CRC
WVI-C
WVI-C
WVI-C
NFI WVI-C
WVI-C
CRC
CRC
CRC
CRC
Caritas, ACTED
Caritas
ACTED
NFI Caritas
Caritas, ACTED
SC
Caritas, UNICEF, Care, CRC
SC
CRC
CRC, SC
NFI Caritas, UNICEF, Care
Caritas, UNICEF, Care, CRC, SC
Protection
Food Security
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Education
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RATANAK KIRI
KAMPONG THOM
KRATIE
MONDUL KIRI
PURSAT
KAMPONG CHHNANG
KAMPONG CHAM
KOH KONG
KAMPONG SPEU
PHNOM PENH
PREY VENG
KANDAL
SVAY RIENG
TAKEO
KAMPOT
PREAH SIHANOUK
KEP
0 25 50 100
Kilometers
Map produced by WFP Cambodia, 07 November 2013
Data Sources: UN/INGO presence according to 3Ws; Department of Geography, 2008; GAUL; and GIST

Impact of Flooding in Cambodia (as of 18 October 2013)

World Food Programme

Flood Impact Map

Oddar Meanchey		
Affected HHs	13,244	-
Displaced HHs	-	-
Affected Population	60,922	32.8%

Banteay Meanchey		
Affected HHs	54,463	-
Displaced HHs	8,902	-
Affected Population	250,530	40.0%

Siem Reap		
Affected HHs	19,022	-
Displaced HHs	3,550	-
Affected Population	87,501	9.8%

Battambang		
Affected HHs	74,160	-
Displaced HHs	4,504	-
Affected Population	341,136	33.3%

Pailin		
Affected HHs	1,989	-
Displaced HHs	239	-
Affected Population	9,149	13.0%

Pursat		
Affected HHs	9,271	-
Displaced HHs	746	-
Affected Population	42,647	10.7%

Kampong Channg		
Affected HHs	6,667	-
Displaced HHs	897	-
Affected Population	30,668	6.5%

Phnom Penh		
Affected HHs	3,522	-
Displaced HHs	1,622	-
Affected Population	16,201	1.2%

Kampong Thom		
Affected HHs	17,463	-
Displaced HHs	1,114	-
Affected Population	80,330	12.7%

Preah Vihea		
Affected HHs	4,609	-
Displaced HHs	397	-
Affected Population	21,201	12.4%

Ratanak Kiri		
Affected HHs	6,524	-
Displaced HHs	2,289	-
Affected Population	30,010	19.9%

Stung Trung		
Affected HHs	9,813	-
Displaced HHs	1,523	-
Affected Population	45,139	40.4%

Kratie		
Affected HHs	18,552	-
Displaced HHs	621	-
Affected Population	85,339	26.7%

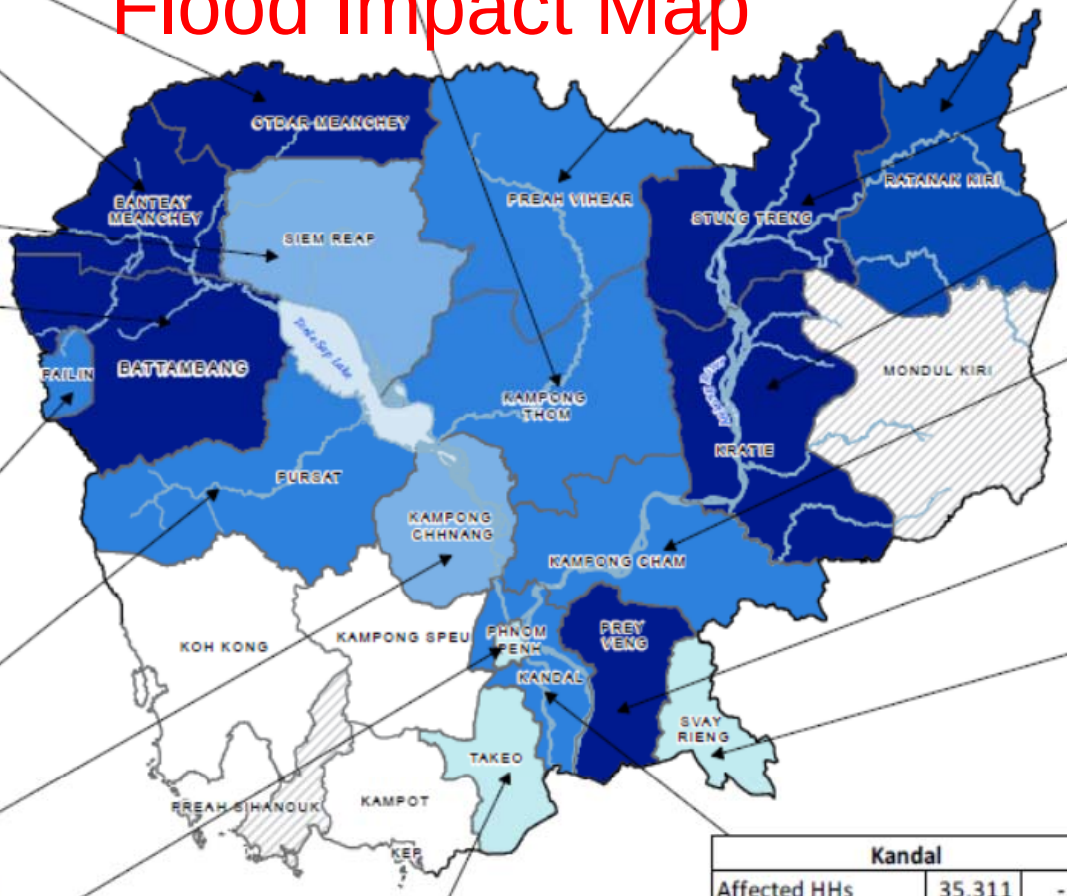
Kampong Cham		
Affected HHs	51,376	-
Displaced HHs	3,546	-
Affected Population	236,330	14.1%

Prey Veng		
Affected HHs	44,764	-
Displaced HHs	866	-
Affected Population	205,914	21.7%

Svay Rieng		
Affected HHs	3,808	-
Displaced HHs	253	-
Affected Population	17,517	3.6%

Takeo		
Affected HHs	2,796	-
Displaced HHs	10	-
Affected Population	12,862	1.5%

Kandal		
Affected HHs	35,311	-
Displaced HHs	235	-
Affected Population	162,431	12.8%



0 25 50 100
Kilometers

Map produced by WFP Cambodia, 22 Oct 2013

Data Source: Affected figures from NCDM as of 18 October 2013 and boundary from Department of Geography 2006

Affected population (%)

- < 5.00
- 5.00 - 9.99
- 10.00 - 14.99
- 15.00 - 19.99
- > 20.00
- No available data
- Not affected province

Useful Websites

- http://reliefweb.int/country/khm
- http://www.unocha.org
- http://www.disasterscharter.org
- http://www.wfp.org/
- http://www.cambodia.org
- And many others

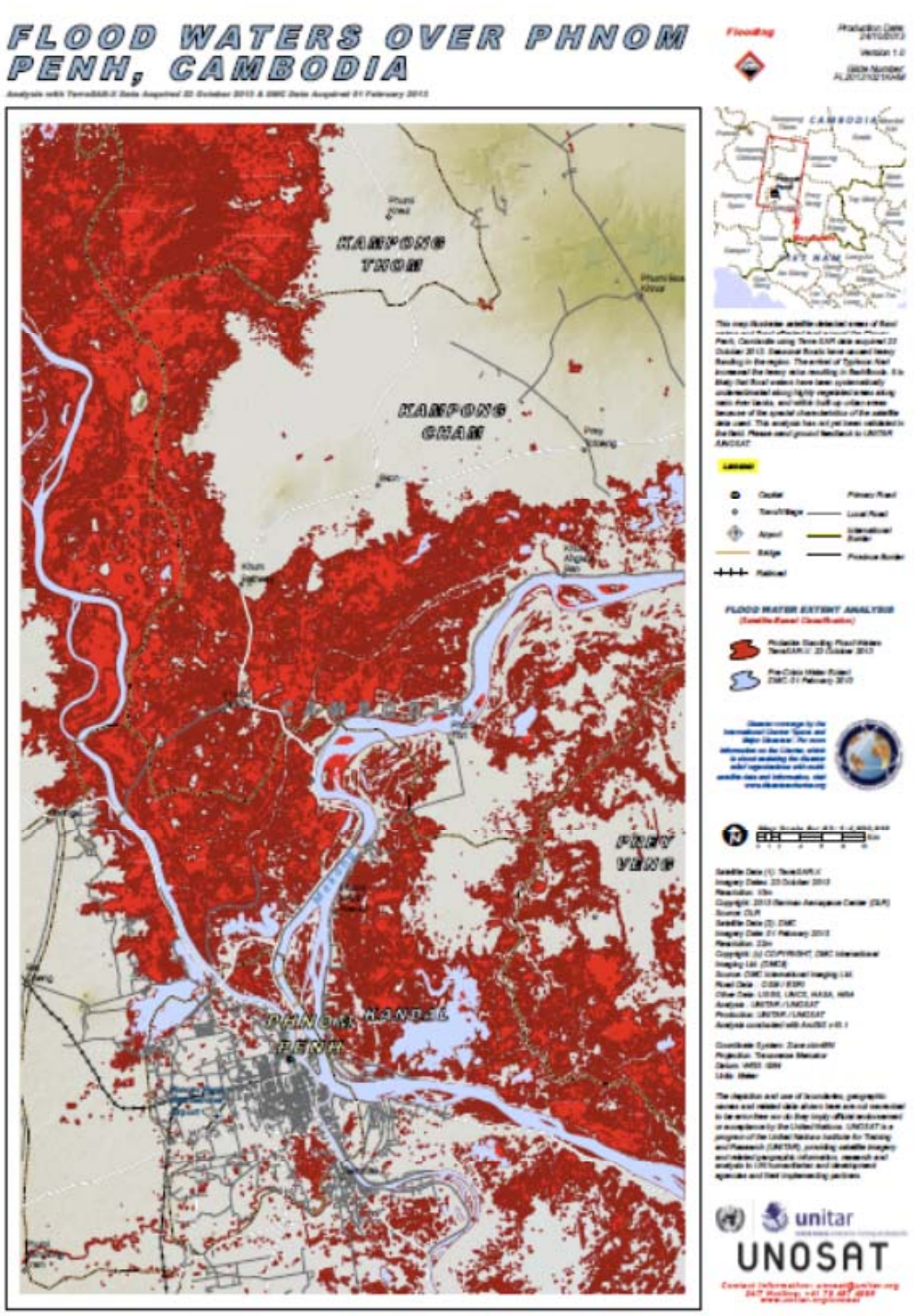


Image available at the International Charter

Thanks to UNOSAT

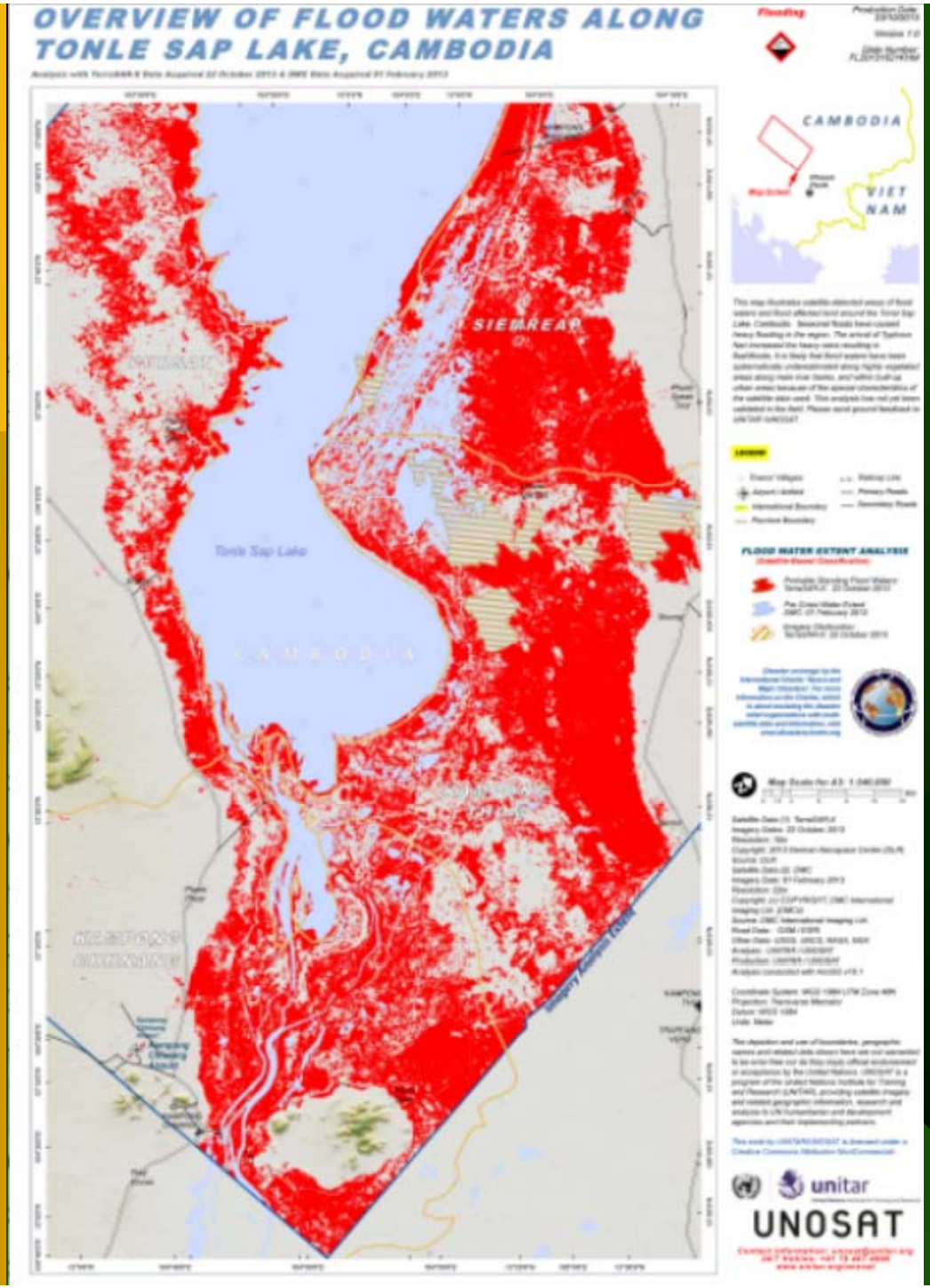


Image available at the International Charter

Lesson Learned

- The spatial information proved very useful in helping disaster relief coordination and responses.
- It’s good way to convince our decision-makers on the usefulness of space applications.
- It’s crucial to have good base map data before disaster happened
- International cooperation is very important

Conclusion

- EOR provided us good opportunity to learn, share, and awake the usefulness of satellite images contributing to disaster management.
- Many activities were focused on disaster responses and emergency relief assistances rather than disaster prevention and awareness.
- Many thanks to International Communities providing all the supports

Thank You !