



ONE ASEAN
ONE RESPONSE

SITUATION UPDATE TROPICAL STORM PODUL AND TROPICAL DEPRESSION KAJIKI Lao PDR

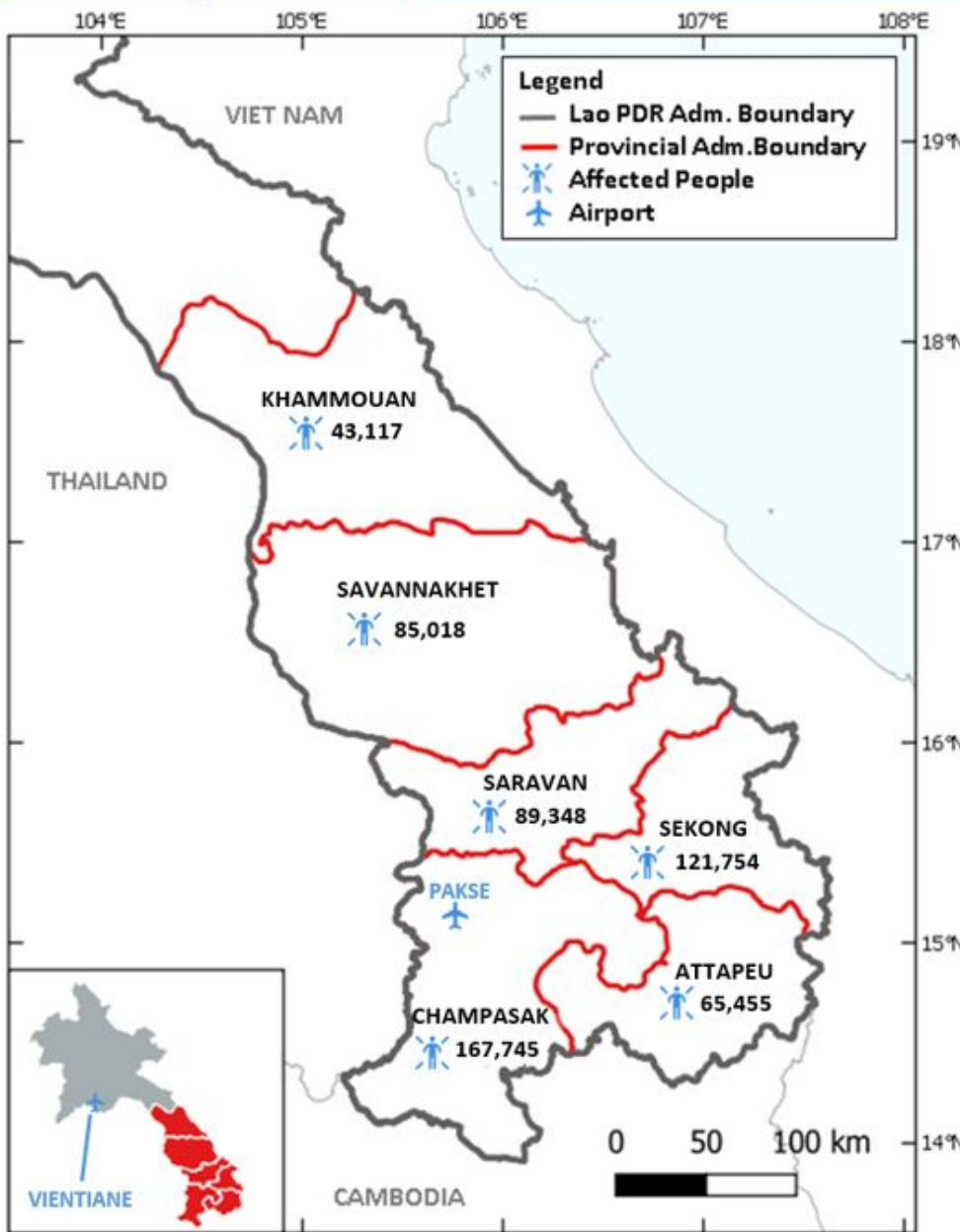
No. **2**

Tuesday, 10 September 2019, 20:30 hrs (UTC+7)

This Situation Update is provided by the AHA Centre for use by the ASEAN Member States and relevant stakeholders. The information presented is collected from various sources, including but not limited to, ASEAN Member States' government agencies, UN, IFRC, NGOs, and news agencies.

TROPICAL STORM PODUL AND TROPICAL DEPRESSION KAJIKI, LAO PDR

Correct as at 10 September 2019



EFFECTS



150K*
AFFECTED FAMILIES



572K*
AFFECTED PERSONS



14*
DEAD



1*
MISSING



102K*
DISPLACED PERSONS



37*
DAMAGED HOUSES

* Estimations are based on data reported/confirmed by the National Disaster Management Organisation of Lao PDR and other verified sources

ASEAN RESPONSE

ICLT

(In-Country Liaison Team)

Actively supporting the NDMO's emergency response

ERAT

(Emergency Response and Assessment Team)

To provide IM support through the AHA Centre EOC

DELSA

(Disaster Emergency Logistic System for ASEAN)

Mobilised stockpiles to be airlifted to Pakse and Vientiane

IM

(Information Management)

Remote support on gap analysis, GIS and mapping to NDMO Lao PDR



1. HIGHLIGHTS

- a. On 29 August (Thursday) and 02 September (Monday) 2019, the Department of Meteorology and Hydrology (DMH), Ministry of Natural Resources, Lao PDR reported potential affected areas in the central and southern part of Lao PDR due to the existence of a Low Pressure Area (LPA), Tropical Storm PODUL, and Tropical Depression KAJIKI. Subsequently, flooding was reported in six (6) provinces: **Attapeu, Champasak, Khammouan, Saravan, Savannakhet, and Sekong.**
- b. Working with the Local Disaster Management and Control Committees in the provincial and district levels, the Government has already deployed emergency response teams from the military, police, and health sectors, equipped with trucks, boats, vehicles, helicopters, tools, and other equipment to evacuate affected people and distribute the following relief: **35 rescue boats, 2,200 packs of drinking water, and 100 family tents.**
- c. From the preliminary assessment by UNITAR-UNOSAT, within the analysed extent of about 60,000 km² in Southern Lao PDR, **a total of about 1,000 km² of land appears to be flooded** as of 06 September (Friday) 2019. However, this analysis has not been validated yet in the field, and the AHA Centre will closely monitor and report should there be any updated information. As reported by NDMO Lao PDR, through the AHA Centre's In-Country Liaison Team (ICLT) on 10 September (Tuesday) 2019, **several areas in Sekong are not yet accessible for ground assessment.**
- d. On 07 September (Saturday) 2019, the Prime Minister (PM), National Government leaders, and leaders of provincial authorities in Lao PDR, visited the affected areas, namely Champasak, Saravan and Savannakhet, to assess the status of the affected population and to lead the ongoing emergency response. The PM, on behalf of the Government, **presented 1.2 billion kip (US\$136,535.71) to authorities** to aid victims.
- e. As updated in a press conference by NDMO Lao PDR on 08 September (Sunday) 2019, **151,000 hectares of farmland**, 251 hectares of vegetable plots, and 3,266 hectares of fish ponds were submerged by the floods. Additionally, **more than 252 km of roads, 43 reservoirs, 12 bridges, 313 schools, and 15 hospitals** and pharmaceutical dispensaries were affected by the floods. As a result, authorities have used helicopters to reach the affected people in these more inaccessible areas.
- f. Based on provincial impact data provided by NDMO Lao PDR today (10 September 2019), **Champasak is the most affected province, accounting for 29% of the total affected persons.** According to the Pacific Disaster Center's (PDC) All Hazards Impact Model processed on 08 September (Sunday) 2019, the **estimated capital exposure is US\$753.4 million.**
- g. Continued rainfall is expected in all 6 affected provinces over the course of the week. According to the Mekong River Commission (MRC), two hydrological stations in Khong Chiam and Pakse (just north of Champasak) have forecast that the water levels will steadily fall over the course of the week, with the downstream Pakse station forecast to remain above alarm levels for the rest of the week.



- h. NDMO Lao PDR has identified the following needs:
- Food: rice, canned fish, drinking water, instant noodles
 - Rescue boats and life jackets
 - Non food items: family kits, personal hygiene kits, kitchen kits, sleeping kits (**the AHA Centre is currently responding to these needs**)
 - Water treatment equipment
 - Cash support
- i. The AHA Centre mobilised its ICLT, which met with the National Focal Point of NDMO Lao PDR in Vientiane today (10 September 2019). As of this writing, **ICLT is in Pakse to actively support the emergency response.**
- j. The ICLT is providing technical assistance to NDMO Lao PDR on designing **coordination structures** and **needs assessment** during emergency response.
- k. The AHA Centre and ICLT on the ground in Pakse are coordinating the delivery of relief items in **two batches**, as requested by NDMO Lao PDR, from the DELSA regional stockpile in Subang, Malaysia. The **first batch is expected to arrive tomorrow (11 September 2019) in Pakse International Airport** through our partner, the United Nations Humanitarian Response Depot (UNHRD), while the second batch is expected to be delivered on 12 September (Thursday) 2019 by the Royal Malaysian Air Force (RMAF) via Wattay International Airport in Vientiane. In total, the following relief items will be delivered:
- 820 Family Kits
 - 6,850 Hygiene Kits
 - 1,370 Kitchen Sets
 - 1,400 Mosquito Nets
 - 1,400 Jerry Cans (10 litres)
- l. The AHA Centre is **preparing to provide remote support to NDMO Lao PDR on Information Management** – specifically on gap analysis, GIS and mapping, from the AHA Centre Emergency Operations Centre (EOC) in Jakarta, Indonesia.



2. SUMMARY OF EVENTS, FORECAST AND ANTICIPATED RISK

- a. Tropical Storm PODUL first made landfall in the Philippines on 26 August (Monday) 2019, before exiting and continuing west. On 29 August (Thursday) 2019, Tropical Storm PODUL made landfall in central Viet Nam and continued moving west over Lao PDR and towards Myanmar. This was quickly followed by Tropical Depression KAJIKI, which formed in the South China Sea close to the Vietnam coast on 02 September (Monday) 2019, made landfall in Viet Nam and passed Lao PDR, before moving back out over Viet Nam coast on 06 September (Friday) 2019.
- b. The Department of Meteorology and Hydrology (DMH), Ministry of Natural Resources, Lao PDR reported potential affected areas in the central and southern part of Lao PDR due to the existence of a Low Pressure Area (LPA), PODUL and KAJIKI. Subsequently, thunderstorm advisories and heavy rainfall warnings were issued for six (6) provinces: Khammouan, Savannakhet, Champasak, Saravan, Sekong, and Attapeu. This was followed by reports of flooding in all 6 provinces.

Forecast and anticipated risk

- c. Continued rainfall is expected in all 6 affected provinces over the course of the week. The ASEAN Specialised Meteorological Centre (ASMC) generally forecasts above-normal rainfall in the southern portion of Lao PDR for the month of September 2019.
- d. According to the Mekong River Commission (MRC), two hydrological stations in Khong Chiam and Pakse (just north of Champasek) have observed that water levels exceeded flood levels at least until 10 September (Sunday) 2019. The water levels are forecast to steadily fall over the course of the week, with the downstream Pakse station forecast to remain above alarm levels for the rest of the week.

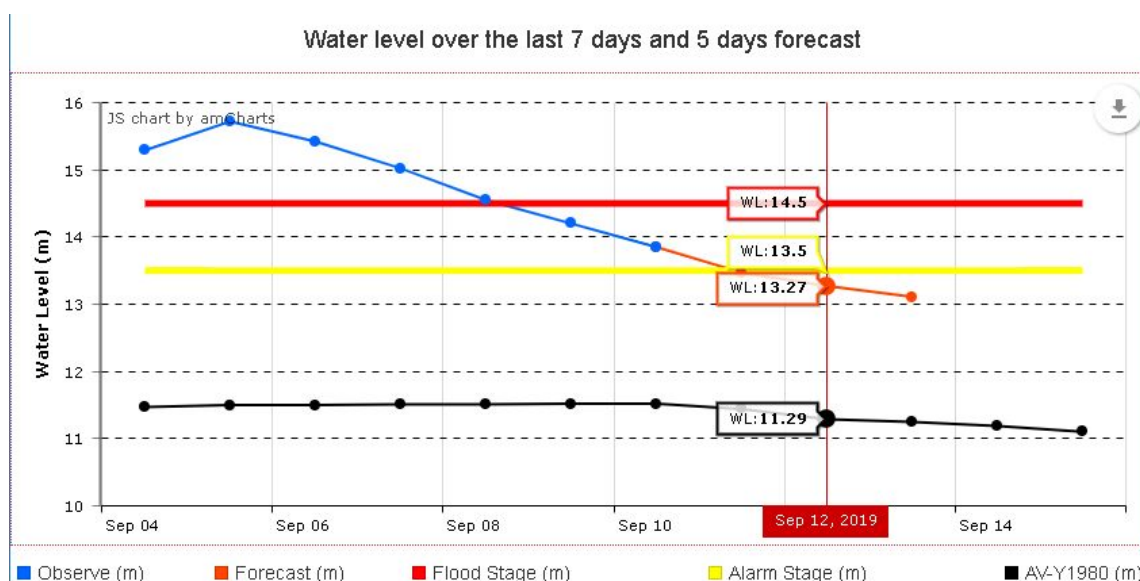


Figure 1: Observed and forecasted water level in Khong Chiam, Lao PDR. Forecasted water level of 13.27 m on 12 September (Thursday) 2019 falls below the alarm level of 13.5 m. Source: Mekong River Commission



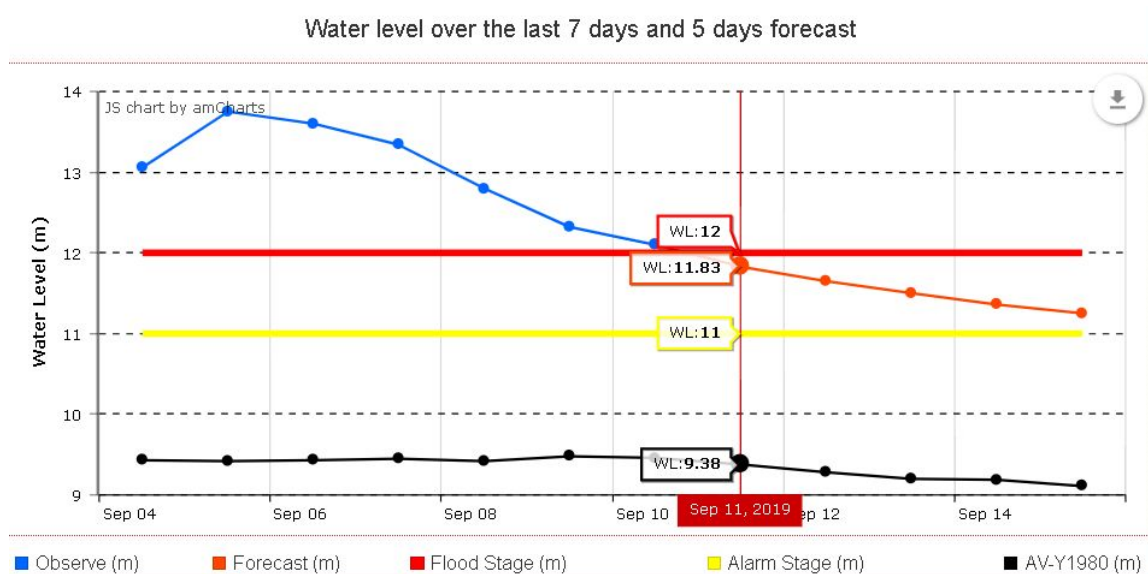


Figure 2: Observed and forecasted water level in Pakse, Lao PDR. Forecasted water level of 11.83 m on 11 September (Wednesday) 2019 will fall below the flood level of 12 m but is still expected to remain above the alarm level of 11 m at the end of the forecast period. Source: Mekong River Commission

- e. According to ICLT which arrived at Pakse International Airport today (10 September 2019), the **water level is already receding**, as per the forecasts by the Mekong River Commission (MRC). However, due to the airport being located in the vicinity of the Mekong River, the AHA Centre will continue to closely monitor the situation for any potential flood risk that may affect the deployment of relief items, including water level monitoring and weather forecast.



Figure 3: Estimated distance between the Mekong River Commission’s hydrological station in Pakse and Pakse International Airport (PKZ) where the AHA Centre’s ICLT has been deployed to coordinate the delivery of the first batch of DELSA relief items. Source: Modified from Mekong River Commission



3. ASSESSMENT OF DAMAGE, IMPACT, AND HUMANITARIAN NEEDS

- a. NDMO Lao PDR has identified the following needs:
- Food: rice, canned fish, drinking water, instant noodles
 - Rescue boats and life jackets
 - Non food items: family kits, personal hygiene kits, kitchen kits, sleeping kits
 - Water treatment equipment
 - Cash support
- b. According to the Pacific Disaster Center’s (PDC) All Hazards Impact Model, the maximum potential population exposure based on flood extent layer provided by the Earth Observatory of Singapore ARIA-SG (EOS ARIA-SG) for the 6 provinces is 197,245 people. **Estimated capital exposure is US\$753.4 million**, with the following breakdown: 32% from the residential sector, 28% from the service sector, 18% from the industrial sector, and 22% from schools. These estimates are as of 08 September (Sunday) 2019.
- c. The breakdown in impact data by province is given in Table 1 below. In addition, there is one (1) reported missing person in Champasak. Note that the number of affected persons for Attapeu and Savannakhet are estimates based on the reported number of affected families (for Attapeu, one family is assumed to consist of five family members while for Savannakhet, the multiplier is calculated from previous reported figures).

Provinces	Affected Families	Affected Persons	Dead	Displaced Persons	Damaged Houses
Attapeu	13,091	65,455*	4	-	-
Champasak	37,167	167,745	4	40,033	-
Khammouan	12,205	43,117	-	8,515	28
Saravan	21,424	89,348	3	30,000	-
Savannakhet	42,509	85,018*	3	23,868	-
Sekong	24,019	121,754	-	-	9
Total	150,415	572,437	14	102,416	37

Table 1: Figures for impacts in the 6 affected provinces of Lao PDR. Data obtained from NDMO Lao PDR as of 10 September (Tuesday) 2019.

- d. Figures for the number of displaced people in Attapeu and Sekong provinces are still to be confirmed, while all the figures for Sekong have not changed since the previous update on 08 September (Sunday) 2019. Ground reports gathered by the ICLT suggest several areas in Sekong are inaccessible. **This is an assessment gap that needs to be filled.**



- e. Currently, there are some challenges in data collection and gap analysis. To address this, NDMO Lao PDR requested the AHA Centre for technical assistance (refer to Section 4. Actions Taken).
- f. According to Vientiane Times, as updated in a press conference by NDMO Lao PDR on 08 September (Sunday) 2019, **151,000 hectares of farmland**, 251 hectares of vegetable plots, and 3,266 hectares of fish ponds were submerged by the floods. Additionally, **more than 252 km of roads, 43 reservoirs, 12 bridges, 313 schools, and 15 hospitals** and pharmaceutical dispensaries were affected by the floods.
- g. From the preliminary assessment by UNITAR-UNOSAT, within the analysed extent of about 60,000 km² in Southern Lao PDR, a total of about 1,000 km² of land appears to be flooded as of 06 September (Friday) 2019. This preliminary analysis was based on observation from Sentinel-1 imagery acquired on 06 September (Friday) 2019 (Annex 1). Currently, the reported affected population on the ground is much higher than the preliminary assessment (Table 2), which may be due to backscattered radar signals that underestimate flood extent and also population figures in the preliminary assessment are limited to the population statistics inside the areas of interest.

Provinces	Flood Extent (km ²)	Total Population	Potentially Affected Population	Reported Affected Population
Attapeu	96	102,700	3,290	65,455*
Champasak	332	540,700	42,350	167,745
Khammouan	101	167,200	5,840	43,117
Saravan	119	195,700	16,250	89,348
Savannakhet	352	600,200	32,680	85,018*
Sekong	No apparent flooded area in mapped analysis yet			121,754
Total	1,000	1,606,500	100,410	572,437

Table 2: Figures for area of likely flood extent, total population, and affected population in the 6 affected provinces of Lao PDR. Data obtained from UNITAR-UNOSAT as of 06 September (Friday) 2019, and from NDMO Lao PDR as of 08 September (Sunday) 2019.

- h. The floods mostly occur in the major river valleys and floodplains along the Mekong River, which forms the border between Lao PDR and Myanmar to the west. Some flooding also occurs towards the central regions of Khammouan and Savannakhet, and along the western provincial borders of Attapeu in the valley of Sekong River (Annex 1).



4. ACTIONS TAKEN AND RESOURCES MOBILISED

Response by Government of Lao PDR

- a. According to the update released by Lao PDR's National Disaster Management Organisation (NDMO Lao PDR) on 05 September (Thursday) 2019 at 09:00 (UTC +7), the Provincial Disaster Prevention and Control Committee called for an emergency meeting and planning for response, especially to deploy rescue boats for evacuation in collaboration with the army and police. Emergency relief items had been distributed to the affected population.
- b. On 07 September (Saturday) 2019, the Prime Minister, Mr. Thongloun Sisoulith, called for an emergency meeting and gave orders to the relevant agencies to quickly assist the affected areas. Working with the Local Disaster Management and Control Committees in the provincial and district levels, the Government has already deployed emergency response teams from the military, police, and health sectors, equipped with trucks, boats, vehicles, helicopters, tools, and other equipment to evacuate affected people and distribute the following relief: **35 rescue boats, 2,200 packs of drinking water, and 100 family tents.**
- c. According to Vientiane Times, on 07 September (Saturday) 2019, the Prime Minister, National Government leaders of Lao PDR and leaders of provincial authorities visited the affected areas, namely Champasak, Saravan and Savannakhet, to assess the status of the affected population and to lead the ongoing emergency response. The officials also provided consolation to the victims and support to the responders. The PM, on behalf of the Government, **presented 1.2 billion kip (US\$136,535.71) to authorities** to aid victims. The PM also directed local authorities to take care of the health and hygiene of those affected, deploy nurses, and provide adequate food and drinking water. He also suggested that authorities monitor prices of goods and prevent any thefts.
- d. According to Xinhua News, Ministry of Labor and Social Welfare is mobilising funding and relief supplies and is calling on state organisations and private businesses to assist the victims.
- e. Authorities are having trouble reaching some areas because as reported on 08 September (Sunday) 2019, more than 252 km of roads have been affected by the floods. As a result, authorities have used helicopters to reach the affected people in these areas.
- f. NDMO Lao PDR, through the National Focal Point (NFP), made a request for assistance to the AHA Centre on 08 September (Sunday) 2019, calling for logistical relief items support.

Response by ASEAN Member States

- a. Malaysia will provide logistical support in transporting DELSA regional stockpile from Subang, Malaysia to Vientiane, Lao PDR.

Response by the AHA Centre

- b. The AHA Centre has expressed condolences to Lao PDR and offered support from regional resources, including mobilising ASEAN Emergency Response and Assessment Team (ASEAN-ERAT), providing relief items from the Disaster



Emergency Logistic System for ASEAN (DELSA) regional stockpile, and facilitating the deployment of capacities available in the region, such as from the ASEAN Standby Arrangements.

- c. The AHA Centre Emergency Operations Centre (EOC) alert level was raised to Orange (Response Preparation) on 08 September (Sunday) 2019, and is still on Red (Active Response).
- d. The AHA Centre mobilised its ICLT, which met with the National Focal Point of NDMO Lao PDR in Vientiane today (10 September 2019). As of this writing, **ICLT is in Pakse to actively support the emergency response.**
- e. The AHA Centre and ICLT on the ground in Pakse are coordinating the delivery of relief items in **two batches**, as requested by NDMO Lao PDR, from the DELSA regional stockpile in Subang, Malaysia. The **first batch is expected to be delivered tomorrow (11 September 2019) to Pakse International Airport** through our partner, the United Nations Humanitarian Response Depot (UNHRD). This first batch of relief items includes: **820 Family Kits, 4,192 Hygiene Kits, 1,144 Kitchen Sets, 1,400 Mosquito Nets, and 1,400 Jerry Cans** (10 litres). The second batch is expected to be delivered on 12 September (Thursday) 2019 to Wattay International Airport in Vientiane by the Royal Malaysian Air Force (RMAF). This second batch will include the remainder of the relief items: 2,658 Hygiene Kits and 226 Kitchen Sets.



Figure 4: DELSA relief items being prepared at the warehouse in Subang, Malaysia for loading and transport by UNHRD.

- f. The AHA Centre is preparing to mobilise support, as requested by NDMO Lao PDR, on the following areas:
 - Coordination structures
 - Needs assessment
 - Remote support on gap analysis



- Remote support on Geographic Information System (GIS) mapping and database, in which NDMO Lao PDR intend to come up with maps and information products in the local language

Response by Other Humanitarian Partners

- a. Pacific Disaster Center (PDC) produced a hazard brief on flood impact and exposure estimates on 08 September (Sunday) 2019, in collaboration with the AHA Centre.
- b. UNITAR-UNOSAT provided map data on the likely flood extent as of 06 September (Friday) 2019.
- c. MapAction provided a map for internal analysis in the AHA Centre EOC, and has received the AHA Centre's request for staff support with GIS and geospatial analysis expertise in the AHA Centre EOC within this week.
- d. UNHRD is supporting the AHA Centre's logistical operations and deployment of relief items from the DELSA stockpile. They are currently loading the first batch of relief items for transport, with delivery expected to take place tomorrow (11 September 2019).

Response by Other Partners

- a. The AHA Centre, in lieu of NDMO Lao PDR, requested activation of Sentinel Asia's Emergency Observation Request (EOR) through the Asian Disaster Reduction Center (ADRC) on 06 September (Friday) 2019. We received first map data on likely flood extent from the ARIA-SG team at the Earth Observatory of Singapore based on satellite data as of 06 September (Friday) 2019.



5. RECOMMENDATIONS AND PLAN OF ACTIONS

The AHA Centre's plans

- a. The AHA Centre has expressed condolences to Lao PDR and offered support in facilitating regional resources. Based on the acceptance of the NDMO Lao PDR, the AHA Centre has already deployed ICLT, and is now mobilising DELSA regional stockpiles. In addition, the AHA Centre is now preparing for the request on remote support on Information Management.
- b. The AHA Centre and ICLT on the ground in Pakse are expecting the delivery of the first batch of relief items by tomorrow (11 September 2019) to Pakse International Airport through our partner, the United Nations Humanitarian Response Depot (UNHRD). The second batch is expected to be delivered on 12 September (Thursday) 2019 to Wattay International Airport in Vientiane by the Royal Malaysian Air Force (RMAF).
- c. The AHA Centre is preparing to mobilise support, as requested by NDMO Lao PDR, on the following areas:
 - Coordination structures
 - Needs assessment
 - Remote support on gap analysis
 - Remote support on Geographic Information System (GIS) mapping and database, in which NDMO Lao PDR intend to come up with maps and information products in the local language



6. IMAGERY

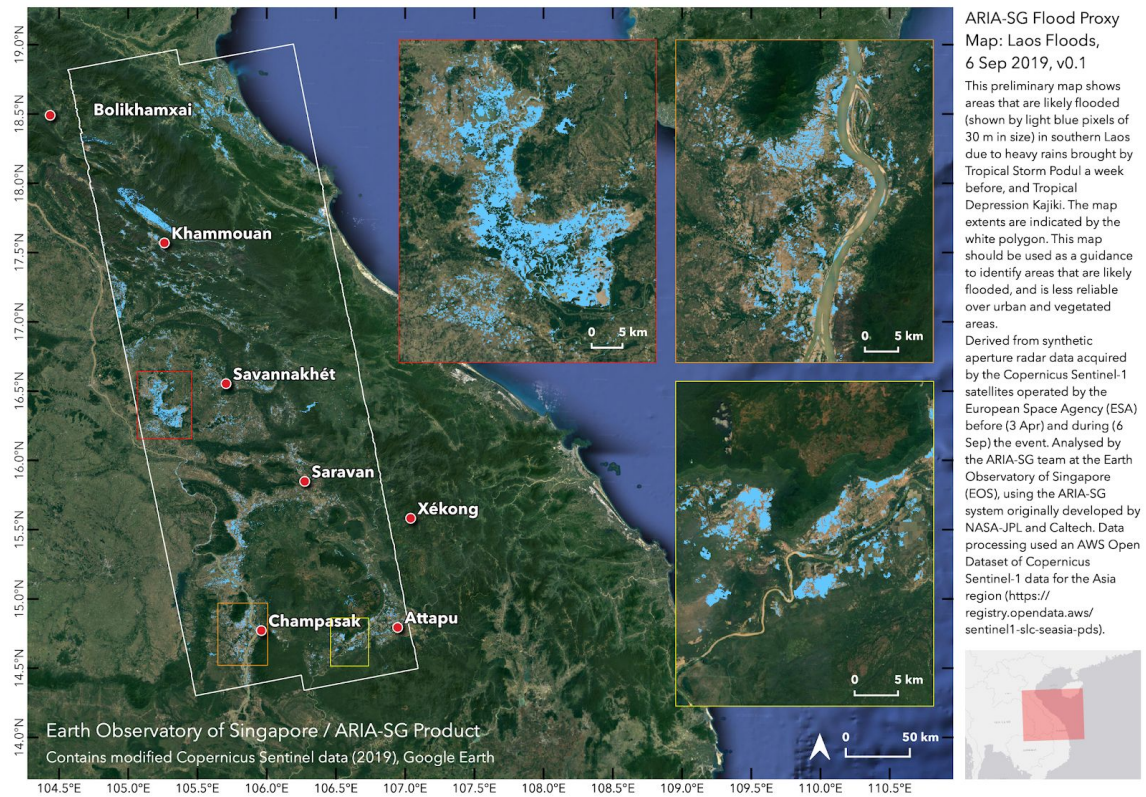


Figure 5: Map of affected areas in Lao PDR showing the likely flooded areas (light blue pixels), based on synthetic aperture radar satellite data before (03 April 2019) and during (06 September 2019) the flood event. Analysis was done by the ARIA-SG team at the Earth Observatory of Singapore (EOS) for Sentinel Asia.



Figure 6: Flooding in Khammouan province





Figure 7: A road marker in Attapeu



Figure 8: *Champasak provincial hospital completely inundated*





Figure 9: River bursts its banks in Pakse





Figure 10: A flooded roadway in Sekong province

Figures 6-10: Images from *The Laotian Times*, published online in ‘Floods Continue to Devastate Southern Laos’ article dated 05 September 2019.

Prepared by:

The AHA Centre - Emergency Operations Centre (EOC)

ABOUT THE AHA CENTRE

The AHA Centre - ASEAN Coordinating Centre for Humanitarian Assistance on disaster management - is an inter-governmental organisation established by 10 ASEAN Member States – Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam - to facilitate the cooperation and coordination among ASEAN Member States and with the United Nations and international organisations for disaster management and emergency response in the region.

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Satellite detected waters extents, as of 6 September 2019 over southern provinces of Lao PDR

This map illustrates satellite-detected surface water in southern provinces of Lao PDR as observed from Sentinel-1 Imagery acquired on 6 September 2019. Within the analysed extent of about 60,000 km², a total about 1,000 km² of land appear to be flooded as of 6 September 2019. This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to UNITAR - UNOSAT.

Important Note: Flood analysis from Sentinel-1 Imagery acquired on 6 September 2019 may seriously underestimate presence of standing flood water in built up areas due to backscattering of the radar signal

Legend

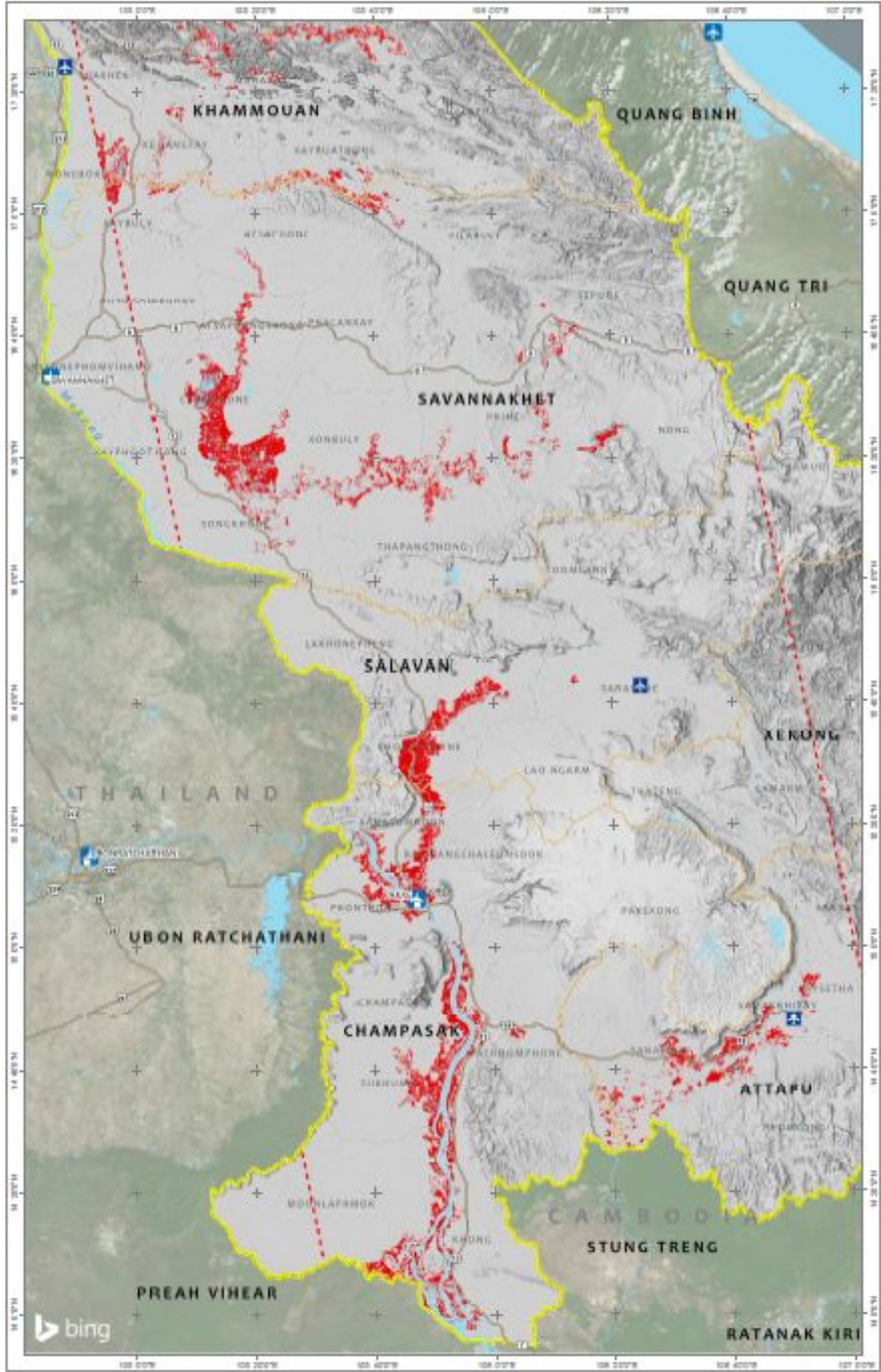
- City/Town
- Airport
- Road
- District boundary
- Province boundary
- International boundary
- Analysis extent
- Reference water
- Satellite detected water (6 September 2019)

Province	District	Flood Area (km ²)	Total Population (in AD)	Population Potentially Affected
Khammouan	Savathakhet	13	30,700	300
	Saysetha	7	25,500	200
	Phouang	8	14,500	300
	Savannay	15	37,400	2,300
	Phou	15	74,000	4,400
Champasack	Savannakhet	76	39,800	6,300
	Champasack	23	33,000	500
	Phoukhouang	23	82,000	4,500
	Champasack	38	47,800	4,800
	Xiengkhouang	48	36,700	3,200
	Sikhone	47	41,000	4,300
	Xiang	80	114,000	8,200
	Halong	38	36,500	4,400
	Phoukhan	9	23,000	300
	Wichay	22	36,000	1,200
Khammouan	Songkhla	7	3,700	400
	Wichay	18	23,000	700
	Wichay	18	30,700	400
	Wichay	18	30,400	2,000
Salavan	Savathakhet	15	11,800	300
	Savathakhet	7	10,500	500
	Savathakhet	27	63,800	3,400
Attapeu	Wichay	30	85,100	10,800
	Wichay	11	36,200	1,500
	Wichay	30	84,000	1,500
	Wichay	9	36,100	500
Savannakhet	Wichay	13	36,500	300
	Phoukhan	18	19,200	1,600
	Phoukhan	34	36,000	3,200
	Phoukhan	20	80,000	10,000
	Phoukhan	30	76,700	8,200
	Phoukhan	18	31,400	2,500
Savannakhet	Wichay	7	29,000	300
	Wichay	8	29,800	300
	Wichay	8	29,800	300
	Wichay	8	29,800	300
Total	1,040	1,638,000	184,100	

Map Scale for A2: 1:1,200,000

Analysis conducted with SNAP 7.0 and ArcMap v10.7

Coordinate System: WGS 1984 UTM Zone 48N
 Projection: Transverse Mercator
 Datum: WGS 1984
 Units: Meter



Satellite Data: Sentinel-1
 Imagery Date: 6 September 2019
 Resolution: 10 m
 Copyright: Copernicus 2019 / ESA
 Source: ESA

Boundary data: OCHA/DP
 Population data: WorldPop (2018)
 Reference water: Global Surface Water, JRC
 Analysis: UNITAR - UNOSAT
 Production: UNITAR - UNOSAT

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