ONE ASEAN
ONE RESPONSE

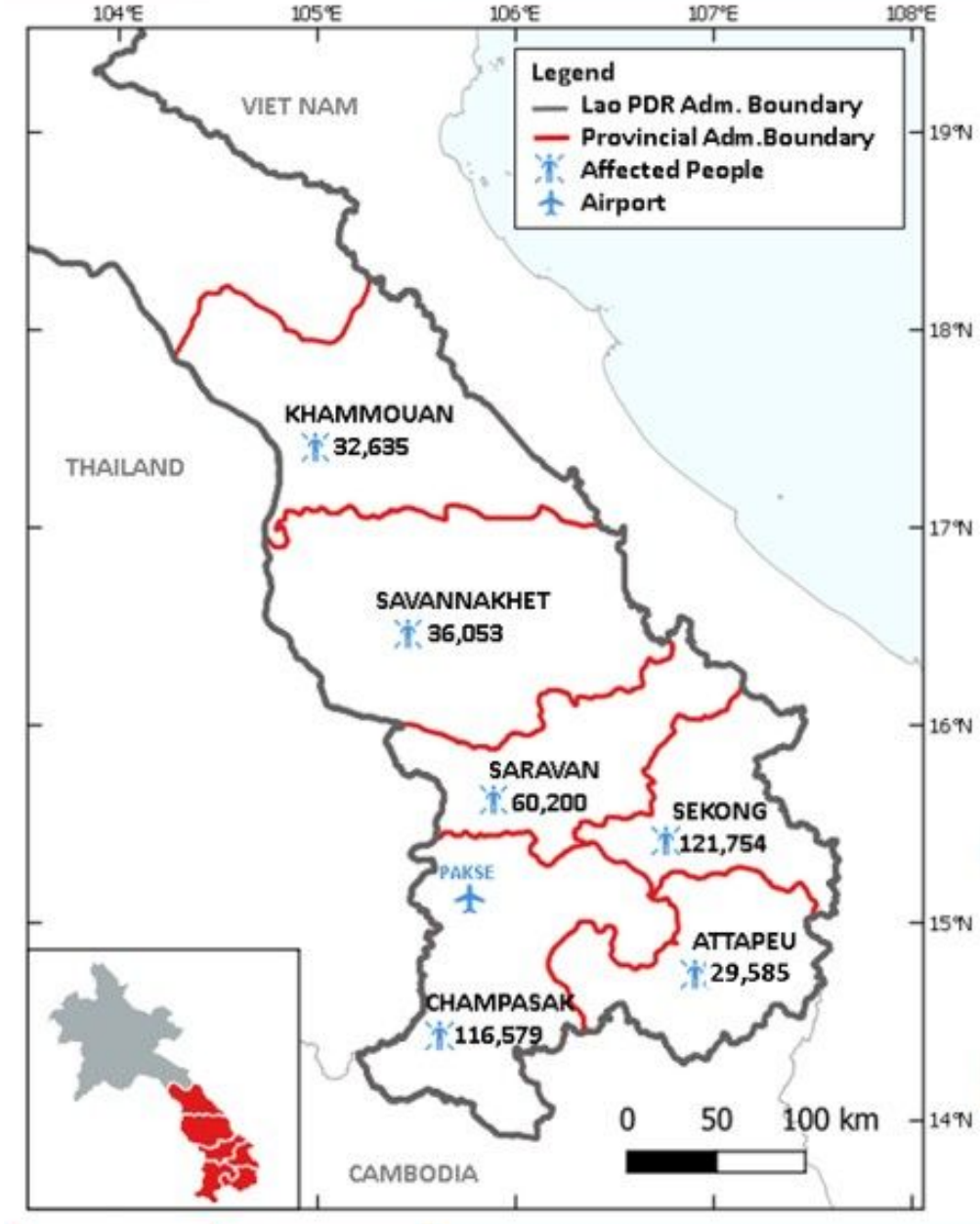
SITUATION UPDATE
TROPICAL STORM PODUL AND TROPICAL DEPRESSION KAJIKI
Lao PDR
Monday, 09 September 2019, 20:30 hrs (UTC+7)

No. 1

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 09 September 2019



EFFECTS

- 123K* AFFECTED FAMILIES
- 397K* AFFECTED PERSONS
- 14* DEAD
- 88K* DISPLACED PERSONS
- 20* EVACUATION CENTRES
- 28* 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) — Arrived in Vientiane

DELSA (Disaster Emergency Logistic System for ASEAN) — Preparing to mobilise stockpiles

ERAT (Emergency Response and Assessment Team) — On standby

IM (Information Management) — Coordinating with partners to obtain information and maps

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: **Khammouan, Savannakhet, Champasak, Saravan, Sekong, and Attapeu**.

b. According to the update released by Lao PDR's National Disaster Management Organisation (NDMO) 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. On 07 September (Saturday) 2019, the Prime Minister of Lao PDR, Mr. Thongloun Sisoulith, called for an emergency meeting and gave orders to the relevant agencies to quickly assist the affected areas.

c. 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**.

d. National Government leaders of Lao PDR visited the affected areas 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.

e. Based on provincial impact data provided by NDMO Lao PDR, **Champasak and Sekong are responsible for 61% 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**.

f. 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. The existing data seems to suggest a gap in ground assessment and validation and a lack of evacuation in the more mountainous Attapeu and Sekong.

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 Champasek) 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
   - Water treatment equipment

- Cash support

i. The AHA Centre has mobilised its In-Country Liaison Team (ICLT) to establish direct coordination lines with NDMO Lao PDR on the ground, and to coordinate the delivery and handover of DELSA regional stockpile in Subang, Malaysia to Pakse International Airport in Lao PDR, as requested by NDMO Lao PDR.

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 08 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.

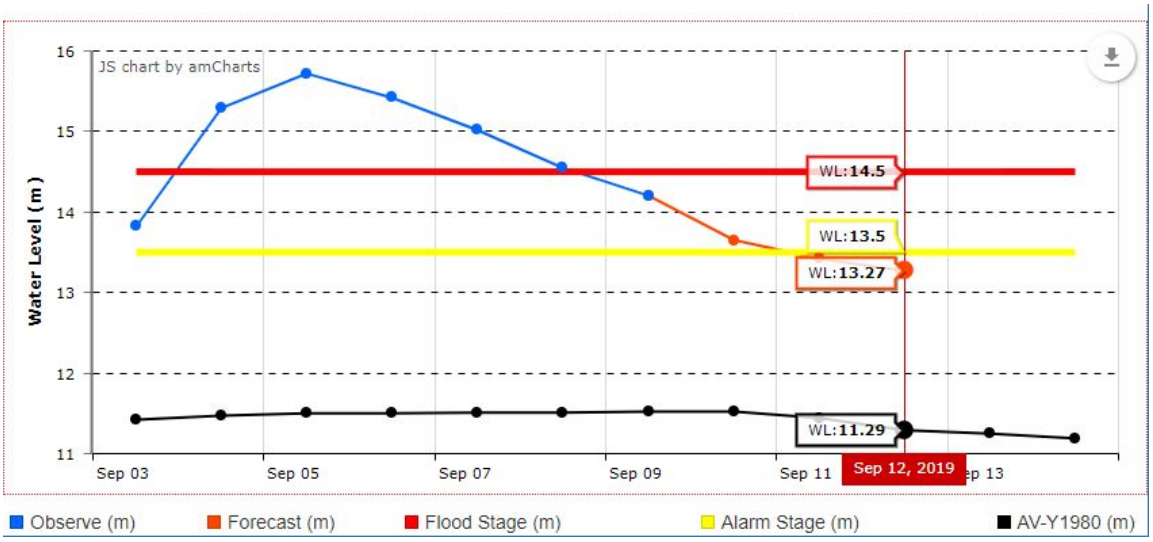


Figure 1*: Observed and forecasted water level in Khong Chiam, Lao PDR. Forecasted water level of 13.27 m on 12 September (Thursday) 2019 falls below the alarm level of 13.5 m. Source: Mekong River Commission*

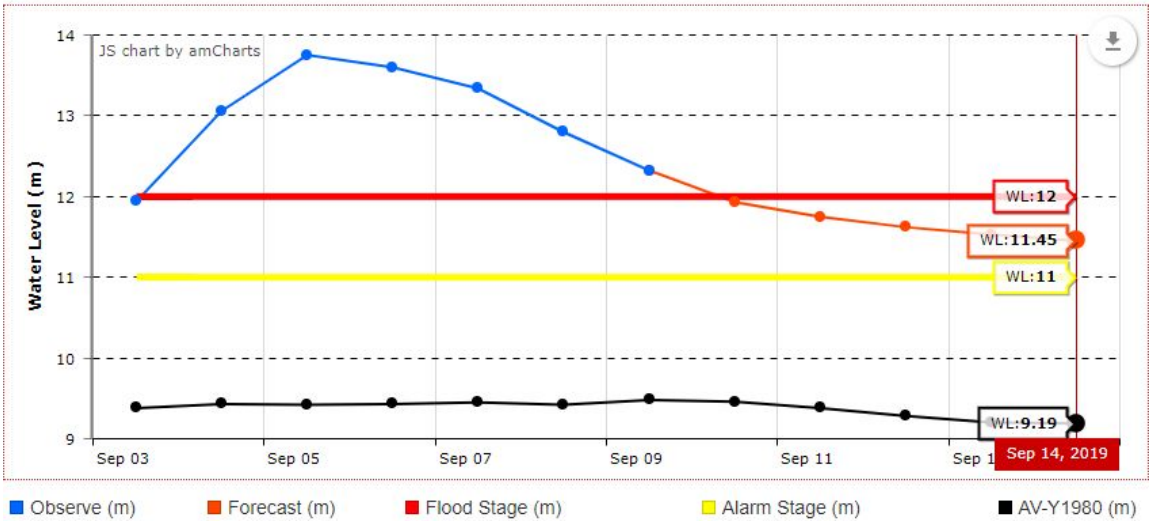


***Figure 2**: Observed and forecasted water level in Pakse, Lao PDR. Forecasted water level of 11.45 m on 14 September (Saturday) 2019 at the end of the forecast period is still above the alarm level of 11 m. Source: Mekong River Commission*

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. Note that the number of affected persons for Attapeu is an estimate based on the reported number of affected families (one family is assumed to consist of five family members).

Provinces	Affected Families	Affected Persons	Dead	Displaced Persons	Damaged Houses
Attapeu	5,917	29,585*	4	-	-
Champasak	36,223	116,579	5	30,014	-
Khammouan	11,855	32,635	-	4,008	28
Saravan	28,514	60,200	2	30,000	-
Savannakhet	16,474	36,053	3	23,868	-
Sekong	24,019	121,754	-	-	9
Total	**123,002**	**396,806**	**14**	**87,890**	**37**

***Table 1**: Figures for impacts in the 6 affected provinces of Lao PDR. Data obtained from NDMO Lao PDR as of 08 September (Sunday) 2019.*

d. Figures for the number of displaced people in Attapeu and Sekong provinces are still to be confirmed even though Sekong is the most affected province (according to the latest data from NDMO Lao PDR, over 30% of the total affected persons come from this province). Topography may have influenced reaching affected areas for assessment.

e. 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 could be due to the backscattering radar signals that caused underestimate flood extent.

Provinces	Flood Extent (km2)	Total Population	Potentially Affected Population	Reported Affected Population
Attapeu	96	102,700	3,290	29,585
Champasak	332	540,700	42,350	116,579
Khammouan	101	167,200	5,840	32,635
Saravan	119	195,700	16,250	60,200
Savannakhet	352	600,200	32,680	36,053
Sekong	No apparent flooded area in mapped analysis yet			121,754
Total	1,000	1,606,500	100,410	390,889

***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.*

f. The floods mostly occur in the valleys 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 floor (Figure 3).

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 Provincial and District-level Disaster Management and Control Committees, the Government has already deployed personnel and volunteers to evacuate affected people and distribute the following relief: **35 rescue boats, 2,200 packs of drinking water, and 100 family tents**.

c. As of 08 September (Sunday) 2019, emergency response teams from the military, police, and health sectors, equipped with trucks, boats, vehicles, helicopters, tools, and other equipment, have been deployed to the affected provinces. National Government leaders of Lao PDR visited the affected areas 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.

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. 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 the AHA Centre

a. 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.

b. The AHA Centre Emergency Operations Centre (EOC) alert level was raised to Orange (Response Preparation) on 08 September (Sunday) 2019 and is now at Red (Active Response).

c. The AHA Centre has mobilised its In-Country Liaison Team (ICLT) which consists of Janggam Adhityawarma (ICLT Leader), Halanson Roy Simanjuntak, and Jeerasak Yaemsee to Vientiane, Lao PDR today (09 September 2019). ICLT will be assigned to establish direct coordination lines with NDMO Lao PDR on the ground, with the first meeting expected tomorrow on 10 September (Tuesday) 2019.

d. The AHA Centre and ICLT are coordinating the delivery of relief supplies, as requested by NDMO Lao PDR, from the DELSA regional stockpile in Subang, Malaysia to Pakse International Airport in Lao PDR.

e. The AHA Centre is in contact with partners (ADRC, Sentinel Asia, EOS ARIA-SG, PDC, UNITAR-UNOSAT, and Map Action) for the satellite imageries, spatial analysis, and map products.

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 has been contacted to provide remote mapping support to the AHA Centre.
d. United Nations Humanitarian Response Depot (UNHRD) is supporting the AHA Centre's logistical operations and deployment of relief items from the DELSA stockpile.

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.

5. RECOMMENDATIONS AND PLAN OF ACTIONS

The AHA Centre's plans

a. 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.

b. DELSA stockpiles are being mobilised for delivery to Pakse International Airport (PKZ) via military aircraft or commercial charter with target ETA on 10 September (Tuesday) 2019.

c. By tomorrow (10 September 2019), a field call with EOC Jakarta will be held, while ICLT Leader will meet with NDMO Lao PDR in the morning, the rest of the ICLT team will proceed to Pakse International Airport. ICLT Leader, with NDMO Lao PDR, will follow to Pakse in the following afternoon.

d. ASEAN-ERAT has been activated and is currently on standby for possible deployment, in the event of escalation in the flooding situation and request for support from Lao PDR.

6. IMAGERY

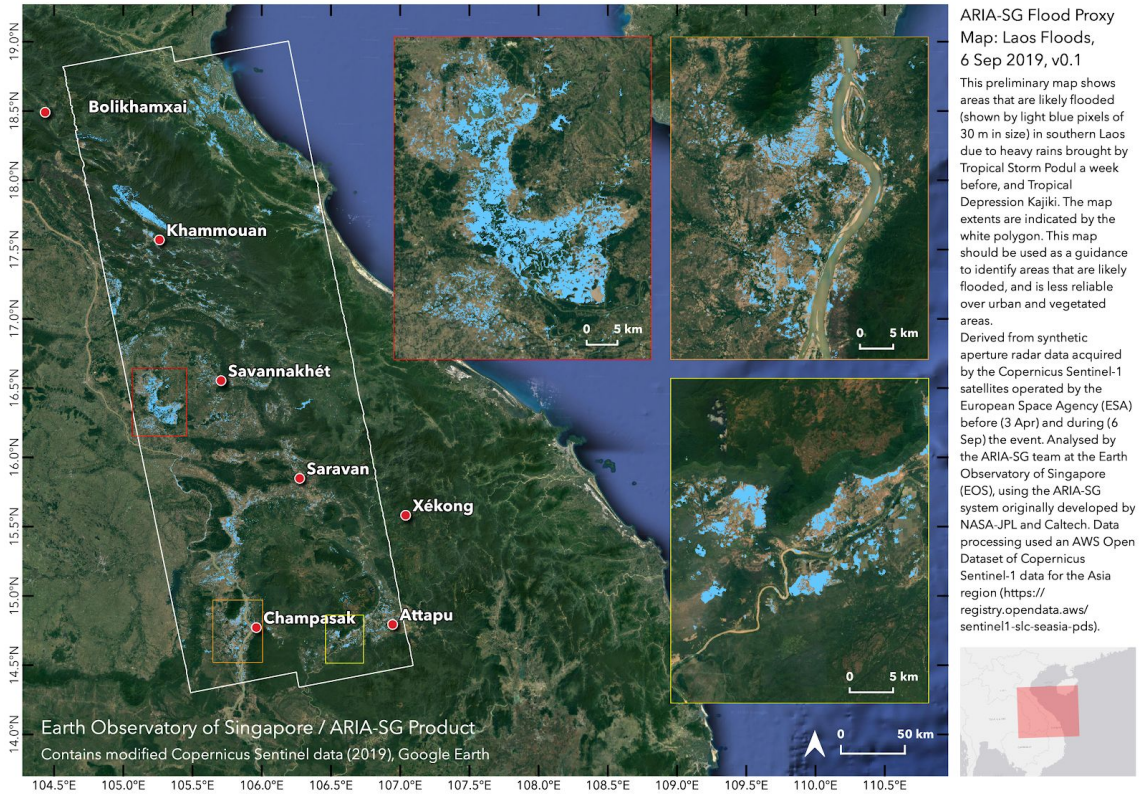


***Figure 4**: Map of affected areas in Lao PDR showing the likely flooded areas (light blue pixels), based on synthetic aperture radar satellite data before (03 April 2019) and during (06 September 2019) the flood event. Analysis was done by the ARIA-SG team at the Earth Observatory of Singapore (EOS) for Sentinel Asia.*

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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unitar
United Nations Institute for Training and Research

LAO PDR

Attapeu, Champasack, Khammouan, Salavan and Savannakhet Province

Imagery analysis: 6 September 2019 | Published 8 September 2019 | Version 1.0

Flood

FL20190905LAO

UNOSAT

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
- Internation boundary
- Analysis extent
- Reference water
- Satellite detected water [6 September 2019]

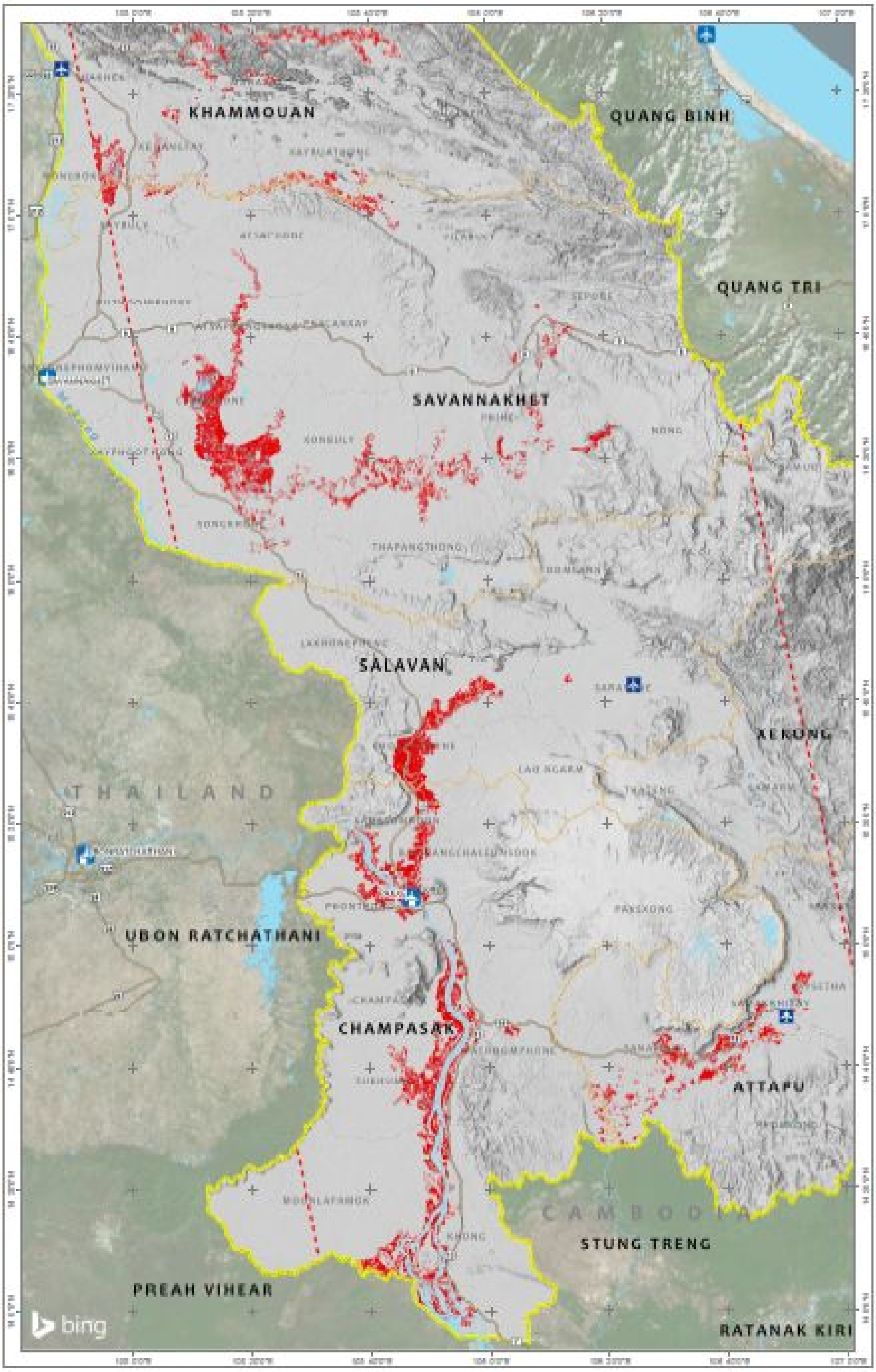
Province	District	Flood Extent (km2)	Total Population in AOI	Population Potentially Affected
Attapeu	Samakkhixay	13	30,700	300
	Sanxay	7	35,000	200
	Phouvong	6	14,000	300
	Saysetha	15	37,400	2,300
Champasack	Pakse	15	74,000	4,400
	Sanasomboun	75	59,800	6,500
	Bachiangchaleunsook	1	33,600	100
	Phonthong	33	83,000	4,500
	Champasack	38	47,600	4,600
	Moonlapamok	48	36,700	3,300
	Soukhouma	47	41,000	4,300
	Khong	85	101,000	6,200
	Pathoumphone	38	66,000	4,400
Khammouan	Thakhek	3	29,000	300
	Mahaxay	22	36,000	1,300
	Nongbok	7	3,700	600
	Nhommalath	18	23,000	700
	Boualapha	18	20,700	440
	Xebangfay	18	39,400	3,500
	Saybouathong	10	11,800	300
Salavan	Saravane	3	101,600	100
	Vapy	27	40,000	3,800
	Khongsedone	80	83,100	12,000
Savannakhet	Atsaphangthong	11	38,200	1,500
	Phine	35	84,000	1,500
	Sepone	3	39,100	800
	Nong	13	20,000	300
	Thapangthong	19	57,000	1,400
	Songkhone	38	98,000	3,300
	Champhone	130	95,000	10,000
	Xaibouly	80	70,700	8,200
	Xayphouthong	15	31,400	2,500
	Vilabouly	7	23,000	100
	Atsaphone	8	23,600	200
	Total	1,000	[illegible]	[illegible]

Map Scale for A3: 1:1,200,000

0 5 10 20 30 40 Km

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 Dates: 6 September 2019
Resolution: 10 m
Copyright: Copernicus 2019 / ESA
Source: ESA

Boundary data: OCHA/ROAP
Population data: WorldPop (2015)
Reference water: Global Surface Water, JRC
Analysis : UNITAR - UNOSAT
Production: UNITAR - UNOSAT

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