



ONE ASEAN
ONE RESPONSE

SITUATION UPDATE TROPICAL STORM PODUL AND TROPICAL DEPRESSION KAJIKI Lao PDR

No. **3**

Wednesday, 11 September 2019, 23:30 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



Figures are the latest updates, correct as of 11 September 2019

104°E 105°E 106°E 107°E 108°E

Legend
— Lao PDR Adm. Boundary
— Provincial Adm. Boundary
✈ Affected People
✈ Airport

VIET NAM

KHAMMOUAN

43,117

THAILAND

SAVANNAKHET

85,018

SARAVAN

138,861

SEKONG

121,754

PAKSE

CHAMPASAK

206,314

ATTAPU

65,455

CAMBODIA

0 50 100 km

VIENTIANE

EFFECTS



661K*
AFFECTED
PERSONS



63K*
DISPLACED
PERSONS



18*
DEAD



298 KM*
AFFECTED
ROADS



275K HA*
AFFECTED
FARMLAND



613*
AFFECTED
SCHOOLS

GOVERNMENT RESPONSE



39*
RESCUE
BOATS



> 3,000*
PACKS OF
DRINKING WATER



120*
FAMILY
TENTS



US\$570K*
(LAK 5 BILLION)
EMERGENCY AID

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

ASEAN RESPONSE

MALAYSIA

Providing logistical support for stockpiles to arrive in Vientiane tomorrow

THE AHA CENTRE

Actively supporting the NDMO's emergency response through EOC and ICLT, mobilised DELSA stockpiles that will arrive in Vientiane tomorrow, and Information Management technical assistance



SITUATION UPDATE

1. HIGHLIGHTS

- a. On 29 August (Thursday) and 02 September (Monday) 2019, the Lao PDR Department of Meteorology and Hydrology (DMH), Ministry of Natural Resources and Environment, 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: **Champasak, Saravan, Sekong, Savannakhet, Attapeu, and Khammouan** (order is based on the most affected province).
- b. **As many as 89 bridges, 613 schools, 46 health centres and hospitals, 298 km of roads, 274,719 hectares of farmland, 574,742 livestock, and 36 reservoirs** were affected by the floods. Total damage is estimated to **cost US\$10 million (88 billion LA kip)**. These figures are correct as of 11 September (Wednesday) 2019.
- c. According to the Vientiane Times, the Government has approved the deployment of **US\$569,878 (5 billion LA kip)** by the Ministry of Labor and Social Welfare (MLSW) for emergency aid.
- d. According to the DMH, **rainfall is expected in the central and southern parts of Lao PDR over the next 24 hours**. According to the Mekong River Commission (MRC), two hydrological stations in Southern Lao PDR, namely Khong Chiam and Pakse (north of Champasak Province) have forecast that the **water levels, which are currently above alarm levels, will remain below flood stage** (Figure 1 and 2) until 14 September (Saturday) 2019. Meanwhile, the current and forecasted water levels in Vientiane are around 3 m, well below the alarm level of 11,5 m.
- e. The AHA Centre mobilised its ICLT, which participated in the coordination meeting at the Local Emergency Management Authority in Pakse today (11 September 2019). **ICLT is heading to Vientiane today to facilitate the arrival of DELSA regional stockpiles in support of the emergency response.**
- f. **The relief items is expected to be delivered by tomorrow (12 September 2019)** to Wattay International Airport in Vientiane through the Royal Malaysian Air Force (RMAF) where the **Executive Director of the AHA Centre will do the handover to NDMO Lao PDR.**
- g. 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 and Environment, 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), and tropical cyclones PODUL and KAJIKI. Subsequently, thunderstorm advisories and heavy rainfall warnings were issued for six (6) provinces: Attapeu, Champasak, Khammouan, Saravan, Savannakhet, and Sekong. This was followed by reports of flooding in all 6 provinces.

Forecast and anticipated risk

- c. According to the DMH, rainfall is expected in the central and southern parts of Lao PDR over the next 24 hours. 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, both of which lie in the most affected Champasak Province, have observed that current water levels are above alarm levels. The water levels are forecast to increase over the course of the week from tomorrow (12 September 2019), due to a low pressure area over the middle part of the Mekong River that may bring heavy rainfall and affect water levels in the downstream areas (southern parts of Lao PDR), including in Pakse.

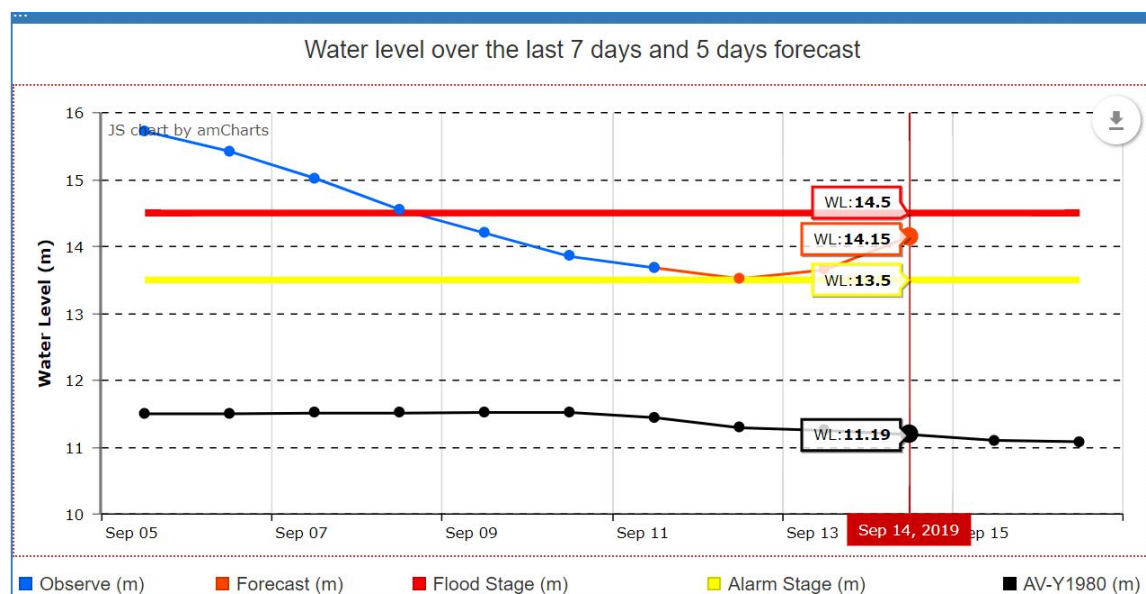


Figure 1: Observed and forecasted water level in Khong Chiam, Lao PDR. Forecasted water level will increase to 14.15 m on 14 September (Saturday) 2019, above the alarm level of 13.5 m. Source: Mekong River Commission

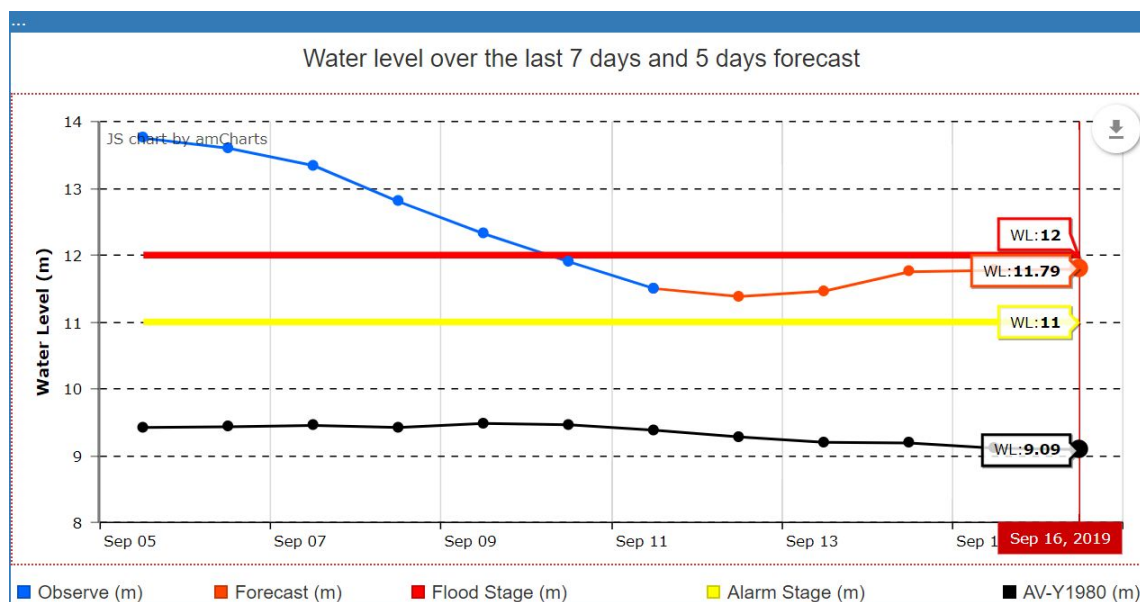


Figure 2: Observed and forecasted water level in Pakse, Lao PDR. Forecasted water level will increase to 11.79 m on 15 September (Sunday) 2019, above the alarm level of 11 m. Source: Mekong River Commission

- e. Based on tomorrow's weather forecast and water level forecasting of hydrological stations in Vientiane, the area is safe from flood risk that may affect the deployment of relief items, even though thunderstorms will likely occur.

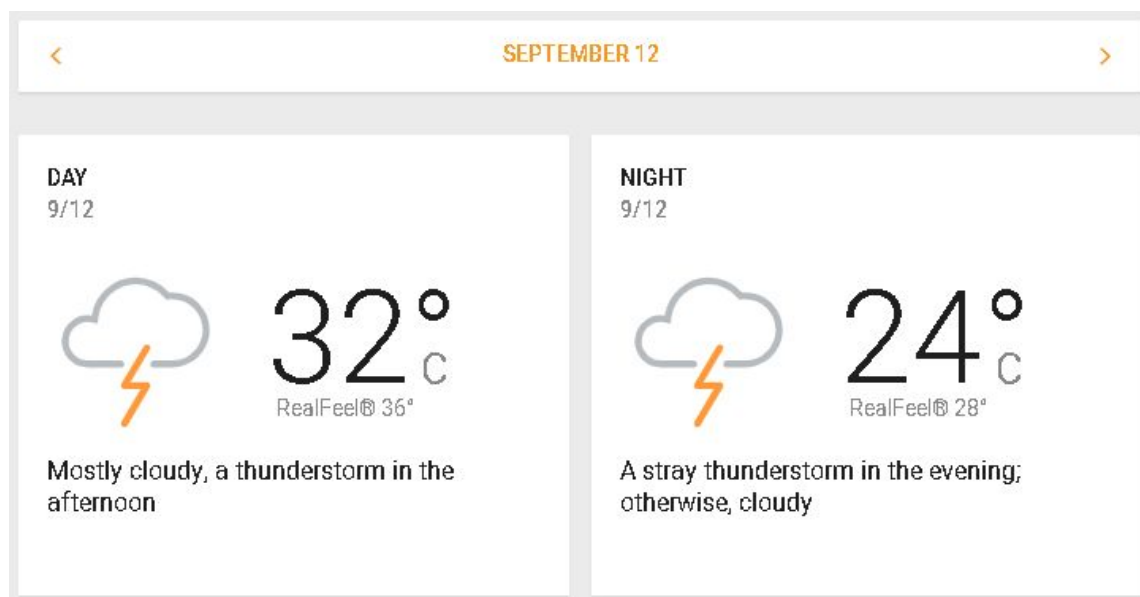


Figure 3: Forecast weather in Vientiane, Lao PDR for 12 September (Wednesday) 2019. Source: Accuweather.com



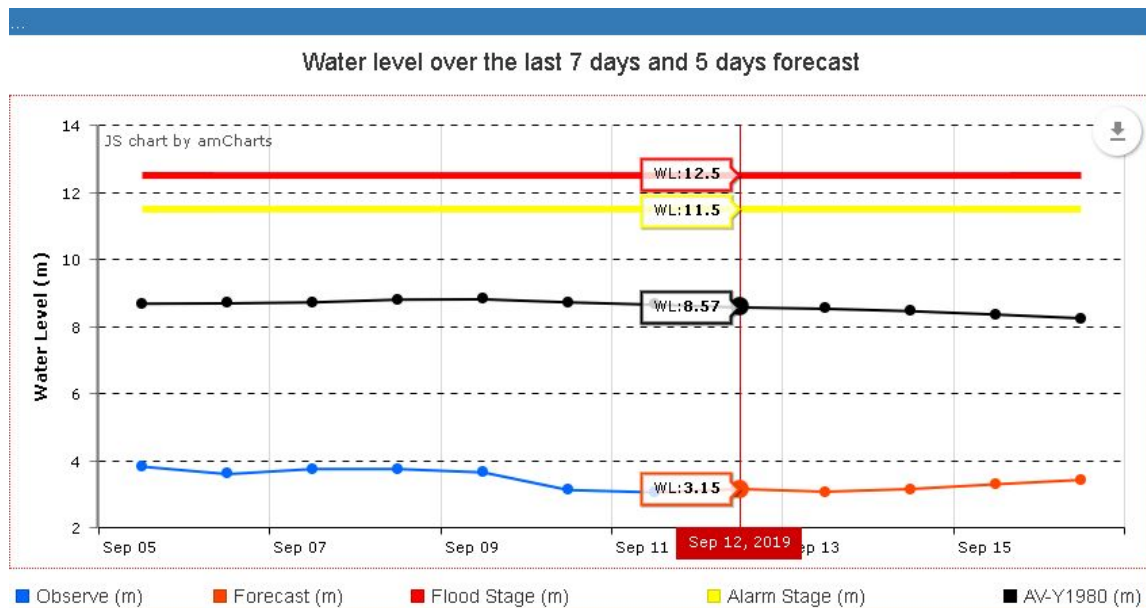


Figure 4: Observed and forecasted water level in Vientiane, Lao PDR, well below the alarm level of 11.5 m. Source: Mekong River Commission

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 (**the AHA Centre is currently responding to these needs**)
 - 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. Figure 5 graphs the evolution in key reported impacts. There is a significant decrease in the number of displaced persons particularly in Champasak province.

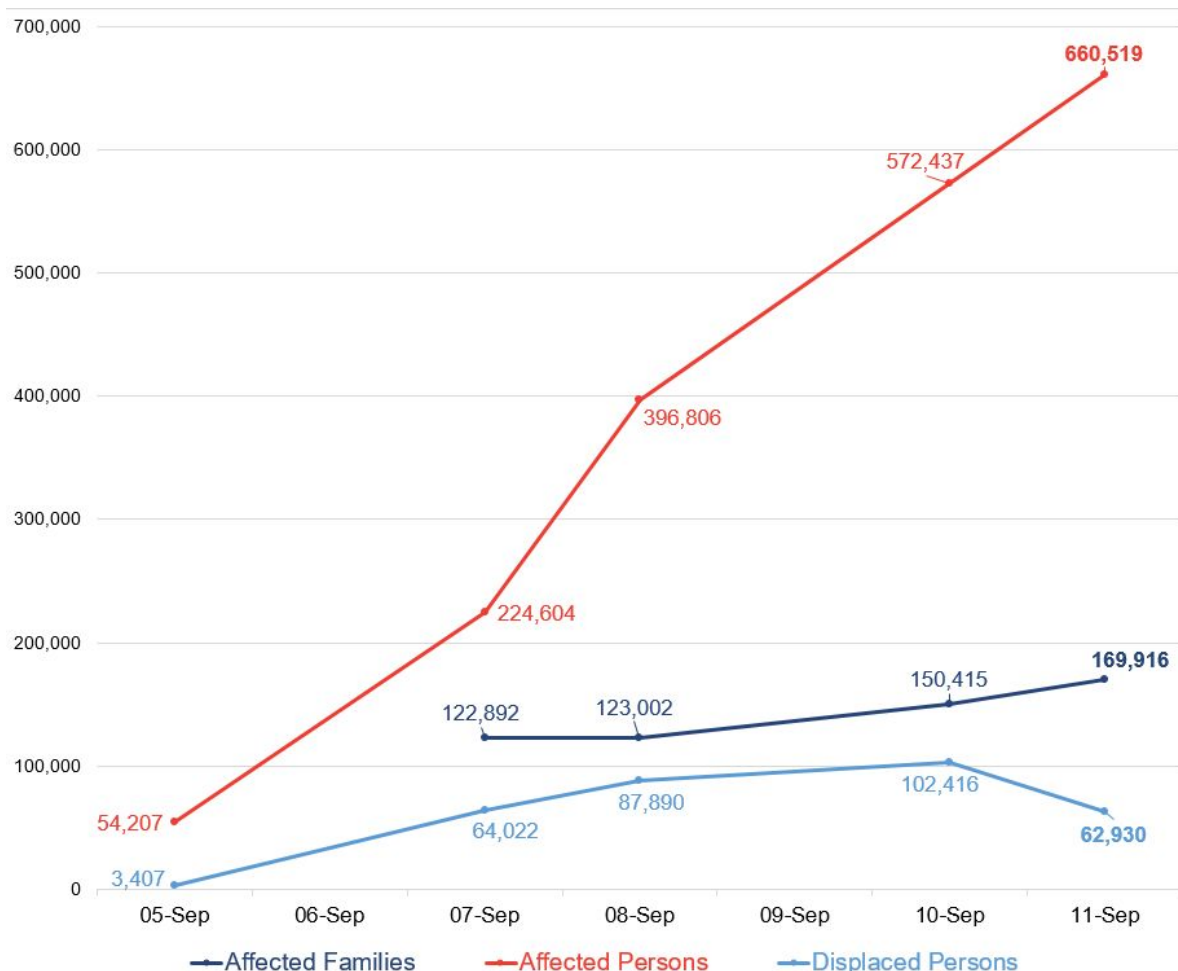


Figure 5: Evolution of impact figures over the monitored period. Estimated based on the figures provided by NDMO Lao PDR.



- d. 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
Champasak	42,187	206,314	8	15,638	-
Saravan	35,905	138,861	3	14,909	-
Sekong	24,019	121,754	-	-	9
Savannakhet	42,509	85,018*	3	23,868	-
Attapeu	13,091	65,455*	4	-	-
Khammouan	12,205	43,117	-	8,515	311
Total	169,916	660,519	18	62,930	320

Table 1: Figures for impacts in the 6 affected provinces of Lao PDR. Data obtained from NDMO Lao PDR as of 11 September (Wednesday) 2019.

- e. Figures for the number of displaced people in Sekong and Attapeu are still to be confirmed, as the ground assessment is still ongoing. 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. **As many as 89 bridges, 613 schools, 46 health centres and hospitals, 298 km of roads, 274,719 hectares of farmland, 574,742 livestock, and 36 reservoirs** were affected by the floods. Total damage is estimated to **cost US\$10 million (88 billion LA kip)**. These figures are correct as of 11 September (Wednesday) 2019.
- g. According to Champasak's Industry and Commerce Department, as reported by the Vientiane Times, **the price of rice has doubled to 11 US cents per kg** (1,000 LA kip per kg) while the price of pork has increased by about 57 US cents per kg (5,000 LA kip per kg), but both **prices are within manageable levels due to the Government's intervention**.
- h. 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). As expected, the current report of affected population on the ground is much higher than the potential figures in 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. 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.**

Provinces	Flood Extent (km ²)	Total Population	Potentially Affected Population	Reported Affected Population
Champasak	332	540,700	42,350	206,314
Saravan	119	195,700	16,250	138,861
Sekong	No apparent flooded area in mapped analysis yet			121,754
Savannakhet	352	600,200	32,680	85,018*
Attapeu	96	102,700	3,290	65,455*
Khammouan	101	167,200	5,840	43,117
Total	1,000	1,606,500	100,410	660,519

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 11 September (Sunday) 2019.

- i. The floods mostly occurred 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 occurred 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 (PM), 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, other aircraft, tools, and other equipment to evacuate affected people and distribute the following relief: **39 rescue boats, 120 family tents, and more than 3,000 packs of drinking water.**
- c. According to the Vientiane Times, on 07 September (Saturday) 2019, the PM, 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 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. 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.
- e. Authorities are having trouble reaching some areas because 298 km of roads and 89 bridges have been reportedly affected by the floods. As a result, authorities have used helicopters and other aircraft from the Ministry of National Defence to reach the affected people in these areas.
- f. According to the Vientiane Times, the Government has intervened in the market for rice and pork to keep prices within manageable levels.
- g. The Government has approved the deployment of **US\$569,878 (5 billion LA kip)** by the Ministry of Labor and Social Welfare (MLSW) for emergency aid. The MLSW has also been mobilising funds, food, and drinking water from many sectors since 09 September (Monday) 2019.
- h. According to the Vientiane Times, the Ministry of Health has assigned medical personnel with essential medicines to assist the affected people, especially in Champasak and Saravan. Authorities have also set up drinking water production



equipment at the border of Sekong and Saravan, for delivery of clean drinking water to the affected areas.

- i. Emergency assessment teams are being deployed to evaluate the damage and needs.
- j. Authorities are currently repairing infrastructure and facilities, especially roads, bridges, schools, and hospitals.

Response by ASEAN Member States

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

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 Logistics 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 still on Red (Active Response).
- c. The AHA Centre mobilised its ICLT, which met with the NFP of NDMO Lao PDR in Vientiane on 10 September (Tuesday) 2019 and participated in the coordination meeting at the Local Emergency Management Authority in Pakse today (11 September 2019). ICLT has arrived in Vientiane today (11 September 2019) to facilitate the arrival of relief items while still actively supporting the emergency response, as well as to provide technical assistance to NDMO Lao PDR on designing coordination structures and needs assessment during emergency response. The AHA Centre will be deploying another staff tomorrow (12 September 2019) to Vientiane as an Information Management specialist to support the rapid needs assessment planning and implementation.



Figure 6: Coordination meeting at the Local Emergency Management Authority in Pakse, 11 September (Wednesday) 2019.

- d. The relief items is expected to be delivered by tomorrow (12 September 2019) to Wattay International Airport in Vientiane through the Royal Malaysian Air Force (RMAF) where the **Executive Director of the AHA Centre** will do the handover to **NDMO Lao PDR**.



Figure 7: DELSA relief items being prepared at the warehouse in Subang, Malaysia for loading and transport.



- e. The AHA Centre is **preparing to provide remote support to NDMO Lao PDR on Information Management** – specifically on gap analysis, GIS and mapping (in which NDMO Lao PDR intend to come up with maps and information products in the local language), from the AHA Centre EOC in Jakarta, Indonesia.

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.

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 NDMO Lao PDR, the AHA Centre has already deployed ICLT to actively support the emergency response and provide technical assistance, and is now mobilising the DELSA regional stockpile.
- b. The relief items is expected to be delivered by tomorrow (12 September 2019) to Wattay International Airport in Vientiane through the Royal Malaysian Air Force (RMAF) where the Executive Director of the AHA Centre will do the handover to NDMO Lao PDR.
- c. ICLT is in Vientiane to facilitate the arrival of relief items in support of the emergency response, as well as to enhance the provision of technical assistance to NDMO Lao PDR on designing coordination structures and needs assessment during emergency response. The AHA Centre will be deploying another staff tomorrow to Vientiane as an Information Management specialist to support the rapid needs assessment planning and implementation.
- d. 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 EOC in Jakarta, Indonesia.



6. IMAGERY

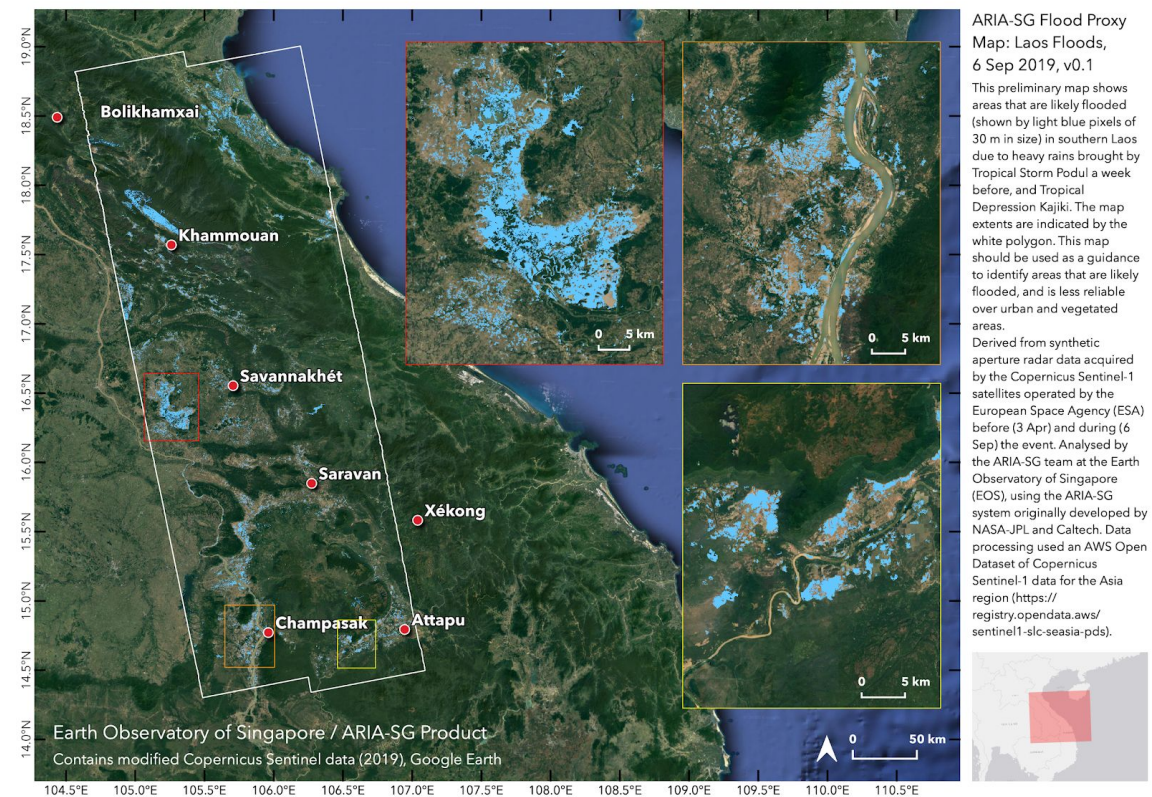


Figure 8: Map of affected areas in Lao PDR showing the likely flooded areas (light blue pixels), based on synthetic aperture radar satellite data before (03 April 2019) and during (06 September 2019) the flood event. Analysis was done by the ARIA-SG team at the Earth Observatory of Singapore (EOS) for Sentinel Asia.



Figure 9: Flooding in Khammouan province





Figure 10: A road marker in Attapeu



Figure 11: Champasak provincial hospital completely inundated





Figure 12: River bursts its banks in Pakse





Figure 13: A flooded roadway in Sekong province

Figures 9-13: 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

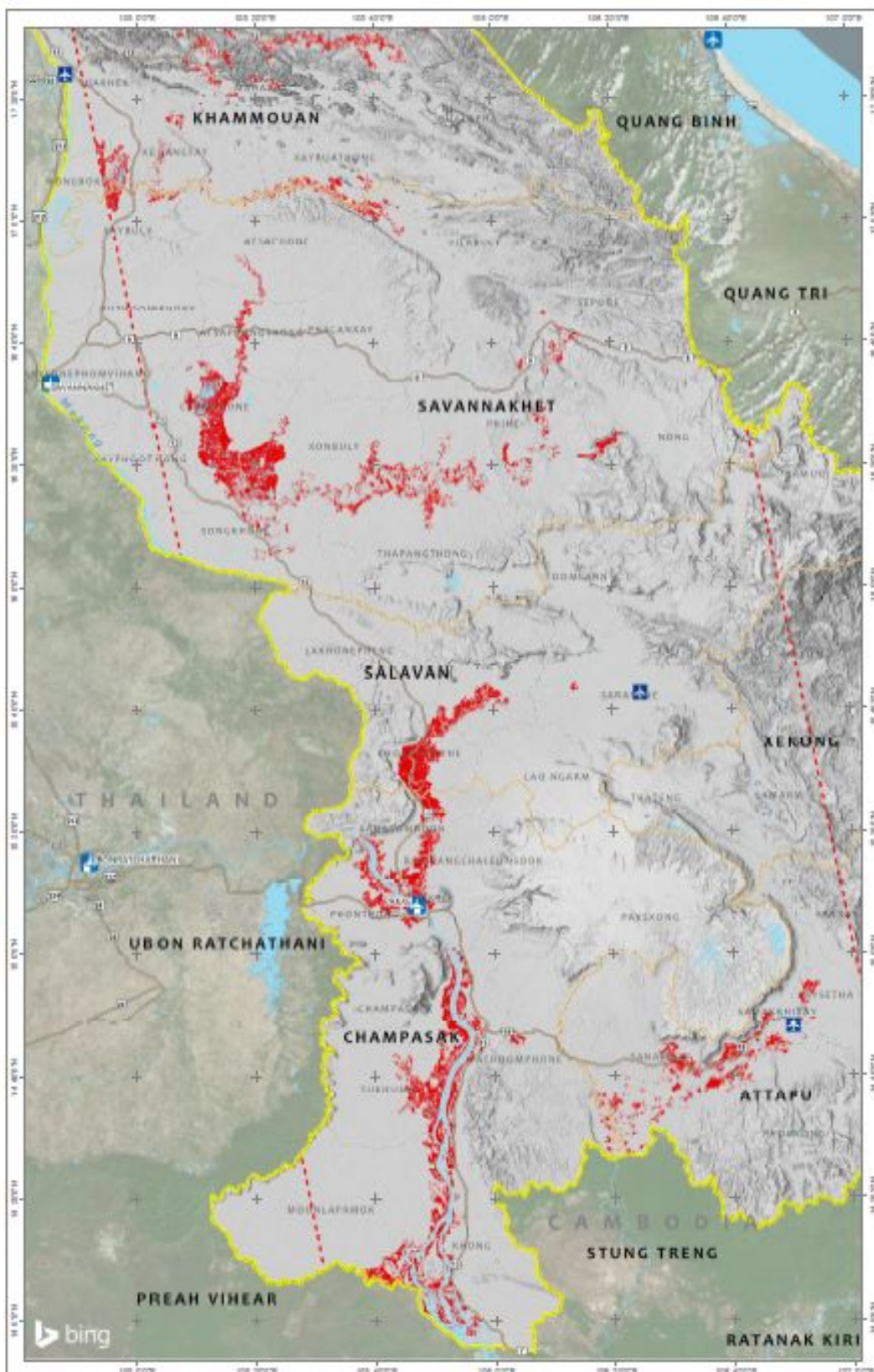
Legend

-  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	Savannakhet	13	30,700	300
	Savannakhet	7	25,000	200
	Phoumy	8	14,000	300
	Savannakhet	15	37,000	2,000
	Phoumy	10	14,000	4,000
Champasack	Savannakhet	10	30,000	6,000
	Savannakhet	23	30,000	4,500
	Champasack	38	47,000	4,000
	Champasack	45	36,700	3,000
	Champasack	47	41,000	4,000
Salavan	Salavan	50	114,000	8,200
	Salavan	38	36,000	4,400
	Salavan	3	10,000	500
	Salavan	22	30,000	1,200
	Salavan	7	3,700	800
Attapeu	Attapeu	18	33,000	700
	Attapeu	18	33,700	800
	Attapeu	18	30,000	2,000
	Attapeu	18	11,000	200
	Attapeu	7	10,000	500
Stung Treng	Stung Treng	27	60,000	5,000
	Stung Treng	30	25,100	10,000
	Stung Treng	11	30,000	1,000
	Stung Treng	30	30,000	1,000
	Stung Treng	3	30,000	500
Ratanak Kiri	Ratanak Kiri	13	30,000	500
	Ratanak Kiri	14	11,000	1,000
	Ratanak Kiri	34	30,000	3,000
	Ratanak Kiri	20	30,000	10,000
	Ratanak Kiri	30	70,700	8,200
Total		1,000	1,000,000	100,000

Map Scale for A3: 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: GADM/DAF
 Population data: WorldPop (2018)
 Reference water: Global Surface Water, JRC
 Analysis: UNITAR - UNOSAT
 Production: UNITAR - UNOSAT

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