



INUNDATED AREA MAPS OF THE KALA OYA BASIN

FLOOD IN MAY 2016



**HYDROLOGY AND DISASTER MANAGEMENT DIVISION
IRRIGATION DEPARTMENT
SRI LANKA**

MARCH 2021

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Remarks:

The inundated areas were marked according to the field observations taken with the Global Positioning System (GPS) instruments after the flood event (in July 2019).

Inundation Maps of Floods of Kala Oya in May 2016

1. Introduction

Kala Oya is a medium size river, bears the Number 93, in the River Basin Atlas of Sri Lanka. It is situated in between Mi Oya to the south, and Aruvi aru to the north. The River discharges to the sea near the Wilpaththu national park at Wilpaththuwa. Kala Oya crosses the Colombo–Anuradapura Road near at Nochchiyagama. The catchment area of the river is 2526 km², which is situated entirely in the Dry Zone of the country. The average annual rainfall of the catchment is around 1420 mm and the average discharge to the sea has been estimated as 530 MCM per annum.

There are four main tributaries called Mirisgani Oya, Siyambalangamuwa Oya, Welamiti Oya and Hawanwella Oya, of Kala Oya. The Mirisgani Oya and Hawanwella Oya confluenced with Kala Oya at Balalu Wewa. Three major reservoirs have been constructed across Kala Oya named as Balalu Wewa, Kala Wewa and Rajanganaya.

There are few Anicuts constructed across Kala Oya including Neela Bamma across the main river some kilometers below Rajanganaya Wewa. In addition there are many minor irrigation tanks constructed mainly for irrigation in the basin.

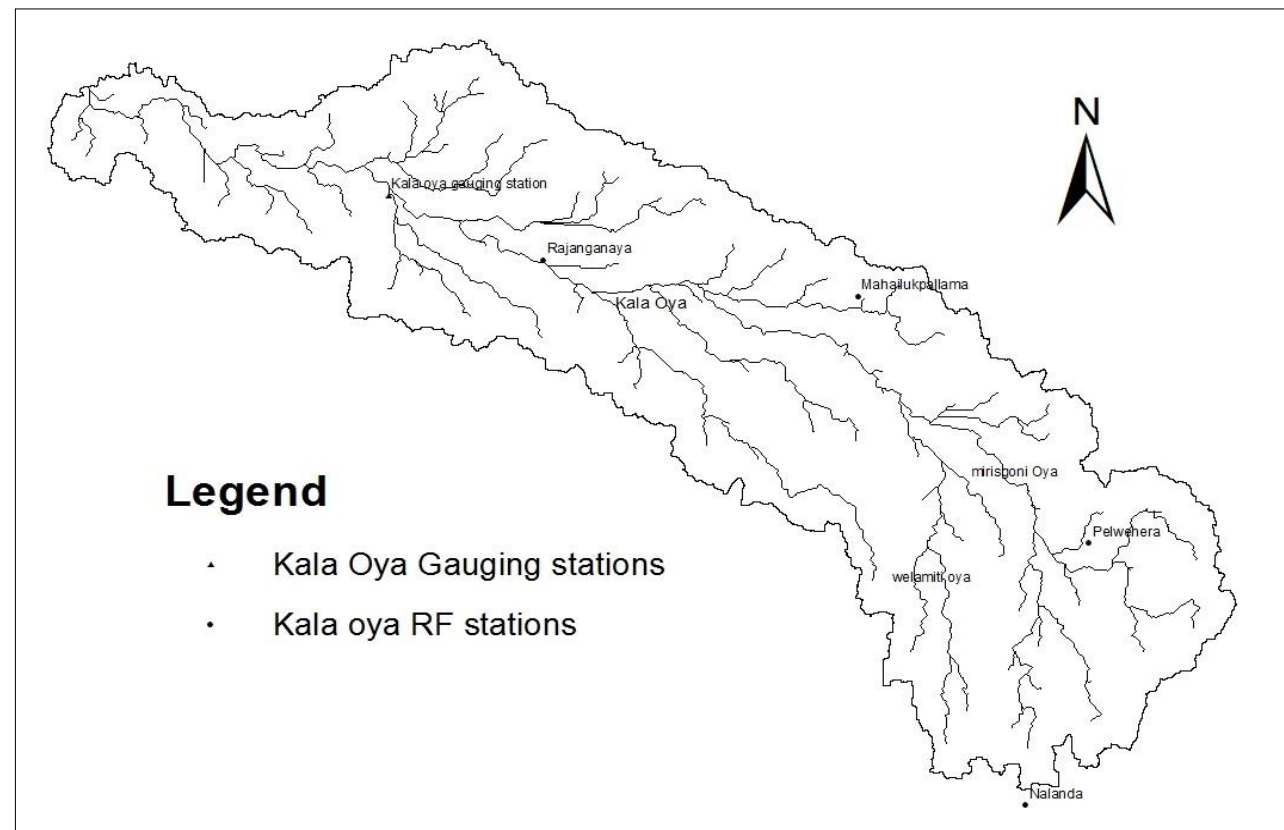


Figure I . The Kala Oya Basin with the Locations of Hydro-Meteorological Stations

2. Hydrometric Stations in Kala Oya Basin

River gauging history of the Kala Oya goes back to August of 1977 when Nochchiyagama (Kala Oya) hydrometric station was established. Water levels had been recorded once a day at the beginning. Then water levels had been recorded hourly from 1979. However the station had been closed in 1995 due to now an unknown reason. Dambulla hydrometric station was established in 1971. This station have been collected both water level and rainfall. However it is closed in 2002. At present 9 gauging stations were functioning time to time in the basin. Those are Kadigala, Kumbuk wewa, Nochchiyagama, Neela Bemma, Eluwankulama and some gauging stations at tributaries. Some stations has been modernized under the Hydro Meteorological Information System (HMIS) constructed under DSWRP. Now there are facilities to collect water levels and rainfalls automatically and transmit to the Hydrology Division with automated communication facilities through satellite (or GPRS).

Ex: Kalawewa, Rajanganaya reservoir, Dambulu Oya, Dambulu Oya Reservoir.

Apart from those, there are sufficient number of manually operated rainfall stations (Pelwehera, Nalanda, Kala Oya, Mahailukpallama) within or adjacent to the Kala Oya catchment area.

Layout of these stations is shown in Figure 1. The recorded highest flood levels at a hydrometric station is given in Table 1.

Table 1 . Recorded highest flood levels at Kala Oya hydrometric Station.

Station Name	Location	Period of records available	Highest W.L recorded (m)	Date of Highest Flood occurred
Kala Oya	125660, 332532	1977 to 1979	6.25	1957.12.26

3. The Flood in May 2016

3.1 Extreme Rainfalls Caused Flooding

Extreme rainfalls that caused floods in May 2016 are presented in Table 4. Some of these Rainfall stations are maintained by the Hydrology Division (HD) of Irrigation Department while some others are maintained by some other organizations. Rainfalls are recorded at 1 hour interval at Kala oya while the other stations record daily rainfalls only.

Table 2. Extreme Rainfalls caused May 2016 Flood (from 9.00 am to 9.00 am)

Station Name	13-May	14-May	15-May	16-May	17-May	18-May	19-May	20-May	Total (mm)
Mahailukpallama	51.8	17.2	138	267.8	17.5	1.6	0.9	0.4	495.2
Nalanda	25	25	115	85	80	0	0	0	330
Pelwehera	29.3	19.2	114.2	135.3	19.8	3.2	2.4	0	323.4
Rajanganaya	32.3	15.2	91.6	155	13	0	10	0	317.3
Average	34.7	19.2	115	161	32.6	1.2	3.33	0.1	-

As per the details shown above, the catchment has recorded moderate rainfalls on 13th May and fairly high rainfalls on 14th and 15th and extremely high rainfalls on 16th May. Mahailukpallama station recorded the highest rainfall while Rajanganaya being the second highest. Spatial distribution of rainfalls over the catchment is fairly uniform.

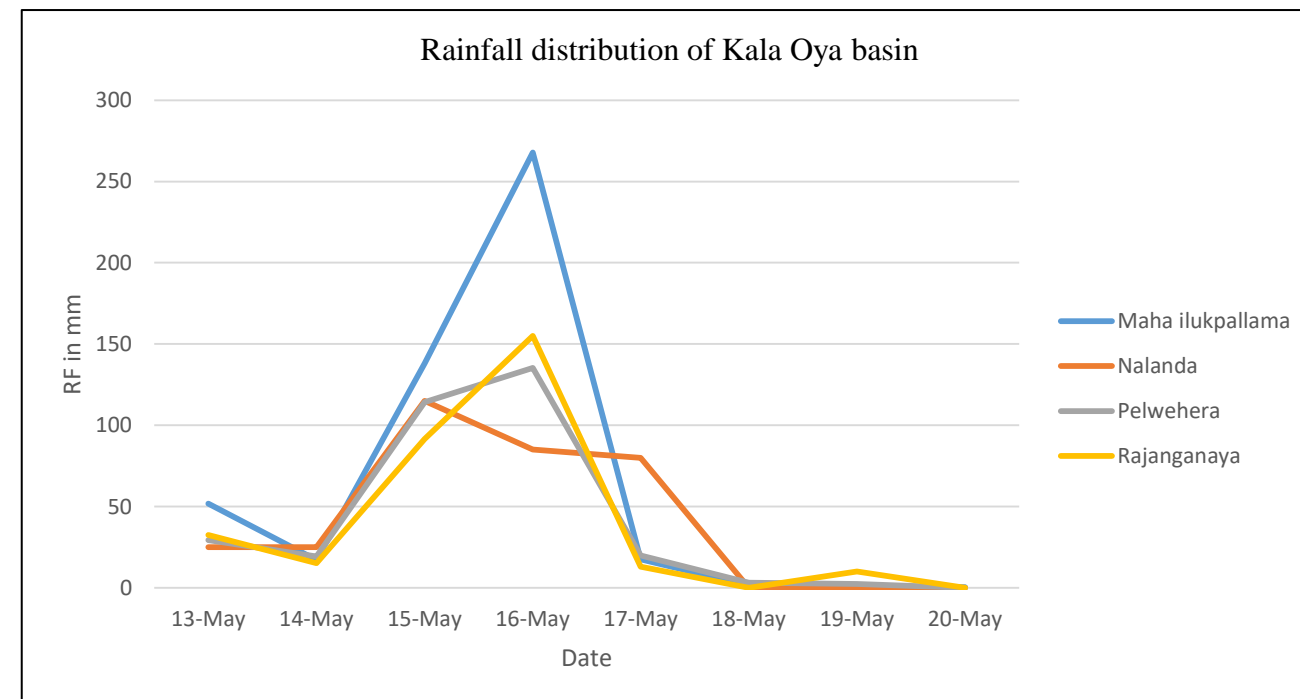


Figure 2. Rainfall distribution in May 2016 flood.

3.2 Divisional Secretary Areas Affected

Mainly the low lying areas of Ipalogama, Rajanganaya, Tambuttegama, Galnewa, Thalawa, Nochchiyagama, Giribawa, Galgamuwa, Palagoda, Wanathawilluwa and Kaluwragaswewa Divisional Secretary divisions were affected by the flood.

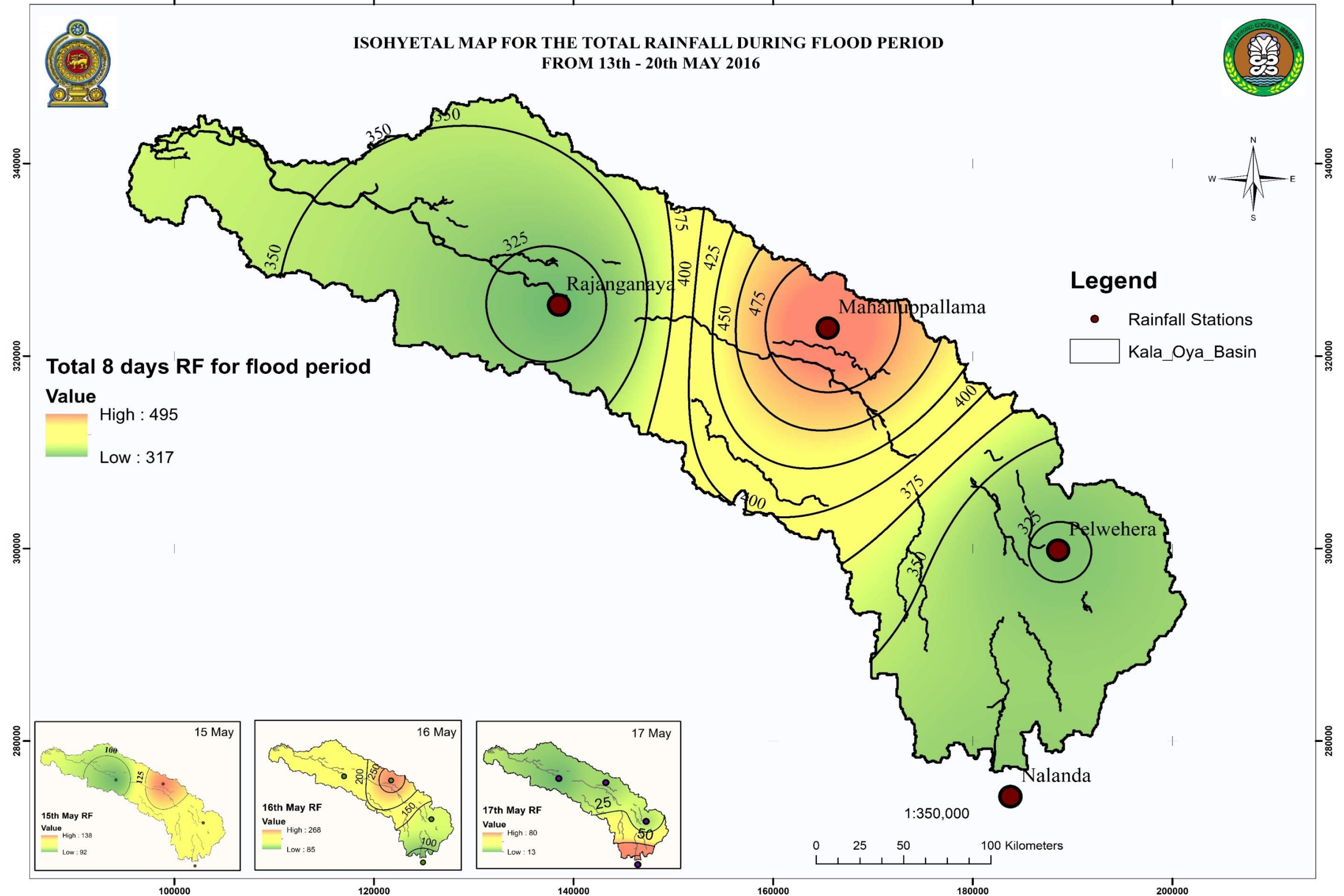
4.0 Flood Mapping

Flood inundation survey was carried out in May 2016, by a group of Hydrological Assistants attached to Hydrology Division. Boundaries of the inundated areas were observed with GPS (Global Positioning System) instruments based on the flood marks and the information provided by the residents of the area.

GPS coordinates taken along the boundary of inundated area were overlaid with digitized 1:50000 maps using the ArcGIS software to develop the flood maps. These maps are provided in hard and soft copies at different scales, in order to facilitate various parties carrying out flood relief activities and rescue operations. Accuracy of these maps may not be sufficient for more precise works but can be used as an initial guide for such activities. The residents in the flood prone areas can use these maps to have some idea whether their houses and properties are in danger in future cases of flooding and take necessary precautions for securing themselves. However it should be mentioned that the behavior of one flood may differ from another due to spatial and temporal distribution of rainfalls and also with the other climatic factors and ever changing catchment characteristics.

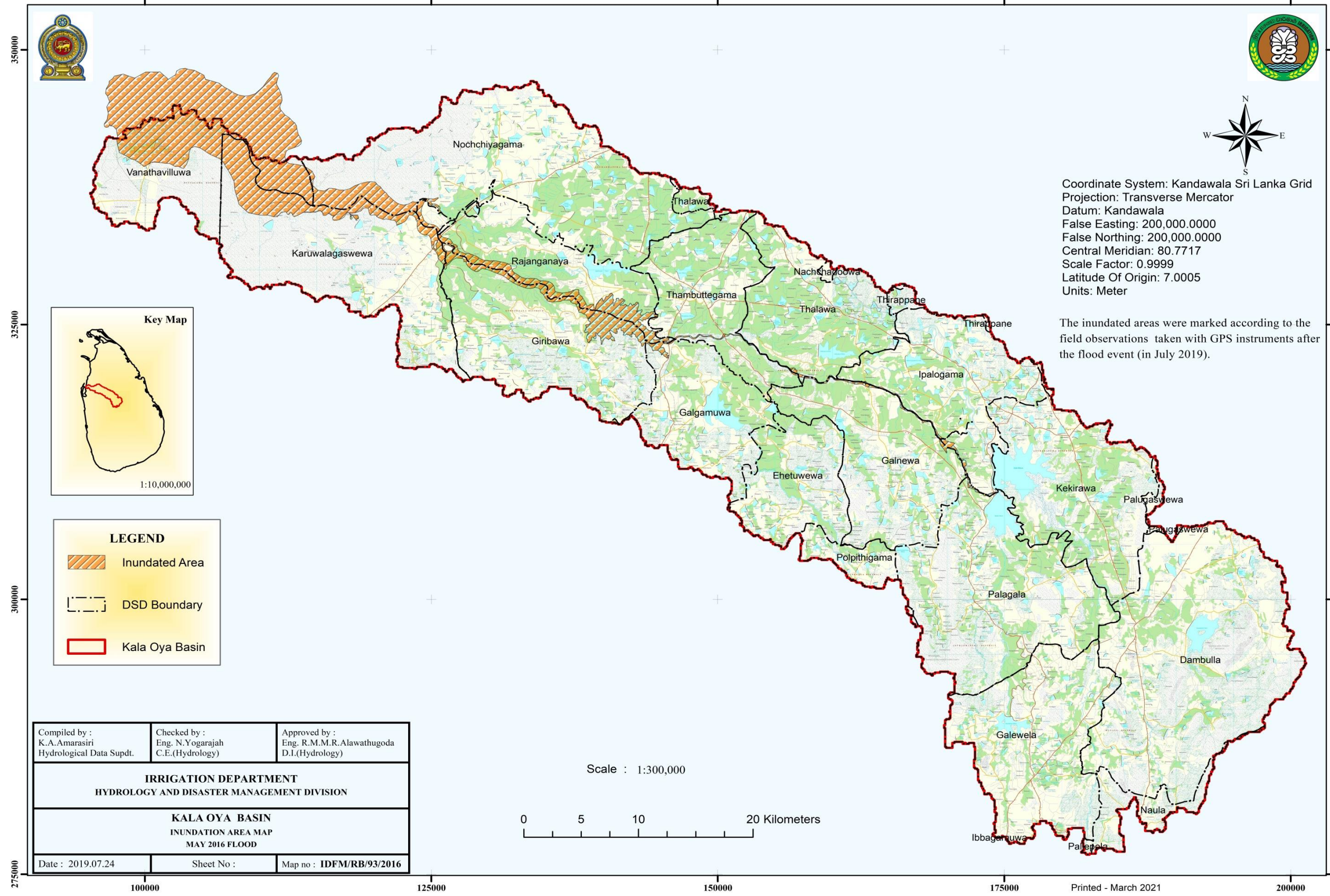
Eng.S.P.C. Sugeeshwara
Director of Irrigation (Hydrology & Disaster Management)

SPATIAL AND TEMPORAL VARIATION OF RAINFALL OVER FLOOD PERIOD



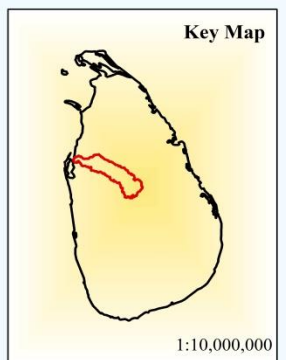
INUNDATION AREA MAP - KALA OYA BASIN IN MAY 2016 FLOOD

ID FLOOD MAP



Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
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 False Northing: 200,000.0000
 Central Meridian: 80.7717
 Scale Factor: 0.9999
 Latitude Of Origin: 7.0005
 Units: Meter

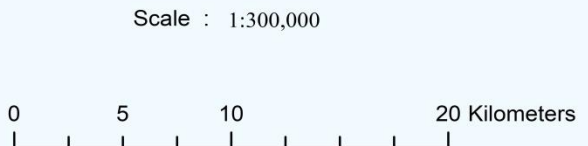
The inundated areas were marked according to the field observations taken with GPS instruments after the flood event (in July 2019).



LEGEND

- Inundated Area
- DSD Boundary
- Kala Oya Basin

Compiled by : K.A.Amarasiri Hydrological Data Supdt.	Checked by : Eng. N.Yogarajah C.E.(Hydrology)	Approved by : Eng. R.M.M.R.Alawathugoda D.I.(Hydrology)
IRRIGATION DEPARTMENT HYDROLOGY AND DISASTER MANAGEMENT DIVISION		
KALA OYA BASIN INUNDATION AREA MAP MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No :	Map no : IDFM/RB/93/2016



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 350000 325000 300000

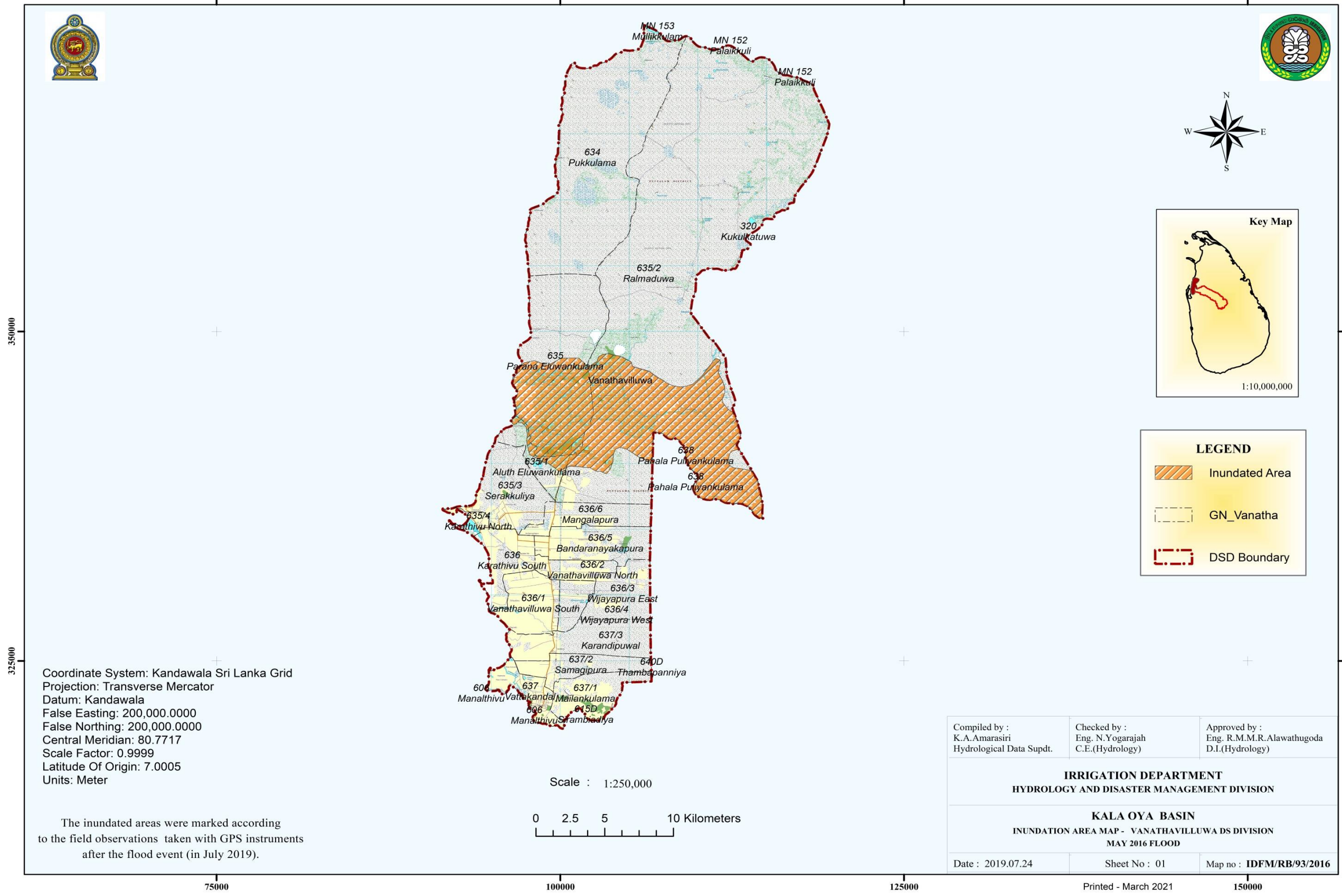
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Table 01**INUNDATION AREAS IN KALA OYA BASIN - MAY 2017**

DS DIVISION	DS DIVISION AREA Sq.Km.	INUNDATED AREA Sq.Km.	Percentage %
VANATHAVILLUWA	736.53	47.08	6.39
KARUWALAGASWEWA	503.94	89.74	17.81
NOCHCHIYAGAMA	843.57	16.9	2
RAJANGANAYA	100.9	401.3	397.7
GIRIBAWA	207.15	275.49	132.99
THAMBUTTEGAMA	111.49	33.59	30.13
THALAWA	220.6	10.79	4.89
IPALOGAMA	142.43	51.67	36.28
GALNEWA	140.23	37.36	26.64
GALGAMUWA	273.3	21.05	7.7
PALAGALA	226.97	13.5	5.95
Total	3507.1	998.46	28.47

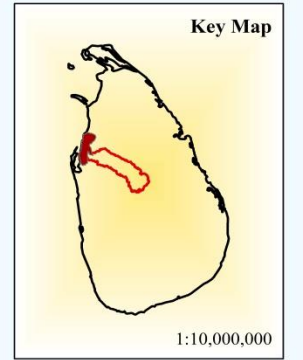
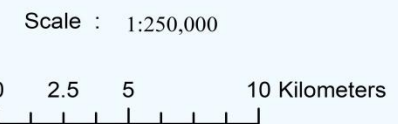
INUNDATION AREA MAP - VANATHAVILLUWA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
 False Easting: 200,000.0000
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 Units: Meter

The inundated areas were marked according to the field observations taken with GPS instruments after the flood event (in July 2019).



LEGEND	
	Inundated Area
	GN_Vanatha
	DSD Boundary

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KALA OYA BASIN INUNDATION AREA MAP - VANATHAVILLUWA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 01	Map no : IDFM/RB/93/2016

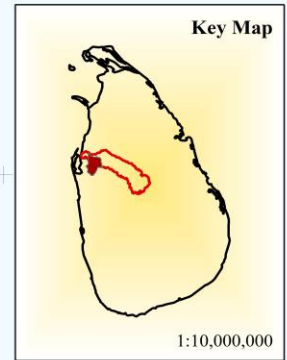
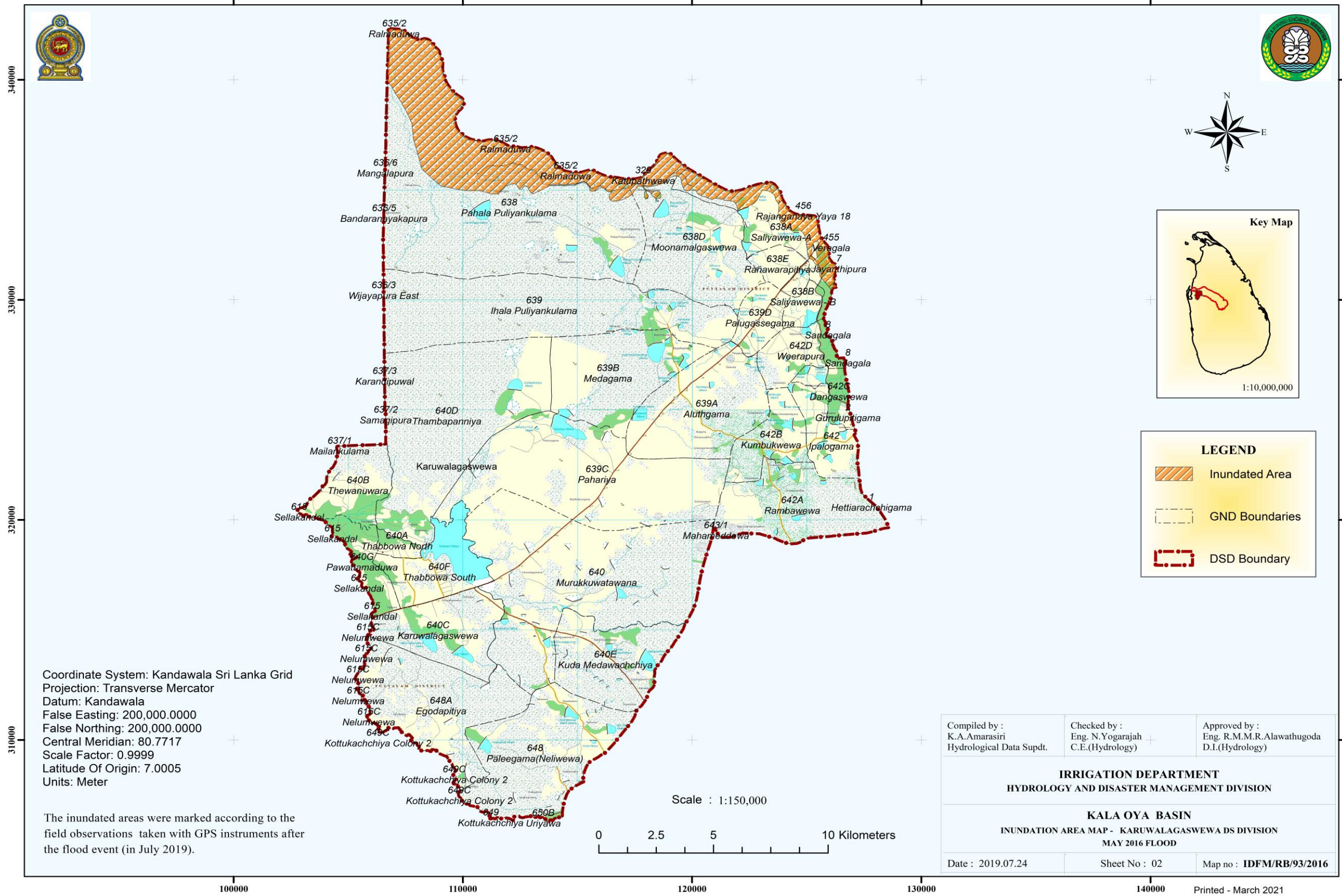
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Table 02

Inundated Areas in Vanathavilluwa Divisional Secretariat Division in May 2016 flood					
Norh Western Province					
Puttlam District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
VANATHAVILLUWA	635/2	Ralmaduwa	345.38	34.08	9.87
VANATHAVILLUWA	635	Parana Eluwankulama	70.38	10.08	14.32
VANATHAVILLUWA	635/1	Aluth Eluwankulama	10.59	2.42	22.89

INUNDATION AREA MAP - KARUWALAGASWEWA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
 False Easting: 200,000.0000
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KALA OYA BASIN INUNDATION AREA MAP - KARUWALAGASWEWA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 02	Map no : IDFM/RB/93/2016

Table 03

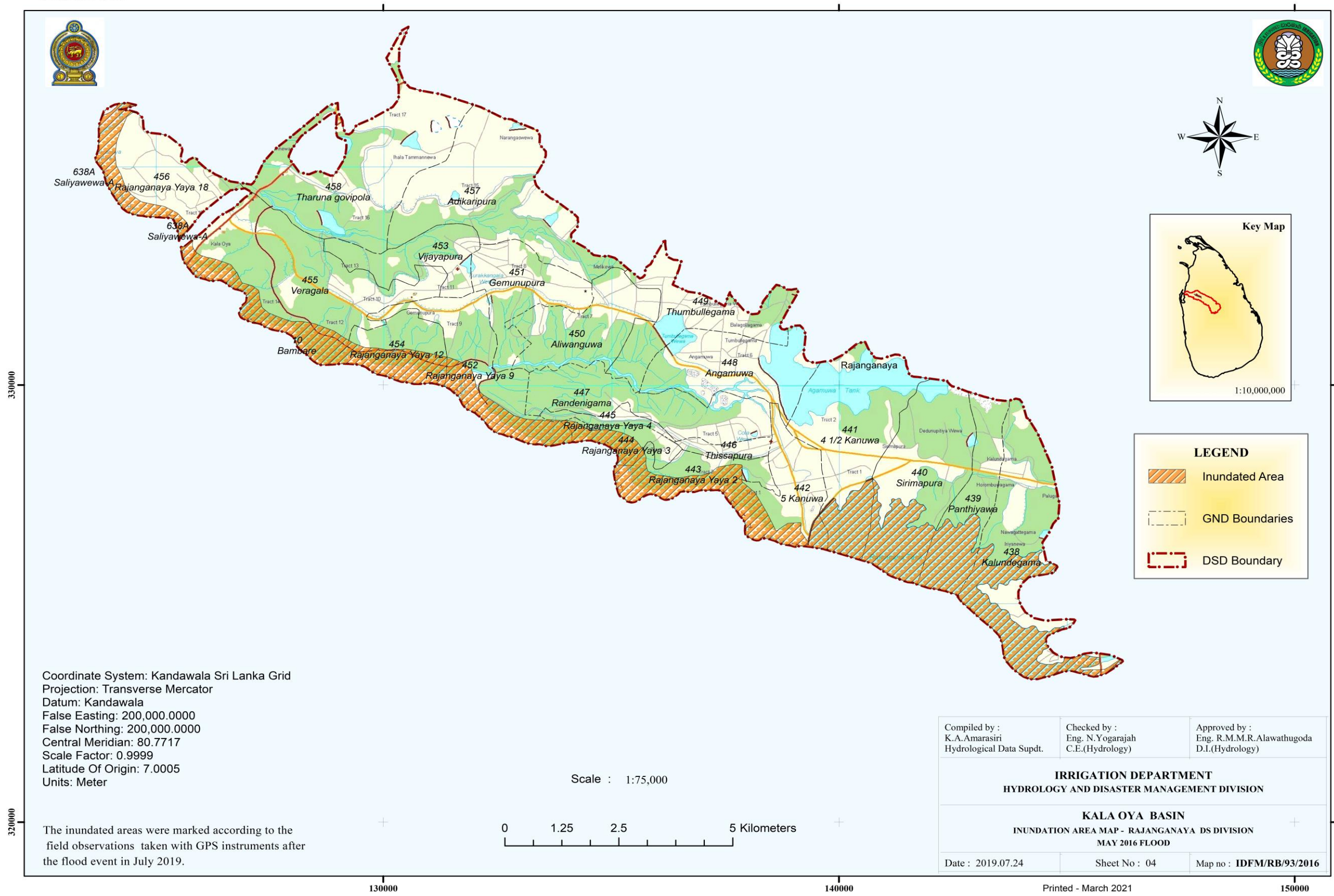
Inundated Areas in Karuwalagaswewa Divisional Secretariat Division in May 2016 flood					
North Western Province					
Puttlam District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
KARUWALAGASWEWA	638D	Moonamalgaswewa	24.13	2.15	8.90
KARUWALAGASWEWA	638	Pahala Puliyankulama	75.20	25.30	33.64
KARUWALAGASWEWA	638A	Saliyawewa-A	12.94	6.11	47.19

Table 04

Inundated Areas in Nochchiyagama Divisional Secretariat Division in May 2016 flood					
North Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
NOCHCHIYAGAMA	329	Katupathwewa	85.41	14.43	16.90

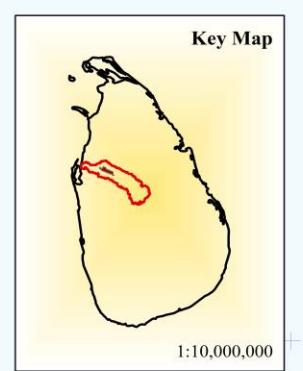
INUNDATION AREA MAP - RAJANGANAYA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



Coordinate System: Kandawala Sri Lanka Grid
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 Central Meridian: 80.7717
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LEGEND	
	Inundated Area
	GND Boundaries
	DSD Boundary

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KALA OYA BASIN INUNDATION AREA MAP - RAJANGANAYA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 04	Map no : IDFM/RB/93/2016

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330000

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140000

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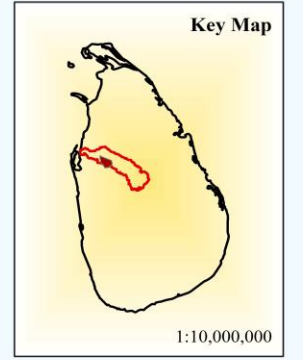
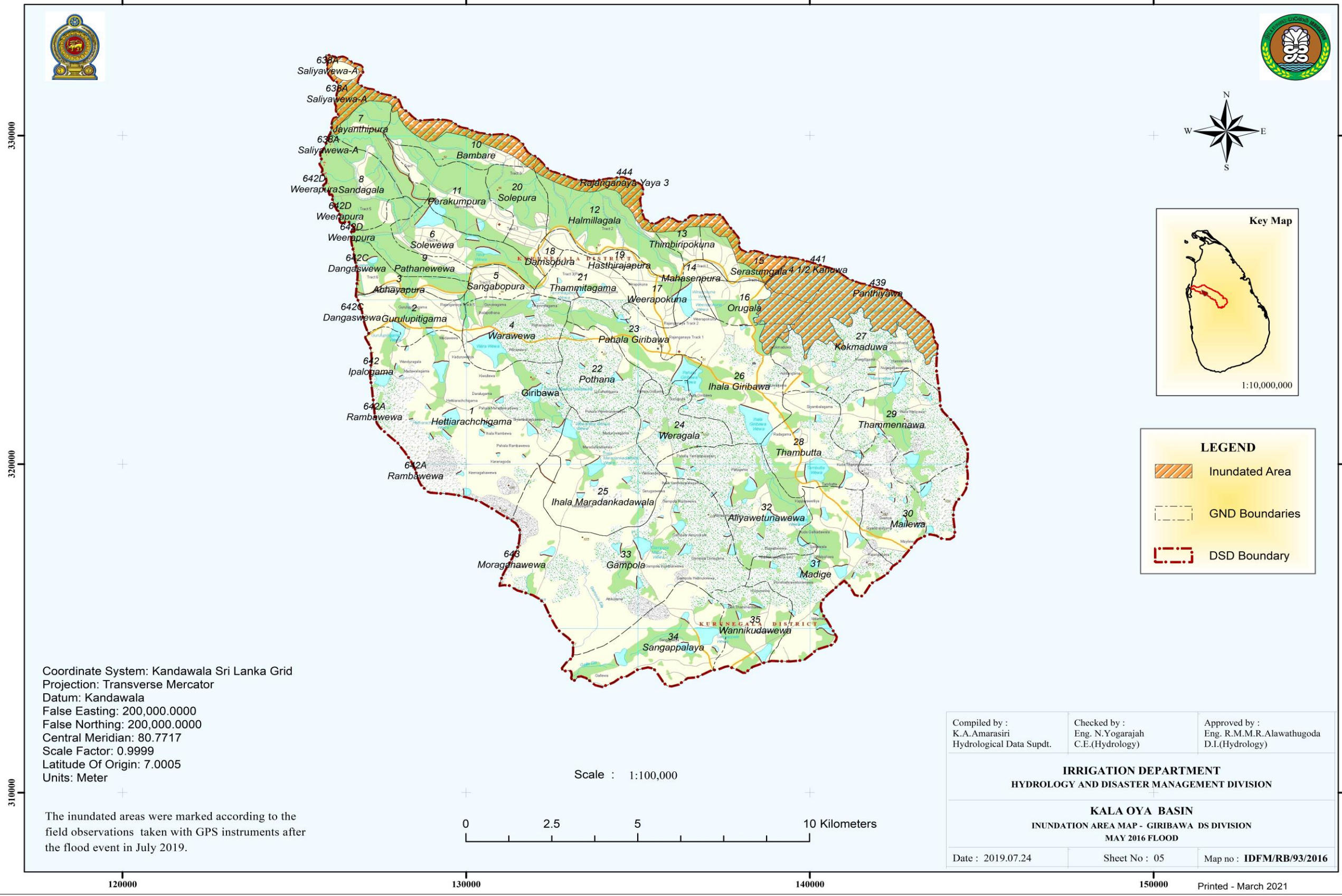
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Table 05

Inundated Areas in Rajanganaya Divisional Secretariat Division in May 2016 flood					
Norh Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
RAJANGANAYA	438	Kalundegama	8.01	3.02	37.69
RAJANGANAYA	440	Sirimapura	7.12	2.05	28.73
RAJANGANAYA	455	Veragala	9.55	1.97	20.62
RAJANGANAYA	452	Rajanganaya Yaya 9	4.91	1.71	34.80
RAJANGANAYA	439	Panthiyawa	3.81	1.61	42.35
RAJANGANAYA	443	Rajanganaya Yaya 2	2.67	1.49	55.64
RAJANGANAYA	454	Rajanganaya Yaya 12	2.84	1.46	51.25
RAJANGANAYA	456	Rajanganaya Yaya 18	5.31	1.43	27.02
RAJANGANAYA	442	5 Kanuwa	3.96	1.34	33.74
RAJANGANAYA	441	4 1/2 Kanuwa	7.46	1.33	17.88
RAJANGANAYA	444	Rajanganaya Yaya 3	1.38	0.69	50.06
RAJANGANAYA	445	Rajanganaya Yaya 4	0.68	0.01	1.52

INUNDATION AREA MAP - GIRIBAWA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
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 False Easting: 200,000.0000
 False Northing: 200,000.0000
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 Scale Factor: 0.9999
 Latitude Of Origin: 7.0005
 Units: Meter

Scale : 1:100,000



The inundated areas were marked according to the field observations taken with GPS instruments after the flood event in July 2019.

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KALA OYA BASIN INUNDATION AREA MAP - GIRIBAWA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 05	Map no : IDFM/RB/93/2016

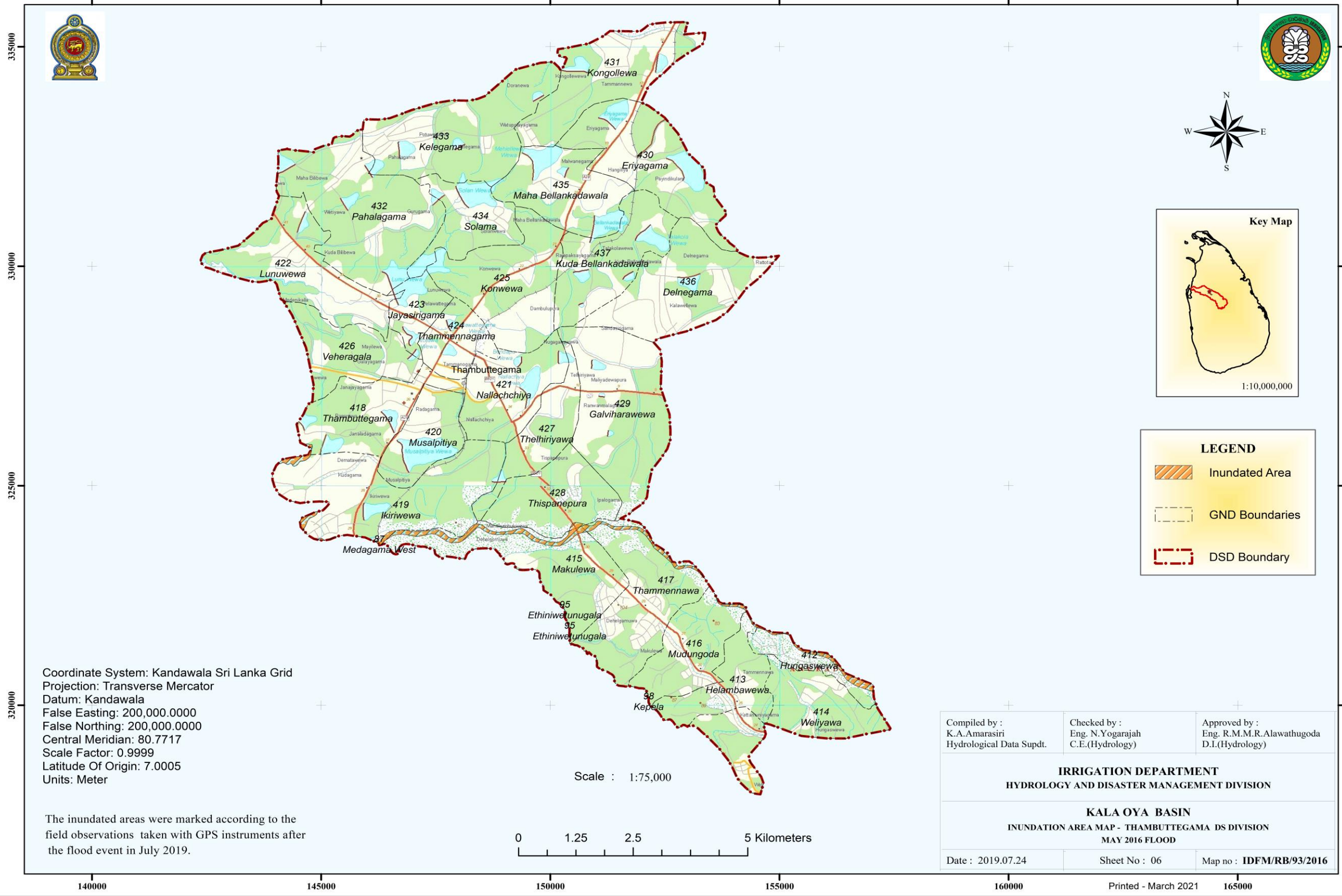
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Table 06

Inundated Areas in Giribawa Divisional Secretariat Division in May 2016 flood					
North Western Province					
Kurunegala District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
GIRIBAWA	27	Kokmaduwa	12.50	5.15	41.24
GIRIBAWA	15	Serasumgala	4.31	2.88	66.68
GIRIBAWA	10	Bambare	4.28	1.79	41.80
GIRIBAWA	12	Halmillagala	7.21	1.54	21.36
GIRIBAWA	7	Jayanthipura	4.61	1.45	31.32
GIRIBAWA	16	Orugala	3.24	1.12	34.69
GIRIBAWA	13	Thimbiripokuna	1.40	0.47	33.52
GIRIBAWA	26	Ihala Giribawa	9.76	0.45	4.56
GIRIBAWA	20	Solepura	3.47	0.01	0.31

INUNDATION AREA MAP - THAMBUTHTHEGAMA DS DIVISION IN MAY 2016 FLOOD

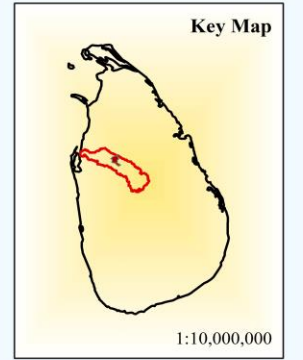
ID FLOOD MAP



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 Units: Meter

The inundated areas were marked according to the field observations taken with GPS instruments after the flood event in July 2019.

Scale : 1:75,000



LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

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KALA OYA BASIN INUNDATION AREA MAP - THAMBUTTEGAMA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 06	Map no : IDFM/RB/93/2016

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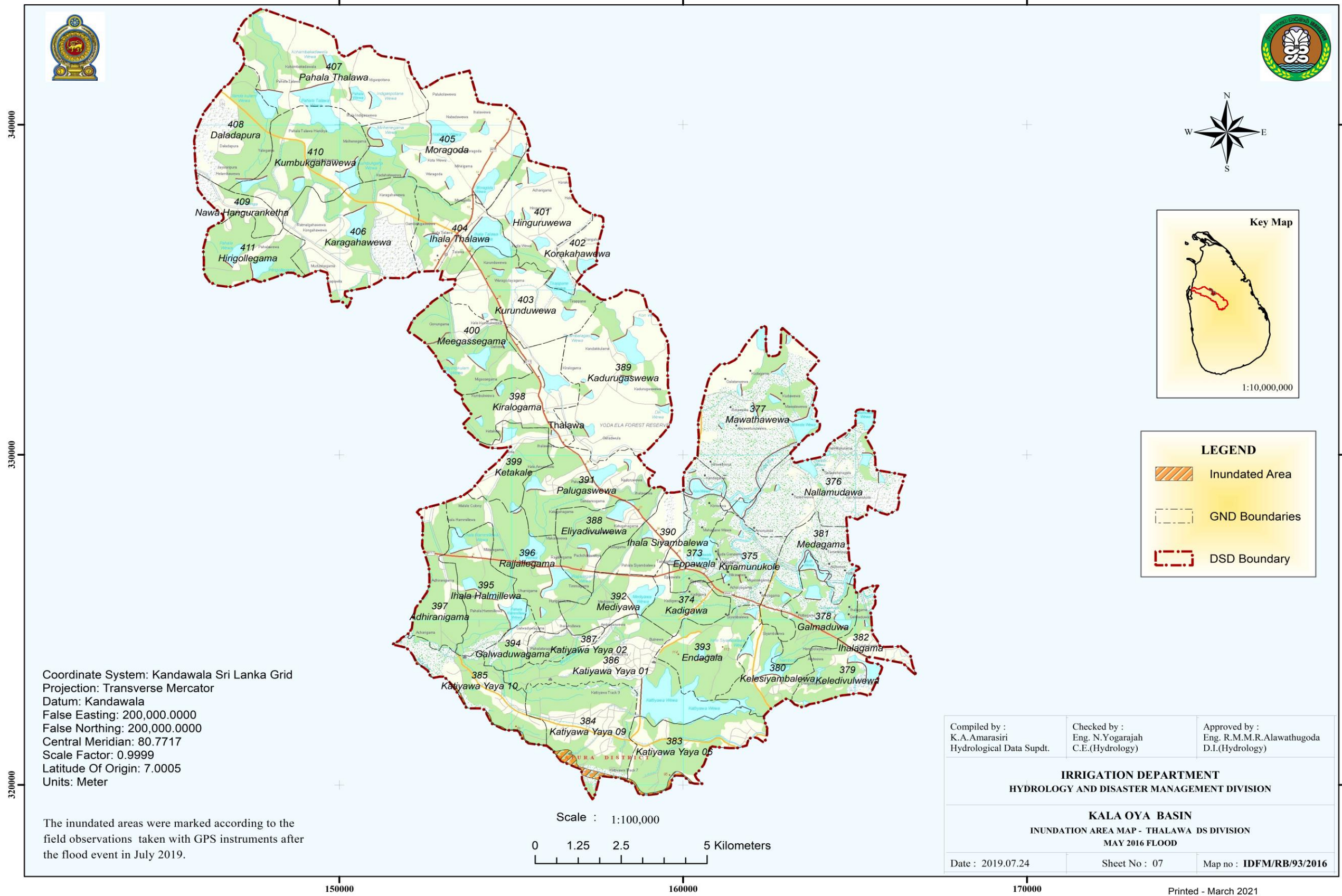
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Table 07

Inundated Areas in Thambuttegama Divisional Secretariat Division in May 2016 flood					
North Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
THAMBUTTEGAMA	415	Makulewa	4.97	0.44	8.85
THAMBUTTEGAMA	417	Thammennawa	5.36	0.21	3.96
THAMBUTTEGAMA	412	Hurigaswewa	1.37	0.21	15.42
THAMBUTTEGAMA	419	Ikiriwewa	7.37	0.20	2.67
THAMBUTTEGAMA	416	Mudungoda	3.34	0.04	1.15
THAMBUTTEGAMA	428	Thispanepura	3.65	0.03	0.87
THAMBUTTEGAMA	418	Thambuttegama	3.85	0.01	0.32
THAMBUTTEGAMA	413	Helambawewa	2.70	0.01	0.34

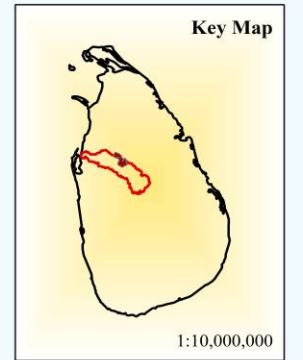
INUNDATION AREA MAP - THALAWA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
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LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

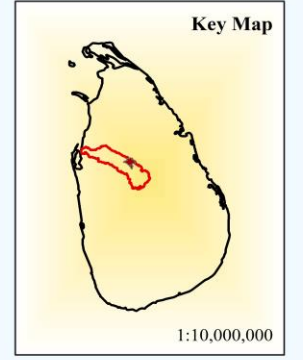
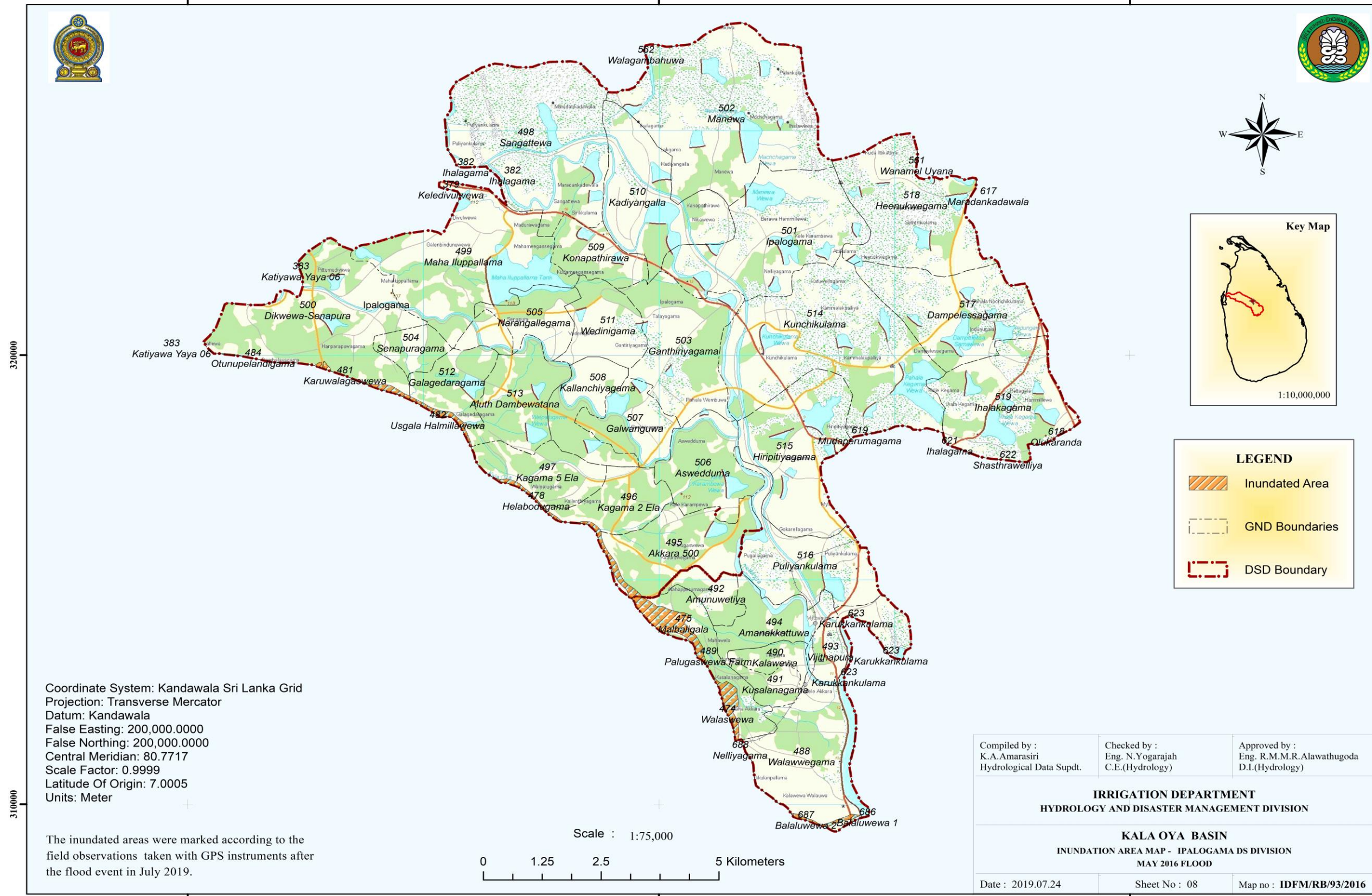
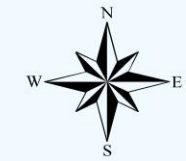
Compiled by : K.A.Amarasiri Hydrological Data Supdt.	Checked by : Eng. N.Yogarajah C.E.(Hydrology)	Approved by : Eng. R.M.M.R.Alawathugoda D.I.(Hydrology)
IRRIGATION DEPARTMENT HYDROLOGY AND DISASTER MANAGEMENT DIVISION		
KALA OYA BASIN INUNDATION AREA MAP - THALAWA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 07	Map no : IDFM/RB/93/2016

Table 08

Inundated Areas in Thalawa Divisional Secretariat Division in May 2016 flood					
North Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
THALAWA	384	Katiyawa Yaya 09	7.39	0.39	5.28
THALAWA	383	Katiyawa Yaya 06	5.87	0.17	2.88
THALAWA	385	Katiyawa Yaya 10	4.85	0.13	2.62

INUNDATION AREA MAP - IPALOGAMA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP

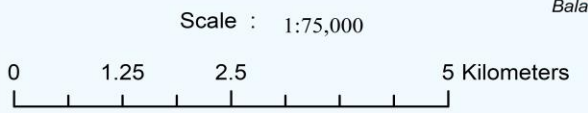


LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
 False Easting: 200,000.0000
 False Northing: 200,000.0000
 Central Meridian: 80.7717
 Scale Factor: 0.9999
 Latitude Of Origin: 7.0005
 Units: Meter

The inundated areas were marked according to the field observations taken with GPS instruments after the flood event in July 2019.



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IRRIGATION DEPARTMENT HYDROLOGY AND DISASTER MANAGEMENT DIVISION		
KALA OYA BASIN INUNDATION AREA MAP - IPALOGAMA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 08	Map no : IDFM/RB/93/2016

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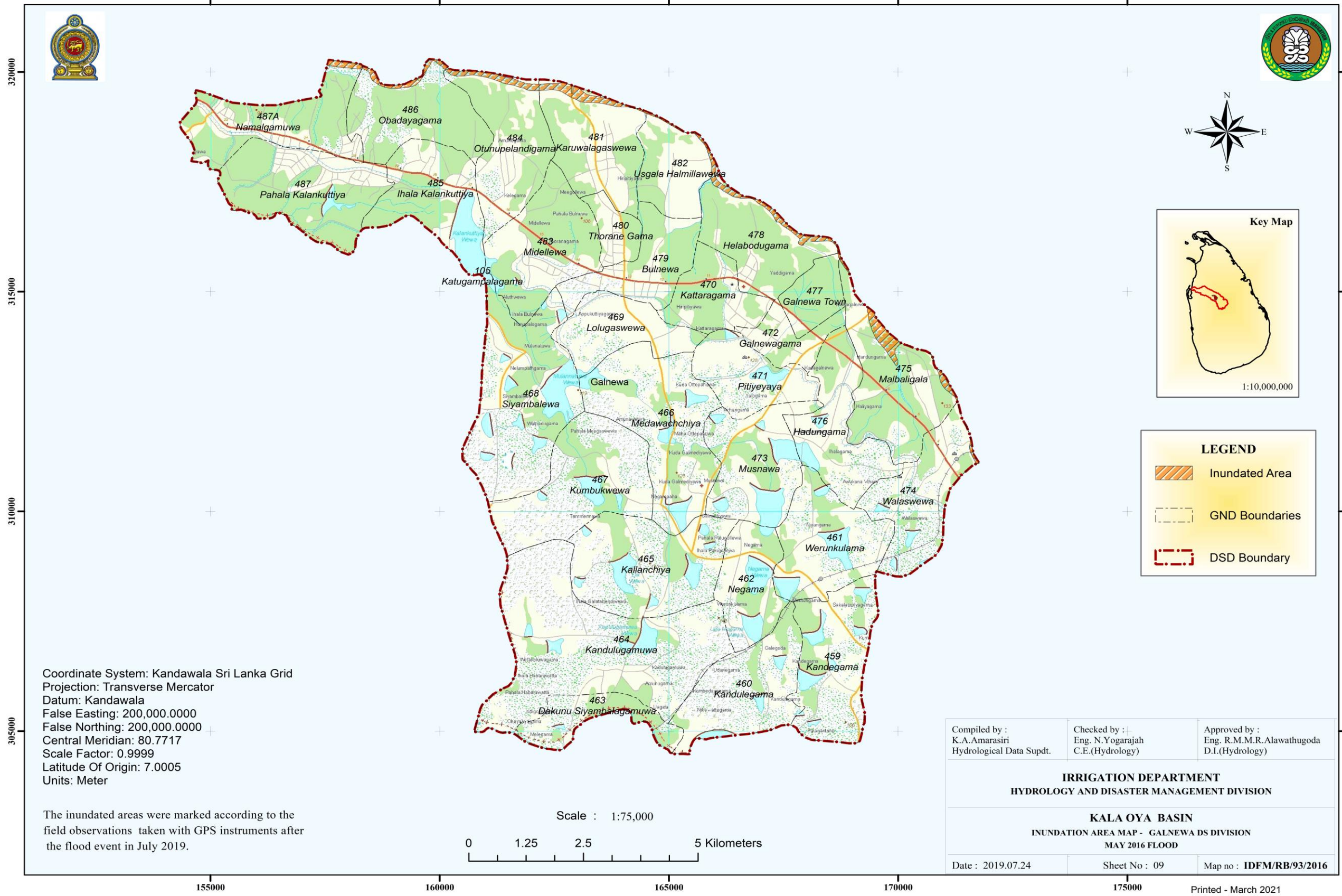
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Table 09

Inundated Areas in Ipalogama Divisional Secretariat Division in May 2016 flood					
North Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
IPALOGAMA	500	Dikwewa-Senapura	7.96	0.13	1.58
IPALOGAMA	489	Palugaswewa Farm	2.81	0.91	32.18
IPALOGAMA	495	Akkara 500	4.27	0.18	4.33
IPALOGAMA	512	Galagedaragama	2.15	0.12	5.62
IPALOGAMA	488	Walawwegama	5.63	0.10	1.69
IPALOGAMA	497	Kagama 5 Ela	2.63	0.07	2.72
IPALOGAMA	496	Kagama 2 Ela	2.33	0.06	2.75
IPALOGAMA	513	Aluth Dambawatana	3.38	0.03	0.80

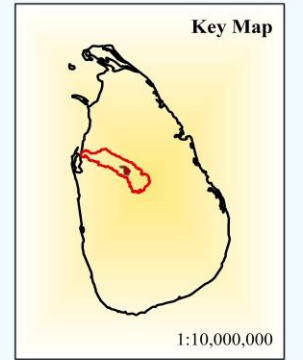
INUNDATION AREA MAP - GALNEWA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
 False Easting: 200,000.0000
 False Northing: 200,000.0000
 Central Meridian: 80.7717
 Scale Factor: 0.9999
 Latitude Of Origin: 7.0005
 Units: Meter

The inundated areas were marked according to the field observations taken with GPS instruments after the flood event in July 2019.



LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

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IRRIGATION DEPARTMENT HYDROLOGY AND DISASTER MANAGEMENT DIVISION		
KALA OYA BASIN INUNDATION AREA MAP - GALNEWA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 09	Map no : IDFM/RB/93/2016

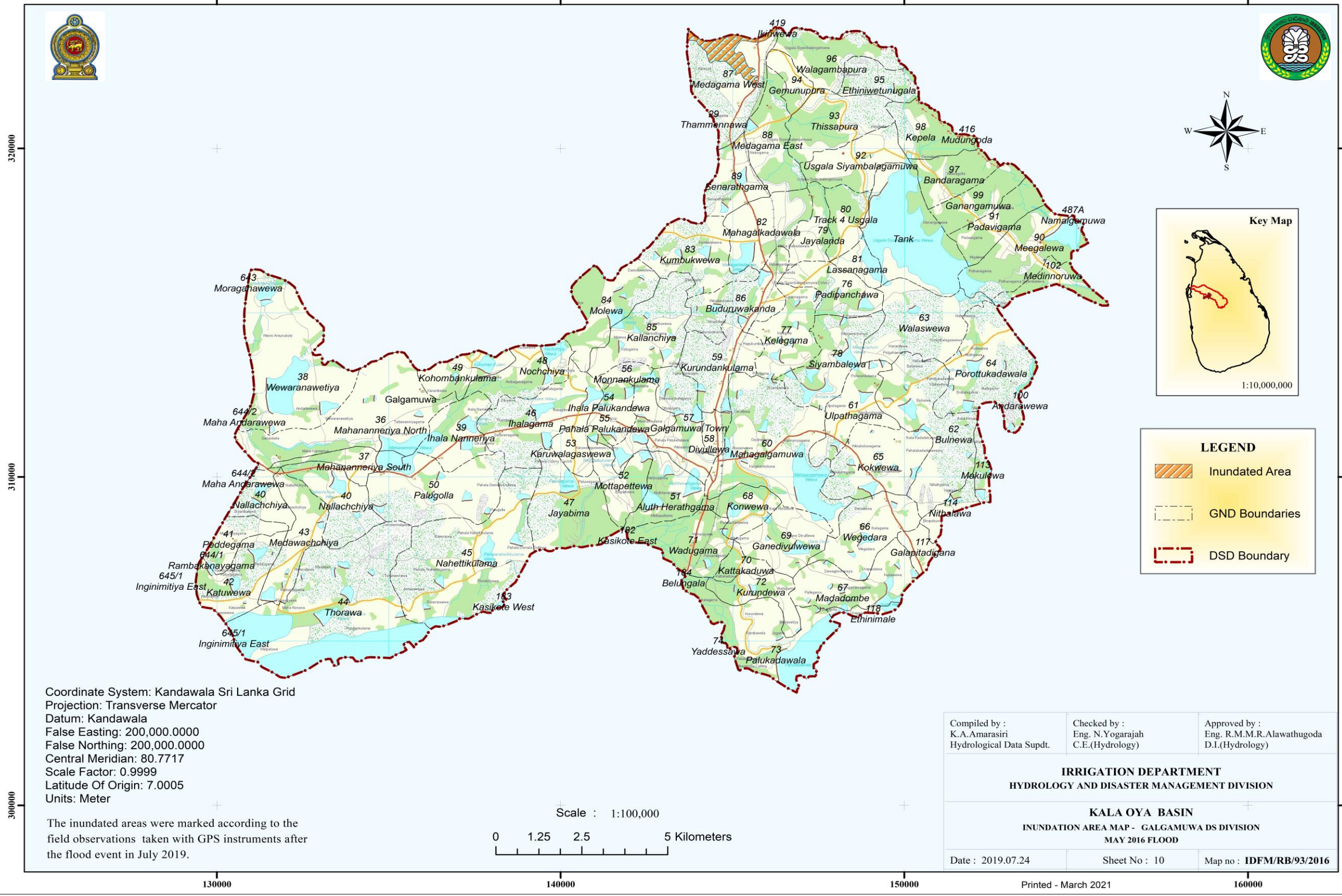
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Table 10

Inundated Areas in Galnewa Divisional Secretariat Division in May 2016 flood					
North Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
GALNEWA	475	Malbaligala	5.39	0.40	7.46
GALNEWA	481	Karuwalagaswewa	4.68	0.33	7.02
GALNEWA	478	Helabodugama	4.30	0.31	7.19
GALNEWA	484	Otunupelandigama	4.83	0.26	5.29
GALNEWA	486	Obadayagama	4.69	0.19	4.02
GALNEWA	482	Usgala Halmillawewa	2.93	0.10	3.42
GALNEWA	487A	Namalgamuwa	4.88	0.10	1.97
GALNEWA	474	Walaswewa	4.54	0.03	0.71
GALNEWA	477	Galnewa Town	1.65	0.004	0.26

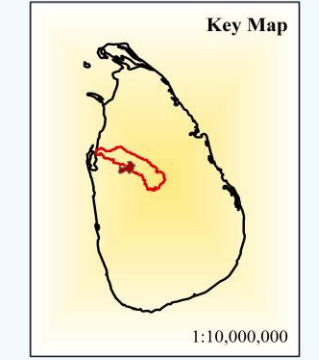
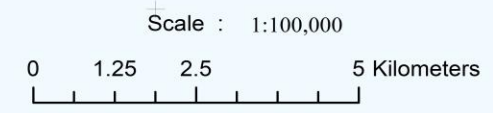
INUNDATION AREA MAP - GALGAMUWA DS DIVISION IN MAY 2016 FLOOD

ID FLOOD MAP



Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
 False Easting: 200,000.0000
 False Northing: 200,000.0000
 Central Meridian: 80.7717
 Scale Factor: 0.9999
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 Units: Meter

The inundated areas were marked according to the field observations taken with GPS instruments after the flood event in July 2019.



LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

Compiled by : K.A.Amarasiri Hydrological Data Supdt.	Checked by : Eng. N.Yogarajah C.E.(Hydrology)	Approved by : Eng. R.M.M.R.Alawathugoda D.I.(Hydrology)
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**IRRIGATION DEPARTMENT
 HYDROLOGY AND DISASTER MANAGEMENT DIVISION**

**KALA OYA BASIN
 INUNDATION AREA MAP - GALGAMUWA DS DIVISION
 MAY 2016 FLOOD**

Date : 2019.07.24	Sheet No : 10	Map no : IDFM/RB/93/2016
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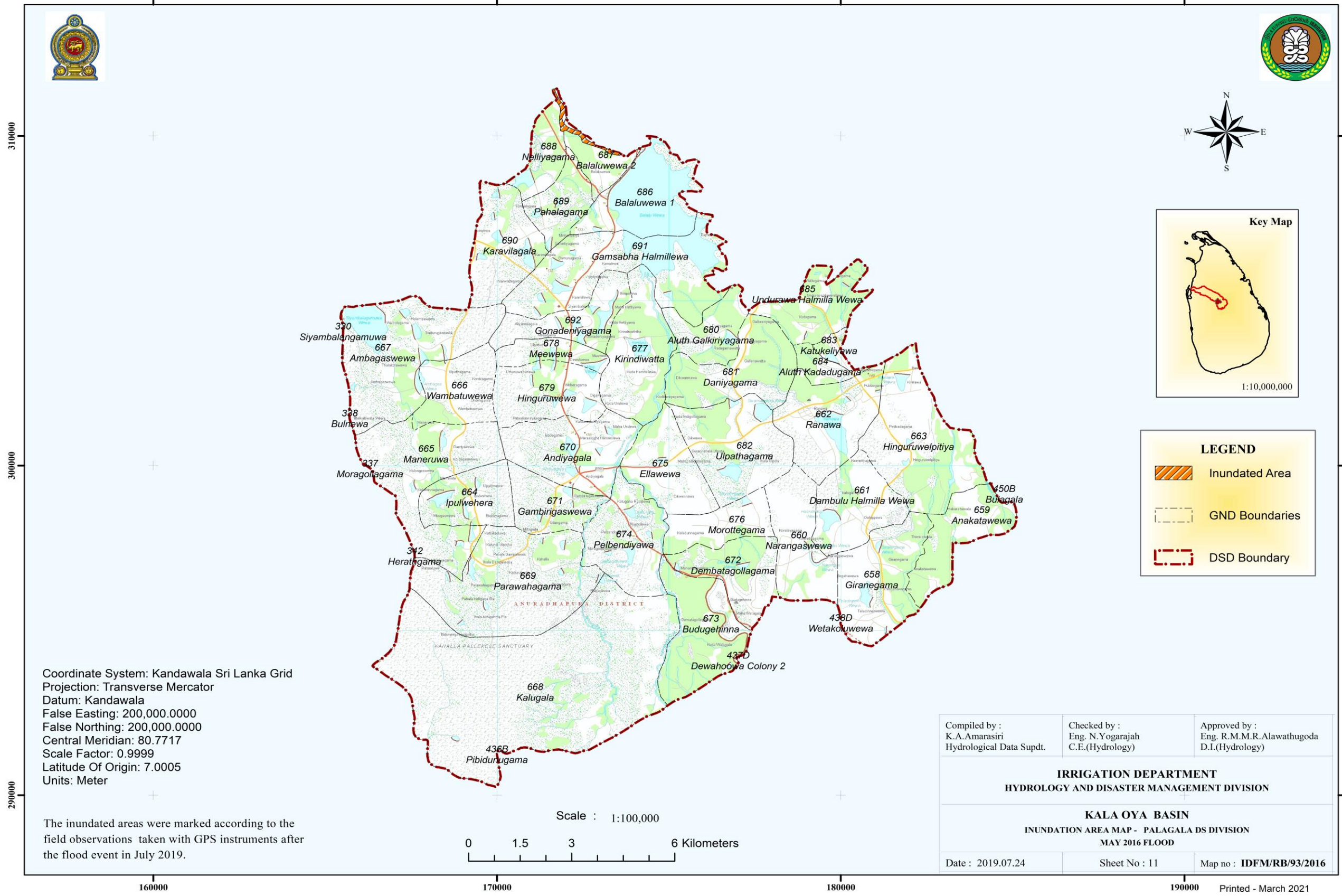
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Table 11

Inundated Areas in Galgamuwa Divisional Secretariat Division in May 2016 flood					
North Western Province					
Kurunegala District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
GALGAMUWA	87	Medagama West	5.87	1.24	21.05
GALGAMUWA	96	Walagambapura	3.68	0.00003	0.00094

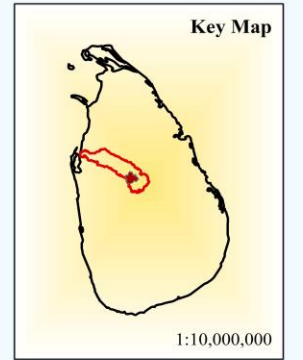
ID FLOOD MAP

INUNDATION AREA MAP - PALAGALA DS DIVISION IN MAY 2016 FLOOD



Coordinate System: Kandawala Sri Lanka Grid
 Projection: Transverse Mercator
 Datum: Kandawala
 False Easting: 200,000.0000
 False Northing: 200,000.0000
 Central Meridian: 80.7717
 Scale Factor: 0.9999
 Latitude Of Origin: 7.0005
 Units: Meter

The inundated areas were marked according to the field observations taken with GPS instruments after the flood event in July 2019.



LEGEND

- Inundated Area
- GND Boundaries
- DSD Boundary

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IRRIGATION DEPARTMENT HYDROLOGY AND DISASTER MANAGEMENT DIVISION		
KALA OYA BASIN INUNDATION AREA MAP - PALAGALA DS DIVISION MAY 2016 FLOOD		
Date : 2019.07.24	Sheet No : 11	Map no : IDFM/RB/93/2016

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Table 12

Inundated Areas in Palagala Divisional Secretariat Division in May 2016 flood					
North Western Province					
Anuradhapura District					
DS Division	GN Division NO	GN Division Name	Area Sq.Km.	Inundated Area Sq.Km.	Percentage %
PALAGALA	687	Balaluwewa 2	2.06	0.18	8.98
PALAGALA	688	Nelliyagama	2.77	0.13	4.52