



MEMORANDUM



Puttingal Temple Fire Cracker Explosion Paravoor, Kollam District, Kerala (10-04-2016)



Submitted by
Additional Chief Secretary, Revenue & Disaster Management
(State Relief Commissioner)
Government of Kerala

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1. Introduction

Disaster struck the crowded precincts of the Puttingal Devi Temple at Paravoor, South of Kollam District on 10th April 2016 at 03:13am. The Puttingal Devi Temple at Paravoor was holding its annual festival which is popularly known as '*Meena Bharani Ulsavam*' which is celebrated in Meenam Month of Malayalam era corresponding to March-April months of the English calendar. The festival of this year was scheduled from 04-04-2016 to 10-04-2016 with various stage programmes, procession and fireworks display. This festival has been taking place for the last many decades.

Every year, the festival committee conducts the fireworks display as a contest. According to the local belief & tradition, fireworks display and ceremonies are essential part of offerings to the presiding deity.

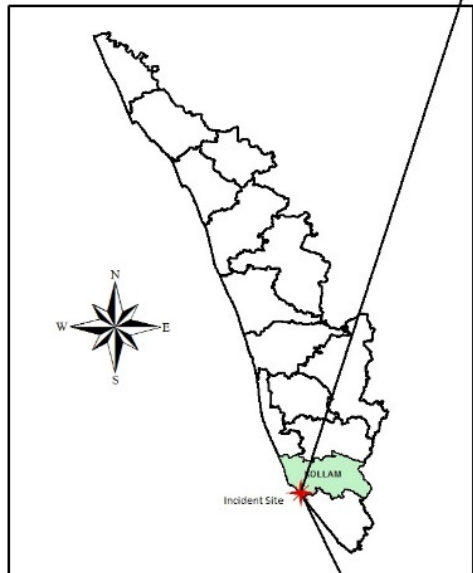
This year, the District Collector did not give permission to conduct fireworks competitions, yet the temple authorities went ahead with the contest. On the last day of the festival, on 10-04-2016 at around 3.13 am, a massive explosion occurred at the venue.

Immediately after the disaster, massive rescue and relief operations were undertaken by the local people and the State Government to evacuate those injured to hospitals nearby.

So far, 107 persons lost their lives including two women and two children; 1197 persons were injured. There are 411 persons still in hospital, of which 29 persons are severely injured and their condition is very critical.

Abstract	
Latitude & Longitude	8°48' 45.57" N 76°39' 52.07" E
Panchayath wards affected	6 (15, 12, 24, 25, 26, 27)
Village	Paravoor
Taluk	Kollam
Divisional Office	Kollam
District	Kollam
State	Kerala
Total Population of Paravoor Village	5817
No. of Deaths	107
No. of Injured	1197

**Location Map
Puttingal Temple,
Paravoor, Kollam District**



1.1. Time line of incident

Date	Day	Time	Incident
03.04.2016	Sunday		The annual festival of Paravoor commences
09.04.2016	Saturday		The final day of festivities
		23:30	Fireworks at Puttingal Temple, Kollam begins
10.04.2016	Sunday	3:13	Fire crackers explodes off target and falls on 'Kambappura' (store house of the crackers).
10.04.2016	Sunday		Police Intervenes
10.04.2016	Sunday		Rescue operations begin
10.04.2016	Sunday	5.00	Event raised as L2. Support from all departments of the State requested
10.04.2016	Sunday	6.23	Event reported to NDRF HQ and NDMA Control Room
10.04.2016	Sunday	6:30	Fire at the temple brought under control
10.04.2016	Sunday	7.00	Event raised as L3. Support for medical care from national level responding forces requested via SEOC

1.2. Action taken by the State Government

- 1 District Collector, District Police Chief and team immediately proceeded to the site and conducted and initial assessment of the event and lead the rescue operations
- 2 The district administration and the state was alerted
- 3 A control room was opened and its number was sent to all including media
- 4 All nearby hospitals were alerted and beds were blocked for treating the injured
- 5 Victims were moved to District Hospital, Kollam and nearby private hospitals
- 6 Heavily injured were moved to Medical College, Thiruvananthapuram
- 7 Deputy Collectors and Tahasildars were deployed to all hospitals and Revenue Divisional Officer, Kollam was put in charge at the accident spot
- 8 Services of HAM Radio Operators were also availed
- 9 SEOC was alerted at 5 am via Television and further on direct verification from District EOC via telephone and the event was elevated as an L2 event

- 10 The first report of the accident to NDMA Control Room and HQ NDRF regarding the accident was sent at 6.23 am via email after cross checking and telephonically verifying the available data
- 11 Fire was brought under control by 6.30 am
- 12 Event was raised as L3 by 7.00 am and decision was made by Chief Secretary and State Relief Commissioner to request for national level medical help
- 13 Request for two aircrafts for moving heavily injured were sent to Airforce by State EOC and the aircrafts were promptly made available by Air Force
- 14 Request for two medical teams from Army were sent by State EOC and the teams were promptly made available by Army
- 15 Navy mobilised two ships with medical aid and medical teams to Kollam via helicopters based on the directions from Ministry of Home Affairs
- 16 NDRF sent in a one team as standby with medical doctors in the team based on the directions from Ministry of Home Affairs
- 17 A team of experts from All India Institute of Medical Sciences were provided by MHA
- 18 Medical teams of Army, Airforce and Navy were deployed to Kollam District Hospital
- 19 Medical teams of AIIMS and NDRF were deployed to Medical College, Thiruvananthapuram
- 20 Although additional support was made available from all major national forces, the state machinery of Revenue, Police, Fire & Rescue Services and Health was self-sufficient
- 21 Reports to NDMA, MHA and NDRF Control Rooms were sent intermittently
- 22 A meeting of the members of the available council of ministers was held at 1 pm on 10-04-2016 at Kollam Guest House
- 23 Hon'ble Prime Minister visited the site of disaster and District Hospital Kollam
- 24 Hon'ble Prime Minister declared Rs. 2 lakhs ex-gratia to the families of the deceased and Rs. 50,000/head to seriously injured from Prime Minister's Relief Fund
- 25 A review meeting was held by Hon'ble Prime Minister along with Hon'ble Union Minister for Health, Hon'ble Chief Minister, Chief Secretary and senior officials at 5.15 pm in Kollam Guest House

- 26 Provisions of State Disaster Response Fund was made applicable for exgratia payments considering it as a calamity of rare nature
- 27 Government declared Rs. 10 lakhs to the families of the bereaved (Rs. 4 lakhs from SDRF and remaining from CM's Distress Relief Fund), Rs. 2 lakhs to severely injured and Rs. 50,000 to injured and all hospitals were instructed not to charge for treatments rendered to the victims
- 28 A judicial enquiry and a crime branch enquiry was announced by the Government
- 29 A team of 6 including doctors and nurses, specialising in burn care from Ganga Hospital, Coimbatore was brought in Air Force Helicopter to Thiruvananthapuram on 11-04-2016
- 30 The Cabinet decided to request Government of India to declare the disaster as a 'National Disaster'
- 31 A cabinet sub-committee visited the disaster site on 14-04-2016 to review the relief operations

1.3. Action taken by Department of Health

- 1 Soon after the explosion, the disaster management activities by the Health department started with an alert call from district administration to the District Medical Officer (DMO), Kollam. The message was disseminated by the DMO to the state authorities, Superintendent of District – Taluk Hospitals and other relevant stakeholders to initiate the emergency response to the crisis. The district hospital Kollam initiated all arrangements to manage the mass casualty by mobilizing doctors and para-medical staff from in and around the district.
- 2 The mass casualty was attended by a team of doctors
- 3 Triage done at the Casualty
- 4 All arrangements were made by mobilizing the ambulances from the nearby public and private hospitals for facilitating the patient transfer
- 5 Director, Health Services reached the spot and directly supervised the disaster management activities

- 6 Arrangements were made at District Hospital, Kollam to do autopsy on a war footing. 10 teams were made available. Forensic Surgeon from Pathanamthitta was brought for technical support.
- 7 Sufficient blood in all groups, plasma expanders & all medicines for critical care was ensured
- 8 24 hour information centre was started with help desk 0474-2742004 and 2797609

1.4. Action taken by Department of Health - onsite

- 1 24x7 Outpatient camp started at the site of disaster and house to house visit by the field staff and ASHA workers was initiated to identify injured persons in the locality nearby and for public health surveillance.
- 2 Mobile team constituted with ENT surgeon for screening the patients with hearing impairments.
- 3 For preventing epidemics in the disaster region, testing was carried out in drinking water sources to check the possibility of contamination.
- 4 All efforts were made to document the names of missing persons and to identify dead bodies
- 5 District mental health team was assigned for providing counselling for the families of patients with post-traumatic stress.

HOSPITAL	Out Patients (including brought dead, referred cases, In patients, casualty)						
	11.04.16, 2 pm	12.04.16, 2 pm	13.04.16, 2 pm	14.04.16, 2 pm	15.04.16, 2 pm	16.04.16, 2 pm	OP Cumulative
District Hospital, Kollam	218	0	5	4	0	0	227
Medicity	88	0	0	1	0	0	89
Holycross	100	3	0	0	0	0	103
KIMS Kottiyam	51	0	0	0	0	0	51
ESI Parippally	102	0	0	0	0	0	102
Rama Rao Nedungolam	269	0	0	15	6	5	295
N.S Hospital Palathara	37	0	0	0	0	0	37
Benzigar	12	1	0	0	0	0	13
Upasana	6	0	0	0	0	0	6
Meditrina	25	0	0	0	0	0	25
Azeezia Kollam	19	0	0	1	0	0	20
Sankers Hospital	4	0	0	0	0	0	4
Nayers Hospital	3	0	0	0	0	0	3
B R Hospital Paravoor	45	0	0	0	0	0	45
Medical College, Tvm	110	0	0	0	0	0	110
Ananthapuri TVM	5	0	0	0	0	0	5
SP Forte	9	0	0	0	0	0	9
KIMS TVM	27	0	0	0	0	0	27
Gokulam Medical College	3	0	0	0	0	0	3
SUT Pattom	1	0	0	0	0	0	1
PRS Hospital tvm	1	0	0	0	0	0	1
SSNMM Varkala	16	0	0	0	0	0	16
Total	1156	4	5	16	6	5	1197

HOSPITAL	In Patients (including Brought dead, referred cases, In patients, casualty)						
	11.04.16, 2 pm	12.04.16, 2 pm	13.04.16, 2 pm	14.04.16, 2 pm	15.04.16, 2 pm	16.04.16, 2 pm	OP Cumulative
District Hospital, Kollam	37	4	6	4	0	0	51
Medicity	65	3	1	1	0	0	70
Holycross	60	0	0	0	0	0	60
KIMS Kottiyam	8	1	0	0	1	0	10
ESI Parippally	12	4	0	0	0	0	16
Rama Rao Nedungolam	30	5	0	4	2	1	41
N.S Hospital palathara	11	1	0	0	0	0	12
Benzigar	8	1	0	0	0	0	9
Upasana	0	0	0	0	0	0	0
Meditrina	15	0	0	0	0	0	15
Azeezia Kollam	17	0	0	0	0	0	17
Sankers Hospital	3	0	0	0	0	0	3
Nayers Hospital	0	0	0	0	0	0	0
B R Hospital Paravoor	0	0	0	0	0	0	0
Medical College, Tvm	56	0	0	0	0	0	56
Ananthapuri TVM	5	0	0	0	0	0	5
SP Forte	9	0	0	0	0	0	9
KIMS TVM	23	0	0	0	1	0	24
Gokulam Medical College	3	0	0	0	0	0	3
SUT Pattom	1	0	0	0	0	0	1
TH Attingal	0	0	0	0	0	0	0
TH Varkala	2	0	0	0	0	0	2
PRS Hospital tvm	1	0	0	0	0	0	1
SSNMM Varkala	5	0	0	0	0	0	5
Total	371	19	7	9	4	1	411

2. Objectives of the memorandum

The Tenth Finance Commission held the view that 'if a calamity of rare severity occurs, it should be dealt with as a national calamity, requiring additional assistance and support from the Centre, beyond what is envisaged under the CRF scheme'.

This memorandum is based on a rapid assessment of the damages. It is submitted to seek special grant from Government of India for rehabilitation of families of those who died and got injured. It is intended to consider this disaster as rarest of rare incidents, which resulted in loss of 107 lives and left more than 1000 people injured. Even after a week of the disaster, there are 411 patients admitted in 24 hospitals in two districts, some of whom are critical. This is the largest number of casualties in Kerala in a single disaster after Indian Ocean Tsunami, 2004. The affected community requires prolonged medical treatment and psycho-social care. Permanent disability and partial disability is expected in large number of victims of this disaster.

The State Government hereby request Government of India to consider the Puttingal Temple Fire Cracker Explosion as a '**National Calamity**' of rare severity requiring additional assistance and support from Government of India, beyond what is envisaged under the CRF scheme.

3. Losses

3.1. Human loss

One hundred and seven (107) lives were lost in the disaster. Government declared Rs. 10 lakhs to the families of the bereaved (Rs. 4 lakhs from SDRF and remaining from CM's Distress Relief Fund), Rs. 2 lakhs to severely injured and Rs. 50,000 to injured and all hospitals were instructed not to charge for treatments rendered to the victims

Table 1: Abstract of fatalities and injuries

Sl. No	Condition	Number	Ex-gratia by State
1	Fatalities	107	10,70,00,000
2	Injured & hospitalised >1 week	411	8,22,00,000
3	Injured & hospitalised <1 week	679	3,39,50,000
Total		1197	₹22,31,50,000

3.2. Hospitalisation costs

Actual cost of hospitalisation of the victims will only be known after several weeks. This amount is project based on available rapid estimates from hospitals. An approximate estimate is given in Table 2 below.

Table 2: Abstract of fatalities and injuries

Sl. No	Condition	Number	Actual Estimate
1	Out-patient expenditure @ ₹3000/head	774	23,22,000
2	Critical care @ ₹8,00,000/head	29	2,32,00,000
3	In-patient expenditure @ ₹17000/head	382	64,94,000
Total			₹3,20,16,000

3.3. Houses damaged

Figure 2 shows a rapid assessment of damaged houses. Based on this assessment, about 1993 houses have experienced the effects of the explosion. Table 3 shows the statistics of a rapid visual screening.

Table 3: District wise house damage estimates

Sl. No	Condition	Number	As per SDRF Norms	Actual estimate
1	Severely damaged houses	100	95,10,000	15,00,00,000
2	Partially damaged houses	409	21,26,800	10,22,50,000
3	Minor damaged houses	1484	77,16,800	14,84,00,000
Total		1993	₹1,93,53,600	₹40,06,50,000

3.4. Agriculture

A rapid assessment of agriculture loss was conducted based on satellite derived landuse data. Table 4 shows the damages. SDRF rates are @₹18,000/ha. Actuals are calculated considering the cost of replanting @₹50,000/ha.

Table 4: Damage to agriculture

Sl. No	Landuse	Area (ha)	Loss as per SDRF	Actual loss
1	Rubber	23	414000	11,50,000
2	Residential	3	0	0
3	Perennial	60	1080000	30,00,000
4	Mixed Crop	110	1980000	55,00,000
5	Banana	6	108000	3,00,000
6	Coconut	99	1782000	49,50,000
7	Coconut Dominant Mixed Crop	18	324000	9,00,000
8	Commercial	17	0	0
9	Mining/Industrial wastelands	7	0	0
		343	₹56,88,000	₹1,58,00,000

3.5. Clearance of debris from affected area

A rapid assessment of affected area indicates that debris and direct pollutants from the 3.43 km² area needs to be contained and removed. This debris includes pollutants, concrete blocks, firecracker dust and toxic waste, the composition of which is still unknown. An average value of ₹25000/ha is assumed for agricultural land & mining/industrial waste lands, and ₹2,00,000/ha is assumed for commercial and residential area.

Table 5: Debris clearance cost

Sl. No	Landuse	Area (ha)	Actual loss
1	Rubber	23	5,75,000
2	Residential	3	6,00,000
3	Perennial	60	15,00,000
4	Mixed Crop	110	27,50,000
5	Banana	6	1,50,000
6	Coconut	99	24,75,000
7	Coconut Dominant Mixed Crop	18	4,50,000
8	Commercial	17	34,00,000
9	Mining/Industrial wastelands	7	14,00,000
	Total	343	₹1,33,00,000



Buildings Affected by Fire Cracker Explosion at Puttingal Temple within 1km Radius.

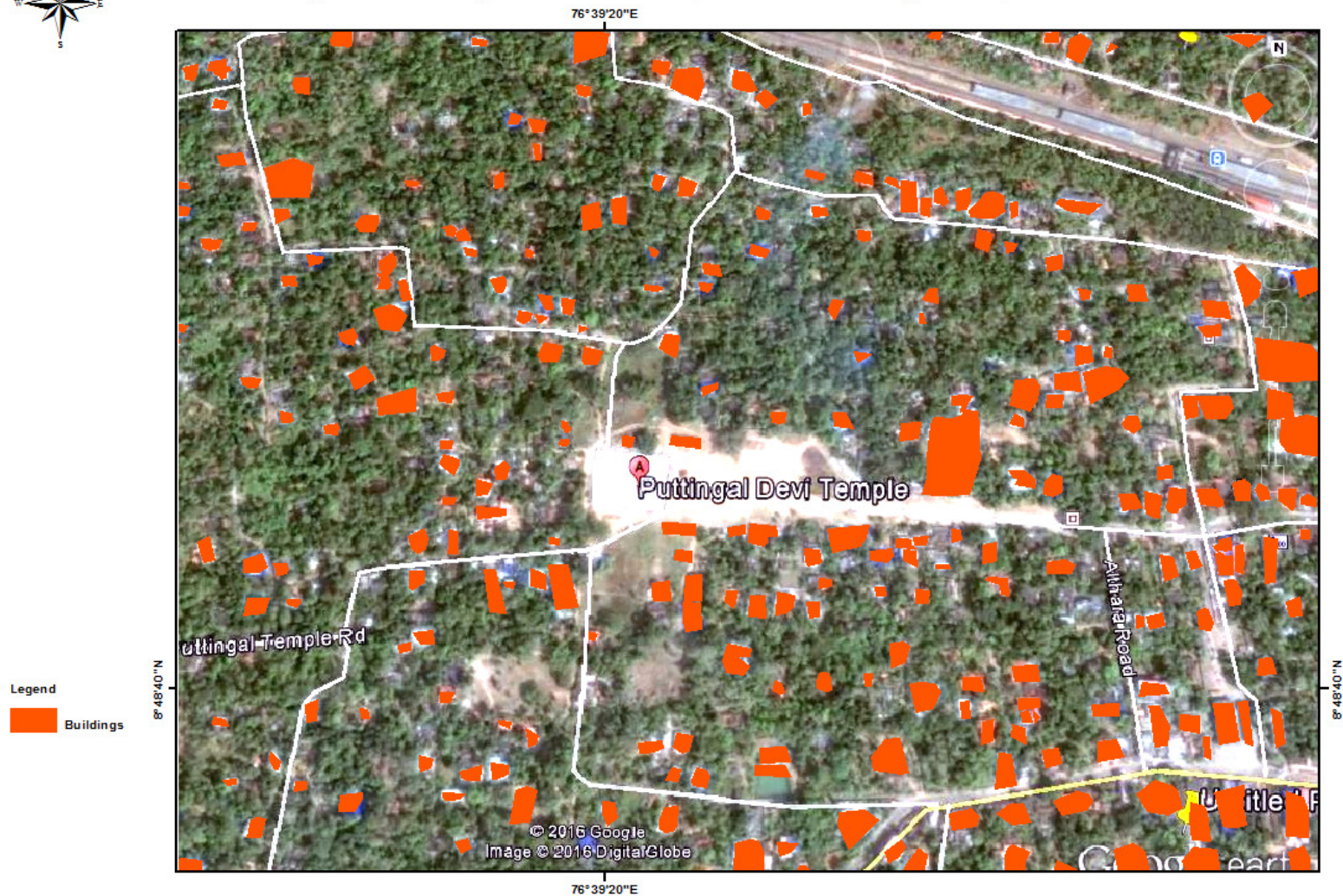
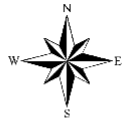


Figure 2: Rapid damage assessment of buildings

Landuse Map Around Puttingal Temple, Paravoor, Kollam District



Legend

▲ Puttingal Temple

Landuse Type

- Banana
- Coconut
- Coconut dominant mixed crop
- Commercial
- Mining/Industrial wastelands
- Mixed crop
- Perennial
- Residential
- Rubber

Source: Landuse Board; Reference Year: 2000

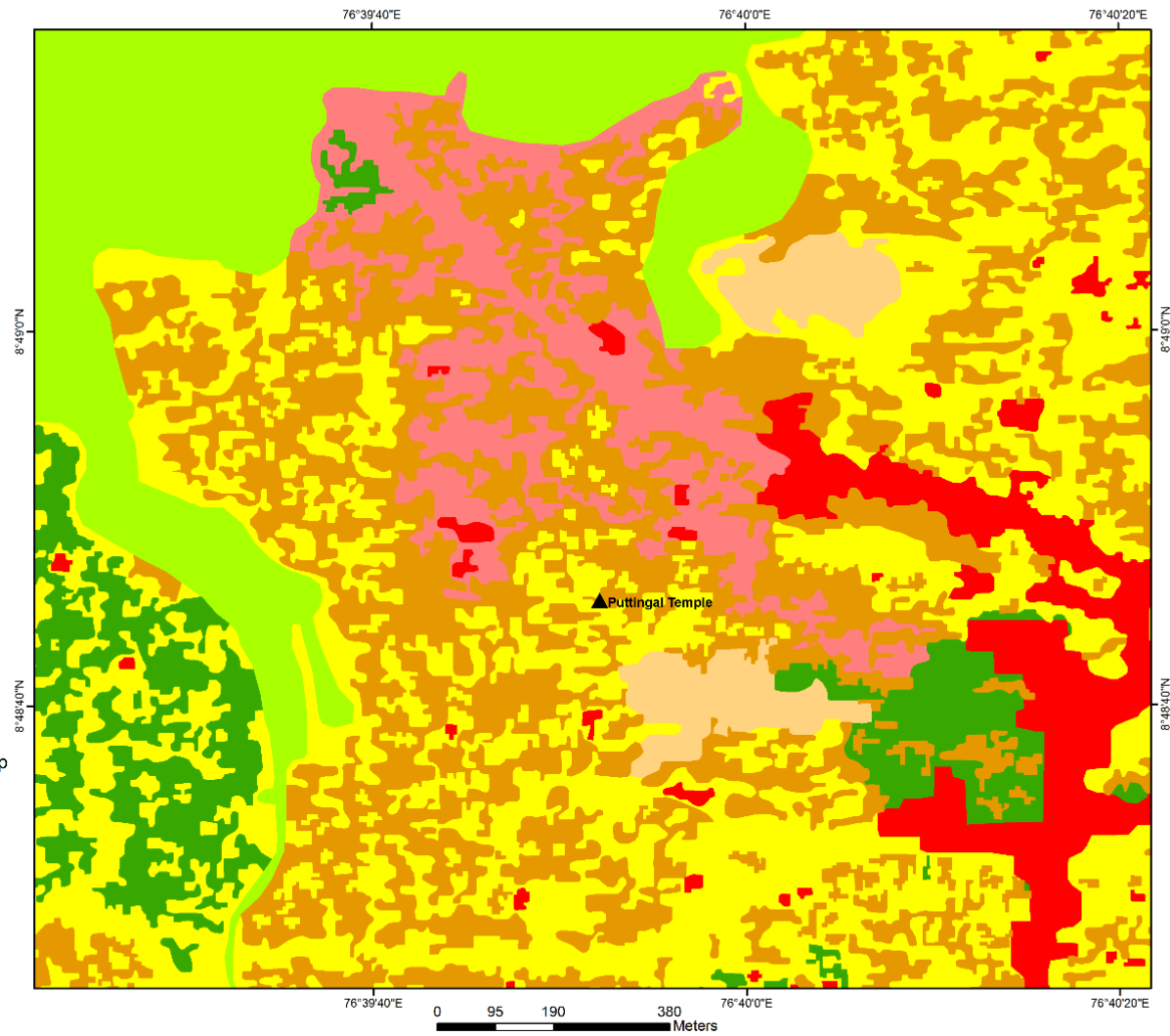


Figure 2: Rapid damage assessment of agricultural area

3.6. Wells

The disaster site was visited by experts from State Pollution Control Board. As many as 200 open wells in the area have been contaminated or damaged in the disaster. Table 6 shows the approximate burden on state exchequer for repairing and cleaning these wells.

Table 6: Open wells

Sl. No	Condition	Number	Actual estimate
1	Repair & maintenance @ ₹25,000/well	200	₹50,00,000

3.7. Relief assistance for clothing & utensils

A lot of people who visited the temple lost their belongings, clothes and utensils. Relief needs to be extended to these households.

Table 7: Clothing & utensils

Sl. No	Condition	Number	SDRF Norms	Actual estimate
1	Clothing & utensils to 1993 house @ ₹2,000/household & actual estimate @ ₹50,000/household	1993	₹39,86,000	₹9,96,50,000

3.8. Search and Rescue

The services of Indian Air Force, Indian Army, Indian Navy, National Disaster Response Force and Coast Guard were used by the State Government with the support of Ministry of Home Affairs.

The expenditure incurred for the services of these forces will only be known later. It is requested that the Government of India may kindly waive all costs related to the services rendered by Central Response Forces, particularly, the costs of air lifting and fuel charges related to the movement of the forces, medical teams and supplies.

The State estimates that an amount of ₹5 crores, approximately, is incurred in actuals by various State Departments for search and rescue activities related to the event. Actuals may be reimbursed to the State.

Table 8: Search and rescue

Sl. No	Condition	Actual estimate
1	Search and Rescue costs (24 hours from T0)	₹5,00,00,000

3.9. Drinking water supply

The disaster struck the state in the peak of summer. As many as 15 tankers of 10,000 litres are being operated in the region to ensure safe drinking water. The costs are roughly

₹15,000/trip. This shall be continued till June, when monsoon sets-in. It is expected that water supply in tankers will be continued for 50 days.

Table 9: Drinking water supply

Sl. No	Condition	Actual estimate
1	50 days; 18 tankers; 1 trip per day; 900 trips	₹1,35,00,000

3.10. Kerala State Electricity Board

The entire power supply network of the area was damaged due to the disaster. A rough estimate shows that as many as 100 minor poles and two transformers were damaged in the event.

Table 10: Drinking water supply

Sl. No	Condition	Actual estimate
1	Electricity sector damages	₹2,00,00,000

4. Long term recovery plan

Experts have opined that the region will require a long term rehabilitation plan including psycho-social care. The area affected with the disaster will require long term decontamination measures to remove heavy metals and toxic substances in the soil and water.

An estimate for setting up and running long term recovery and rehabilitation measures in the region is projected as below. The State is requesting the support of Government of India for the establishing this long term rehabilitation project for the area. A detailed proposal in this regards will be furnished to Government of India, separately.

Table 11: Long term rehabilitation plan

Sl. No	Item	Actual estimate
1	Long term psycho-social care @ 10,00,000/month engaging ASHA Workers and Professional Volunteers for 1 year (Department of Health)	1,20,00,000
2	Treatment of hearing impaired including hearing aids – actual number of people affected will only be evident after 3 months (Department of Health)	1,00,00,000
3	Seed funds for establishing a burn care centre at District Hospital, Kollam – numerous patients had to be transported to Medical College, Thiruvananthapuram as sufficient burn care facilities were not available at District Hospital, Kollam (Department of Health)	3,00,00,000
4	Establishing a permanent drinking water kiosk using atmospheric water maker & solar energy (Kerala State Disaster Management Authority)	50,00,000
5	De-contamination of soil and water (State Pollution Control Board)	9,50,00,000
Total		₹15,20,00,000

Abstract

STATEMENT OF LOSSES DUE TO PUTTINGAL TEMPLE FIRE CRACKER EXPLOSION, 10-04-2016			
Code No.	Item	Loss as per norms (lakhs)	Estimated actual loss (lakhs)
1	2	3	4
1	Gratuitous Relief		
a	Ex-gratia payment to families of deceased persons	4,28,00,000	10,70,00,000
b	Ex-gratia payment for loss of a limb or eyes		
c.i	Grievous injury requiring hospitalization for more than a week	8,22,00,000	8,22,00,000
c.ii	Grievous injury requiring hospitalization for less than a week	3,39,50,000	3,39,50,000
d	Clothing and Utensils	39,86,000	0
e	Gratuitous Relief for families in dire need (Free Ration)	0	0
2	Search and Rescue	5,00,00,000	5,00,00,000
3	Relief Measures		
a	Hospitalisation expenses	3,20,16,000	3,20,16,000
b	Support from Central Forces (Air Force, Army, Navy, Coast Guard & NDRF)	May kindly be waived in actuals by Govt. of India	
c	Provision of emergency supply of drinking water	1,35,00,000	1,35,00,000
4	Clearance of affected areas		
a	Clearance of debris in households and public area	1,33,00,000	1,33,00,000
b	Draining of flood waters in affected areas	0	0
c	Funeral and burial of dead bodies	0	0
5	Agriculture		
i	Assistance to small and marginal farmers		
A	Assistance for land and other loss		
a	Removal of debris on agricultural land	0	0
b	De-silting/restoration/repair of fish farms	0	0
c	Loss of substantial portion of land caused by landslide & change of course of rivers	0	0
d	Repair of bunds of agricultural land	0	0
B	Input subsidy (where crop loss is >50%)		
a	For agricultural crops – rain-fed, irrigated and perennial	56,88,000	1,58,00,000
6	Animal husbandry & dairy		

i	Replacement of milch animals & poultry	0	0
ii	Provision of fodder/feed concentrate in cattle camps	0	0
iii	Additional cost of Medicines and Vaccines	0	0
iv	Damage to straw	0	0
7	Fishery		
i	Assistance to Fishermen for repair/replacement of boats, net – damaged or lost	0	0
9	Housing		
a	Severely/fully damaged houses		
I	Pucca Houses	95,10,000	15,00,00,000
b	Partially damaged houses		
i	Pucca Houses	21,26,800	10,22,50,000
c	Minor damaged houses		
i	Pucca Houses	77,16,800	14,84,00,000
d	Damaged/Destroyed huts	0	0
e	Cattle-shed adjoining house	0	0
10	Infrastructure - Repair/restoration (of immediate nature) of damaged infrastructure		
i)	Road & bridges	0	0
ii)	Community owned assets	0	0
lii)	Cleaning and decontamination of open wells	50,00,000	50,00,000
iv)	Irrigation	0	0
v)	Power (KSEB)	2,00,00,000	2,00,00,000
11	Long term recovery and rehabilitation package		
A	Long term psycho-social care @ 10,00,000/month engaging ASHA Workers and Professional Volunteers for 1 year (Department of Health)	1,20,00,000	1,20,00,000
B	Treatment of hearing impaired including hearing aids – actual number of people affected will only be evident after 3 months (Department of Health)	1,00,00,000	1,00,00,000
C	Seed funds for establishing a burn care centre at District Hospital, Kollam – numerous patients had to be transported to Medical College, Thiruvananthapuram as sufficient burn care facilities were not available at District Hospital,	3,00,00,000	3,00,00,000

	Kollam (Department of Health)		
D	Establishing a permanent drinking water kiosk using atmospheric water maker & solar energy (Kerala State Disaster Management Authority)	50,00,000	50,00,000
E	De-contamination of soil and water (State Pollution Control Board)	9,50,00,000	9,50,00,000
Grand Total		48,15,10,400	117,34,66,000
Estimated actual loss: One hundred and seventeen crores thirty four lakhs sixty six thousand only			
Estimated loss as per state norms: Forty eight crores fifteen lakhs ten thousand four hundred only			

Sd/-
Dr. Vishwas Mehta IAS
Additional Chief Secretary (Revenue & Disaster Management) &
State Relief Commissioner



