

Standard Operating Procedure for Forest Fire Fighting in Thimphu



Interagency Forest Fire Coordinating Group
July 2017, Thimphu.

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BACKGROUND

Forests play an integral role in the socio-economic development and environmental health of Bhutan. Amongst other drivers of deforestation and forest degradation, forest fire is the primary cause for loss in forest cover and valuable biodiversity. Therefore, forest fire poses the single most important threat to the Constitutional requirement of maintaining 60 percent forest cover. Catastrophic forest fires also undermine national conservation and developmental efforts and are often a cause for serious concern for communities as wildland-urban fire interface increasingly gets riskier, particularly in growing urban-hubs like Thimphu, Paro, Punakha and Bumthang.

Forest fire fighting in Bhutan is a challenging task due to steep, rugged terrain, erratic and increasingly severe weather patterns. Many forest fire incidents are anthropogenic in nature, which makes the role of fire managers challenging in managing new fire incidents. While the current approach to forest fire fighting remains unchanged, firefighters continue to respond to the fire with limited management guidance, planning and co-ordination of roles and minimal communication between agencies.

The ability of the first responders to effectively respond to fire incidences surrounding urban areas can greatly reduce damage to forests and quickly deter risk posed by such fires to urban communities. Effective response will depend on inter-agency coordination, preparedness and how adequately response teams are equipped and trained. Currently, firefighters lack a common coordinated system for command and control for incident management planning during forest fire incidents. In the absence of a reliable incident management planning, all concerned agencies often fail to coordinate effective suppression response and also are exposed to unnecessary safety concerns.

Inter agency firefighters, such as Royal Bhutan Army (RBA), the Royal Body Guards (RBG), the Royal Bhutan Police (RBP), Desuung, volunteers and local communities all contribute to fight forest fires. The response to forest fire incidence throughout the country requires a proper incident management system taking into consideration coordination, effective response mobilization and putting firefighter safety first. The system should describe and define the responsibilities for all the stakeholders involved. There should be a standard operational flow from the designated Officers-in-Charge down through the entire operational task force.

His Majesty The King Commanded in February 2017 to strengthen inter-agency coordination and ensure that forest firefighters are adequately and appropriately dressed and equipped while on firefighting duty. As a follow-up on the Command, conveyed by Hon'ble Goongloen Gongma of the Royal Bhutan Army during a Meeting on 13 February 2017, a series of meetings were carried out among agencies to redress issues, strengthen coordination and to enhance effective first response. The Standard Operating Procedure (SOP) described below is being submitted for endorsement.

OBJECTIVES

- To ensure the safety of fire fighting personnel during forest fire incidents.
- To provide for timely, efficient and effective fire fighting action on forest fire incidents.
- For better coordination among the different stakeholders involved in fire fighting.
- To achieve cost-efficient and optimal resources distribution for all forest fire fighters.

SOP: BASIC INITIAL PRIORITIES

These SOPs describe the method by which various forest fires fighting actions should be carried out in a coordinated approach.

While each new forest fire outbreak is different, they share many common features. By working out, in advance, how to react to any of those features, a fire fighter is able to focus attention on the unique features of a particular forest fire. This reduces decision-making workload and reduces the chance that something important might be missed.

By having SOPs, a fire fighter can more easily anticipate the actions of other fire fighters, lessening the risk of working at cross-purposes, which can lead to accidents and ineffective fire fighting. Any contradictory inefficiencies and issues in working by an SOP should be reported immediately via the fire fighter's commanding officer or existing chain of command. If the problem directly affects the safety of those on the fire line, the commanding officer should immediately take action to reduce any such potential risk occurring from the contradiction in priorities.

While some SOPs are general in nature and might be used regularly, others are applicable to specific situations and might only need to be observed in isolated situations.

1. PRE INCIDENT PLANNING AND PREPAREDNESS

1.1 Nomination of Focal Officers for Inter-Agency Forest Fire Coordinating Group (IFFCG)

The most important part of pre-incident planning is formation of the coordination group members (focal officers) from concerned agencies involved in fire fighting. For Thimphu, the members will be from the Department of Forests and Park Services (DoFPS), Royal Bhutan Army (RBA), Royal Bhutan Police (RBP), Thimphu Dzongkhag Administration, Desuung and Department of Disaster Management (DDM). These members are the officials who will take lead coordination role in providing response to forest fire incidents in and around Thimphu. The following focal officials have been nominated from all the concerned agencies to act as the members of the Inter-Agency Forest Fire Coordinating Group (IFFCG) and to act as the primary official contact during fire incidents:

Table 1: IFFCG Members

Sl.No.	Agency	Focal (by Position)
1.	Royal Bhutan Army (RBA)	Commander, Wing VII OC, Army Disaster Response Cell
2.	Royal Bhutan Police (RBP)	SSP, Division XI SP, Fire Service Division
3.	Dept. of Forest and Park Services (DoFPS)	CFO, FPED CFO, Thimphu Division
4.	Dept. of Disaster Management (DDM)	Director Chief Program Officer
5.	Thimphu Dzongkhag Disaster Management Committee	DDMC Chairperson Dzongkhag Disaster Management Officer (DDMO)
6.	Desuung	Director Thimphu Desuung Coordinator

- Any change in membership of the IFFCG should be informed and updated with the IFFCG and contact of the individual members should be updated if it changes.
- The IFFCG Members shall hold an annual meeting to facilitate coordination and raise any issues related to forest fire suppression. The DoFPS member shall update the other members on fire incidences and other details during the meeting.

1.2 Firefighting Training

All fire fighters should be adequately trained in various fire fighting technique, fire safety, coordination and communication protocol.

- The DoFPS will conduct basic fire fighting training of trainers (TOTs) for all the agency focal, who in turn will train their respective RRT and fire fighters.
- DoFPS fire experts will train all focal officers on incident management system and coordination.
- Equipment handling training (Drone) and power chainsaw (felling technique) will also be conducted for focal officers. Selected officials will be nominated and will be trained, who will use these equipment during fire fighting incidents.
- Effective communication is key to smooth coordination and deployment of fire fighters. All focal will be assigned a call code on a radio frequency and trained in use of handsets and a common communication protocol by RBP. The focal will then train their respective fire fighters on their own communication as per Radio Telephony producers in practice.
- As guided by the Forest and Nature Conservation Rules and Regulations 2017, the DoFPS will train members from stakeholder agencies and communities to carry out prescribed burn techniques based on technical burn plans prepared by DoFPS for identified fire prone areas in and around Thimphu.
- Helicopter services have proven to be crucial during fire incidents in difficult terrain and inaccessible locations, where fire fighters have limited access. A joint team of smoke jumpers is proposed to be trained in coordination with DDM and Royal Government Helicopter Services Ltd. (RBHSL) for deployment during such occasions to effectively deliver first response and suppression.

1.3 Rapid Response Team (RRT)

Rapid Response Teams (RRT) will be trained, equipped and kept on stand-by from the RBA, RBP and DoFPS to coordinate quick and effective first response to forest fire incidences in and around Thimphu.

- The RRT's will consists 20-30 member teams from RBA, RBP and DoFPS. Each RRT may be further deployed as crews of 5 members each led by a crew leader.
- Each RRT team will be led by an officer of adequate command and decision making authority, who will coordinate with respective focal officers during incidents.
- The RRTs will be fully trained and equipped with Personal Protective Equipment (PPE) and other fire fighting tools and accessories.

1.4 Fire Line Construction

- The interface between built up areas and forest is becoming a threat, where human lives and properties are at risk from forest fires. Fire lines as specified by experts from DoFPS will be constructed around important structures and property at risk. The identification of such areas will be coordinated by DoFPS in consultation with Thimphu Dzongkhag and Thimphu Thromde Administration.
- The construction of fire line will be coordinated by the IFFCG and implemented with personnel from RBA, RBP, DoFPS and Desuung. Financial requirements for such events will be maintained and logistics arranged annually by DoFPS.

1.5 Equipment:

It is absolutely essential that any individual on forest fire incidences be adequately and appropriately equipped to effectively suppress the fires while at the same time ensuring personal and team safety. The procurement and distribution of all equipments will be coordinated by the DoFPS and approved through the IFFCG. Equipment should be of acceptable international standards. The proposal shall be submitted to the Ministry of Finance for funding. The following list of equipment is necessary for individuals and for teams:

1.5.1. Equipment for RRT

The RRT's should be equipped with personal protective equipment and other fire fighting equipment as listed in Table 2 & 3.

- Each officer in-charge of RRT should use a walkie talkie hand set to communicate with IFFCG and fire fighters in his team.
- Each RRT should have one power chainsaw to fell bigger trees and snags whenever fire line is required to be created to avoid further spread of the fire.
- A minimum of two 4WD Hilux should be maintained for the DoFPS RRT to quickly drop the RRT's to the forest fire incident site for first response. Forest fire vehicles should be equipped with siren and emergency strobe lights to ensure swift response.
- A Drone will be procured and used by RRT from DoFPS to monitor the fire, assess spread and threats and facilitate deployment of the fire fighters.

Table 2: Equipment set required for each RRT

Sl.No.	Name of Equipment	Qty. (Nos.)
1	Shovel	2
2	Flappers	10
3	Rake	2
4	Spade	2
5	Mc leod	5
6	Water Bag pump	5
7	Drip torch and fuel	1
8	Water bottle	30
9	Whistle	30
10	Small bag	30
11	Portable water pump	1
12	Collapsible tank	1
13	Safety Ropes (100m)	1

1.5.2. Individual PPE and Equipment:

The equipment for all the fire fighters besides RRT's should be procured for each agency as per Table 3 and Table 4.

Table 3: List of individual PPE and Equipment

Sl.No	Type of Equipment	RBA	RBP	DoFPS	Desuun g
1.	Fire mask	400	200	100	300
2.	Fire Gloves	400	200	100	300
3.	Safety Goggles	400	200	100	300

4.	Whistle	400	200	100	300
5.	Safety Helmet	400	200	100	300
6.	Torch	400	200	100	300
7.	Water bottle	400	200	100	300
8.	Machete (Patang)	400	200	100	300
9	Safety Rope(4m)	400	200	100	300

1.5.3. Group Equipment:

List of equipment required in different groups for respective agencies should be procured and maintained as shown in Table 4.

Table 4: List of Equipment Required in the Group

Sl.No	Types of Equipment	RBA	RBP	DoFPS	Desuung
1.	Communication handset	10	10	10	10
2.	Rake	40	20	10	30
3.	Shovel	40	20	10	30
4.	Pulaski	40	20	10	30
5.	Flappers	40	20	10	30
6.	Power chain saw	4	2	1	0
7.	Water pack pump	100	100	100	100
8.	Mcleod	40	20	10	30
9.	Portable Water pump	2	2	2	2
10.	Collapsible Tank	2	2	2	2
11.	Drone (UAV)			1	
12.	Safety ropes (100m)	1	1	1	1

1.5.4 Personal Protective Equipment (PPE)

This SOP details the Personal Protective Equipment (PPE) to be used while operating on or near the fire area. Persons undertaking forest fire activities should be appropriately attired to protect themselves from the dangerous effects of fire.

- Ideally, clothing made from natural fibre should be worn that covers all major parts of the body to give protection from radiant heat. Garments made from synthetic materials, (nylon, rayon, etc) should not be worn.
- Helmet to protect the head from falling, low or over-hanging objects should be worn at all times during fire fighting.

- Foot-wear should be sturdy to prevent ankle injury while traversing rugged, loose and uneven terrain.
- Goggles and smoke masks should be worn to protect the eyes and respiratory system from smoke and embers.
- Soft leather gloves with gauntlets should be worn to protect exposed areas of skin extending from shirt/coat sleeves (e.g. wrists, hands and fingers) to provide protection against radiant heat, embers and sharp objects or splinters. Gloves would also minimise blistering from excessive use of hand tools.

2. PRE-INCIDENT ROLES AND RESPONSIBILITIES OF IFFCG

The IFFCG shall have numerous roles and responsibilities before the fire occurs (pre-incident), during the fire incident (suppression) and after the fire (post-fire). The Pre-Incident roles and responsibilities of the IFFCG shall be as follows:

2.1 Collective Roles and Responsibilities of IFFCG

- Coordinate before the onset of the fire season and make preparations for the oncoming fire season including planning, training, awareness, identification of fire prone zones and conduct of prescribed burns wherever required.
- Meet as and when required to discuss on issues related to forest fire management and suppression activities.
- Coordinate, conduct or participate in all necessary training before the onset of the fire season.

2.2 Specific responsibilities of the IFFCG

- Agency members shall facilitate procurement of PPE and fire fighting gear for their respective agencies before the onset of fire season and distribute to the RRT's and other fire fighters as necessary.
- Agency members shall ensure that their respective agencies have basic requirements such as transportation and logistics arranged and ready for deployment for the RRT and other fire fighters.
- Agency members shall ensure that RRT's from their respective agencies are ready and always on stand-by during the forest fire season to deliver effective first coordinated response.
- The DoFPS members shall coordinate conduct of fire fighting and prescribed burn training and awareness programs.
- The DDMC shall bear overall responsibility for arrangement of logistics during fire incidents in coordination with the IFFCG. DDM shall facilitate reimbursement of expenses. Food, refreshments and other logistics shall be made available to IFFCG members of respective agencies for optimal distribution to fire-fighters.

3. FIRE SUPPRESSION AND OPERATIONS ON INCIDENT

3.1 Fire Fighter Safety (SAFETY FIRST)

- The Officer-in Charge is accountable for safety at the forest fire. All fire fighters are also individually responsible for their own safety.
- All fire fighters should work collectively at the incident site to ensure safety of other fire fighters and other people in the area.
- On the incident site everyone should be aware of possible hazards and identify methods to eliminate, reduce or avoid them.
- The first concern should be: “Is anyone in danger? If so, what can we safely do to protect them.
- The second concern should be, “Is there anything of value in danger? If so, can we safely protect it?”
- The third concern should be, “Is there anything we can safely do to help restore normality to the affected area?”

3.2 Operational SOP for Forest Fire Incident Management

On receipt of the first incident report by any members of the IFFCG, respective agencies will immediately deploy their RRTs to the incident site. The RRTs will size up the incident and initiate first response to suppress and contain the fire. Based on the outcome, the RRTs will jointly submit the incident report to the IFFCG stating whether the fire is contained or if additional backup is required. The IFFCG will then deploy additional backup teams on standby in case of larger fires, which could not be contained by the RRTs. The IFFCG shall be fully responsible for coordination and fire suppression till the fire is suppressed and contained. Figure 1 gives a diagrammatic illustration of the flow of decision-making, on-ground suppression action and communication.

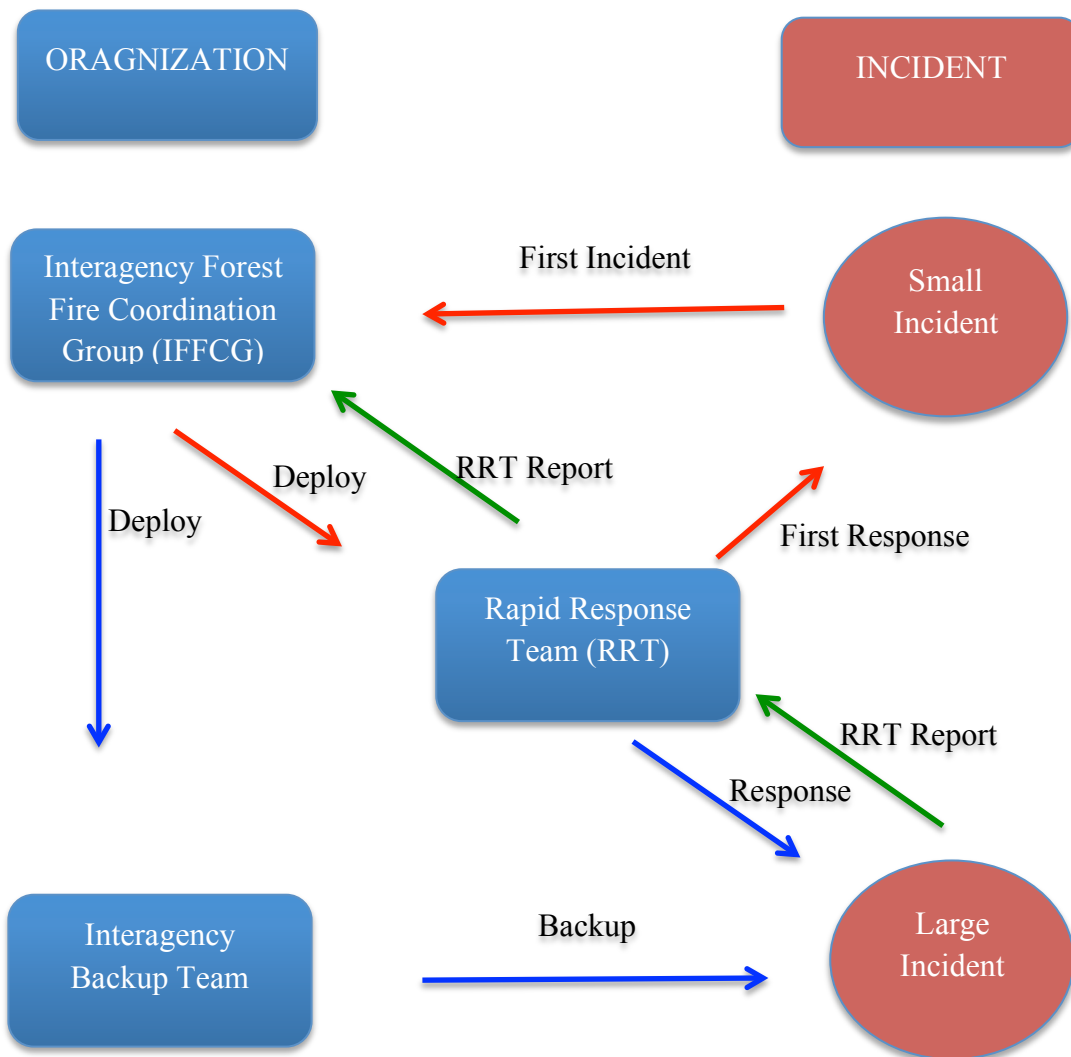


Figure 1: Incident coordination system during forest fires

3.3 Roles and Responsibilities of IFFCG

- As soon as the fire incident is reported the IFFCG will coordinate and plan response with other focals.
- As a first response, the IFFCG will dispatch the RRT to the forest fire incident site to investigate, suppress and contain the fire.
- The IFFCG will start mobilizing backup teams and keep them ready for deployment depending on first incident report from the RRTs.
- The IFFCG members from RBA will coordinate medical support with Military Hospital, RBA while the IFFCG members from DoFPS will coordinate medical support from JDWNRH. The IFFCG should make the medical support team always available at the incident site.

- Arrangement for transportation of the fire fighters and deployment will be done by IFFCG from their respective agencies.
- The DoFPS RRT will investigate and determine the main cause of forest fire and report back to the IFFCG.
- On large incidents the IFFCG from DoFPS will take the lead role in planning and coordinating the next steps for fire suppression.

3.4 Roles and Responsibilities of RRTs

- The RRT's should be fully equipped and will always be on standby for immediate deployment during the forest fire season (Oct-March).
- They will provide the first incident response and combat all forest fires at the initial stage.
- The RRT will conduct assessment of the incident and report to the IFFCG, who will then take further decisions for suppression and containment of the fire.
- The RRTs will try to suppress the fire and call for backup based on the situation and status of the incident.

3.5 Roles and Responsibilities of Backup Teams

- The backup teams will get ready as soon as the RRT is despatched to the forest fire incident site.
- The backup teams will be deployed on instruction from their respective IFFCG members, who will coordinate deployment of the backup teams based on RRT's initial incident report.
- The size of backup teams and timing of deployment will be decided by the respective IFFCG members based on the size and situation of the incident.
- The backup teams should be adequately equipped with PPE and fire fighting equipment, listed in Tables 3 and 4.

4. COORDINATION AND COMMUNICATION

In order to provide fast and efficient suppression response and to ensure fire fighter safety during forest fire incidents, interagency coordination and communication flow are crucial.

4.1 Coordination Protocol

- For any reported forest fire incident, one representative from each agency on the IFFCG shall immediately meet together to plan and deploy fire fighters at an agreed vantage point.

- All IFFCG members should use the common call sign as per Table No 5 and frequency and also commonly used online forum (eg. Wechat, Telegram).
- All IFFCG members will be responsible for coordinating all communication requirements for their respective agencies.

4.2 Communication Protocol

To ensure timely and effective communication amongst IFFCG members and with the RRTs and fire fighters on the forest fire incident the following call signs will be used for communication on radio handsets by the members during forest fire incidents:

Table 5: Name List and Call Sign of IFFCG Members

Sl.No.	Agency	Focal (by Position)	Handset Call Sign
1.	Royal Bhutan Army (RBA)	Commander, Wing VII OC, Army Disaster Response Cell	Alpha 1 Alpha 2 Alpha 3
2.	Royal Bhutan Police (RBP)	SSP/SP, Division XI SP/OC, Fire Service Division	Papa 3 Papa 1 Papa 4 Papa 2
3.	Dept. of Forest and Park Services (DoFPS)	CFO, FPED CFO, Thimphu Forest Division	Echo 1 Echo 2 Echo 3
4.	Dept. of Disaster Management (DDM)	Director CPO, Rehab and Reconstruction Div. CPO, Preparedness and Response Div.	Delta mike 1 Delta mike 2 Delta Mike 3
5.	Thimphu DDMC	DDMC Chairperson DDMO	Tango 1 Tango 2
6.	Desuung	Director Dz.Desuung Coordinator	Delta 1 Delta 2 Delta 3

- All IFFCG Members must use radio handsets and be available on the designated frequency during fire incidences.
- The DoFPS will process with BICMA for availing a designated radio frequency for use of the IFFCG Members.

- IFFCG Members will use their current agency communication protocols for communication with RRTs and other firefighters.
- In areas where radio hand-set do not have reach, the IFFCG shall facilitate procurement of mobile phone vouchers to support communication and information flow.

4.3 Logistic Coordination at Incident Site:

- Overall coordination and logistic distribution will be done by DoFPS IFFCG Members in coordination with respective agency Members.
- Thimphu DDMC will do fund mobilization for food and refreshments.

4.4 Suppression Coordination on Large Fires

- The IFFCG will initiate incident suppression planning including: rotation of fire fighters, calling-off of fire fighters during the night, additional logistic team organization, gathering weather forecast from National Center for Hydrology and Meteorology (by DDM), etc.
- When the use of helicopter services is considered necessary by the IFFCG, Thimphu Dzongkhag will coordinate with DDM for availing and approval of the helicopter service.
- The DoFPS designated team leaders will use GPS and provide coordinates/directions to the helicopter pilot for dropping water on the incident site.
- When fire incidents are in inaccessible areas, helicopter services should be availed to airlift and deploy fire fighters to the incident site based on the decision taken by the IFFCG.

4.5 Water Tankers

- It is necessary to arrange water tankers when fire incidents occur in or around road-heads.
- Water tankers will be deployed to the road-head nearest to incident site to suppress fire, which is accessible from the road for water supply, and to protect adjoining infrastructure.
- The fire brigade will be dispatched by the RBP (IFFCG Members) based on decision taken by the IFFCG.

5. POST FIRE ASSESSMENT AND REHABILITATION

The DoFPS will be responsible for coordination and implementation of all post-fire activities as per provisions of the Forest and Nature Conservation Rules and

Regulations 2017, and other technical guidelines and practices. Such post-fire status report will be shared with stakeholders through the IFFCG.

6. REPLICATION OF THE SOP IN OTHER DZONGKHAGS

This SOP should be first implemented in Thimphu Dzongkhag. Any inconsistencies in implementation and coordination should be jointly amended by the IFFCG and the SOP should then be replicated in other fire-prone Dzongkhags for effective fire suppression. The SOPs should be integrated into Dzongkhag Fire Management Plans as they are developed and implemented.