

A Technical Note

**FIRE DISTURBANCES IN
BLUE PINE FORESTS OF
BHUTAN**

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Technical Note

Fire Disturbance in Blue Pine Forests of Bhutan

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Study Areas:

1. Thimphu Dzongkhag
2. Paro Dzongkhag
3. Wangdi Phodrang Dzongkhag

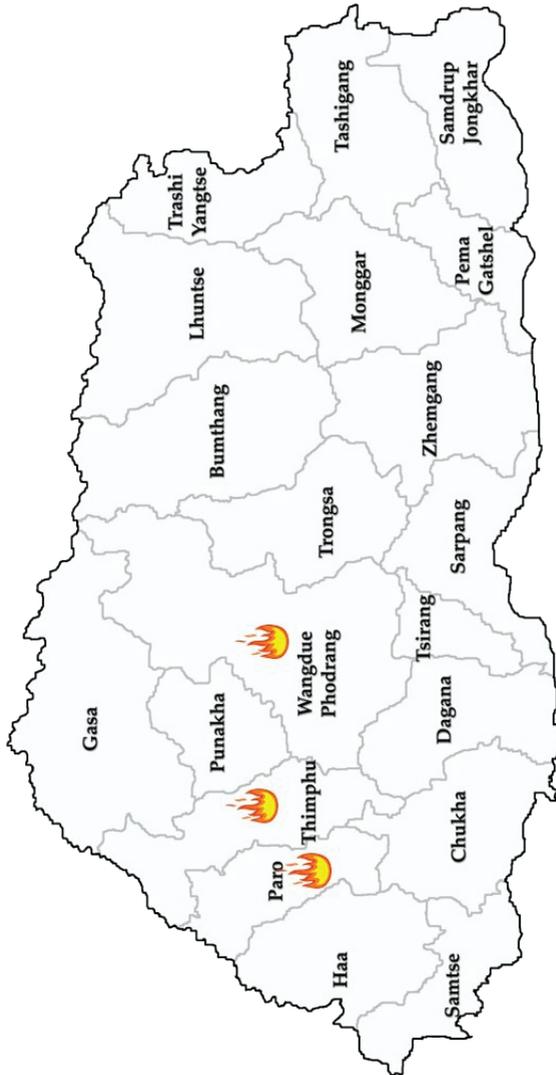


Figure 1. Showing location of 3 study areas

Introduction

In Bhutan fires occurs every winter and pre-monsoon season. In drier areas at mid elevations that are more susceptible to fire, both because of their climate conditions and proximity to human settlements and agriculture, early-successional blue pine (*Pinus wallichiana*) forests are predominant. These forests have high fire frequencies due to increases in fire hazards and changing climate, yet fire dynamics and risk factors are poorly understood in blue pine systems. Therefore, investigation of the multiple factors influencing fire risks, particularly in the Wildland-Urban-Interface around population centers, such as Thimphu and Paro, is critical.

This research provides a foundation for recommendations to fire managers and policy makers that will inform adaptive planning and management intended to protect wildlife, forest resources, and settlements near forested areas. Fire prevention is much more important than fire suppression. One of the main causes of fire being fire escape from agricultural debris burning, debris burning in orchard need to be managed or regulated properly. Especially, allowing agricultural or orchard debris or any such burnings to be carried when the wind speed is low or absent.

Fire prevention programs and efforts are being given high priority in Bhutan, yet funding and staffing are still a challenge that must be addressed by adaptation plans, particularly when determining how to effectively allocate resources to meet future needs.



Photo: Forest Fire in Blue Pine Forests of Thimphu, 2016

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Recommendations

1. Forest Resource Management Division (FRMD), Forest Fire Management Section, Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER), individual researchers and urban planners together need to innovate and experiment with silvicultural techniques designed to reduce fire risks.
2. FRMD, PAs and Territorial Divisions may effectively use climate and fire weather forecasting to help Forest fire management Section, FRMD, PAs, and Territorial Divisions, to most efficiently allocate firefighting and management resources. Thus, strengthening linkages between (Department of Forests and Park Services) DoFPs and other agencies like Department of Disaster Management, UWICER (researchers), Thromdes and Dzongkhag Municipalities would efficiently assist to prevent and create awareness in forest fires.
3. City Corporations and Dzongkhag municipalities in consultation with DoFPs (Fire Section, FRMD and FPED) may address the issues especially concerning the Wildland-Urban Interface.
4. The fire prevention measures should also be addressed at city municipalities, at the local government meetings such as Dzongkha Yargay Tshogdue, Gewog Yargay Tshogdue and other local level meetings.
5. Adapting fire management to the climate change is deemed necessary, which calls for renewed efforts by the policy makers, DoFPs and communities in improving community-based fire prevention systems.

6. Efficient management of forest fires would require concerted efforts by several governmental agencies and community organizations which would benefit from direct supervision by the Government.
7. Silvicultural treatments such as regulating surface fuels and thinning from below the canopy would be effective for fuel management and would also have positive effect on increment and timber quality.
8. Research institutions like UWICER and College of Natural Resources (CNR) with other relevant institutions should initiate to conduct further researches on forest fire risk management, as certain regions of the country are experiencing increased fire events every year.
9. Develop management plans to:
 - implement moderate grazing intensity,
 - proper management of agricultural debris burning,
 - understanding fire dynamics,
 - fire hazard mapping at local scale,
 - fuel management,
 - forest fire-climate interactions,
 - forest fire-bark beetle interactions,
 - forest fire-mistletoe interactions,
 - Wildland-Urban Interface (forest fire-land use interactions),
 - road constructions in the forests, and
 - silvicultural practices.

For additional information please contact

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Photo: Blue pine forests around settlement in north Thimphu.
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Photo: A three year old burnt blue pine forest in Phobjikha, Wangdue Phodrang





Photo: *One year old stand replacing forest fire sites above Lungtenphu, Thimphu, 2015*

