Towards Turkish National Fire Danger Rating System as a Decision Support System

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Contemporary fire management planning requires accurate, timely and readily available information. To acquire and make this information available to fire management organization, a sound decision support system is necessary. Today, decision support systems (DSS) have long been a part of fire management organizations in many countries to help fire managers make sound decisions concerning fire management activities. Fire danger rating systems (FDR) are such decision support systems that determine fire danger and potential fire behavior.

More than fifty percent of the forested areas in Turkey is under the threat of forest fires, and fires are responsible for the loss of goods, resources and even lives. Therefore, there is a great need for such a decision support system. There have been some endeavors in Turkey to establish fire danger rating systems in the country as a decision support system. Major undertakings in this regard have been the studies dealing with fire behavior prediction and fire danger rating. The establishment of a national fire danger rating system is currently underway. For successful implementation of a fire danger rating system, all components of the system, namely Fire occurrence prediction system (FOP), Fire Weather Index System (FWI) and Fire Behavior Prediction System (FBP) should be effectively incorporated under a common structure. This study aims to demonstrate a project work that provides the common structure required for the successful establishment of the National Fire Danger Rating System as a Decision Support System. The system that will be developed as a decision support system that will have the potential to be implemented operationally. The system will include Fire Information System (FIS), FOP, FWI and FBP modules. The FIS module will be designed such that fire managers will be able to input, store, update and manage data easily. Decision makers will also be able to retrieve the required data from the database for past fires. One of the major components of FDR systems is Fire Occurrence Prediction System (FOPS). This component will be developed based on fire risk factors that are thought to have a role in fire ignition (past fire history, environmental factors, land use, land use change and demographic factors), fire danger factors (fuels), literature and experts' opinion. The FWI system will predict fuel moisture contents based on past and current weather conditions. The FBP System will predict fire behavior (rate of fire spread, fire intensity and fuel consumption) under the varying effect of weather, fuel and topography.

The results of the study will provide fire managers with tools and support necessary for successful fire prevention/presuppression, suppression and post fire management planning. Moreover, a successful implementation of the system will prove invaluable in fire training programmes, raising public awareness, suppressing fires, using fires as a management tool and determining fire effects.

Keywords: *Forest Fires, Fire Danger, Fire Danger Rating System, Decision Support Tool*