Forest Damage Assessment using Aerial Imagery

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Abstract Today, studies on fires in natural areas, especially in forests and rangelands of Iran and the world, have drawn many researchers' attention to themselves. Abundant researches have been carried out about relevant subjects. The researches which are conducted by researchers include 3 stages: 1) before fire occurrence in order to avoid and prevent fire occurrence, 2) during fire occurrence in order to detect and suppress fire, and 3) after fire occurrence in forests and rangelands in order to assess natural resources damages as well as to plan for forests restoration. In this thesis, we study the conditions after fire occurrence in forests and rangelands and consequential damages. By using of the image processing science and its techniques and also through aerial or satellite imagery which were received the region after fire occurrence, this work is designed and implemented by Matlab software. In the proposed algorithm, first of all, we separate damaged regions green normal regions with respect to satellite imagery received damaged regions and by using of color models, and then calculate their area through triangular method. Then, by applying imaging scale, we show final area in hectares. Finally, we compare the proposed method with other methods of area assessment and draw their assessment graph. In this study, the basis of comparison and assessment is human method or field method. The findings of this research show that the proposed method is more precise and accurate than other methods and thus, will decrease operating expenses of area estimation and also reduces the time period of damage assessment declaration.

Keywords : Keywords: Image processing, damage assessment, forest fire, burnt region, area calculation, image processing techniques, color models.