

## **Land cover, fire and armed conflict in west Iran**

Since April 2016 ongoing violent clashes have been occurring in north-western Iran between the Kurdish Democratic Party of Iran (PDKI) and the Iranian Revolutionary Guards. This conflict was partially caused due to the Kurdish minority experiencing increased discomfort with their situation. Further amplified due to economic injustice since the province Kurdistan is one of the least developed regions in Iran. Other Kurdish parties supported the PDKI which led to additional outbreaks of violence. Armed conflicts in general are not only a great threat to human livelihoods but also to the environment. One such environmental aspect impacted are vegetation fires. Not only are ecosystems more vulnerable to fires under armed conflict, but forests and croplands can be purposely set on fire as a part of the military strategy.

Prior to this thesis no study assessed the linkage of land cover, armed conflict and fire in Iran. Therefore, the purpose of this thesis is to help fill the research gap in the region by evaluating this relationship. In this study two periods were analysed, one before the clashes started (2012-2015) and the other one where armed conflict started to increase (2016-2020). The hypothesis that armed conflict leads to enhanced fire occurrence that cannot be explained by climate alone, was investigated by using tools such as spatial GIS analysis and statistics. Remote sensing offers an appropriate measure to assess effects of conflict on fire activity, especially in regions where ongoing violent disputes make data collection difficult.

The results highlight that most fires take place on sparse vegetated grounds and croplands, while most conflict materialise within cities followed by croplands. It is important to note that croplands are exposed to more violent conflict events compared to cities. Moreover, conflict and fire occurrence are not strongly spatially correlated over the whole study area. Instead, hotspots of high conflict and high fire occurrence were found. The findings suggest that the effect of conflict on fire events is spatially confined and does not affect areas further away. Additionally, these clusters had lower correlations to the climatic variables compared to the provincial level, implying in these fires might indeed originate from the surrounding conflict. Since high instances of conflict and high fires occurred before the clashes started in 2016, this implies that political instability prior to the start of war already could lead to enhanced fire activity.

This study illustrates initial efforts to research the impact of armed conflict in west Iran with the help of remote sensing. Findings can be further compared with local media reports in an interdisciplinary approach or as motivation for future analysis in Iran. For future research an emphasis should be placed on the local scale and type of conflict that land systems are exposed to. Given that agricultural systems, especially, had a higher proportion of potentially damaging conflict instances, evaluating the effect of conflict on this environment will be crucial.

Keywords: Physical Geography and Ecosystem analysis, fire dynamics, conflict, land cover, Iran, cropland

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