

Study: Charcoal production by Al-Shabaab increases in survey area

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Despite a UN ban on the export of charcoal, charcoal production is the main source of income for the Somali terrorist group Al-Shabaab. Because the area in which Al-Shabaab operates is inaccessible, it is not possible to determine on the ground where and how many trees are felled for the production. Researchers from the University of Twente have now

succeeded in mapping the production in part of Somalia with satellite images. Charcoal production and the felling of trees appears to have increased significantly in recent years. The extensive logging has a major impact on the environment and the food security in Somalia. The research results were recently published in the scientific journal *Energy for Sustainable Development*.

Charcoal production leaves behind dark circles of ashes on the ground. These circles can be recognized with [high resolution satellite images](#). Using a computer algorithm, Master student Michele Bolognesi from the ITC faculty of the University of Twente identified charcoal production sites in an area of about 5000 km² (about the size of the Dutch province of Gelderland), which is controlled by Al-Shabaab. Bolognesi compared images from 2011 and 2013 and was thereby able to observe that about 24,000 tonnes of charcoal were produced in the survey area in two years. Anton Vrieling, Bolognesi's supervisor: "Based on counts of production sites in 2011 and 2013, there appears to have been an increase of 28 percent in two years. Older satellite images from before 2007 show that hardly any charcoal was produced in the area at the time.

The 24,000 tonnes of charcoal is worth more than 10 million euros on the Arabian Peninsula, to where the charcoal is illegally transported. The production is accompanied by a loss of nearly half a million trees, or about 3 percent of all trees in the area. The tree felling leads to soil degradation and eventually to desertification. This has a negative impact on the [food security](#) of the local population in the area where drought and conflict have often already take their toll.

Dr. ir. Anton Vrieling, assistant professor at the ITC and Bolognesi's supervisor: "The UN estimates that the illegal trading income from charcoal amounts to approximately 250 million dollars per year for the whole of Somalia. Between 30 and 40 percent of this goes to Al-Shabaab. The organization finances its terrorist acts with this. The study

area analyzed by Bolognesi covers less than one percent of the surface area of Somalia, but our results show that it is an important production area for charcoal." Since fieldwork in many parts of Somalia is impossible due to war and terror, only satellites can provide insight into where and how much charcoal is produced. This is now possible with the method developed by the University of Twente. Due to the increasing availability of high resolution satellite images it is, for example, possible to develop a national monitoring system for charcoal production for Somalia.

Provided by University of Twente

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