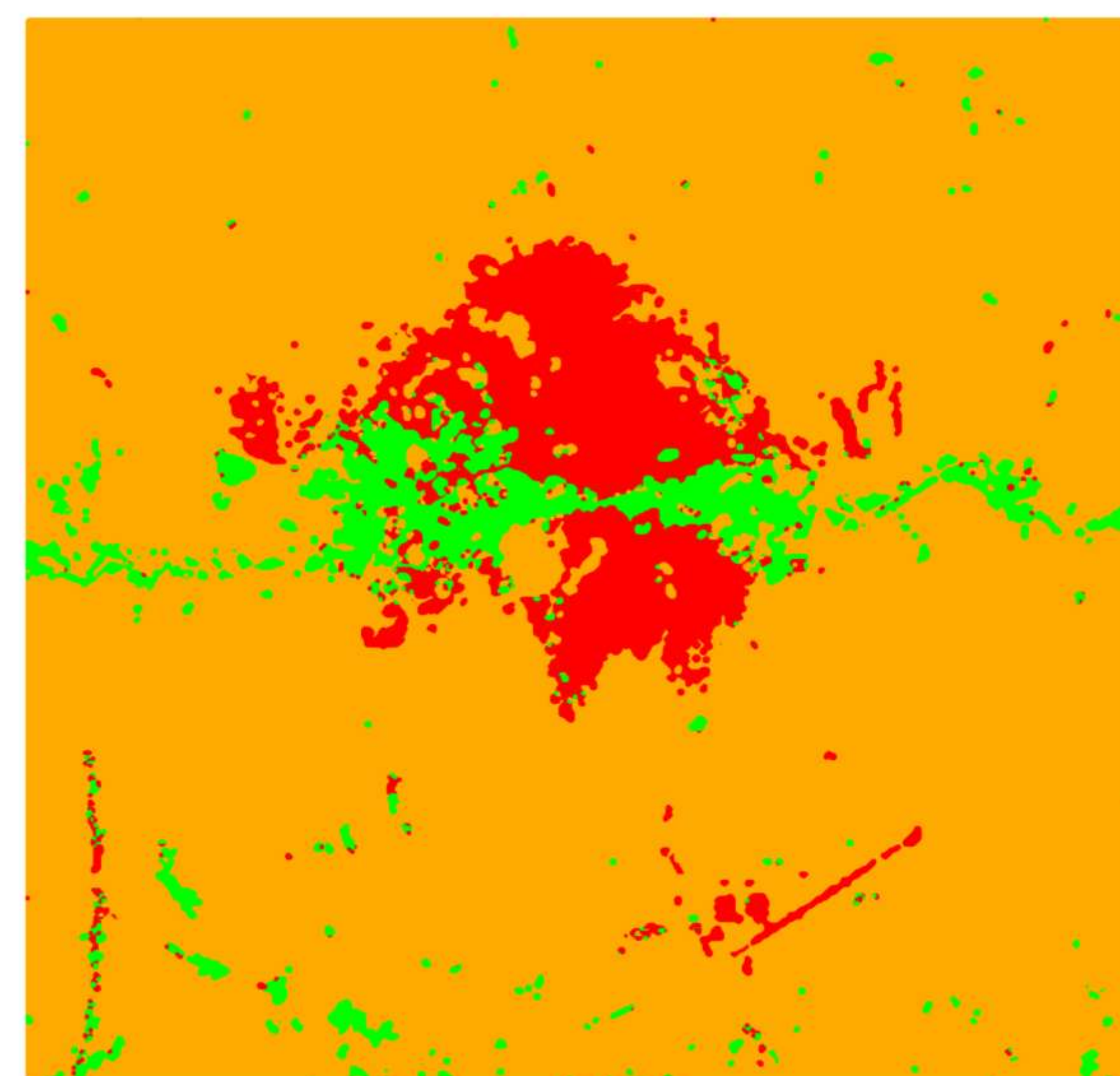
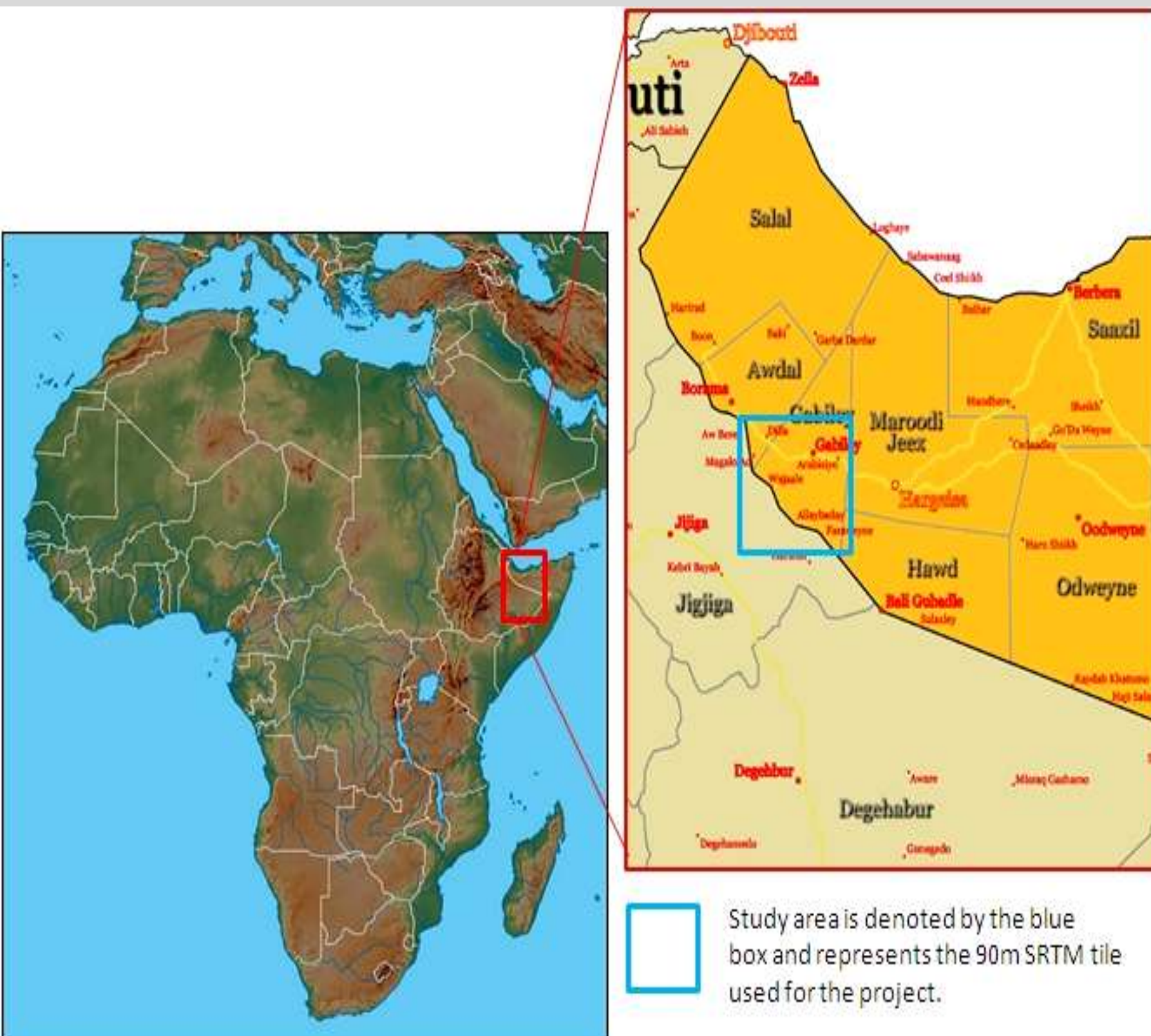


Potential of open source remote sensing for under-developed countries

An example from Somalia

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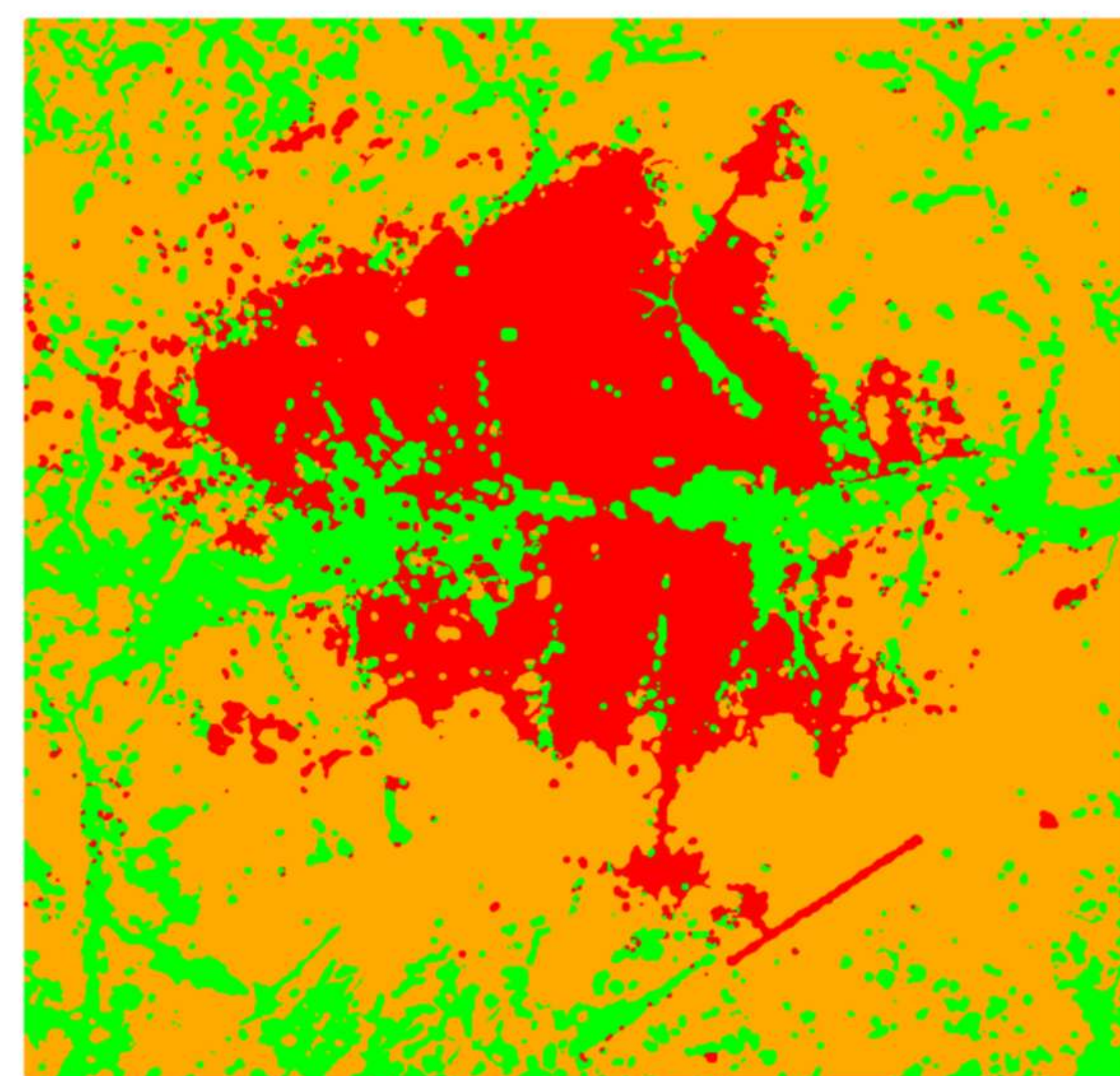
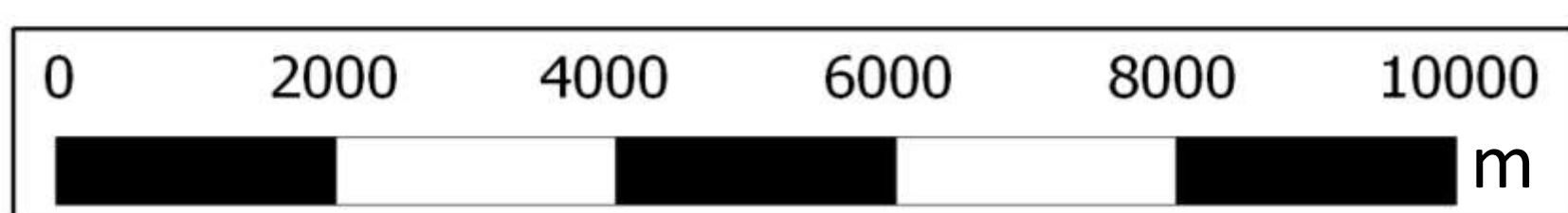
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Hargeisa Land Cover in 1988
 ClassifiedMaxVer-ICM-T-1988

- Bare Land
- Urban
- Vegetation

A



Hargeisa Land Cover in 2008
 ClassifiedMaxVer-ICM-T-2008

- Bare Land
- Urban
- Vegetation

B

Introduction

This study takes the city of Hargeisa and the surrounding region in Somaliland and through simple analysis using open source remote sensing (OSRS) will examine (i) land cover changes the city has undergone in a twenty year period (1988-2008) and (ii) perform an assessment of the region's susceptibility to seasonal flooding.

Objectives

The objectives are:

- To highlight the applicability of OSRS in under-developed countries and locations where on-the-ground scientific studies cannot take place due to political instability.
- Highlight how OSRS can prove invaluable to educational institutions, NGOs and governments alike.

Methodology

- Two Landsat TM images from the same month in 1988 and 2008 were downloaded from the USGS.
- The imagery underwent atmospheric correction using MultiSpec©.
- Pixel-based classification was employed using the K-Means unsupervised algorithm using SPRING.
- For terrain analysis SRTM DEM was acquired from the USGS.

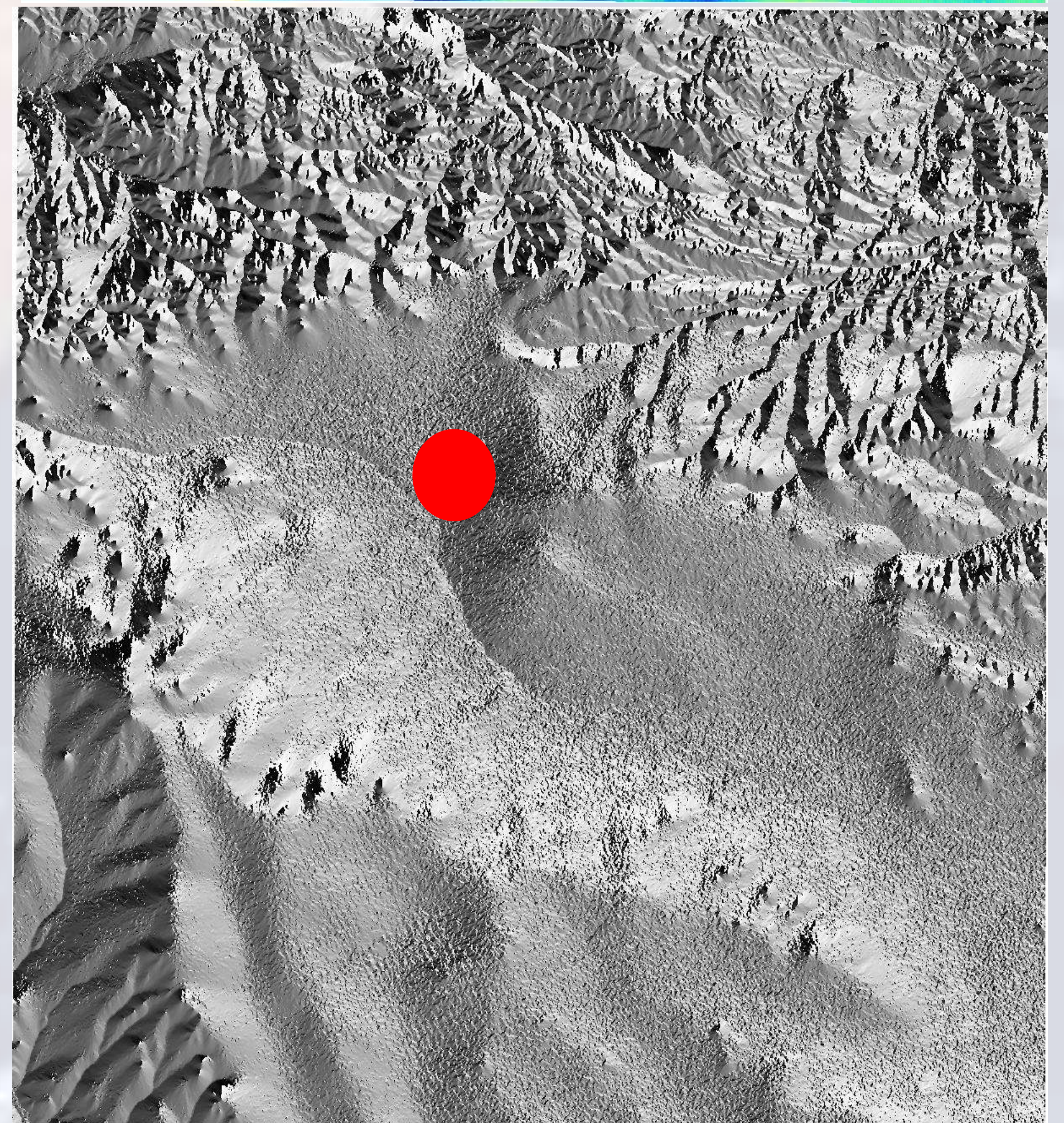
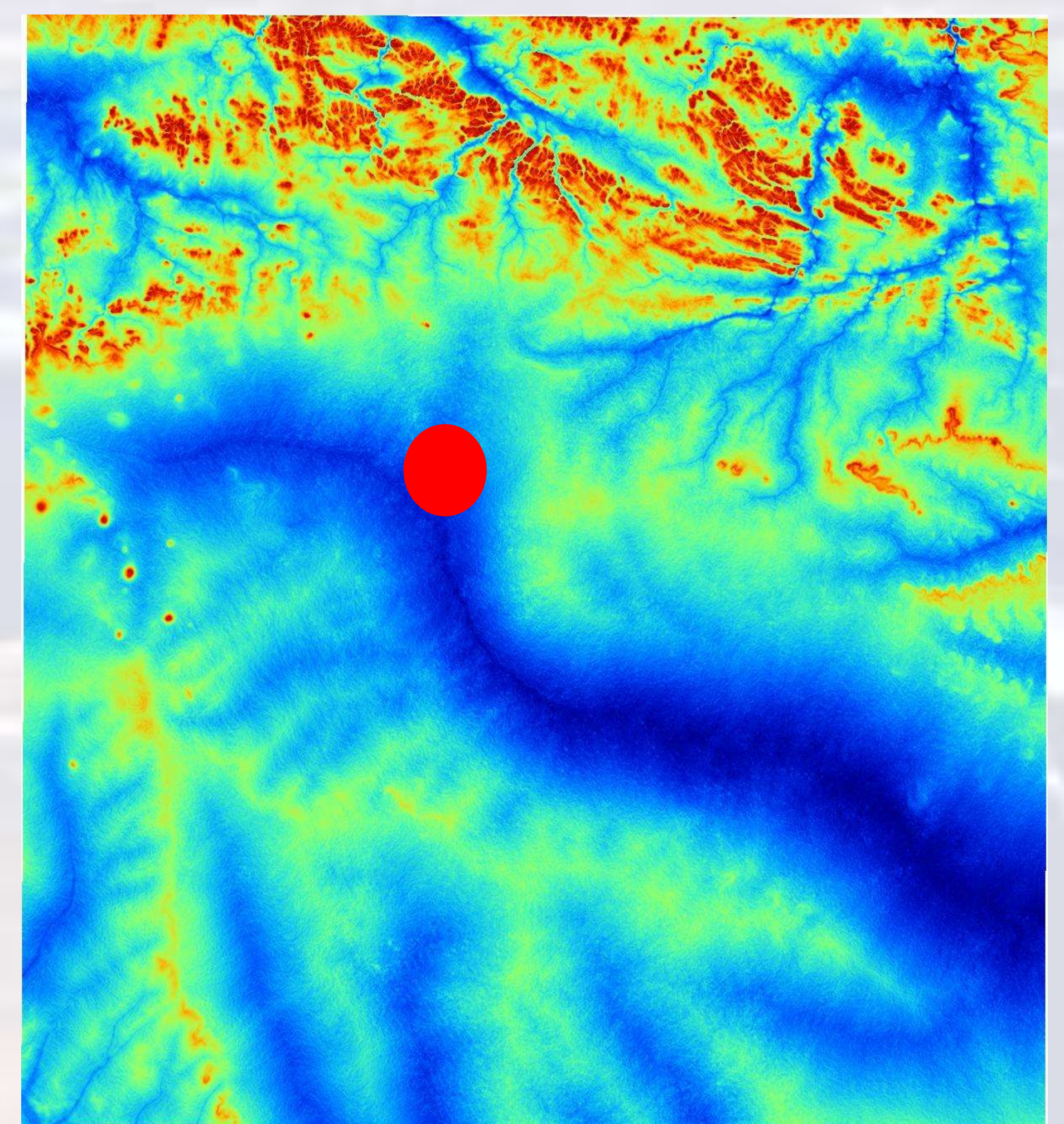
• Identification of drainage basins through the calculation of the runoff volume grid using a flow routing algorithm in the SAGA-GIS was performed on the DEM.

• Extraction of the catchment slope grid and the calculation of the topographic wetness index .

Results and Discussion

It is evident that there has been uncontrolled urban expansion as well as a rapid increase in vegetation over the last 20 years in Hargeisa. These two phenomena can be attributed to the lack of the rule of law in the region:

- There are no regulations of any kind, so illegal construction flourishes.
- Herbivorous wildlife and livestock that kept the surrounding vegetation in check may have been severely reduced because of illegal hunting.



Conclusions

An impediment to the application of research in under-developed countries is the cost of proprietary software. The solution to this obstacle clearly lies within the realm of open source software with the only other possible hindrance being the lack of expertise and language barriers which could be eliminated through international cooperation projects.