

Recommendations from the AfESG pilot study on the use of satellite imagery to map HEC sites in Africa

The following general recommendations result from our work to date:

1. The GIS data should only be developed after the HEC monitoring process has begun at each site. It is only at this point that the boundary of the HEC site can be defined and the amount of time needed to produce the GIS data for each site can be calculated. Waiting for this point should also ensure that there are people working in the field who can collect the data needed to geo-reference the satellite images. **It should be emphasized that there must be a will by the people on the ground to do the work and they must be adequately equipped with vehicles and global positioning systems (GPS's) to be able to do the ground-truthing.**
2. The field experts should be made fully aware of the purpose of producing the spatial data, namely the analysis of HEC incident data. Confusion may arise when the field expert would like the products to be suitable for other purposes that may require more fieldwork or fine-scale data.
3. The field experts should develop a preliminary land-cover classification scheme for each HEC site. They should also mark the position of typical patches of each land-cover type on a low-resolution false-colour composite image that should be sent to the GIS expert by e-mail.
4. Before purchasing any expensive satellite imagery, it is crucial to evaluate the most appropriate analytical technique for the questions to be answered, and the maximum spatial resolution at which such techniques will produce valid results. A spatial resolution of 25km² is appropriate for HEC studies if non-spatial methods are to be used, and freely available datasets can be used for this purpose. This, however, eliminates the effects of spatial patterns that may be of great importance for predicting HEC. More complex spatial methods can be used to elucidate such patterns, and this requires higher-resolution, more expensive data. It's important to ensure, however, that the necessary technical expertise to conduct spatial analyses will be available.
5. The position of small farms should be identified in the field using a GPS unit and these data should be incorporated into the GIS. These data should be collected by the people involved with HEC monitoring and data on the size of each farm, together with any other relevant information, should be collected at the same time.
6. Ideally, the on-screen digitising of the satellite images to produce each land-cover map should be done by someone working at the HEC site. These people would have local knowledge and could confer with others working at the site, so they would be more likely to produce accurate land-cover maps. Unfortunately, the logistics of training someone at each site would have to involve developing a distance-learning system. Such a system would be relatively simple, as on-screen digitising is not a difficult process. **However, experience to date suggests that implementing this scheme is probably not possible in the majority of sites in Africa.**
7. Where it is possible, this type of training would have a number of benefits and would improve the chances of the GIS being used by people on the ground to make management decisions.

BASED ON THESE PILOT STUDIES, RECOMMENDATIONS FOR NEW METHODOLOGIES ARE CURRENTLY BEING DEVELOPED