

Penyusunan Antarmuka *Earth Engine Apps* untuk Pemantauan Deforestasi di Provinsi Kalimantan Barat pada Tahun 2001 - 2020

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ABSTRAK

Indonesia sebagai negara yang memiliki luasan hutan dengan peringkat 9 di dunia. Selama dua dekade terakhir, Indonesia mengalami deforestasi mencapai 270.000 ha. Berdasarkan permasalahan tersebut, maka dilakukan penelitian yang bertujuan untuk (1) memetakan laju dan sebaran deforestasi menggunakan *Hansen Global Forest Change* pada tahun 2001 – 2020 di Provinsi Kalimantan Barat; (2) memetakan perubahan luas dan sebaran tutupan lahan menggunakan algoritma *Random Forest* pada tahun 2001 – 2020 di Provinsi Kalimantan Barat; (3) menyusun desain tampilan antarmuka *Earth Engine Apps* untuk *monitoring* kondisi tutupan hutan pada tahun 2001 – 2020 di Provinsi Kalimantan Barat.

Penelitian deforestasi diolah menggunakan *platform Google Earth Engine* dengan masukan data yang telah tersedia pada menu *datasets Google Earth Engine*. Pengolahan data pada penelitian ini menggunakan data berupa *Hansen Global Forest Change*, *USGS Landsat 7 Collection 1 Tier 1 TOA Reflectance*, dan *USGS Landsat 8 Collection 1 Tier 1 TOA Reflectance*. Proses pengolahan data penelitian pada *Hansen Global Forest Change* yaitu penyajian data, pengolahan luasan pengurangan tutupan lahan hutan, dan pembuatan grafik luasan pengurangan tutupan lahan hutan. Sedangkan untuk pengolahan data penelitian pada data Landsat 7 dan 8 dilakukan dengan proses akuisisi data, komposit citra, pembuatan *training area*, klasifikasi tutupan lahan, dan perhitungan luasan tutupan lahan. Kedua data kemudian disajikan melalui *Earth Engine Apps*. Pembuatan *Earth Engine Apps* disusun menggunakan komponen seperti *panel*, *label*, *button*, dan *button scroll down (select items)*.

Earth Engine Apps merupakan *dashboard apps* yang digunakan untuk menyajikan pemetaan deforestasi melalui *Hansen Global Forest Change* dan pemetaan tutupan lahan melalui Citra Landsat. Hasil yang disajikan dari *datasets Hansen Global Forest Change* yaitu visualisasi parameter (*Percent Tree Cover*, *Loss*, *Gain*, dan *Loss By Year*) dan grafik parameter *Loss By Year*. Sedangkan hasil yang disajikan pada data Citra Landsat yaitu berupa visualisasi tutupan lahan (lahan terbangun, perkebunan, hutan, lahan terbuka, dan tubuh air) pada tahun 2000, 2004, 2006, 2009, 2013, 2016, dan 2020.

Kata Kunci: Deforestasi, *Random Forest*, *Hansen Global Forest Change*, *Google Earth Engine*

***Earth Engine Apps Interface Development for Deforestation Monitoring in
West Kalimantan Province on 2001 - 2020***

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ABSTRACT

Indonesia is a country that has a forest area is ranked 9th in the world. During the last two decades, Indonesia experienced deforestation has reached 270,000 ha. Based on these problems, then research was conducted that aims to (1) map the rate and distribution of deforestation using Hansen Global Forest Change in 2001 – 2020 in West Kalimantan Province; (2) mapping changes in the area and distribution of land cover using the Random Forest algorithm in 2001 – 2020 in West Kalimantan Province; (3) develop an interface design for Earth Engine Apps for monitoring forest cover conditions in 2001 – 2020 in West Kalimantan Province.

Deforestation research is processed using the Google Earth Engine platform with data input has been available on the Google Earth Engine datasets menu. Data processing in this study used data in the datasets of Hansen Global Forest Change, USGS Landsat 7 Collection 1 Tier 1 TOA Reflectance, and USGS Landsat 8 Collection 1 Tier 1 TOA Reflectance. The processing of research data at Hansen Global Forest Change is data presentation, processing of the area of forest land cover reduction, and graphing the area of forest land cover reduction. Meanwhile, the processing of research data on Landsat 7 and 8 data is carried out by means of data acquisition, image composites, training area creation, land cover classification, and calculation of land cover area. Both data are then served via Earth Engine Apps. Making Earth Engine Apps are structured using components such as many panel, labels, buttons, and scroll down buttons (select items).

Earth Engine Apps is a dashboard application is used to present deforestation mapping through Hansen Global Forest Change and land cover mapping through Landsat Imagery. The results presented from the Hansen Global Forest Change datasets are parameter visualization (Percent Tree Cover, Loss, Gain, and Loss By Year) and a Loss By Year parameter graph. While the results presented in the Landsat imagery data are in the form of visualization of land cover (built-up land, plantations, forests, open land, and bodies of water) in 2000, 2004, 2006, 2009, 2013, 2016, and 2020.

Keywords: *Deforestation, Random Forest, Hansen Global Forest Change, Google Earth Engine*