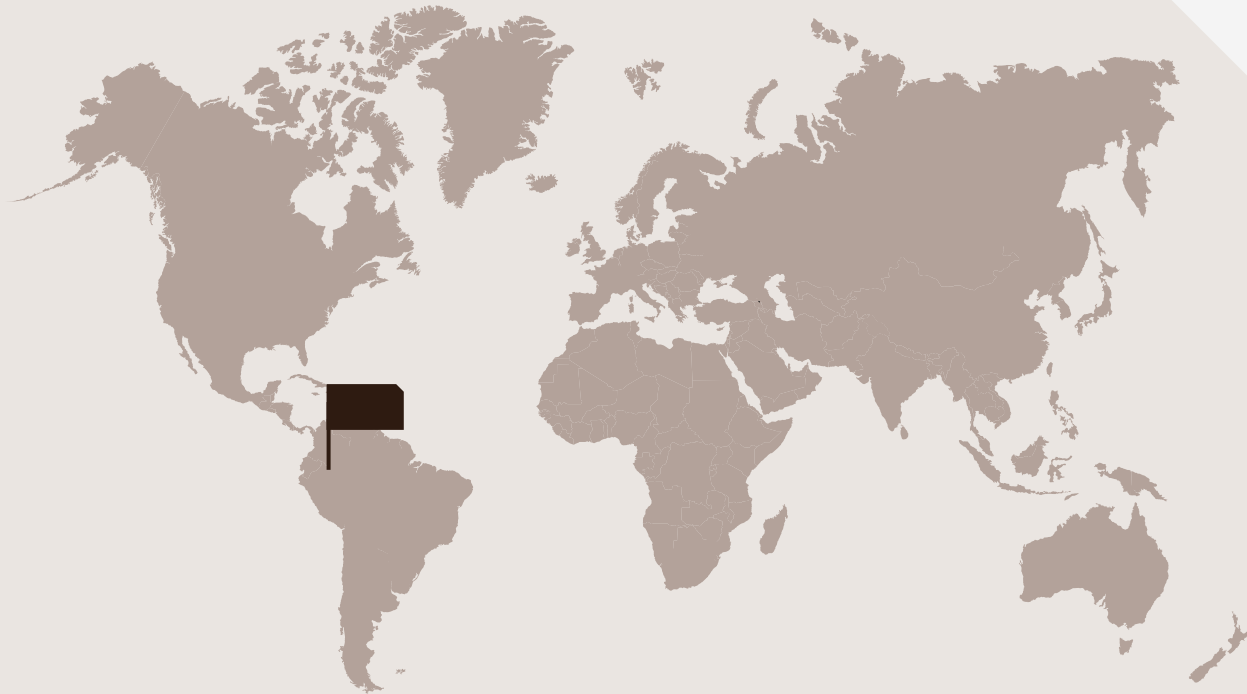


Land Release Impact Assessment in Colombia



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AGENDA

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Project Overview



Background

- Since 1990 more than 7000 civilians and 5000 members of the armed forces have been killed or injured by landmines and explosive remnants of war (ERW) in Columbia.



Problem

- UNMAS wants to assess the impact of these mine action interventions.
- Current approach: manually extracting features from raw data, such as digitizing footprints or generating land cover maps.



Purpose

- Compare pre-clearance and post-clearances images to measure the impact of the land release project in Colombia.



Objective

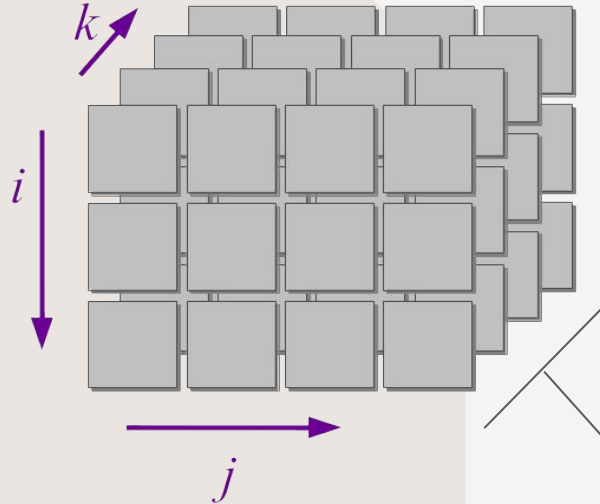
- Build and train machine learning models to identify and classify new buildings, human settlements, roads and land cover in pre-selected area of interest.

Our Data

.TIF file



$(n \times m \times 8)$ np array



- 5 AOIS
- Before Clearance, After Clearance

Wavelength (μm)	
Band 1:	0.45-0.52
Band 2:	0.52-0.60
Band 3:	0.63-0.69
Band 4:	0.77-0.90
Band 5:	1.55-1.75
Band 6:	10.40-12.50
Band 7:	2.09-2.35
Band 8:	0.52-0.90

MODEL & RESULTS

- **Classification on pixel level:** CART, Logistic Regression, Random Forest, XGBoost



Buildings: 0.98 best AUC

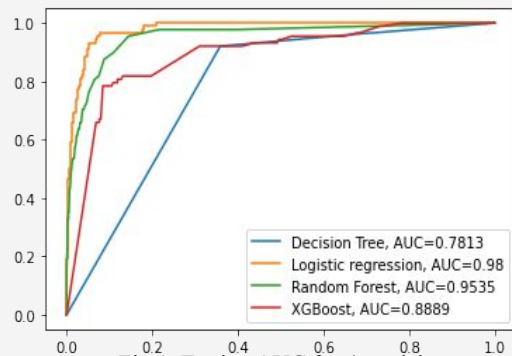


Fig 1. Testing AUC for 4 models

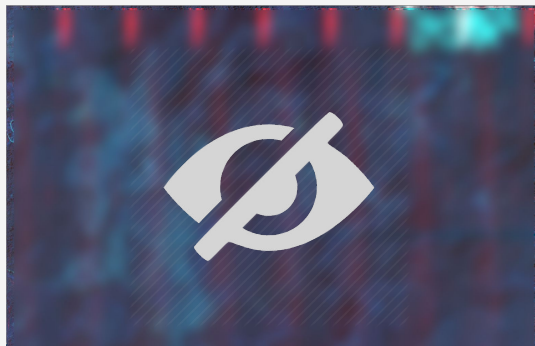


Fig 2. Visualization of Building Identification



Land Cover: 0.91 best AUC

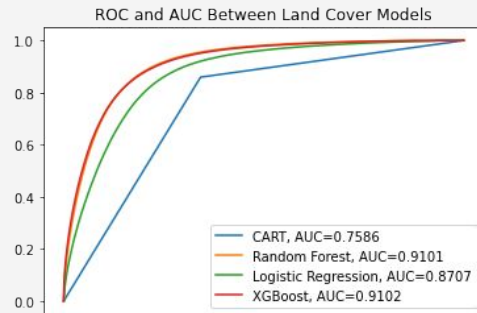


Fig 3. Testing AUC for Land Cover Classification

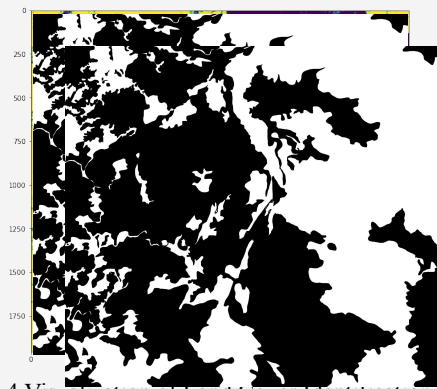


Fig 4. Visualization of Land Cover Identification



Road: 0.93 best AUC

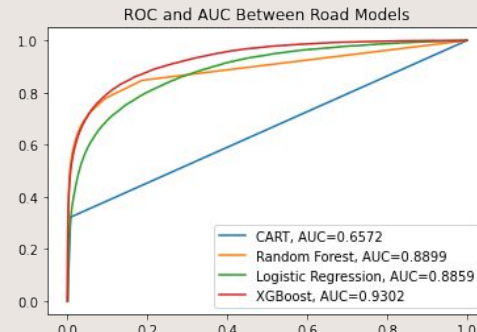


Fig 5. Testing AUC for Road Classification



Fig 6. Visualization of Road Identification

Impacts



Inspect Progress

Check the effectiveness of mining efforts and relocation policies

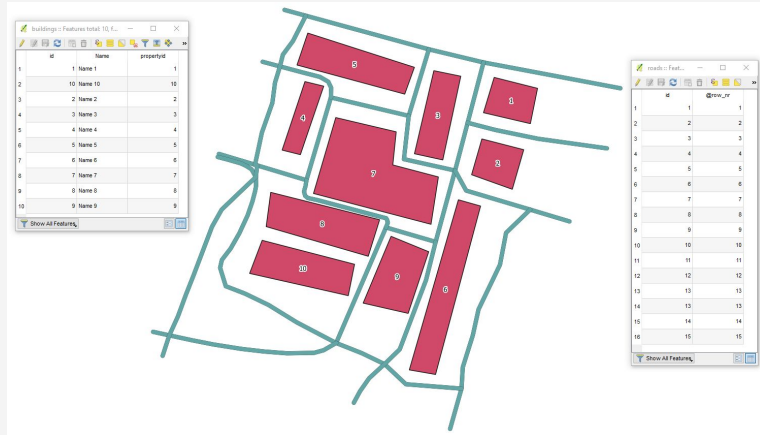
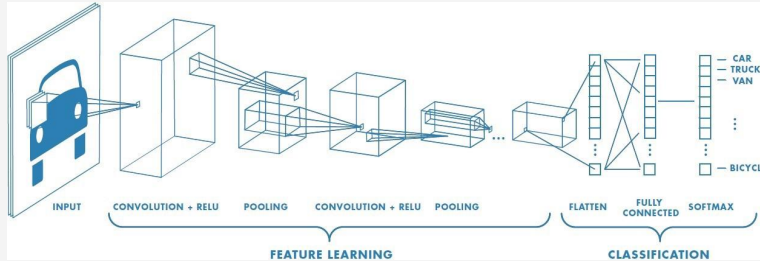
Setup for Causal Inference

Does de-mining cause increased land development?

Reproducibility

Models on other types of identifications

Future Tasks



Future Task: Convolutional Neural Networks

Need: more time, more
data

Future Task: ARCGIS Pro Pipeline

Convert raster products
to shp files