# Land Trafficking and illegal mining

Lima's urban expansion has grown rapidly since the 40's, without adequate urban planning. The growth has been driven mainly by internal migration and displacement. These vulnerable populations have historically settled in the outskirts of the city, without any formal form of land tenure nor planning. This has led to a city where 70% of the buildings are "self-constructed", in other words constructed without any engineering/safety guidelines.
Sadly, this informal expansion of the city is driven by developers interests and by organized gangs that -generally violently-take over the land and sell plots -without any property deed- to vulnerable populations.

Today, most of the land-trafficking occurs in the hills that surround the city, mostly in the Lomas ecosystem, threatening its conservation. In the same line, illegal non-metallic mining puts the sustainability of the ecosystem at risk.

The Lomas Ecosystem, a fog-dependent seasonal ecosystem is located in the hills that surround the city. It has been declared a fragile ecosystem and in a few month, it will be declared regional park, providing more tools for its protection.

## Specification of Area of interest - **polygons of targeted lomas** (Google Earth's KML, ESRI Shapefile etc)

***2 polygons are attached:***

- ***El Niño Souther Oscilation (ENSO) 1997-1998 Lomas****. It is the maximum extension in the latest 20 years for inusual raining. It was obteined from Landsat 5 TM images. Format: ESRI Shapefile.*
- ***Annual lomas. It's the surface that turns green in the fog season (June-September)*** *Format: ESRI Shapefile.*

## Spatial and temporal pattern of land trafficking phenomena

Is uptake of land spatially fragmented or rather clustered?

*Both are possible. In general, the most common type of pattern is rather clustered closest to city.*

*What is typical size of uptaken area (e.g. per time unit: within a week, month or a year).*

We haven't calculated those parameters yet. Approximately, in six years (2013-2018) we lost 846 ha of lomas ecosystem. However is important to note that one event of land-grabbing would only take not more than 100sqm and grow slowly.

*Using Google earth both the Peruvian forest service and the Eba Loma have estimated the Lomas area lost in the recent years.*

| Area | Corridor | Source: SERFOR | | | Source: EbA Lomas | | |
|---|---|---|---|---|---|---|---|
| | | Baseline 2013 (ha) | Remaining 2018 (ha) | Loss (ha) | Baseline 2017 (ha) | Remaining 2018 (ha) | Loss (ha) |
| Lomas del Norte | Ancón – Carabayllo – Santa Rosa | 1767.75 | 1588.00 | 179.76 | 2296.00 | 2154.00 | 142.00 |
| Lomas del Centro - Norte | Puquio, Km 22, Collique, Payet, Amancaes, Mangomarca, Cerro Negro, Jicamarca | 1825.12 | 1747.21 | 77.90 | 2991.00 | 2967.00 | 24.00 |
| Lomas del Centro - Sur | Villa María, Lúcumo, Retamal, Manchay | 3650.98 | 3321.95 | 329.03 | 3244.00 | 3149.00 | 95.00 |
| Complejo Lomas del Sur | Pachacamac, Lurín, Lúcuma, Pacta, Malanche, Caringa, Jime y Cicasos | 12069.17 | 11809.39 | 259.78 | 12253.00 | 12228.00 | 25.00 |
| **Total** | | **19313.02** | **18466.56** | **846.47** | **20784.00** | **20498.00** | **286.00** |

*Do the above hold generally for whole Lima metro area or vary between different districts?*

19 of 43 districts in Lima province have lomas. It depends mainly on the proximity to the city center.

- *Same as above for (2)*
- **Examples** of recent land trafficking
    - Coordinates / KML + time stamp (when trafficking started to ccur)

Carabayllo (Informal settlements). Time stamp: 2016-2018

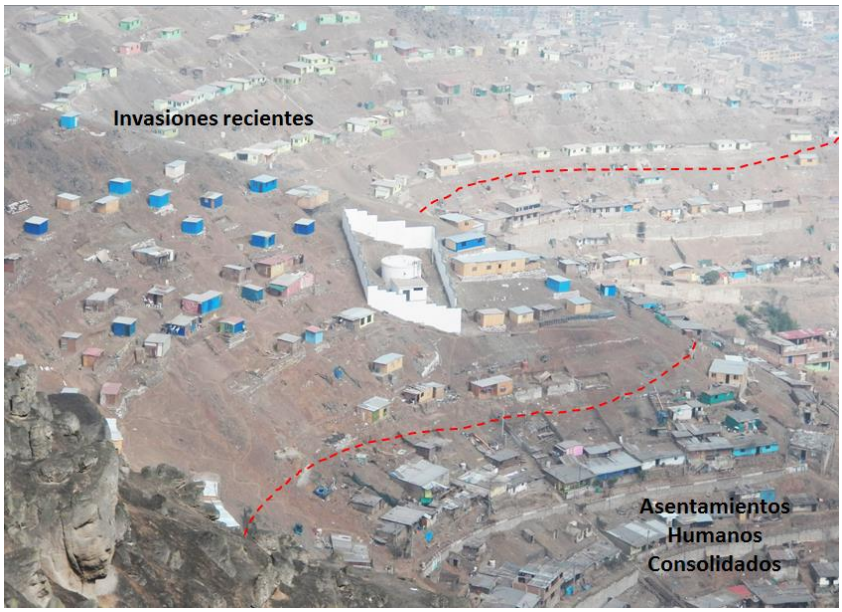
KML Attached

Pachacamac (Waste pile). Time stamp: 2017-2019

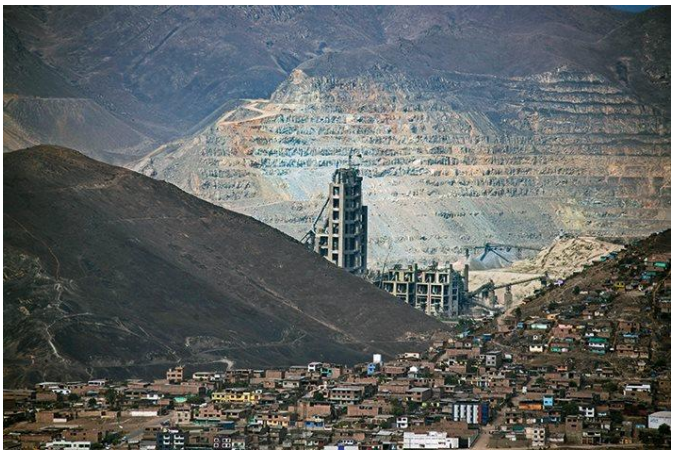
KML Attached

*Photos  to help understand size of dwellings/shacks arosed on grabed land*

**<u>Informal settlements</u>**




**Mining activities in lomas ecosystems**



Furthermore, we would be grateful if you could shortly describe standard means **how is tracfficiking detected now** and why you consider remote sensing technique could help your work.

Currently, the traffic of land is determined through complaints made by civil society. These are channeled through letters, online forms (Arcgis survey) or telephone calls to public institutions that have jurisdiction or rights in the lomas of Lima, such as Ministry of Agriculture, National Assets Service, Forest and Wildlife Service, Ministry of the Environment, Police, Municipalities, among others. However, there are remote areas from the city centre whose invasions won't be reported, so remote sensing techniques are useful if we want to obtain continuous monitoring and automated change detection.

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