



Role of Mining in Peru:

Proximity Analysis and Socio-Economic Development Impact

Background

For years, the mining sector has determined much of the economy of Peru. Data from the last 10 years (2009-2018) reported that 20% of the tax revenues collected by the Peruvian government came from the mining industry. Additionally, data states that mining companies contribute with more than 11 billion of dollars to regional governments and municipalities. This data may imply that this money, provided by this industry, is canalized to the people around the areas of exploitations. Furthermore, previous studies have mentioned that mining companies not only contribute via tax revenues, but also building infrastructure needed for their own operation. This infrastructure like water and sanitation, mobile communication, and electricity also serve to the communities around.

In Peru, many mining companies implement social responsibility plans in response to the communities' pressure or government's requirement. These plans normally include the constructions of local housing, hospitals, schools, roads, etc. Thus, there are many channels in which mining companies are increasing the infrastructure of the communities around. Then, this increase in infrastructure should mean a positive impact on human development. If this is the case, then a country like Peru where, until 2017, 14.07% of the Peruvian territory was concessioned for mining exploitation should show high infrastructure development and human socio-economic development on the regions were more mining concessions have been giving.

This project aims to analyze the impact of proximity to mining concession on infrastructure and socio-economic development in Peru. Accordingly, there are three main spatial question that frame this analysis:

- What are the areas with high proximity to infrastructure?
- What are the areas with high proximity to mining concessions?
- Where are areas of high and low socio-economic development?



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DHP-P207 GIS for International Applications

Presented on May, 2020

(Data from 2017-2019)

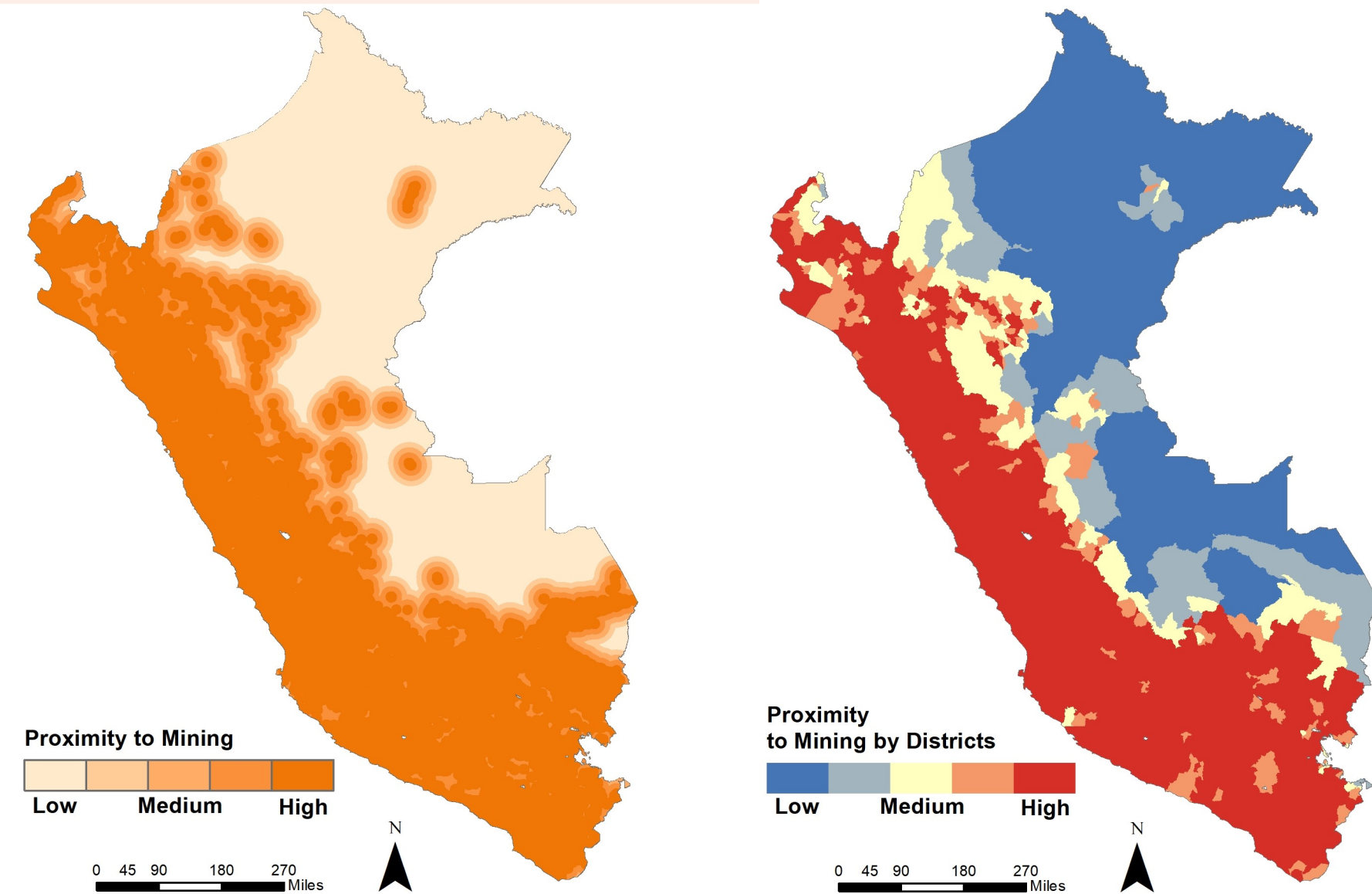
Data Sources: Instituto Geográfico Nacional (IGN), Instituto Geológico Minero y Metalúrgico (INGEMMET), Ministerio de Educación (MINEDU), Ministerio de Salud (MINSa), Ministerio de Transportes y Comunicaciones (MTC), and Instituto Nacional de Estadísticas e Informatica del Peru (INEI)

Photo Sources: www.wordpress.com, www.proactivo Peru.com.pe, MINEDU, Sedapal, ESSALUD

Projection Coordinate System: WGS_1984_UTM_Zone_19S

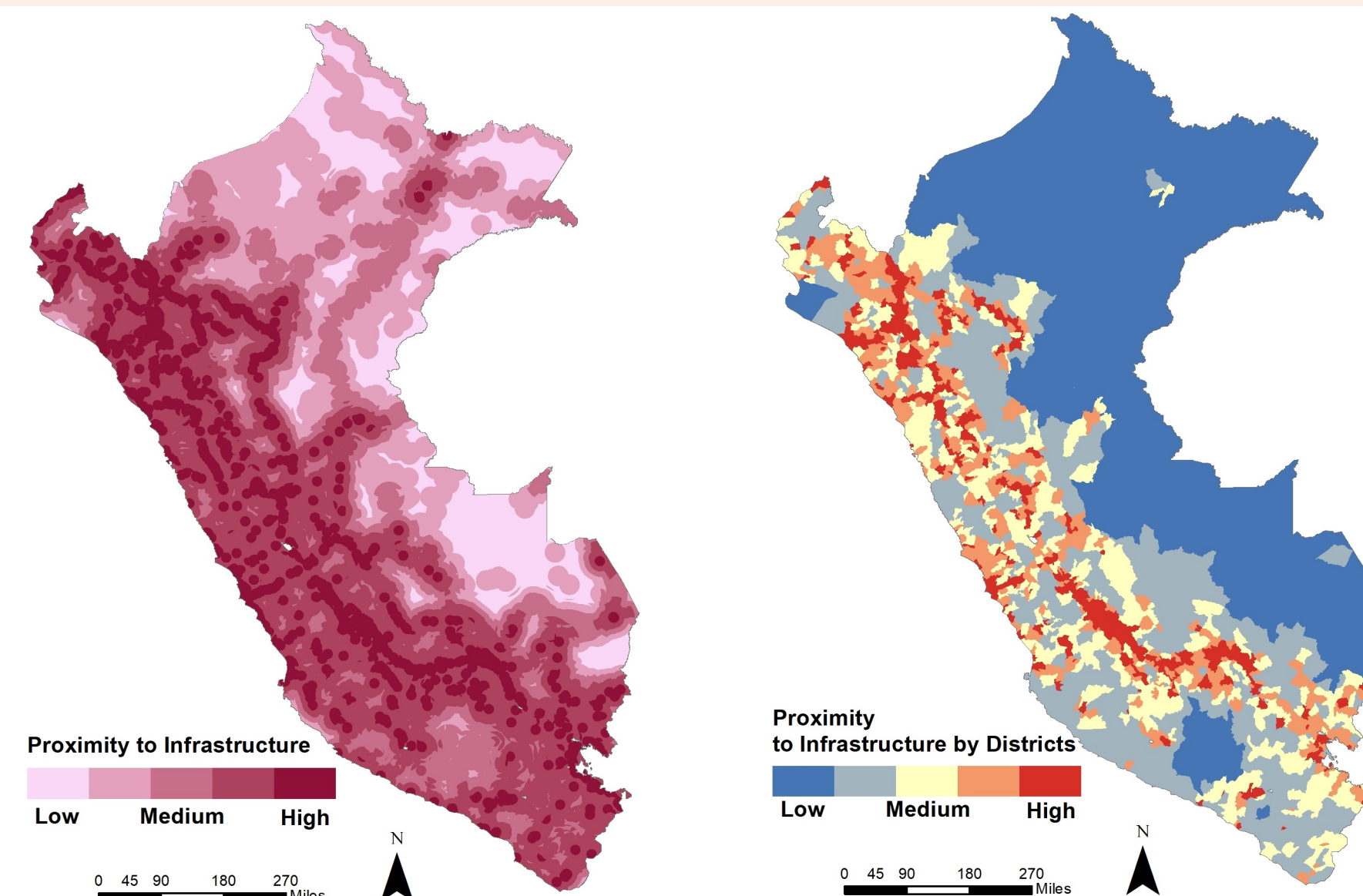
Methodology

What are the areas with high proximity to mining concessions?



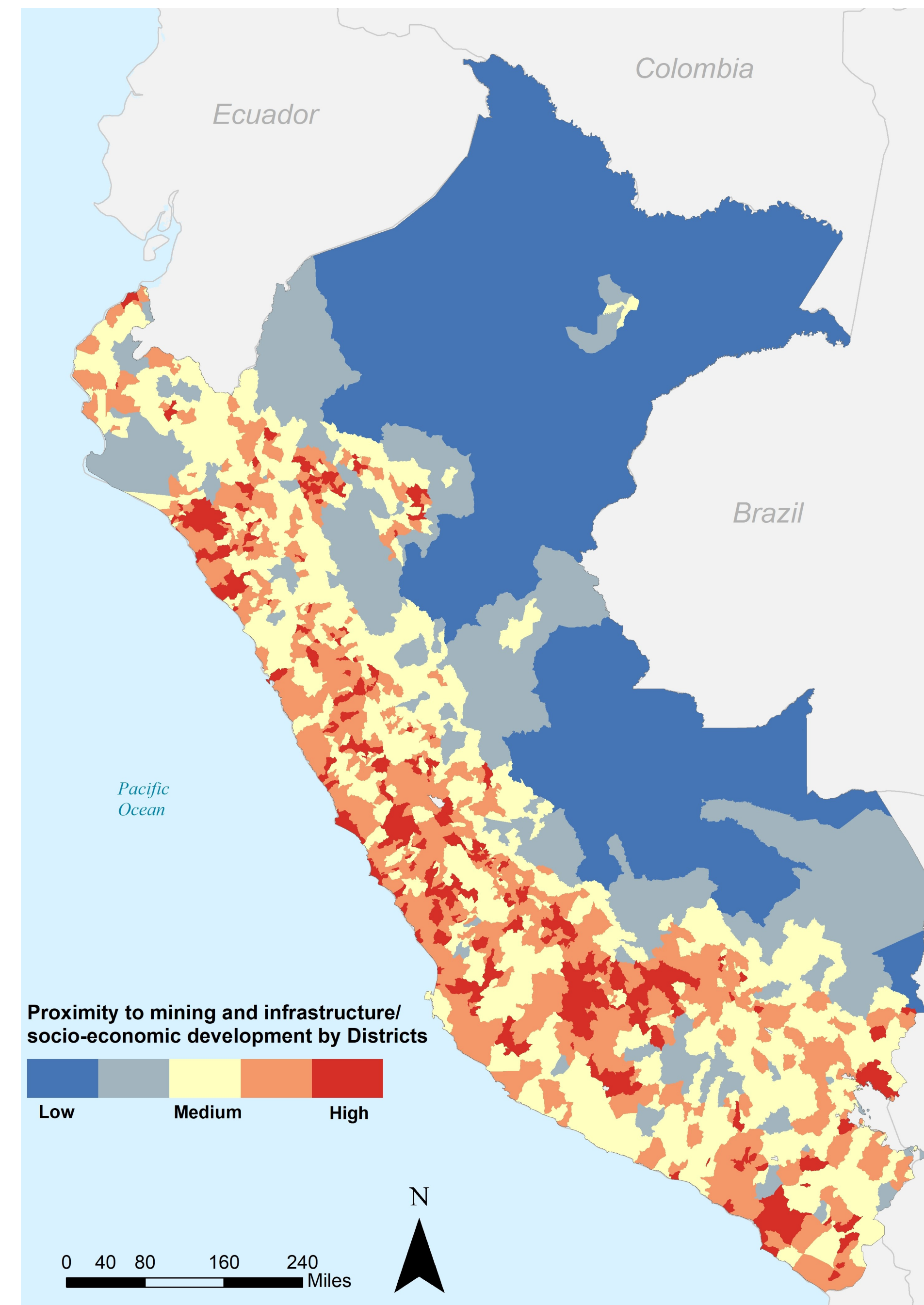
Taking data of the location of mining concession, I classify proximity to the areas of exploitation (map on the left). Later, I summarize this classification to see which districts of Peru have high proximity to these areas (map on the right).

What are the areas with high proximity to infrastructure?



Taking data of the location of hospital, schools and roads, I classify proximity to these type of infrastructure (map on the left). Later, I summarize this classification by districts to see their degree of proximity (map on the right).

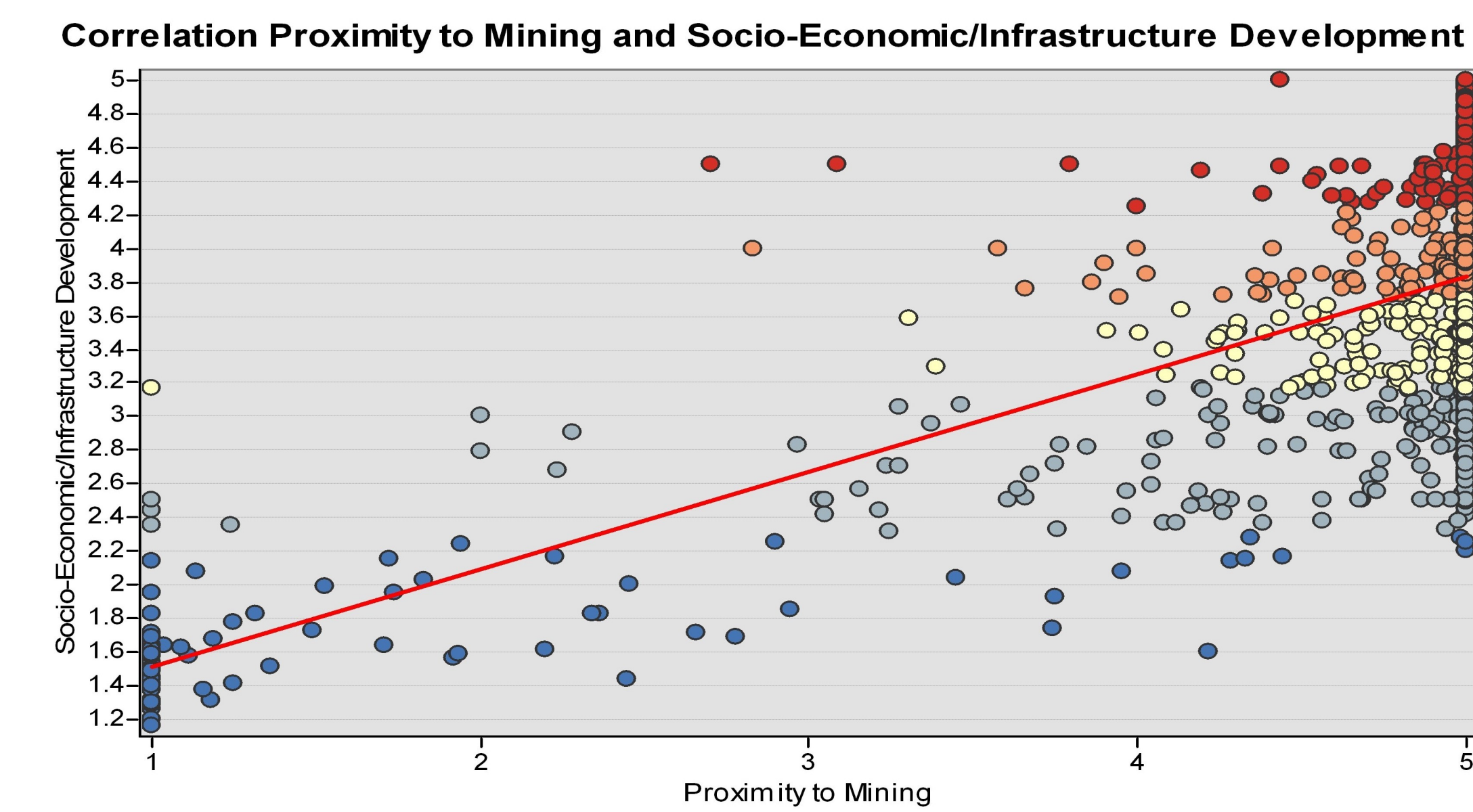
Findings



Map Above: This map summarizes the three question about proximity to mining and infrastructure, and the districts' levels of socio-economic development. The map indicates that despite the large presence of exploitation zones throughout the west and center of Peru, the infrastructure and socio-economic development are not as high.



Conclusion

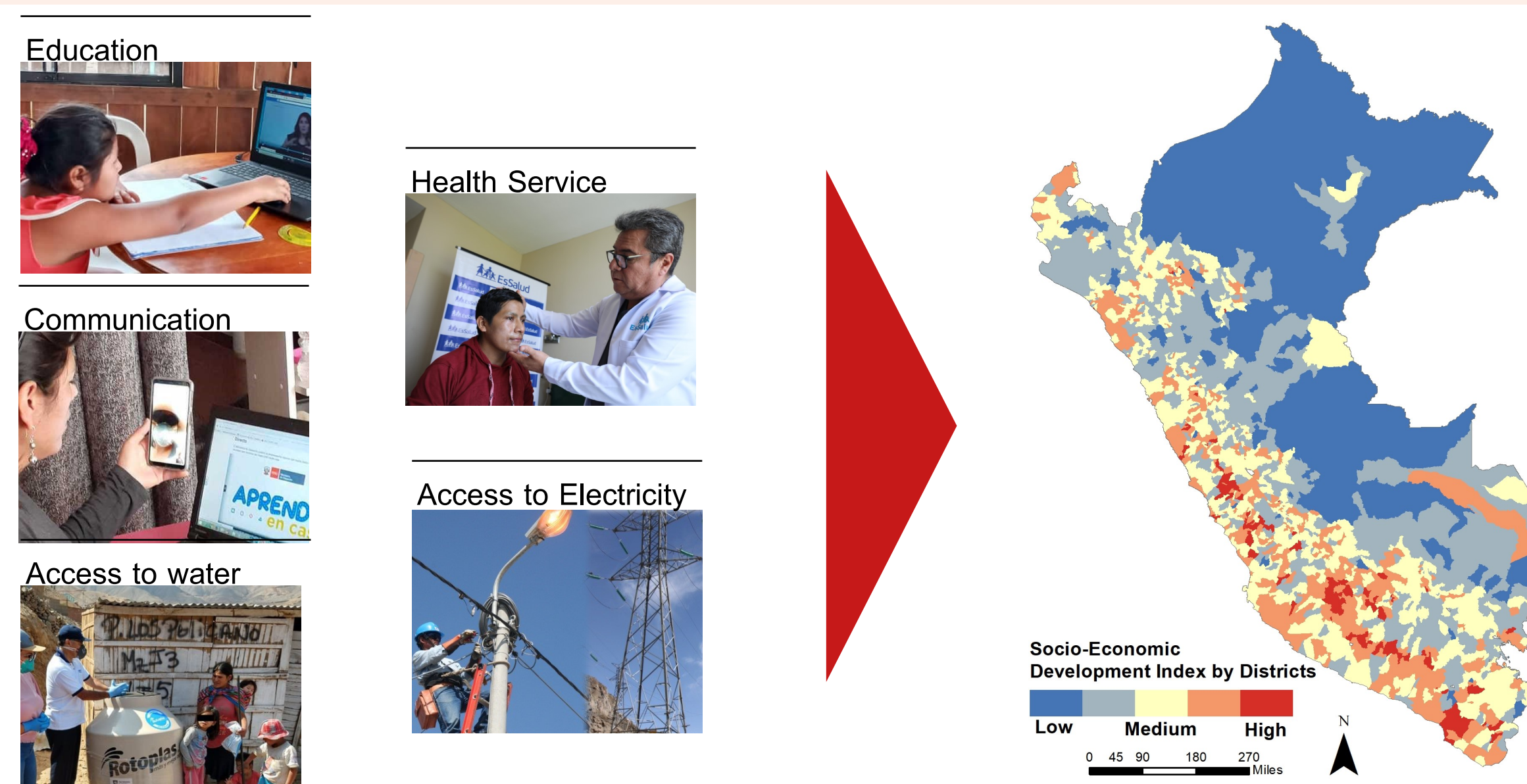


Graphic above: The scatter plot indicates a positive correlation between proximity to mining, and socio-economic and infrastructure development. Those with a high proximity to mines (5) have an increase of infrastructure and accessibility to socio economic-services. However, the graphic also shows high dispersion, which indicates that there are specific districts that despite their proximity to mines have small improvement in infrastructure accessibility and socio-economic development.

POPULATION IMPACTED BY MINING PROXIMITY	
Proximity	Number of People
Low	433,316
Medium	682,321
High	2,235,215
High	25,710,994

The majority of Peruvian population are impacted by their proximity to mining areas. However, infrastructure and socio-economic development in Peru is still not a reality specially around the mountain areas. Further, analysis and the need to include other factors would explain why this is not happening despite the positive correlation showed in the present analysis.

Where are areas of high and low socio-economic development?



Map on the left: The data collected by the Peruvian government in the national census-2017 provided the quantification of households with access to electricity, water, mobile communication, and people with health insurance and high education. These information was incorporated to form an index to measure socio-economic development. Then, the index is mapped to identify these type of development by districts of Peru.

La Oroya (picture on the right): Small city that depended economically on the mining industry. Currently, after the closure of the central mining company due to political and environmental problems, the city is struggling not to fall into poverty.

