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## The blessing of bad geography in Africa

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*African nations with 'bad' terrain suffered less from the slave trade. More than a century after the slave trade ended, the protective benefits of ruggedness still outweigh its contemporary economic disadvantages when it comes to GDP per capita.*

Mountainous terrain is tough to farm, costly to traverse, and often inhospitable to live in; yet in Africa, countries with a rugged landscape tend to perform better than their flatter rivals. To explain this paradox, CEPR Research Fellow Diego Puga and his co-author Nathan Nunn reach back more than two centuries – to the slave trade.

Geographical characteristics affect economic outcomes directly – making life harder for landlocked countries, for example – and indirectly, by altering the path of history.

In Africa, between 1400 and 1900, four simultaneous slave trades, across the Atlantic, the Sahara Desert, the Red Sea and the Indian Ocean, led to the forced migration of as many as 18m people. The economies they left behind were devastated: political institutions collapsed, and societies fragmented.

For African people fleeing this slave trade over the centuries, rugged terrain was a positive advantage. Enslavement often took place through raids by one group on another, and hills and mountains provided plenty of lookout posts and hiding places (caves, for example) for those trying to escape. In general, countries with flatter, more passable terrain lost more of their population to the traders.

Today, however, that same geographical ruggedness is an economic handicap, making it expensive to transport goods to port; raising the cost of irrigating and farming the land; and simply making it more expensive to do business. This contemporary effect of geography applies across the world: in general, mountains are not good for growth.

Because the long-term, positive effect of ruggedness, through fending off the slave-traders, is concentrated in African countries, where the trade took place; while the immediate, negative effect is universal, Nunn and Puga are able to test

which effect is stronger.

Using data from the US Geological Survey, they define 'rugged' terrain, by calculating the average uphill slope for each country. They then study the relationship between ruggedness and income per person; and rule out other ways ruggedness could have an effect – for example, by being correlated with natural resource deposits, or proneness to tropical diseases

Even today, more than a century after the slave trade ended, Nunn and Puga find that the benefits of ruggedness in protecting the population in Africa still outweigh its contemporary economic disadvantages. In fact, the benefits of sloping terrain during the half-century of the slave trade continue to skew the distribution of the African population today, because waves of mass migration into the hills in the path of the slave traders have never been reversed. By comparing ruggedness, population density and the vulnerability of different areas to slave exports, it is possible to show that hundreds of years of flight from the slave trade has left the African population disproportionately concentrated in hilly areas.

Unfortunately, as the authors have shown, the direct, contemporary effect of living in rugged terrain is negative: the high costs of agriculture, transport and industry tend to depress income per head. So the slave trades left a doubly toxic economic legacy in Africa: not only did they devastate the population in many areas, with long-lasting impacts which still persist centuries later; they also left the African population concentrated in areas which make contemporary economic development harder.

The impacts of geography on economic development are therefore complex and long-lasting. Some economists, such as Harvard's Jeffrey Sachs, have suggested increased aid flows and investment could help to overcome the contemporary handicaps created by geography; but the existence of the longer-term, indirect effects revealed in this paper suggest this may not be enough to level the economic playing field.

[CEPR DP 6253 Ruggedness: The Blessing of Bad Geography in Africa](#)

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