

Alternatives to the cross river superhighway balances sustainable infrastructure development with biodiversity conservation

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Abstract

The problem statement is that road infrastructure development is vital, but it can be problematic if it is not well planned. Spatial scientists can give evidence-based reasoning for implementing sustainable and effective road infrastructure provisioning that maximises socioeconomic advantages while maximising nature conservation. The African case study presented in this study shows how re-routing poorly planned highways can reduce negative environmental impacts, conserve biodiversity, and provide innovative and flexible ecosystem management solutions, all based on integrated spatially explicit impacts assessment and cost-benefit analysis. Examining the proposed 260-kilometer motorway in Cross River State, Nigeria's south-east, demonstrates how human actions in equatorial Africa affect biodiversity and wildlife conservation. Findings: The Cross River State Government in Nigeria's proposed roadway would have cut through 115 kilometres of intact tropical rainforest or protected areas and cost US\$2.5 billion to build. We proposed and analysed two alternative routes 1 and 2 that would be less harmful to the Cross River National Park, unprotected forests, and biodiversity areas. Although the alternative routes are slightly longer (290 and 353 km), they are less expensive to build (US\$0.9 billion) than the state government's proposed superhighway. The first option proposed completely avoids intact forest while attempting to maximise benefits to farmers and settlers.

Environmental ethics predates the concept of sustainability and has a lot to contribute to a sustainability ethics. This chapter presents an overview of environmental ethics' primary topics, thinkers, and theoretical methods. It also addresses hot topics like the relevance of scientific and ecological concepts and ideas in environmental ethics. It also looks at the connections between social and ecological communities in terms of environmental justice. Sustainability is an important subject that has a lot of people talking about it and a lot of people supporting it. However, because of its complexity and the massive paradigm shifts it advocates, it is intrinsically difficult to implement.

Conclusion and Importance: In order to meet Goal #9 of the global Sustainable Development Goals, research findings on smart infrastructure provisioning and sustainable land-use management should be used as strategic tools for developing informed conservation economy policy and decision-making in Africa. If Africa is to achieve biodiversity conservation and ecosystem management, road infrastructure development must be optimised to minimise environmental impacts while maximising socioeconomic benefits, which can be realised by promoting lessons, trade-offs, and synergies learned from the cross-river superhighway case study.

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