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Fish Fare Best at Economic Extremes

Emily Sohn, Discovery News

March 9, 2009 -- Coral reefs are healthiest in both the richest, most well developed areas and in the poorest, most under-developed ones, according to a new study based in Africa. Right in the middle of the socioeconomic spectrum is where corals suffer most.

"At middle levels of development, people have enough infrastructure to be destructive, but they don't have enough infrastructure to have alternatives," said Tim McClanahan, an ecologist with the [Wildlife Conservation Society in Kenya](#). "Most problems with coral reefs are human problems."

Some experts have long argued that money and development can help free people from their reliance on fish, trees, and other basic natural resources. And those resources often suffer where population is densest.

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But the new study, published recently in the journal *Current Biology*, was the first to look at the effect on corals of not just an entire country's overall wealth or at the size of its population but also at whether individual communities had schools, hospitals, electricity, water and other types of infrastructure.

After all, McClanahan said, money can be distributed unevenly, and even wealthy countries have slums.

Instead of using national-level statistics available from the United Nations, McClanahan and colleagues collected their own data. They visited 19 communities in five African nations that represented a wide range of wealth, including Kenya, Mauritius and Madagascar.

"We went to community leaders in each village and asked about things they had or didn't have," he said. They also surveyed offshore coral reefs for signs of health, including size and numbers of fish and the structure of corals.

By far the strongest result of the study was the link between a community's infrastructure and the numbers of fish in its [nearby reefs](#). The data spit out a U-shaped curve, with the most fish at either extreme and the least fish at moderate levels of development.

In the poorest areas, McClanahan explained, people depend on fish for survival but they don't have the resources to make a huge dent in fish populations. At the other end, people have other ways of making money as well as the desire to reduce pollution and [protect the environment](#). In the middle, people have just enough equipment and incentive to be destructive.

"Many of us have had these ideas, but they nailed it down here," said Rashid Sumaila, director of the Fisheries Economics Research Unit at the University of British Columbia. "It really gives managers and policy-makers a set of things to think about."

For example, the study found that, no matter how rich or poor a region was, fish populations were bigger if there were designated marine protected areas nearby. So, as poor communities begin to develop, it might become extra important to create legally protected buffers against the environmental destruction that is sure to follow.

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