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DEVELOPMENT AND ITS EFFECTS ON DOMINICA'S STONY CORALS

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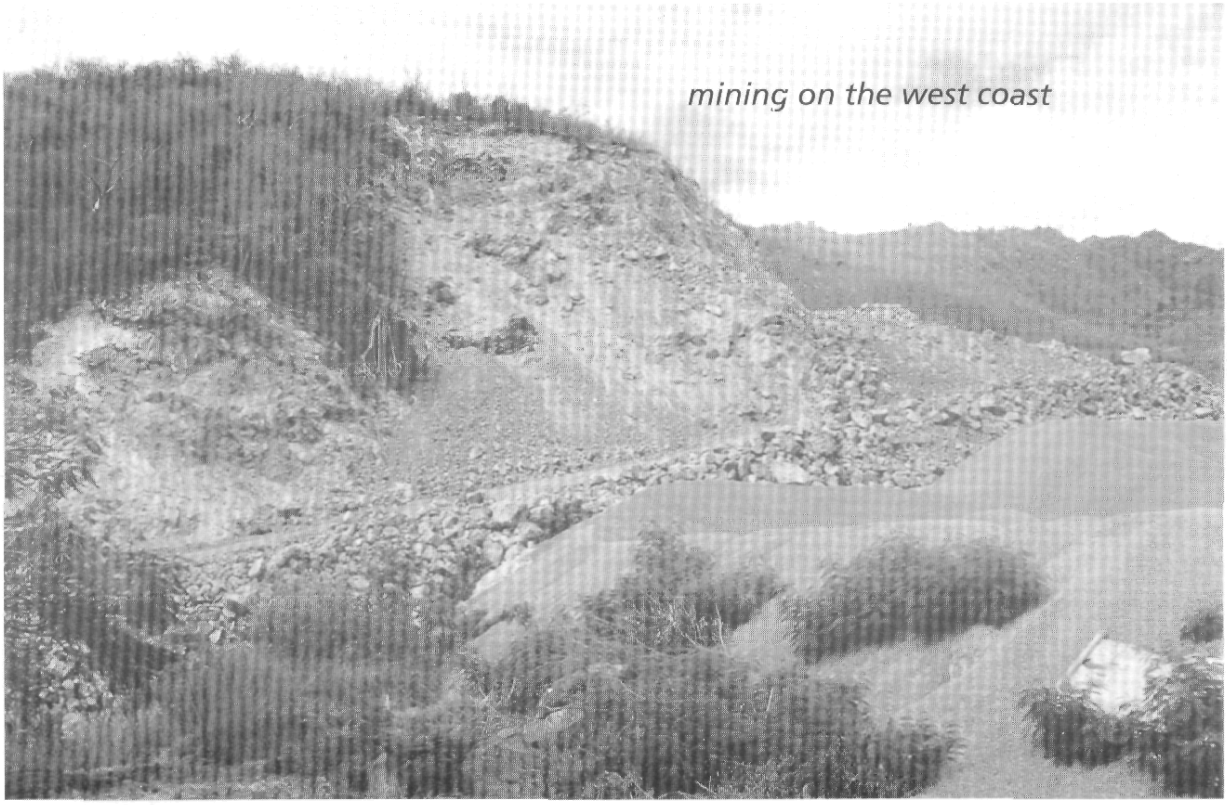
To date, thirty-one species of colonial stony reef corals have been identified in Dominica. Coral reefs not only provide direct benefits and "harvestable" organisms and materials, but they also serve as protecting shield of coastal zones. Reefs protect shorelines during storms by dissipating wave energy and thus reducing beach erosion. Their complex physical structure also provides nurseries for marine organisms, many of which are part of near-shore fisheries. A certain amount of organic matter produced in reefs is exported to neighboring environments, so reefs also serve as source of nutrients.

High amounts of sediment run off can affect coral in two ways. Corals may not be able to "clean" themselves from the settling sediments fast enough and therefore suffocate. Corals produce a protective mucus layer and have microscopic "hairs" or cilia to move sediments off the colony. When the sediment fall-out exceeds the reef's capacity to "clean" itself, the corals die as their "mouths" get clogged and they are no longer able to ingest food particles.

Furthermore, a high amount of suspended sediment leads to high turbidity. This means that sunlight will not reach deeper portions of the reef at levels adequate for corals. The reason corals also depend on light is that they have developed a symbiotic relationship with microscopic algae. The algae live in the tissues of the coral. This relationship is based upon the exchange and recycling of gases and nutrients. Both partners benefit from this symbiosis. The algae, being plants, need sunlight to live and make their contribution to this relationship. This relationship is



mining on the west coast

so important that the partners must live together in order to ensure their survival. This means that coral reefs will flourish in tropical seas with clear waters.

An increase in sedimentation can be caused by increased run off from land and from rivers. Deforestation generally leads to higher sediment run off. But any type of clearing for the construction of buildings, roads or quarries has similar effects. So, in some cases the source of excess sediment originates in areas far away from shore. In other cases, the sources of sediment are near the shore (see sea wall construction along Woodbridge Bay and Canefield Cliffs).

Marine pollution can be defined as the input of wastes at contamination levels resulting in deleterious effects such as: hazards to human health; hindrance of marine activities, including fishing; impairment of sea water quality; and reduction of amenities. In Dominica, pollution related to development may originate, but not be limited to, effluents containing industrial waste, raw sewage, fertilizers, herbicides and pesticides. The consequences of this situation are not as evident as the effects of excessive sedimentation and require substantial public interest and investments in research to be determined. What we do know is that Dominica's corals are affected by bacterial infections known as Black Band Disease and White Plaque. So far, the incidence of these diseases is low and can be considered "normal". Bleaching has also been observed. While scientists attribute bleaching to elevated sea temperatures, as they arise during El Nino events, sea temperatures in Dominica were not elevated during the past year when bleaching was observed. In Dominica the causes for bleaching may thus lie elsewhere (agricultural run off?).

There are no quick answers or solutions to these problems that are applicable across the board. Every society, economy and geographic location will require a unique approach to development and environmental conservation. A few basic components of establishing guidelines for "environmentally-friendly development" include: research, education, environmental impact assessments (EIA), the valuation of environmental attributes and ecosystems, cost benefit analysis, environmental policy and its implementation and enforcement.