

## Kenya in the Western Indo-Pacific realm – its coral reefs in space and time

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The paleo-geology and paleo-oceanography of the WIO during the Cenozoic (67 mya to today) establish mechanistic explanations for extant patterns of reef coral diversity, that also extends to other species groups, including reef fish and stomatopods. These establish hypotheses claiming the northern Mozambique Channel is a centre of diversity for shallow marine species, with separation of a Red Sea/Gulfs province to the north, and Kenya falling in a transition zone between these two systems. On an ecological timescale the mesoscale current dynamics of the Mozambique channel may establish the northern part of the channel as a centre of biological dynamism, with high internal connectivity and energetics, and acting as both an accumulation centre for genetic material from the broader Indo-Pacific realm, and as a source for genetic material to locations to the north, west and south. For Kenya, this means that its marine systems lie downstream from this core region in the northern Mozambique Channel, but complicated by reversing currents on the Somali coast that carry species and ecological interactions from the Red Sea/Gulfs province to the north.

These patterns have implications not only for the evolutionary and systematic relationships among species, but also in the population and resource dynamics, and ecological recovery processes, of Kenya's marine systems. They cannot be managed in isolation from use and management systems to the north and south. Increased exploitation of marine resources, increasing coastal development, the likely expansion of economic activity driven by Kenya's emerging economy and the development of the LAPSETT corridor in the north, and climate change and ocean acidification impacts will place increasing pressures on Kenyan marine systems. Concurrently, changes in these same factors in other parts of the WIO will influence the fate of Kenya's marine resources, and in particular, massive development driven by fossil fuel extraction in the Mozambique Channel may be an important factor in the future wellbeing of Kenya's marine resources. An understanding of the regional dynamics and dependencies, and of the resilience and ability of local systems to sustain extraction and recover from disturbances will be critical to rational management of Kenya's EEZ and coastal resources and ecosystems.