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## **South China Sea: Turning Reefs into Artificial Islands?**

*By Youna Lyons and Wong Hiu Fung*

### **Synopsis**

*Large-scale reclamation work in the South China Sea using living coral reefs as building material is causing severe environmental damage. It is also against international law.*

### **Commentary**

CHINA'S ONGOING reclamation activities in the South China Sea are a cause for environmental concern, given their potential to destroy the little-explored pristine coral reefs of the Spratlys. This development comes as a surprise coming at a time of loss of biological diversity on land and in the sea, and an acute concern for the degradation of the natural environment.

These marine features lie in contested waters. High resolution commercial satellite imagery shows mechanical dredgers and their circular trails operating on reefs in the Spratlys where substantial land reclamation work is being or has been undertaken by China. This is particularly visible on Fiery Cross Reef, Hughes Reef, Mischief Reef, Subi Reef, Cuarteron Reef, Gaven Reef and Johnson South Reef. Even unoccupied shallow features have been dredged to provide building material for nearby reclamations. Coral reefs that have been left untouched for centuries by virtue of their isolation are now gone.

### **Using living coral reefs as building material**

Dredgers, such as cutter suction dredgers, are used to break up and remove hard substrates like coral reefs together with other attached organisms (molluscs, seagrass, etc) before compacting them onto the area being reclaimed. In addition to removing all coral reefs, these dredgers create sediment plumes that further threaten living coral fragments still alive and other photosynthetic organisms that need sunlight to live.

The environmental impact due to past construction of military installations and destructive fishing methods on reefs has already been reported since the late 1980s. But such activities were of a smaller magnitude and did not involve the destruction of entire reef systems –as is being done now in the disputed waters of the South China Sea.

The geographic formations, generally known as the Spratlys Islands, are in fact isolated seamounts covered with coral reefs. These underwater mountains on the seabed are separated by deep and large canyons up to 50 km wide and several thousand metres high. Their summits are or were covered with living corals (and often with seagrass in shallowest areas). But only a dozen out of more than one hundred of them exhibit small cays or islands above water at all tides - altogether less than one square kilometre.

Their dramatic rise from the seabed causes an upward current, bringing up nutrient-rich deep water that feeds life developing in the top layers of the sea. Seamounts are remarkably productive as they create exceptional conditions for a variety of life to develop; both in the light of the top layers of the sea and below. However, their isolation also makes them vulnerable and slow to recover from large-scale disturbances.

Marine research studies carried out in the 1980's by the Joint Oceanographic Marine Survey of the Philippines and Vietnam and more recently by independent scientists show the rich biodiversity in the shallowest parts of these seamounts - their richness in coral reefs, fishes, seabirds, migratory species and other coral reef associated species.

### **Potential impact on littoral States**

Coral ecologists specialising in the Spratlys hypothesised in the 1990's that the very high diversity of species in the Spratlys would provide critical larval sources for overharvested and stressed coastlines bordering the South China Sea and more generally for biodiversity reservoirs. This theory is based on a combination of factors. These include on-site sampling; the proximity of the Coral Triangle; and enhanced transport and dispersal of drifting larvae and juvenile fishes throughout the South China Sea by the ocean circulation pattern that reverses under monsoonal influence.

Recent research suggests that the biodiversity of the South China Sea may be comparable to or even richer than that of the Coral Triangle – the tropical marine waters, roughly triangular in shape, of Indonesia, Malaysia, Papua New Guinea, Solomon Islands and Timor-Leste. It is therefore greater than the biodiversity of the Great Barrier Reef of Australia. Coastal and oceanic fisheries exploited by the littoral States of the South China Sea are also expected to benefit from these reefs.

These spawning and nursery grounds for reef fish can also be feeding grounds that support large population of oceanic and migratory fish such as several tuna species, including yellowfin and skipjack tunas. The disappearance of the reefs would offset most if not all of these benefits.

### **Coral reefs and international law**

Under international law, it is the obligation of 'building States' to protect and employ sustainable management practices with respect to their construction activities in the Spratly seamounts. It is also their obligation to consult with other affected States. International law provides for clear obligations with respect to the protection and sustainable management of the Spratly seamounts, and the prevention and management of transboundary impacts from human activities:

Firstly, the Spratly seamounts and their associated species qualify for protection under a large number of hard and soft law international instruments because they meet the criteria for sensitive environments in need of protection.

Secondly, any State engaging in construction work that carries a risk of severe or irreversible damage to the local marine environment and risk transboundary damage to coral reefs and fisheries of States bordering the South China Sea must consult the affected States. They must also apply the precautionary approach and exercise due diligence in the conduct of their activities including the duty of vigilance and prevention. This would include the adoption of measures such as conducting a transparent environmental impact assessment.

Furthermore, the lack of full scientific certainty concerning the scope of potential negative impacts must not be used as a reason to defer these obligations. The existence of plausible indications of

potential transboundary risks is sufficient to trigger the application of these positive obligations for any State undertaking land reclamations in the Spratlys.

States carrying out construction activities on coral reefs and seamounts in the Spratlys must avoid damaging the marine environment due to the far reaching risks to the States bordering the South China Sea. To ignore such risks could create broader complications for regional cooperation and political stability amongst the States of Southeast Asia and the southwestern Pacific.

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