



# OUR PLANET

The magazine of the United Nations Environment Programme - December 2007

A large, semi-transparent musical score is overlaid on a background of a teal ocean with white-capped waves. The score consists of several staves with various musical notes, clefs, and symbols, creating a sense of harmony and rhythm across the natural scene.

# SYMPHONY OF THE SEAS

The Marine Environment

# OUR PLANET

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\* All dollar (\$) amounts refer to US dollars.

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# tipping points

by Gerald Marten and Amanda Suutari

Mangroves — the ‘rainforests by the sea’ — cover one-quarter of the Earth’s tropical and subtropical coastline. Occupying two worlds, as the interface between land and sea, they are vital for healthy coastal ecosystems, which in turn support healthy fisheries — and, indeed, themselves act as nurseries for fish. They increase the resilience of coasts, protecting them from erosion, tropical storms and tidal waves. They trap sediment running off the land, safeguarding seagrass beds and coral reefs from siltation. And they function as a natural ‘supermarket’, providing necessary materials to those who depend on them — such as fruits, honey, other foods, fuelwood, medicinal plants and construction material. But they are also among the world’s most threatened habitats and their rate of disappearance is accelerating with the conversion of coastal lands for development, charcoal production, tourism, and the controversial practice of shrimp aquaculture.

From 1975 to 1993 about half the mangroves along Thailand’s 2,560 kilometre coast were lost. This had devastating effects, for example, in Trang province, some 800 kilometres south of Bangkok on the western shore of the Andaman Sea. Until the 1960s, its coastal villages largely subsisted on fishing while depending on the mangroves for medicinal plants and materials such as thatch for housing and fishing gear. Then the mechanization of fishing set into motion a range of effects, which seriously undermined the villages’ natural and social capital. Large commercial trawlers violated the 3km coastal zone where the villagers fished. Their destructive gear and methods damaged coral, scraped the seabed, and cleared out young fish which had not yet reproduced, but villagers were afraid to confront them.

At much the same time, mangrove forests were opened up to concessionaires who began clearing them for charcoal production. Some of the poorest villagers saw no other option than to accept low-paid jobs cutting mangroves for concessionaires or on commercial trawlers, destroying their own resource base. Villagers also began clearing the mangroves themselves, with the

attitude that ‘if I don’t cut them, someone else will’. Women began to look for unskilled, low-paid work in factories, leaving children behind with aging grandparents in the village, further undermining the social fabric.

As the fisheries declined — under the impact of both the trawlers and mangrove destruction — villagers had to go further out to sea, and resorted to more destructive methods to catch dwindling numbers of fish — such as using dynamite, cyanide and pushnets which scraped the ocean floor, damaging sea grass beds, coral reefs and other marine habitats. They also had to invest in more expensive equipment to ‘keep up’ with others in the race for dwindling fish. Some resorted to selling off land. The coastal communities were caught in a trap where day-to-day survival strategies eliminated or reduced their future options: the result was a self-reinforcing downward spiral into increasing poverty, and social and environmental degradation.

In 1985, a small organization called Yadfon (‘raindrop’ in Thai) began to work with the coastal villagers. Its founders, Pisit and Ploenjai Charnsnoh, talked for months with the people and the local imam, building confidence and identifying urgent needs. Together they dug a community well and set up a cooperative programme to help fishers buy fishing gear and engines for their boats, sell their daily catch at fair market prices, and reduce their dependence on middlemen. They established a revolving fund to give small interest-free loans to the poorest, most indebted villagers helping them to set up income-generating projects like small-scale aquaculture cultivating mussels, oysters, and grouper.

While all this was taking place, the villagers came up with the idea of reviving their badly degraded mangrove forests. A group of villages created a 235-acre community-managed



forest and sea-grass conservation zone, the first of its kind in Thailand. They initiated no-fishing areas, discouraged the use of cyanide and dynamite, and banned pushnets. Sea grass was replanted in a lagoon, and mangrove seedlings in degraded areas of the forest.

Now there are about ten such community-managed forests, ranging from 12 to 700 hectares, each managed by the group of villages that surround or depend on it. While each has its own rules of management, not one allows shrimp farms within its boundaries because there is general agreement that these endanger the mangroves. Over the years, the forests have begun regenerating, and fisheries have revived as a result. In 1992, Yadfon co-founded the Mangrove Action Project, an international network of some 800 conservation groups and academics from 60 countries working to promote mangrove conservation.

Creating the community forests and related projects began to transform attitudes among villagers who had forgotten traditional ways of working together, and helped them rediscover a sense of engagement, solidarity, and confidence. As their unity developed, leaders began to emerge, and newfound talents began to shine. Successes gave the people confidence that they had the power to help themselves instead of perceiving themselves as victims of an unfair system, waiting for government rescue. Building assets gave them a sense of ownership over their shared resource, and an incentive to band together to protect them from outside interests. Investing in their future motivated them to fight for it. Fishers began confronting trawlers who violated the 3km coastal zone and lobbied the government to enforce it. And when a local corporation spilled poisonous palm oil into a local waterway, villagers took the issue to provincial authorities, eventually forcing the company to pay compensation.

The creation of the mangrove forests was thus an Eco Tipping Point: a lever setting in motion a cascade of far-reaching effects that tipped the local community and environment from a vicious cycle to a virtuous one. The momentum switched from destruction to recovery and sustainability. The invasion of commercial interests into communal resources — the largely simultaneous mechanization of fishing and the arrival of charcoal concessionaires — was a negative tipping point that locked the people into a vicious cycle of declining resources and an accelerating race to get what little remained. Their prospects seemed so bleak that recovery would have seemed a fantasy.

But all this was reversed, and a virtuous cycle initiated, when villages began creating community mangrove forests and seagrass beds. The fishery began to restore itself, and the mangroves began to supply useful products again, reinforcing the community's commitment to protecting and managing them. Using simple wooden traps or nets, children can now earn 250-300 baht from catching crabs in the mangrove in an afternoon — the equivalent of what was once a whole day's earnings cutting mangrove trees for concessionaires. Instead of being locked into depletion, villagers are locked into conservation, as the financial incentive to preserve mangroves now outweighs the incentive to destroy them. Similarly, in a study of 500 families from 1991 to 1994, the total fish catch rose by 40 per cent. And as the fishers spent 3-4 hours fewer in their boats and did not go out as far, their net income increased by 200 per cent. They could return with full boats without using dynamite or push nets. Fish stocks recovered faster, making their jobs even easier. And better incomes meant there was less need to migrate from villages.

Eco Tipping Points, such as these, offer a new paradigm for restoring communities, both natural and human. Conventional approaches to ecological problems — from piecemeal micromanagement, to techno-fixes, to top-down regulation — often fail. But with the right levers, the same forces that endanger environments and communities can be harnessed to heal them. 