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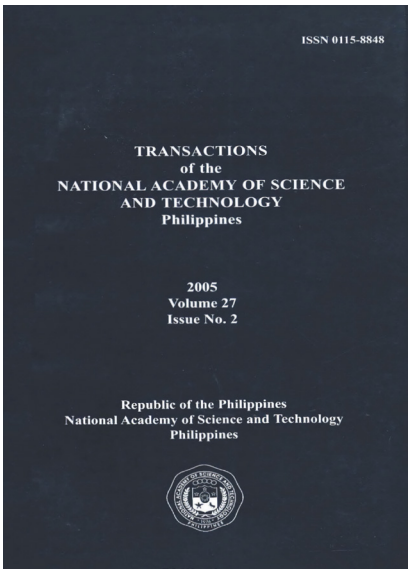

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Academician Angel C. Alcala

Emeritus Professor of Biological Sciences and Director
Angelo King Center for Research and Environmental Management
Silliman University
Dumaguete City

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Philippine Agriculture 2020 and the Environment

STRATEGIC PLANS FOR RESOURCE DEVELOPMENT

Academician Angel C. Alcala
Emeritus Professor of Biological Sciences and Director
Angelo King Center for Research and Environmental Management
Silliman University
Dumaguete City

There are good reasons to consider seriously the environment in any strategic plan for resource development. First, the country's geographic setting is in a tectonically active part of the earth. Second, in the past 15-20 years, the frequency and severity of natural occurrences brought about or influenced by climate change and tectonic movements of the earth's crust have been increasing. Third, the effects of these natural events have been exacerbated by environmental degradation resulting from human-induced factors particularly since 50-60 years ago.

My brief presentation deals with some environmental constraints and environmental implications of proposed programs on poverty alleviation, food security, and resource sustainability, bringing together relevant material in the document, the lessons of the past, and the more recent research findings on both land and marine resources.

The four possible strategic adaptive responses, through interventions, to altered environments (Chapter 3) could well take into consideration lessons learned from past mistakes, in policy and programs, in disregarding the environment while pursuing development goals. The conversion of large areas of mangrove swamps to fishponds, prawn aquaculture sites and human settlements has compromised the capacity of mangrove ecosystems to provide ecological support and services for fishery production and for biodiversity preservation in coastal areas. Large areas of abandoned mangrove forests have not recovered to their previous status, probably because of the altered physical and chemical environment. These areas should be converted back to mangrove forests, which used to supply a greater part of the carbon requirement to sustain the productivity of coastal waters.

Prawn farming, which reached its height in 1988-1993, collapsed after 1993 due to disease and poor water quality, throwing thousands of aquaculture workers out of work. The collapse was due not only to environmental degradation but also to the greedy prawn farmers who ignored the principle of carrying capacity in pursuit of large profits in within a short time. This behavioral trait is the primary cause of massive fish kills of cultured fish in Sampaloc Lake in the early 1990s and in Bolinao, Pangasinan recently. The former event was triggered by the natural physical-chemical phenomenon of winter lake overturn. These incidents serve to remind us to incorporate long-term anti-pollution measures in large-scale aquaculture ventures.

The tendency of people to exploit marine resources to the point of local extinction without regard to sustainability is another negative behavioral trait. An example to illustrate this human trait leading to resource exhaustion is the heavy exploitation pressure on sea cucumbers presently occurring in the vicinity of the Gigante Islands in the Visayan Sea. The much lower biomass of fish and macro-invertebrates in the Spratly Group of Islands west of Palawan, a part of our exclusive economic zone, compared to that of marine protected areas in the Bohol and Sulu Seas is also readily explained in terms of this behavioral trait.

Fixing impaired ecosystem services is not easy to do. I doubt whether the projected timeframe of 15 years (2005–2020) is enough. In upland areas, one obvious long-overdue intervention is reforestation and forest protection in order to moderate flooding and the transport of large quantities of sediment produced from land erosion, negatively affecting fisheries. The massive reforestation 15 years ago was apparently not effective, as indicated by perennially swollen rivers such as the Rio Grande in Mindanao, which deposits sediment on islands 20 kilometers away. Up to 5% by area of reefs continue to deteriorate every year due to sedimentation and other man-induced factors.

In the marine environment, our studies with Dr. Ed Gomez indicate decadal timeframes of recovery of dynamite-blasted and typhoon-damaged coral reefs. Recovery in 10 years has failed to support reasonable fish biomass unless reefs are protected. Our recent studies with Dr. Garry Russ in central Philippines and that of Dr. Tim McClanahan in Kenya on fully protected marine reserves show decades of time for recovery of highly desired top carnivorous fish (e.g. groupers). The good thing about no-take marine reserves is that they result in spillover of adult fish biomass within a decade of full protection, which translates into improved local fishery production.

Although not a panacea, the establishment of marine protected areas or MPAs (coral reefs, mangroves, sea grass beds), as a proactive rather than reactive strategy, must be pursued during the next 15 years to boost fishery production in coastal ecosystems and conserve valuable marine biodiversity considered the highest in the world for near-shore fishes, according to Carpenter and Springer. One challenge is to increase the area of MPAs from the estimated 200,000 ha to at least 600,000 ha or 30% of 2 million ha of coral reefs in the Philippines. Another challenge is to set up deep-sea no-take marine reserves for recovery of deep-water dwelling and pelagic fish species (e.g. tuna, high value shells for the collectors' market).

MPAs prevent ecological phase-shifts from highly productive autotrophic natural ecosystems (e.g. coral reefs) to less productive heterotrophic ones (e.g. certain algal communities), which may include toxin-producing species. Already toxins (e.g. paralytic shellfish toxins) are produced by dinoflagellates in several bays in the Philippines during the northern summer months, rendering fish and shellfish unfit for human consumption.

The Asset Reform section of the document is a comprehensive discussion on the environmental support to production to alleviate poverty. There are a number of excellent recommendations, some novel (e.g. the concept of environmental lien of my friend, Atty. Tony Oposa) and others already in place (e.g. CBFM program of DENR; the popular CBCRM; establishment of MPAs)—all of which will increase production, preserve biodiversity and prevent or at least slow down the extinction rate of Philippine terrestrial endemic species estimated at 20-25% during the past 50-60 years. CBFM ran into trouble sometime ago, but the reason was inadequacy of the social component, which can easily be remedied. Community-Based Coastal and Marine Resource Management (CBCRM) has had dramatic results in the protection of marine biodiversity and improvement of local fisheries in the hands of empowered coastal communities and local government units under co-management and collaborative management schemes. As already mentioned, establishment of MPAs should be vigorously pursued to sustain demersal fisheries and to increase the area of presently protected coral reefs.

Increased agricultural activities (e.g. rice culture) also increases the production of ozone-depleting gases and increases chemical inputs to marine and fresh waters that could result in reduction of species richness, if not local extinctions, or in triggering red tide occurrences. Hopefully, these negative effects would be neutralized by CBFM forest areas and protected

tropical rainforests as well as by coral reefs, which also could sequester carbon dioxide. But increased domestic wastes generated by the increasing human population would require secondary physical/chemical treatments. And practically all coastal cities do not implement secondary treatment of their sewage and domestic wastes polluting the marine environment.