

**SUSTAINABLE DEVELOPMENT OF OCEANS AND COASTS:  
THE ROLE OF THE PRIVATE SECTOR**

Paul Holthus, Executive Director, Marine Aquarium Council

3035 Hibiscus Dr., Honolulu, Hawaii USA 96815  
Phone: (+1 808) 923-3254 Fax: (+1 808) 923-6023  
Email: paul.holthus@aquariumcouncil.org Website: www.aquariumcouncil.org

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**ABSTRACT**

Oceans and coasts provide the majority of the world's ecosystem benefits and much of the private sector is dependent on ocean and coastal resources, services and space. Due to their unique transboundary characteristics, the sustainable development of these areas requires the participation of all stakeholders. However, the international regime for the sustainable development of oceans and coasts is being developed through governmental processes in which the private sector does not have much opportunity for involvement.

Business and industry is recognizing and responding to sustainable development, and ocean and coastal issues are increasingly a part of this. For the private sector to operate sustainably and profitably in ocean and coastal areas, it must understand how it affects these ecosystems and the other users of their resources, services and space, as there is strong public interest in these issues.

Business and industry has the opportunity to develop its role and responsibilities in the sustainable development of oceans and coasts at several levels: a) in relation to consumers; b) at the level of individual corporations; c) at the level of entire business and industry sectors; d) within the private sector as a whole; and e) in relation to the other stakeholders. Important developments are taking place at the first three of these levels, as indicated by numerous examples. Much remains to be done at the important multi-sectoral levels, i.e. within the private sector and in relation to other stakeholders.

A private sector network on oceans and coasts is proposed as a mechanism to ensure information exchange and interaction on the sustainable development of these areas within the private sector. This forum would also provide a vehicle for business and industry input to international processes on oceans and coasts, fostering understanding and interaction between the private sector and other stakeholders.

**The Private Sector and Sustainable Development**

Sustainable development is the responsibility of all parts of society, i.e. governments, public interest groups, consumers, and the private sector (Brundtland, 1994). The latter is essential to sustainable development, as business and industry is the principle engine of society - producing goods and services that generate wages, dividends and tax revenue. In developing countries, where much of the world's biodiversity is found, private sector funds from developed countries far outweigh other financial flows (OECD, 1995). Over US\$ 260 billion flowed from private sector sources in OECD economies to developing countries in 1995, compared to US\$ 56 billion in official development assistance from OECD governments, which is decreasing. Most of the private sector flow is not to the least developed countries of Asia and Africa that are major repositories of biodiversity.

Economics are becoming central to all conservation issues (McNeely, 1997) and it is increasingly evident that economic prosperity and a market that works for the interests of biodiversity are essential to sustainable development (Brenton, 1994). As a result, policies need to reflect the use of economic and market instruments, offering government, industry and the public a wider range of options and more effective tools (Sahl and Bernstein, 1995).

Although the private sector is focused on its primary role of generating profit, it increasingly recognizes that maintaining economic growth and a healthy environment are inter-related and that the corporate world has a major responsibility (Choucri, 1994). This responsibility is embodied in the Business Charter for Sustainable Development of the International Chamber of Commerce and the Principles of the Coalition for Environmentally Responsible Economies (CERES). The corporate signatories to these documents commit themselves to principles and practices of sustainable development, including:

- recognizing the need for long-term economic growth and environmental sustainability;
- developing and providing products and services that have no undue environmental impact, are safe, are efficient in consumption of energy and natural resources, and are able to be reused, recycled or disposed of safely;
- protecting the biosphere, preserving biodiversity and safeguarding habitats;
- informing and working with the public and creating dialogue with stakeholders;
- working towards self regulation and a demonstrated environmental commitment by corporate management; and
- undertaking environmental audits to measure progress (Schmidheiny, 1992; Dias and Begg, 1994).

### **The Challenges of Sustainable Development of Oceans and Coasts**

While the private sector is generally taking note of sustainable development issues and some parts are responding proactively, little of this has focussed on oceans and coasts. Ocean and coastal areas provide an enormous portion of the world's ecosystem goods and services upon which the private sector and society depends, e.g. food, recreation, waste receiving waters, fossil fuels. Most important is the 6 % of the world's surface comprising the nearshore marine environment - i.e. estuaries, coastal wetlands, mangroves, coral reefs, and continental shelves. This small portion of the planet provides 43 % of the world's ecosystem goods and services, much of which is critical to business and industry (Costanza *et al*, 1997).

Oceans and coasts also support a significant, unique component of the world's biological diversity, habitats and resources - all of which are connected by a dynamic, three-dimensional water world covering over 70% of the earth's surface (Norse, 1993). Due to the fluid nature of the oceans and the international character of coastal ecosystems, their biological and ecological richness and resources often extend over vast geographic scales (Scientific American, 1998). However, many of the patterns and processes involved are not well known or understood.

Inadequate understanding of the marine environment has led to the oceans being perceived as having an inexhaustible supply of resources and an unlimited capacity to receive our wastes (Economist, 1998). This has often been coupled with open access to marine areas and resources and the lack of management for sustainability. Meanwhile, on the land side, population growth and human activities have become heavily concentrated in a narrow band along the coast. The vast majority of major urban centers around the world are located on the coast and all of them are expanding rapidly. In SE Asia, 65 % of all major cities are coastal, in Latin America the rate is 75 %. Overall, about 37 % of the world's inhabitants - over 2 billion people - live within 100 km of the sea, and almost 50 % of the world's population live within 200 km of the shore (Cohen, 1998).

It is now clear that the complex, multi-sectoral mix of human activities on and adjacent to the sea is seriously affecting oceans and coasts. These have led to the unsustainable use of resources, the degradation and destruction of habitat, and extensive pollution of ocean and coastal areas,

especially from land-based activities. These impacts are rapidly expanding in scope and increasingly extend across borders and throughout the global "commons" of the seas (Economist, 1998). The cumulative and synergistic effects of these impacts complicate our ability to understand and manage oceans and coasts for sustainability. The sustainable development of oceans and coasts is thus inherently multi-sectoral and international, creating unique challenges and requiring the participation of all stakeholders, including business and industry.

### **The Value of Oceans and Coasts to Business and Industry**

Oceans and coastal ecosystem benefits are critical to the private sector and a substantial proportion of business and industry is entirely dependent upon these resources, services and space. This includes marine transport, port development and operations, shipbuilding, fisheries and fish processing, marine and coastal tourism and recreation, offshore oil and gas, coastal mining, and coastal aquaculture (Clark, 1996).

A much wider range of business and industry influences oceans and coasts less directly, predominantly through hydrological linkages in coastal watersheds (Grigalunas and Congar, 1995). The most common example of this is through the use of fresh water and/or the discharge of effluent that ends up in nearshore waters. Many less obviously marine-related industries are also sited near the coast, e.g. to use coastal waters for processing or cooling. There are also more encompassing economic linkages. For example, cost-effective marine transport is the basis for many industries and population centers being located at the coast. Additional businesses and industries concentrate in the same areas in order to access and service the coast-dependent industries, marine transport networks, and coastal urban centers.

The result is that the economies of most countries are heavily dependent on ocean and coastal benefits, as illustrated by the US, where one-third of the GDP is produced in coastal areas through fishing, transportation, recreation, and related industries and one of every 6 jobs is marine related (Daley, 1998). When broken down by sector, ocean and coastal connections are predominant in many components of the US economy. In the tourism sector, coastal states account for 85 % of tourism, with 180 million people spending about US\$ 75 billion on coastal recreation (White, 1997; Houston, 1996). In trade and transport, marine transportation dominates foreign commerce, handling 2 billion tons of cargo each year, including 95 % of US foreign trade. This ship-borne trade passes through 190 US seaports and has a value of over US\$ 500 billion/year. In the fisheries sector, US commercial fisheries generate another US\$ 20 billion/year and global fisheries, including processing and marketing, employs 200 million people (Economist, 1998).

In US coastal and island states, ocean and coastal economic links are particularly important. For example, in California, industries that depend directly on a healthy coastal and marine environment generate US\$17.3 billion/year and employ 370,000 people. In Hawaii, commercial fishing, ocean recreation, maritime transportation and repair, ocean research, seafood marketing, and aquaculture generated \$2.9 billion in revenues in 1992. These industries are projected to generate US\$3.8 billion in revenues and employ more than 20,000 people in 1998, adding about 2,300 new jobs since 1992 (Hawaii DBEDT, 1998). Florida's 220 mile long reef tract generates US\$ 1 billion in annual fishing and tourism revenues (Lee, 1996). Similar figures are available in Australia where the Great Barrier Reef attracts more than 2 million visitors per year and is worth more than AUS\$ 1 billion annually (Alcock, 1996).

Although it is difficult to obtain figures quantifying the value of oceans and coasts to the economies of developing countries, it is evident that the amounts are significant. In SE Asia, for example, almost 90 % of fisheries come from shallow continental shelf and coral reefs (Chua and Garces, 1994) and fish supply an estimated 65-70 % of animal protein in these countries (Valencia, 1990; ADB, 1993). One km<sup>2</sup> of healthy coral reef produces about 37 metric tons of fish/km<sup>2</sup> (Alcala, 1988) and is worth about US\$12,000/year in fisheries production and US\$1.16 million over 25 years in fisheries, tourism, and coastal protection value (Cesar *et al*, 1997).

Travel and tourism is particularly important to developing countries and is largely focussed on the coastal and marine environment. Much of this is in countries and communities with few economic development alternatives, especially in small island states. In the Caribbean, up to 30 % of investment, GDP and jobs are generated by tourism - with 100 million visitors joining the region's 170 million residents each year (Jenner and Smith, 1992). In Jamaica alone, tourism and recreation generates US\$ 80 million per year (as compared to fisheries which generate US\$ 25 million/year), with tourists indicating in a World Bank survey a willingness to pay US\$387 per person per year to protect coral reefs and the environment (Huber, 1997). Coastal areas also account for a significant percentage of tourism in continental developing countries. For example, in Costa Rica and Mexico, beaches are the primary destination for 30 - 37 % of tourists. In Ecuador, the Galapagos Islands are the major visitor destination (Jenner and Smith, 1992).

### **Competition, Conflict and Public Perception**

Given the level of economic dependence on ocean and coastal resources, services and space - and the level of human population that coastal areas support - it is not surprising that there is a high degree of competition. Business and industry is competing with other sectors of society for these amenities and often finds itself in conflict with the government or public (Tol *et al*, 1996; Turner, 1997). There is also a high degree of competition and conflict within the private sector itself, i.e. among the various components that have overlapping needs for ocean and coastal resources, services or space (Hodgson and Dixon, 1988).

The value put on ocean and coasts by the public is a key consideration. A 1996 survey in the US by a leading market survey group found that 87 % of people felt that the condition of the ocean is "very important" or "somewhat important" to them (SeaWeb, 1996). In coastal communities, fully two-thirds consider the condition of the ocean to be "very important". Over 80 % of the US public believes that oceans are threatened by human activity, with over half seeing this as a serious threat to the quality of life. A majority felt strongly about the following ocean issues: oil entering the ocean, overfishing, loss of species, beaches closed due to pollution, and loss of coastal habitat.

In spite of efforts by some components of business and industry to address marine environmental issues, the US public believes that the private sector in general is largely responsible for ocean problems, e.g. that corporations were the major polluters. Oil spills, chemical runoff from "corporate farms", polluted water discharge, and seafood contamination were the most serious ocean problems identified by the public. Of these, people were most "angry" about oil spills and they felt oil companies were the most able to affect the oceans.

In order for the private sector to operate sustainably and profitably in ocean and coastal areas, it must not only understand how it affects the resources, services and space it uses, it must also understand how it affects the other users of those amenities, particularly the public. There is clearly a need and opportunity for business and industry to address ocean and coastal environmental issues and communicate its efforts to the public. Those that respond to this will connect with a large constituency.

Conversely, it is also important to understand how the other users of ocean and coastal areas affect the potential for business and industry to operate sustainably. This includes consideration of how the various components of the private sector affect each other, e.g. the impact of oil

operations on local commercial fishing. Finally, added to all of these interactions are the effects of the environment itself on ocean and coastal ecosystems, e.g. through climate events such as hurricanes and El Nino.

### **The International Regime for the Sustainable Development of Oceans and Coasts**

The international regime for the sustainable development of oceans and coasts is being developed through numerous organizations, programs, and agreements, most of which are UN related:

- the UN Conference on Environment and Development and Agenda 21 (especially Chapter 17 of the latter on oceans and coasts);
- the UN Commission on Sustainable Development (CSD), which follows up the implementation of Agenda 21;
- the Sub-Committee on Oceans and Coastal Areas of the UN Administrative Committee on Co-ordination (ACC SOCA), which reports to the UN CSD and coordinates UN agency efforts on ocean and coastal issues;
- the UN Convention on the Law of the Sea (UNCLOS), which provides a global legal framework; and
- the Convention on Biological Diversity (CBD), which has promulgated the "Jakarta Mandate" on marine and coastal biodiversity conservation and sustainable use.

Numerous other international agreements cover more specific aspects of the sustainable development of oceans and coasts. These include:

- the IMO-administered conventions on marine pollution from sea-based sources;
- the UNEP-administered Global Program of Action for Protection of the Marine Environment from Land-Based Activities;
- the FAO-administered Code of Conduct for Responsible Fisheries;
- the Convention on the International Trade in Endangered Species (CITES); and
- several Regional Seas Conventions under the auspices of inter-governmental bodies.

The international "playing field" and "rules" for the sustainable development of oceans and coasts are being established by these important international efforts. However, generally only governments and intergovernmental agencies are able to directly participate. Business and industry is largely not included, or is only able to operate on the margins. Exceptions include the IMO, where organizations registered as NGO's participate in a consultative status, such as a large number of industry associations. The International Seabed Authority, established under UNCLOS in 1996, also has mechanisms for dealing with private sector entities.

Agenda 21, Article 10 of the Rio Declaration, and other recent developments call for the involvement of all sectors of society in sustainable development. There is clearly a need and an opportunity for business and industry to ensure that the private sector is involved in inter-governmental efforts on the sustainable development of oceans and coasts.

## **The Role of the Private Sector in the Sustainable Development of Oceans and Coasts**

The role and responsibilities of business and industry in relation to the sustainable development in ocean and coastal areas can be considered at five levels:

- consumers;
- individual corporations;
- business and industry sectors;
- the private sector as a whole; and
- the full range of ocean and coastal stakeholders.

Important developments are taking place at the first three of these levels and examples are cited below. It is beyond the scope of this paper to provide a thorough survey of private sector efforts in relation to the sustainable development of oceans and coasts and more work needs to be done to assemble this information. However, it is clear that at the essential multi-sectoral levels, i.e. within the private sector as a whole and in relation to other stakeholders, the sustainable development of oceans and coasts has not been actively addressed by business and industry and important challenges and opportunities lie ahead.

### *At the Level of Consumers and Markets*

The private sector is increasingly seeking to link sustainable development issues to consumer preference and market forces through improved environmental performance (Schmidheiny *et al*, 1997). Products and services that offer environmental benefits often provide a competitive advantage and this may be the most effective and long term link between the private sector and sustainability, i.e. creating "win-win" situations whereby consumers demand products or services that contribute to sustainable development that at the same time generate profits for the company and industry involved.

Voluntary self-regulation and establishing standards of practice through a "code of conduct" are some of the principle ways in which improved environmental performance is being developed (UNEP I & E, 1998; UNEP I & E, 1995; ICS, 1997). These are often linked to a "labeling" program to simplify and market the result to the consumer (US EPA, 1993). However, self-regulation that emanates entirely from industry often has problems of credibility and acceptance on the part of the public and government. Similarly, codes of practice that are developed only by government and/or NGOs may have problems of acceptance and practicality for the private sector.

Certification and labeling systems that are developed and implemented by independent, third party bodies offer a more comprehensive and credible approach to improving private sector environmental performance and linking this to the marketplace. These institutions can provide a multi-stakeholder process to develop the standards of practice by involving the private sector, government, NGOs, scientists and other concerned parties. An independent system is then developed to certify compliance with the standards and label the result. The certification institution also often provides a credible body for creating consumer demand and confidence in the certified practices, products and participant companies.

In the ocean and coastal realm, two major international certification and labeling efforts have begun - the Marine Stewardship Council (MSC) and the Marine Aquarium Council (MAC). Both of these are independent, non-profit organizations that are building multi-stakeholder networks to develop standards of practice for the sustainable use of marine resources and implement certification and labeling programs - all with the involvement of private sector, non-government, government and other concerned constituents.

The MSC is coordinating the development of certification and labeling for food fish and fisheries while the MAC is doing the same for the commerce in marine aquarium organisms. These certification programs are growing rapidly and are being complimented by related efforts to

identify and support innovative, market-based opportunities for sustainable development of the oceans and coasts, e.g. through the World Bank Marine Market Transformation Initiative.

#### *At the level of Individual Corporations*

It is at the corporate level that the private sector is perhaps most motivated to integrate sustainable development issues with profitability, as the desire to develop and maintain market edge and niche is a powerful incentive and leads to innovative and adaptive efforts (Schmidheiny *et al*, 1997). Progressive companies that relate sustainability to their own long term viability and profitability - as well as to their corporate responsibility - are responding to the concept, challenges and opportunities of sustainable development with vision and leadership. An informal survey of some of these corporations indicates that there are often two common elements, especially among larger entities. There has often been a public "slap in the face" to the company involved, in which their environmental performance has been criticized. Secondly, the decision to respond proactively and strategically to environment issues has come from the highest levels.

It is not possible to cite more than a few examples here of the increasing number of company level efforts to address sustainable development that are directed towards ocean and coastal issues. Many of these are being developed in partnership with environmental NGOs (Holthus, 1998), such as the commitment of Unilever, one of the world's largest fish purchasing and processing companies, to co-launch the Marine Stewardship Council along with WWF and commit to source only MSC certified fish in the future.

In the oil and gas industry, several companies are making significant efforts to ensure that offshore and coastal operations have negligible impact and document the experience as part of efforts to improve environmental performance. For example, in Liverpool Bay, UK, BHP has worked with the community to develop an offshore installation and onshore gas terminal in an area of high environmental sensitivity. Similarly, in Indonesia, Total has engaged in oil exploration and production in some mangrove areas for over 20 years with minimal impact (IPIECA and E & P Forum, 1997).

In the marine recreation sector, the Professional Association of Dive Instructors (PADI), the global leader in scuba dive instruction, has established PADI Project Aware to improve the environmental knowledge of its instructors and, through them, expand marine conservation awareness in the diving public. PADI has also created the Project Aware Foundation to assist local dive groups with marine environmental projects.

Companies that are addressing ocean and coastal environmental issues through improved performance are increasingly creating advertising campaigns around these efforts. For example, a recent color two page ad in an international weekly news magazine displayed a large reef fish, with the message that "there is already plenty of color in the sea" - this from a major German luxury car manufacturer that was promoting their reduction in the use and discharge of non water-soluble paints. Similarly, Europe's largest manufacturer of chemical pulp marketed their efforts to phase out chemicals that reach the sea in two-page ads to "Take good care of [the] ocean". The ads exhorted the public to help the company reach its target of zero chlorine use by demanding paper produced without the chemical.

### *At the level of Each Sector within Business and Industry*

Many sectors as a whole are also making efforts to address sustainable development, usually through trade and industry associations. Much of this initially emerged in preparation for, or in response to, UNCED. Several sectors, such as the oil and gas industry and the tourism industry, developed responses to Agenda 21 and seek to raise the standard of performance and responsibility for the sector ( e.g. IPIECA and UNEP, 1996; WTTC, n.d.). Most of the effort to "push the envelop" on sustainable development for the sector as a whole often comes from the same companies that are most progressive at the corporate level.

Some sector level action on sustainable development does address ocean and coastal issues, either because the industry is ocean dependent or because many of the most environmentally challenging aspects of the industry are in the marine and coastal environment. An example of the latter is reflected in the work of the International Petroleum Industry Environmental Conservation Association (IPIECA) and the Oil Industry International Exploration and Production Forum (E & P Forum). These two organizations recently compiled industry-wide case studies of best practice for operating in sensitive environments, almost half of which concerned the marine or coastal environment (IPIECA and E & P Forum, 1997). In additions, the E & P Forum and the environmental NGO community collaborated to produce best practice guidelines for oil and gas exploration in several ecosystems (IUCN and E & P Forum, 1991; IUCN and E & P Forum, 1993).

In the tourism industry, which is largely focused on coastal and marine areas, the World Travel and Tourism Council (WTTC) has developed mechanisms for bringing its Agenda 21 to reality. This includes " Green Globe", an environmental management program for companies, and the European Community Network for Environmental Travel and Tourism (Eco-Nett). In the marine recreation sector, the Billfish Foundation and the Ocean Futures program of the Dive Equipment Manufacturers Association (DEMA) and are examples of associations that link the marine sports industry and its participants around shared concern for the habitat and biota. Similarly, the American Marinelife Dealers Association (AMDA) and the Ornamental Aquatic Trade Association (OATA) promote responsible marine aquarium keeping and standards of practice for those involved in the commerce of marine aquarium organisms in the US and UK, respectively.

Industry level interaction with governments on sustainable development is often via intergovernmental agencies. The best example of this is the UNEP Industry and Environment program, which works with a range of industries on cleaner production and pollution reduction, both of which have important downstream benefits to the marine and coastal environment. Private sector interaction with governments and intergovernmental agencies has been expanding into multi-stakeholder efforts at an industry-wide level. For example, as a follow up to CSD recommendations, the governments of Brazil and the Netherlands convened a meeting of international experts on environmental practices in offshore oil and gas activities in 1997. This resulted in an initiative by UNEP I & E, the E & P Forum, several governments, several environmental NGOs and the UN Conference on Trade and Development (UNCTAD) to improve access to state-of-the-art information on environmental practices in the industry.

### *At the Level of the Private Sector as a Whole*

A growing portion of business and industry is undertaking efforts to address sustainable development at the broadest level (Stone *et al*, 1997). This is usually through general associations, e.g. the International Chamber of Commerce (ICC), World Economic Forum (WEF), and the OECD Business and Industry Advisory Committee (BIAC). There are now also institutions focused specifically on the role of the private sector in sustainable development, e.g. the World Business Council for Sustainable Development (WBCSD) (Schmidheiny *et al*, 1997;). However, to date, the sustainable development of oceans and coasts has not received specific attention.

The unique characteristics of oceans and coasts require that their sustainable development be addressed in a collective, comprehensive manner. At a minimum, there is a need for a global network to link business and industry with a stake in the future of oceans and coasts and ensure a more coordinated, comprehensive, and proactive approach to the sustainable development of these areas.

Such a forum could:

- Raise awareness among business and industry of the unique issues regarding the sustainable development of oceans and coasts.
- Provide a clearinghouse for information important to business and industry on these issues, especially on the international agreements and processes that are creating the "playing field" and "rules".
- Ensure that these issues and their relation to business and industry are represented at multi-sectoral associations, e.g. ICC, WEF, OECD and WBCSD, and at sector specific trade associations, e.g. IPIECA, WTTC, International Chamber of Shipping (ICS).
- Foster and facilitate:
  - increased action on the sustainable development of oceans and coasts by individual corporations and sectors;
  - increased dialogue, interaction and partnerships between corporations; and
  - exploration of emerging issues and the search for solutions to controversial issues and potential areas of conflict.

The first step in this direction would be for the representatives of business and industry with a strong interest in the sustainable development of oceans and coast to simply begin interacting on these issues.

#### *At the Level of the Full Range of Ocean and Coastal Stakeholders*

The characteristics of oceans and coasts and human impacts on them mean that their sustainable development must be addressed through a "critical mass" of effort by those affecting the shared marine and coastal environment. The most commendable efforts by any single corporation, an entire sector of business and industry - or even the entire private sector - may not make a difference in the long term if other issues and impacts are not addressed. This means that the private sector must interact with the other stakeholders, especially at the international level.

Although there are many international agreements related to the sustainable development of oceans and coasts, the UN Convention on the Law of the Sea (UNCLOS) provides the overall global legal framework on oceans. Following the entry into force of UNCLOS in 1994, the States Parties to the Law of the Sea began meeting. There is also an annual one day UN General Assembly session on oceans. However, the private sector presence and involvement in these is minimal.

The private sector network on the sustainable development of oceans and coasts described above would be a vehicle for interaction with other stakeholders by:

- Providing business and industry input to the related intergovernmental processes; and
- Fostering and facilitating information sharing, interaction and partnerships between the private sector and governments, intergovernmental organizations and NGOs on the sustainable development of oceans and coasts.

## References

- ADB (Asian Development Bank) (1993) *Fisheries Sector Profile of the Philippines*. ADB, Manila.
- Alcala, A. (1988) Effects of marine reserves on coral fish abundances and yields of Philippines coral reefs. *Ambio*, **17**, 194-199.
- Alcock, D. (1996) *Tourism: The key player in the ecologically sustainable development of the Great Barrier Reef*. Paper presented at the 1996 World Congress on Coastal and Marine Tourism, Honolulu.
- Brenton, T. (1994) *The Greening of Machiavelli: The Evolution of International Environmental Politics*. Earthscan/Royal Institute of International Affairs, London.
- Brundtland, G. H. (1994) The challenge of sustainable production and consumption patterns. *Natural Resources Forum*, **18**, (4), 243-246, 1994.
- Cesar, H., Lundin, C., Bettencourt, S. and J Dixon, J. (1997) Indonesian coral reefs - An economic analysis of a precious but threatened resource. *Ambio*, **26**, (6), 345-350.
- Choucri, N. (1994) Corporate strategies toward sustainability. In *Sustainable Development and International Law*. MIT Press, Cambridge.
- Chua, T.E. and Garces, L.R. (1994) Marine living resources management in the ASEAN region: Lessons learned and the integrated management approach. In *Ecology and Conservation of Southeast Asia Marine and Freshwater Environments including Wetlands*. Kluwer Academic Publishers, Belgium.
- Clark, J.R. (1996) *Coastal Zone Management Handbook*. CRC Press, New York.
- Cohen, J.E. (1998) Estimates of coastal populations. *Science*, **278**, (5341), 1211-1212.
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R., Paruelo, J., Raskin, R., Sutton, P. and van den Belt, M. (1997) The value of the world's ecosystem services and natural capital. *Nature*, **387**, 253-260.
- Daley, W.M. (1998) Ocean Update. SeaWeb.
- Dias, A.K. and Begg, M. (1994) Environmental policy for sustainable development of natural resources: mechanisms for implementation and enforcement. *Natural Resources Forum*, **18**, (4), 275-286.
- Economist (1998) *A Survey: The Deep Green Sea*. London.
- Grigalunas, T. and Congar, R. (eds). (1995) *Environmental economics for integrated coastal area management: Valuation methods and policy instruments*. UNEP Regional Seas Reports and Studies No 164. UNEP, Nairobi.
- Hawaii DBEDT (Department of Business, Economic Development, and Tourism) (1998) Website. Energy, Resources, and Technology Division; Ocean Resources Branch.
- Hodgson, G. and Dixon, J (1988) *Logging versus tourism and fisheries in Palawan: An environmental and economic analysis*. Occasional Paper No. 7, Environment and Policy Institute. East West Center, Honolulu.

- Holthus, P. (1998) Workshop on Incentives Private Sector Partnerships and the Marine and Coastal Environment. In *Report of the 8<sup>th</sup> Global Biodiversity Forum, Montreal, August 1997*. IUCN, Gland, Switzerland.
- Houston, J. (1996) *The economic value of US beaches*. Paper presented at the 1996 World Congress on Coastal and Marine Tourism, Honolulu.
- Huber, R. (1997) Presentation at World Bank Reef Management Workshop, Montego Bay.
- ICS (International Chamber of Shipping) (1997) *Shipping and the Environment: A Code of Practice*. ICS, London.
- IPIECA (International Petroleum Industry Environmental Conservation Association) and E & P Forum (The Oil Industry International Exploration and Production Forum). (1997) *The Oil Industry: Operating In Sensitive Environments*. IPIECA and E & P Forum, London.
- IPIECA (International Petroleum Industry Environmental Conservation Association) and UNEP (1996) *The Oil Industry Experience: Technology Cooperation and Capacity Building: Contribution to Agenda 21*. UNEP, Nairobi.
- IUCN -The World Conservation Union and The Oil Industry International Exploration and Production Forum (E & P Forum) (1991) *Oil Exploration in the Tropics: Guidelines for Environmental Protection*. E & P Forum, London.
- IUCN -The World Conservation Union and The Oil Industry International Exploration and Production Forum (E & P Forum) (1993) *Oil and Gas Exploration and Production in Arctic and Subarctic Onshore Regions*. E & P Forum, London.
- Jenner, P. and Smith, C. (1992) *The Tourism Industry and the Environment*. Special Report No. 2453. The Economist Intelligence Unit, London.
- Lee, D. (1996) *The economics of managing Florida's coral reefs*. Paper presented at the 1996 World Congress on Coastal and Marine Tourism, Honolulu.
- McNeely, J. (1997) *Conservation and the Future: Trends and Options Towards the Year 2025*. IUCN -The World Conservation Union, Gland, Switzerland.
- Norse, E. (1993) *Global Marine Biodiversity: A Strategy for Building Conservation into Decision-Making*. Island Press, California.
- OECD (1995) *Linkages: OECD and Developing Economies*. OECD, Paris.
- Sahl, J. D. and Bernstein, B.B. (1995) Developing policy in an uncertain world. *International Journal of Sustainable Development and World Ecology*, **2**, 124-135.
- Schmidheiny, S. (1992) Changing course: a global business perspective on development and the environment. In *Technology Cooperation*, Chapter 8. MIT Press, Cambridge.
- Schmidheiny, S., Chase R. and DeSimone, L. (1997) *Signals of change: Business progress towards sustainable development*. World Business Council for Sustainable Development (WBCSD), Geneva.
- Scientific American (1998) The Oceans. *Scientific American Quarterly*, **9**, (3).
- SeaWeb (1996) Presentation of Findings from a Nationwide Survey and Focus Groups conducted by the Mellman Group.

Stone, D., Ringwood, K. and F. Vorhies, F. (1997) *Business and Biodiversity: A Guide for the Private Sector*. World Business Council for Sustainable Development (WBCSD) and IUCN-The World Conservation Union, Switzerland.

Tol, R., Klein, R., Jansen H. and Verbruggen, H. (1996) Some economic considerations on the importance of proactive integrated coastal zone management. *Ocean and Coastal Management*, **32**, (1), 39-55.

Turner, R. (1997) Ecological economics and project management in the coastal zone. *Terramare*, **1**, 28-29.

UNEP I and E (UNEP Industry and Environment) (1995) *Environmental Codes of Conduct for Tourism*, UNEP I and E Technical Report 29. UNEP I and E, Paris.

UNEP I and E (UNEP Industry and Environment) (1998) *Voluntary Industry Codes of Conduct for the Environment*, UNEP I and E Technical Report 40. UNEP I and E, Paris.

US EPA (Environmental Protection Agency) (1993) *Status report on the use of environmental labels worldwide*, Office of Pollution Prevention and Toxics, Washington D.C., EPA 742-R-9-93-001.

Valencia, M. (1990) International conflict over marine resources in Southeast Asia: Trends in politicization and militarization. In *Conflict over Natural Resources in Asia and the Pacific*. United Nations University Press, Oxford University Press and Ateneo University Press, Manila.

White, R. (1997) *Rethinking integrated coastal management into the next millennium*. Paper presented at Coastal Zone 97, Boston.

WTTC (World Travel and Tourism Council) (no date) *Agenda 21 for the Travel and Tourism Industry - Towards Environmentally Sustainable Development*. WTTC, London.