

The Decline of Coral Reefs: a Political Economy Approach

*Samuel Asumadu-Sarkodie,
Samuel.sarkodie@metu.edu.tr
Middle East Technical University, Northern Cyprus Campus,
Kalkanli, Guzelyurt, TRNC 99738 via Mersin 10,
Turkey.*

Abstract

Coral reefs provide economic services like job, food and tourism. Yet, within the past decades, there has been an overwhelming decline in the vitality of coral reefs and their ecosystem. Scientist have not be able to set the record straight regarding their scientific argument on biodiversity and ecological wealth of natural environment. Therefore, actions to recover coral reefs from destruction have proved futile. This paper will analyze the economical values, economic valuation, socioeconomics of coral reefs, and propose an approach at the end of the paper by looking through the eyes of the political economist.

Keywords: *Coral reefs, decline, political economy*

General Introduction

Climate change has become a global canker which has not only affected the human ecosystem but also the marine ecosystem. Coral reefs have received their fair share in the marine ecosystem as a result of marine pollution. Coral reefs are a vital natural resource found in tropical waters throughout the world (Spalding et al.: 2001).

Coral reefs are known to be among the most biologically productive and diverse ecosystems in the world (Birkeland: 1997; Serageldin: 1998).

Coral reefs are beneficial to the ecosystem by protecting shores from the impact of waves and from storms, and add value to human by providing economic benefit to local communities in tourism and also provide humans with food and medicine (Anup, S.: 2013).

Interestingly, due to the enormous benefits derived from coral reefs, World Meteorological Organization, 2010 has estimated Coral reefs to provide approximate worth of US\$ 30 billion yearly in goods and services, including income from and resources for tourism, building materials and coastal protection.

What will be the fate of future generations yet unborn if we eliminate the primary source of food in the marine ecosystem? Rethinking, it is really a sustainable practice? No, don't think so.

The decline in coral reefs worldwide has begun to receive attention from world superpowers. For example, there has been a formation of the United States Coral Reef Task Force and International Coral Reef Initiatives. Top levels of world governments have also showed interest in the decline of coral reef. For example, the United States President, William Jefferson Clinton's Executive Order 13089 on June 11, 1998 emphasized on this point; "All Federal agencies whose actions may affect U.S. coral reef ecosystems should seek or secure implementation of measures necessary to reduce and mitigate coral reef ecosystem degradation and to restore damaged coral reefs."

Scientific perspective of coral reef destruction

Over the past decades, the decline of coral reefs have received attention from both Governments and Scientist. This session of the paper will outline some scientific works on the mass decline of coral reef and their environmental effect.

For thousands of years, people have coexisted with coral reef ecosystem by enjoying the products, functions, services, protection, and contribution to coastal culture delivered by these diverse communities (Mahfuzuddin, A. et. al.: 2005).

Notwithstanding, coral reef sites are reported to be at risk of damage arising from human-induced change. Talbot and Wilkinson (2001) have already reported that 11 per cent of all coral reefs have been totally destroyed beyond recovery, and that a further 16 per cent were destroyed in 1998 by climate-change-related coral bleaching. They also reported that, without effective management, another 30 per cent of the world's reefs would become seriously depleted in the next 20 to 40 years. Bryant et al. (1998) observed that, in 1998, 27 per cent (67,900 km²) of the world's reefs were at high risk of destruction.

Below shows the current status of coral reefs as assessed by the International Coral Reef Initiative;

1. They estimated in their report that, 20% of the world's coral reefs have been devastated;
2. The report foresees that 24% of the world's reefs are at risk of ruin as a result of human actions; and a further 26% are under a risk of ruin;
3. The report further indicates that, increasing human pressures such as; poor land management practices as a result of releasing more sediment, nutrients and other pollutants to the marine ecosystem, continues to affect the decline of coral reefs around the world
(*See table 2*);

Table 1 shows the 2004:19 edition of the Status of Coral Reefs around the World.

Table 1: Top 10 Emerging Threats.

Global Change Threats	<ul style="list-style-type: none">• Coral bleaching triggered by elevated sea surface temperatures due to global climate change;• Rising levels of CO₂• Diseases, Plagues and Invasive
Direct Human Pressures	<ul style="list-style-type: none">• Over-fishing;• Sediments from poor land use, deforestation, and dredging;• Nutrients and Chemical pollution• Development of coastal areas for urban, industrial, transport and tourism developments.
The Human Dimension (Governance, Awareness and Political Will)	<ul style="list-style-type: none">• Rising poverty, increasing populations, alienation from the land• Poor capacity for management and lack of resources• Lack of Political Will, and Oceans Governance

Source: International Coral Reef Initiative, 2004

Table 2: The Current Status of the World's Coral Reefs.

Region	Coral Reef Area km²¹	Effectively Lost Reefs (%)²	Reefs at Critical Stage (%)³	Reefs at Threatened Stage (%)⁴	Reefs at Low Threat level (%)⁵
Red Sea	17 640	4	4	10	82
The Gulfs	3800	70	15	12	3
Eastern Africa	6800	15	22	28	35
SW Indian Ocean	5270	9	24	39	29
South Asia	19 210	25	20	25	30
SE Asia	91 700	40	20	25	15
E & N Asia	5400	20	22	18	40
Australia, PNG	62 800	3	4	10	83
SW Pacific Islands	27 060	4	17	35	44
Polynesian Islands	6733	3	2	5	90
Micronesian Islands	12 700	8	7	15	70
Hawaiian Islands	1180	2	4	8	86
US Caribbean	3040	21	31	19	29
North Caribbean	9800	12	13	30	45
Central America	4630	14	24	22	40
Lesser Antilles	1920	13	31	22	34
S Tropical America	5120	13	40	17	30
TOTAL	284 803	19	15	20	45

Source: Wilkinson, C. (ed.), (1998:184)

Political economy approach

Going beyond the scientists' perspective on the decline of the coral reefs today, the political economist is wondering about the socio-economic value of the coral reef.

In this situation, the neo-classical economic approach will be relied on. The reason is that, the neo-classical economic approach recommends a simple solution: to "internalize" (to introduce into the market economy and trading economy) the externalities, in this case, services and functions provided by the coral reef ecosystem, in order for the environment to be analyzed according to the monetary evaluation methods (Griculas et Gondar: 1995; Dixon et al.: 1997).

It may sound unethical trying to give a monetary value to a natural environment that, by effect, has escaped the market economy. Well, from biodiversity perspective, coral reefs are amongst the richest environments of the planet. Coral reef ecosystem shelters roughly a third of the seas and oceans biodiversity (Mc Allister: 1991:14-18; Moberg et Folke: 1999:215-233), but it suffers increasingly serious anthropogenic aggressions which either causes the disappearance of surfaces occupied by this ecosystem, or causes a drop in productivity (Salvat: 1987:424; Belwood et al: 2004:827-833).

As a result of this, some local populace whose professional activities and daily life depend on coral reef exploitation suffers evidential social and economic disturbances such as; loss of jobs in the fishing industry and growing malnutrition caused by the loss of productivity of subsistence fishing. These disturbances stem from the economic circle and are measured in a monetary form: de facto, reefs can't escape the economic reality (David: 2007:44).

For a decade now, economists have been more and more involved on the environmental degree of this action and the two biggest international non-governmental agencies in the conservation field, IUCN and WWF, are now using their services (IUCN/WCA: 1998:52; Emerton: 1999:22; Cesar et al.: 2003:23; IUCN/TNC/World Bank: 2004:33), which in reality, is legitimating economy as a discipline enlightening environmental issues.

I presume the scientific world is doing little than I expect in this regard. The content of the message must be clear: coral reefs are not free space, without economic or social value. They play a role as any other ecosystem by providing functions: goods and services. Goods and services are the benefits that the population draw directly or indirectly from the functions of the ecosystem (Costanza et al.: 1997:253-260). Figure 1 identifies the factors that needs to be considered in the evaluation of the total economic value of coral reefs.

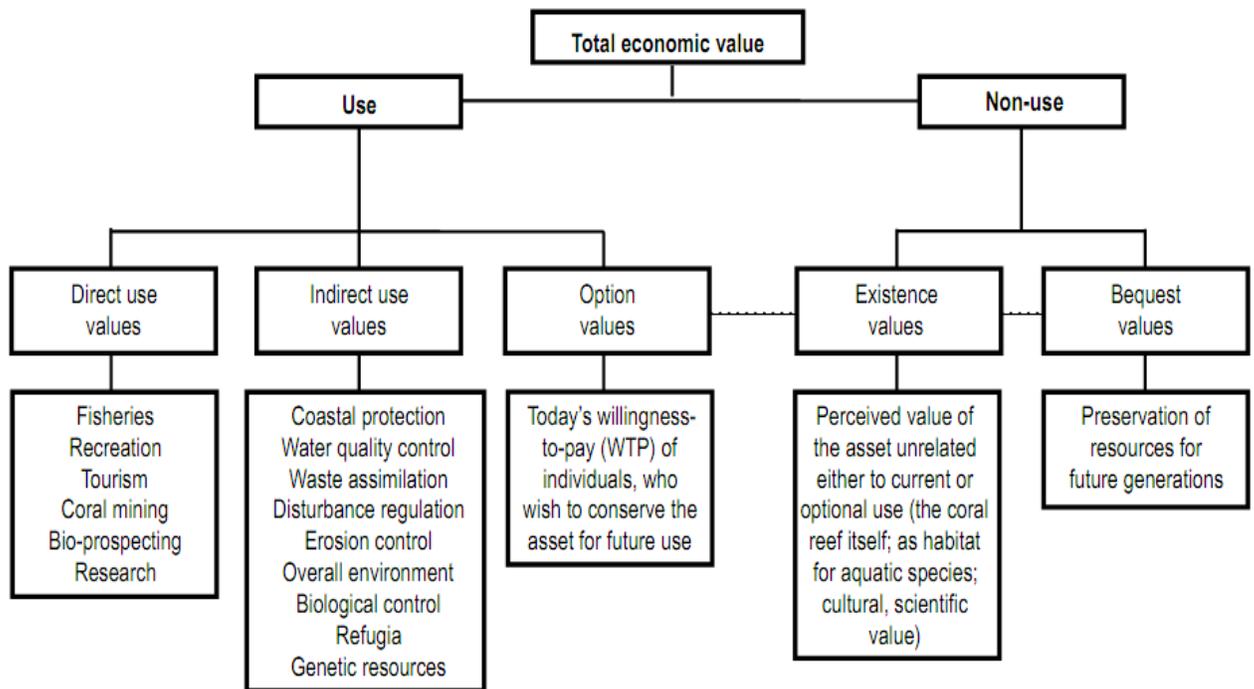


Figure 1. Total economic value of coral reefs (Adapted from Payoyo: 1994; Woodward and Wui 2001:257-270; and Costanza et al.: 1997:253-260)

By giving a monetary value to the reefs, the environment gets integrated in the economy field and the stakeholders get a message in a language they do understand, which leads to a change in attitude and decision (David: 2007:44).

Even though, Non-market values are a little more complicated to estimate, as they do not rely on objective indicators of value (Woodward and Wui: 2001:257-270). Yet, there must be an avenue to estimate the non-market values supported by coral reefs (Mahfuzuddin: 2005). Other economists like Comolet (1994) notes that: “natural goods get a value only when they start to become scarce and that it requires spending money to keep using them” (Comolet 1994: 258). Thus, the value of coral reefs remains “hidden” until they become so rare that a fee will be established to limit frequenting. The amount of those fees is not fixed but increases accordingly to the demand. A market enabling to assess the economic value of the reef put into use is thus being born (Mahfuzuddin: 2005).

Conclusion

Today, 10% of the coral reefs are irredeemably damaged worldwide, with 30% threatened on the short or medium run (Wilkinson: 1998:184). This is because, scientists have done little regarding their scientific argument on biodiversity and the ecological wealth of the natural environment. Therefore actions to recover coral reefs from destruction have proved futile. Giving a monetary value to coral reefs will automatically incorporate ecology into the economic field thereby speaking to stakeholders in a language they do understand.

Even though, neo-classical economy has been widely used as a principal economic valuation method for a natural environment, but it is not exclusive. Logic would want the estimate of the reefs monetary value to be based on the knowledge of the ecology and uses of coral reef. The studies in that field are still scarce and their approach focuses on ecological goods and services, therefore, only a multidisciplinary effort, associating marine biologists and socio-economists, will succeed. Considering reefs as both heritage and natural capital is a key step to curbing this global menace.

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