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Ecotourism and Economic Growth in the Galapagos: An Island Economy-wide Analysis

by

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Abstract

This paper raises questions about the compatibility of "ecotourism" and conservation in the unique environment of the Galapagos Islands. It updates a 1999 economy-wide analysis that predicted that increases in tourism would result in rapid economic as well as demographic growth on the islands. The following six years witnessed sharp growth in tourism; a restructuring of tourism around larger cruise ships and new, larger hotels; and rapid population growth. Our findings indicate that total income (that is, the gross domestic product) of the Galapagos increased by an estimated 78% between 1999 and 2005, placing Galapagos among the fastest growing economies in the world. Tourism continues to be far and away the major driver of economic growth; however, new injections of all sorts of spending, including by government, commercial fishing, and conservation agencies, have had a multiplier effect on income in the Galapagos economy, and as a result, on population growth, via uncontrolled immigration that is theoretically prohibited by the Special Law of the Galapagos to prevent ecological harm to the islands. Further, immigration has diminished the effect of economic growth on household income, creating political pressure to find even more economic development options for Galapagos residents, including commercial fishing. The linkage between economic growth, led by tourism or any other sector, and environmental protection of the Galapagos should be taken seriously when designing and implementing economic development and conservation programs.

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Introduction

The Galapagos archipelago's historical isolation created its scientific and economic value today. In the past two decades, the islands have become not only a laboratory for biological and ecological research but also an experiment in ecotourism, with potentially important ramifications for ecotourism policies worldwide. The *Ley Especial de Galapagos* (Special Law of the Galapagos), implemented in 1998, marked a shift towards local decision-making in the design and implementation of development policy on the islands. The findings presented below cast doubt on islanders' ability to balance the dual objectives of economic development and conservation under this new policy regime.

The World Conservation Union and the Ecotourism Society define eco-tourism as "responsible travel to natural areas that conserves the environment and sustains the well-being of local people" (Blangy and Wood, 1993). The goal of channeling economic benefits to the local population in order to create incentives for conservation is central to nearly all definitions of ecotourism and has been a focus of recent conservation policy in the Galapagos.

Prior to 1990, studies of tourism's influence in the Galapagos used partial approaches, based on surveys of tourists, which understated tourism's impacts. De Miras (1995) reported that only 7.6 percent of the average cost of trips to the Galapagos was spent on the islands (e.g., in hotels, restaurants, souvenir shops, etc.). The rest went to purchase tourist packages, pay for stays on cruise ships, and hire tour operators based outside the islands. Zador (1994) argued that more than 90 percent of the income generated by Galapagos tourism was absorbed directly by the two airlines serving the islands and by cruise ships based physically on the islands but owned by local operators or entities in mainland Ecuador. Both of these studies ignored the possibility that these entities may have economic linkages with the islands that shape island incomes. Examples of such linkages include the salaries of crew members whose families are based on the islands and the purchase of food from local fishermen and farmers to feed cruise-ship guests.

In contrast, Taylor et al. (2003) proposed a micro economy-wide approach, using data from surveys of tourists, businesses, and households. Social Accounting Matrix (SAM; see Taylor and Adelman, 1986) and small-economy general-equilibrium models (Taylor, et al., 2003) reveal complex market linkages that transmit the impacts of exogenous income injections (like tourist spending) through local economies. The study by Taylor, et al. (2003) demonstrates that indirect effects contribute significantly to the direct effects of tourist spending, resulting in significant multipliers of tourist expenditures in the local economy. For example, even though Galapagos tourists rarely purchase vegetables from farmers or fish from fishermen, a 10% increase in tourist spending (the addition of approximately 6,600 tourists in 1999) was predicted to result in increases of 3.9% and 4.7%, respectively, in incomes of agricultural and fishing households on the islands, as well as an increase in population, via migration, equivalent to 5.7% of the existing island workforce.

The period from 1999 through 2005 witnessed far-reaching changes in the Galapagos economy, including a sharp increase in the number of visitors to the islands (from 66,071 in 1999 to 108,600 in 2005; Figure 1); rapid demographic growth, through migration (the population of the archipelago increased from 15,311 in 1998 to 24,000 in 2005; see Figure 2); a restructuring of the tourist sector in favor of larger cruise ships (Table 1); and growth in the fishing sector, as reflected in an increase in the number of fishermen (from 795 to 993) and a doubling of the fishing fleet (to 446 vessels).[1]

The present research updates the 1999 study to obtain estimates of total economic growth and its components between 1999 y el 2005. The results reveal a rapidly growing economy driven by tourism, which was a magnate for new migrants from mainland Ecuador. The high elasticity of immigration, predicted by the 1999 model, limited the effect of total income growth on welfare as measured by per-capita income. As a result, despite major changes in environmental laws, the Galapagos Islands find themselves on a treadmill of income growth and immigration, resulting in new demographic pressure, an increased risk of exotic species introduction into the islands' fragile ecosystem, and unmanageable pressure on the island's infrastructure for potable water, sewage, and waste disposal that are essential for the environmental protection of the islands.

Background and Methodology

No fewer than one third of the species of flora and fauna found on the Galapagos are unique to the islands. The creation and maintenance of the islands' fragile ecosystems depend on isolation; however, this imperative for isolation stands in contrast to the islands' economic development model:

> "While the ecosystems are fragile because they depend on physical isolation, human societies multiply contacts, linkages, and exchanges...The contradiction only grows" (Ospina, 2006, p. 12).[2]

The Islands are a focus of international conservation efforts, but in the 1990s they were the site of intense political conflicts between local residents, on one side, and conservation organizations and the central government, on the other. An alliance among the Ecuadoran government based in Quito, conservationists, and tourism enterprises resulted in the *Plan Global de Manejo Turístico y Conservación de Galapagos* (the General Plan for Tourism Management and Conservation in the Galapagos) in 1991 (Presidencia de la Republica, 1991). It became a catalyst for a local backlash against efforts by "outsiders" to impose a development and conservation model on the islands.

[1] The Galapagos Islands, unlike the rest of Ecuador, have below-replacement fertility. Demographic growth is attributable to new migration, principally from Ecuador's west coast (Taylor and Yúnez-Naude, 1999). Sources for fishing population are SPNG (1999, 2005) and CAPTURGAL (2005). Information on vessels is from the Galapagos Unidad de Recursos Marinos, SPNG (1998, 2005).

[2] Original translation from Spanish.

The result was the enactment of a compromise *Ley Especial* (Special Law) for Galapagos, creating significant local autonomy in managing economic development and conservation. This has made the Galapagos a laboratory for assessing the potential effectiveness of local-based economic development and conservation.

Drivers of Economic Growth in the Galapagos Islands

There are four key drivers of economic growth in the Galapagos. The importance of each one of these increased between 1999 and 2005. They include:

Tourism. A total of 108,600 people visited the Galapagos Islands in 2005, compared with 66,071 in 1999 (Figure 2). The majority of these tourists, 76,000, were foreign. Increases in tourism directly stimulate growth in the tourism sector, which includes hotels, restaurants and bars, day-tour operations, cruise ships, boutiques and souvenir shops, dive shops, and other businesses that sell goods and services to tourists. Each of these businesses purchases inputs, pays salaries, and generates profits, which in turn enter the household economies of the three islands. Off-island purchases by businesses and to a smaller extent households are a leakage, shifting growth effects of Galapagos tourism to mainland Ecuador. Nevertheless, island households spend most of their income on the islands, creating additional rounds of growth in the Galapagos economy.

The organization of the tourist sector in the Galapagos is evolving towards a greater emphasis on tourist packages purchased abroad and oriented towards cruise ships and recreational activities, particularly diving. In addition, returning to the islands in 2005 one immediately notes the construction of newer and more luxurious hotels and a bipolar restructuring of the cruise ship sector around large ships (of 100 or more berths) and yachts, with 8 to 16 berths, including luxury ships. With few exceptions, the most notable of which was a short-term visit by the cruise ship Discovery last year, all cruise ships are based on the islands. However, as the Galapagos cruise ship sector becomes more and more capitalized, an increasing share of berths are owned by outside investors. As a result, a larger share of profits in this sector left the islands in 2005 than in 1999.[3]

Fishing. Due to the archipelago's rich marine environment, fishing has been an important activity since the time when the Galapagos Islands were first settled. Concerns that fishing constitutes a risk to conservation in the Galapagos, together with what appears to be a growing population dependent on fishing (including many of the islands' poorest families) has created an atmosphere of discord between fishermen, on one side, and tourism and conservation interests, on the other. At the start of our study period in 1999, extraction of sea cucumbers was illegal but contraband harvesting of this species was common. Highly publicized conflicts erupted over demands by fishermen to open up the sea cucumber fishery and access to protected areas.[4] This activity had been legalized

[3] Review of SPNG and CAPTURGAL records and discussions with cruise ship operators during fall 2005.

[4] Conflicts over conservation policies in the Galapagos made headlines after fishermen, angry over a quota on the harvest of sea cucumbers, slit the throats of nine giant tortoises on Santa Cruz Island. In 1999, fishermen stormed the Baltra Island airport and

by 2005, and data on the quantity of sea cucumbers extracted in the Galapagos are available for 2005 (but not 1999). However, sea cucumber production has since decreased sharply due to diminishing natural populations, and controversy over Galapagos fishing has shifted to contraband shark fin harvesting for Asian markets. In the midst of these debates, it is easy to lose sight of the fact that a major driver of fish production on the islands is endogenous: income growth creates a thriving demand for fish, and fishermen expand their activities to meet this demand. Island households spend an average of 3 to 5 percent of their income on fish.[5]

Conservation and Research. Scientific research and interest in conserving the islands' unique ecosystem have stimulated another increasingly important activity on the islands: conservation and research. The work of scientists and conservation agencies is devoted to protecting the Galapagos environment, but it also injects millions of dollars each year into the Galapagos economy and is an increasingly important source of income growth. Most of this spending is done by the Galapagos National Park Service (GNPS) and foreign non-governmental organizations, whose presence is readily noted by visitors on the islands. Like tourism and fishing, expenditures on conservation and research have a multiplier effect on Galapagos incomes.

Government. As population and tourism expand, so do public services funded, in part, by tourist entrance fees and economic growth on the islands. Government services are diverse, including public security, education, public works, water and sanitation, the management of the Galapagos National Park, and other activities. Multiplier effects of fiscal spending on income and employment are well known in the macroeconomics literature, dating back to the seminal work of Keynes (1936). Keynesian multipliers operate on a local as well as on a national level.

All of these income sources—tourism, fishing, conservation and research, and government—are structural parts of the Galapagos economic system, stimulating the rest of the island economy. Because of this, it is critical to adopt a systems approach when studying economic change and its components on the islands.

Promoting Ecotourism in an Open Demographic System

From an environmental point of view, the critical imperative facing the Galapagos, like other fragile ecosystems, is to limit competition between humans and other species. This includes creating economic incentives for the local population to conserve the resource base. The prevailing view among conservationists and researchers is that channeling the benefits of eco-tourism to local populations is a *sina qua non* for creating conservation incentives. However, in an open demographic system confronted

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kept the minister of the environment's plane grounded on the tarmac, shot at researchers and National Park guards, and took tortoises hostage. In 2000, fishermen stormed park offices, and looters stole computers and smashed windows at the Charles Darwin Research Station, center of environmental research on the islands. An excellent discussion of these conflicts appears in Ospina (2006); also see Wyss (2000).

[5] Calculations based on original household survey data from 1999; see Taylor and Yúnez-Naude (1999).

by a high elasticity of immigration, local income growth also creates incentives for demographic growth. Per-capita income in Galapagos depends on the migration response to total income growth. If the migration response is sufficiently high, economic benefits from tourism may accrue to newcomers instead of to the local population, and the conservation incentives argument may break down. In fact, a high migration response may not only limit the flow of benefits to islanders but also reinforce an inequitable income distribution which, in turn, may create disincentives for those at the bottom of the distribution to conserve.

A simple example illustrates this point. Imagine a hypothetical island economy with a population of 12 and a highly unequal income distribution such that two rich individuals have 5 units of income each, while the remaining 10 have one unit each. Total income, then, is 20 units, per-capita income is 1.67 (but the median is 1.0), and the Gini coefficient of income inequality is 0.33.

Now suppose that an increase in tourism doubles income on the island to 40, but new immigration to the island also doubles the number of low-income households (those with one unit of income), from 10 to 20. It is easy to show that per-capita income increases slightly (by 11.5%, to 1.82), the median is unchanged at 1.0, and the Gini coefficient increases by 22.7%, to 0.41. Income from tourism is channeled to the island population, but the island population changes. Note that the increase in tourist income is a Pareto improvement for the island in a strict economic sense: the incomes of two households increase while the rest are unchanged. From the point of view of the country of which the island is part, the change is also positive in a Pareto sense, assuming that individuals would not migrate to the island unless the 1 unit of income they obtained by doing so were higher than the income they would have obtained at their places of origin. However, with income in most households unchanged, it is difficult to argue that channeling the economic benefits from tourism to the local population increases conservation incentives in this example. In fact, if relative deprivation negatively affects conservation incentives, it may even do the opposite.[6]

Research Methodology

How to estimate the effect of tourism on income in the Galapagos, given the complex market linkages on the islands, was the focus of the 1999 study presented in Taylor, et al. (2003). It began by constructing three social accounting matrices (SAMs), one for each of the populated islands of the archipelago (Santa Cruz, San Cristóbal and Isabela). These were then nested within a larger SAM for the entire archipelago. The archipelago SAM was used to estimate tourist multipliers (Taylor and Yúnez-Naude, 1999) and as the data input for a Galapagos Islands computable general equilibrium model (Taylor, et al., 2003). The models were designed to capture both direct and indirect effects of tourism on the island economies.

[6] Using the index of relative deprivation proposed by Stark and Yitzhaki (1988) and Stark and Taylor (1999) in the example above total relative deprivation on the island would increase by 36.8%.

Injections of income into the economic system of the Galapagos by tourists (or other actors) directly raise the incomes of those who sell goods and services to tourists (cruise ships, hotels, restaurants, etc.). These direct impacts are easily estimated from surveys of tourist expenditures.[7] The SAM is a double-entry accounting system adhering to the identity that total expenditures equal total income for every actor in the economy. Because of this, in a SAM-based model, increases in income (e.g., of cruise ships and hotels) result in increased expenditures (e.g., on crew salaries, hotel staff, and other goods and services that are inputs into these businesses). This, in turn, raises the incomes and thus the expenditures of other agents in the economy (e.g., the households of crew and hotel staff). Off-island purchases of goods or services represent a leakage to the economy. However, if an important share of income is spent locally (as is the case in Galapagos), tourism can produce an income multiplier affecting agents throughout the economy, even those who do not sell to tourists. Taylor and Yúnez-Naude found that a $100 increase in spending by international tourists increased the gross island product by $28. This impact is nearly four times that estimated by De Miras (1995). The difference is due to the income multiplier that results from linkages among production, factors and households on the islands.[8]

In general, income multipliers are good for economic development in low-income countries, particularly if they reach the poor. However, concerns arise when increased economic activity threatens the resource base, for example by raising the demand for environmental inputs and triggering demographic growth through migration. Understanding the direct and indirect environmental ramifications of tourism requires linking socio-economic and ecological models, which is beyond the scope of the present research. The first step, is to quantify the determinants of economic growth on the islands. It is the focus of this paper.

Updating the Matrix

The method we use to estimate economic growth and its determinants in the Galapagos is based on updating the 1999 SAM to 2005. First, new data from 2005 were substituted into the 1999 SAM. The new data include:

1) The 2005 budget for the *Parque Nacional de Galapagos* (Galapagos National Park, or PNG). The PNG budget increased from $4.5 to $7.6

[7] Previous attempts to quantify the impacts of tourism in the Galapagos, based only on tourist surveys, capture only these direct impacts..

[8] Tourist multipliers tend to be smaller than multipliers from other types of injections, including government and conservation spending and fishing, because as noted by De Miras (1995), a large share of tourist expenditures does not enter the island economy directly. If one considers only the part of tourist expenditures that enters the islands (e.g., netting out international and domestic airfares, travel agency commissions, tourist spending en route to and from the islands, etc.), the island multiplier would be considerably higher and more comparable to multipliers of other types of income injections.

million between 1999 and 2005 (Table 2). This information was used to update total PNG spending in the SAM.

2) Budgets of municipal and provincial governments were used to update total spending by these government agencies (Table 2).

3) A survey of 187 fishermen carried out in 2005 by Henderson, Zurita and Hardner provided information to update technology coefficients for fishing activities in the SAM.

4) Data on total fish sales off-island, by species, were used to update Galapagos fish exports to 2005 levels. Data on fish production to satisfy demand on the islands in 2005 are not available, but the rebalancing of the SAM produces an estimate of this production. The data show a notable shift in off-island sales between 1999 and 2005 (see Table 3). Lobster sales decreased sharply (from $1.18 to $0.52 million), reflecting both over-exploitation of this species and an opening up of sea cucumber harvesting. In 2005, sea cucumber sales totaled just under $1.4 million, or 53% of total legal off-island fish sales. The principal illegal fishing activity in 2005 was the harvesting of shark fins. Limited information on this activity is available for 2005. We use this information, below, to explore the sensitivity of our findings to assumptions about the magnitude of clandestine fishing activities.

5) A new survey of 223 tourists in the Galapagos, which we carried out between October 2005 and February 2006, was used to update tourist budget shares in the SAM. A comparison of tourist spending patterns between 1999 and 2005 appears in Table 4. It reveals a shift in spending by both foreign and domestic tourists in favor of island-based activities. This almost certainly reflects strict quotas on cruise-ship berths but not on island hotel construction. The Table also shows a shift in foreign tourist expenditures in favor of tour packages purchased abroad (the internet has had a profound effect on Galapagos tourism in this regard). Between 1999 and 2005, the part of the average tourist budget spent on packages abroad increased 65%, from $1,271 to $2,098. There is also an increase in average total expenditures by foreign tourists, from $3,677 to $4,180.

6) A collection of 2005 data on the total number of tourists visiting the Galapagos (from the PNG) was used, together with total spending per tourist obtained from the tourist survey, to update total tourist expenditures. Between 1999 and 2005, estimated total expenditures by domestic and foreign tourists in the Galapagos increased by 92.9% and 61.7%, respectively.

7) New data on foreign and local ownership of cruise ship berths were used to adjust the share of profits leaving the islands from this sector.

8) The United Nations Development Program (PNUD) compiled a list of expenditures on conservation and research in the Galapagos from 1998 to 2005. It catalogued 63 projects funded by multiple private, multinational,

and bilateral donors and international and local NGOs totaling $64.9 million. 73% of this amount was channeled through government agencies on the islands. Thus, to avoid double counting, we conservatively estimate non-governmental (primarily NGO) spending on conservation and research at $17.5 million over this 7-year period, or $2.5 million per year. The true level of conservation spending is likely to be higher than this.[9]

The basic idea underlying our updating methodology is relatively simple. The 1999 SAM represents an economy in equilibrium in the sense that, for every production activity, factor, household group, and exogenous account, the sum of incomes from all sources (the row total in the SAM) is equal to the sum of expenditures (the corresponding column total). For example, fishing generates incomes and entails input costs (including salaries). The sum of input costs plus profits equals the total value of fish production. Similarly, for every household group, total expenditures equal total income.

Updating the SAM to reflect 2005 tourist expenditures, off-island fish sales, and government and conservation spending results in new injections of income into the economic system represented by the SAM. In the case of tourism, fishing, and government activities, it also entails updating SAM coefficients (e.g., tourist budget shares, fishing input-output coefficients, on- and off-island profit shares for tour operators, and the distribution of government expenditures across activities). This results in disequilibrium in the sense that total expenditures and incomes are no longer equal for every endogenous actor in the economy (production activities, factors, and households). For example, the expansion of tourism increases tourist-sector incomes, salaries, and household incomes. The actors must adjust their expenditures accordingly, and this in turn increases incomes and expenditures elsewhere in the system. In a similar fashion, new off-island sales (i.e., of sea cucumbers) increase fishing-household incomes, resulting in an imbalance between income and expenditures for these households. Fishing-household budget shares from the 1999 SAMs were used to allocate this new income across expenditure categories.

A RAS algorithm was used to rebalance the SAM in order to regain consistency; all sectors of the economy adjust to restore the equilibrium.[10] By comparing the new (2005) SAM to the old (1999) one, we obtain estimates of total income growth as well as its composition between 1999 and 2005.

The approach described above was the only feasible one given a lack of new survey data on businesses and households. We believe that on-going collection of socioeconomic as well as biological data should be a high priority in the Galapagos as at other eco-tourist destinations. In the mean time, a methodological contribution of the present study is how to use limited secondary data and small-scale targeted surveys to update small-economy SAMs and obtain estimates of economic growth and its components.

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[9] Conversation with Scott Henderson, Director of Conservation International in the Galapagos.

[10] Use of the RAS procedure is appropriate given that we start out with a consistent SAM for 1999. For a useful discussion of the RAS procedure see Robinson, Cattaneo and El-Said (2001).

Nevertheless, one should keep in mind the limitations of this approach when interpreting the results presented below. The major limitation is the lack of new data on household expenditure patterns and on island businesses. Because of this, it is necessary to assume that household budget shares did not change significantly over the 6-year period—that is, each group of households in the SAMs spent a given increase in income the same way in 2005 as it would have in 1999. We also have to assume that each production sector—e.g., agriculture, commerce, etc.—allocated its gross earnings in the same proportions in 2005 as in 1999. This is tantamount to assuming that production technologies did not change significantly between these two years. The exception is for fishing, inasmuch as new data on inputs were available from the Henderson, et al., survey to adjust input-output coefficients. Although these assumptions are restrictive, we see no alternative until new household and business surveys are conducted on the islands. Sensitivity tests of our findings with respect to changes in budget-share and input-output parameters are discussed below.

The accounts in the Galapagos SAMs are summarized in Appendix 1. The endogenous accounts include, for each of the three islands, 19 production activities, four factors, and five household groups. They also include six shared accounts. Exogenous accounts include government (federal, regional, and municipal), conservation agencies, and savings. Each island has three rest-of-world accounts: the rest of Galapagos (which is endogenous, because trade between islands depends on island incomes and expenditures), the rest of Ecuador, and the rest of the world outside Ecuador (these last two accounts are exogenous). When a foreign tourist enters the Galapagos economy, the cost of her trip is represented in the SAM as an injection from the rest of the world outside Ecuador into the tourist account (netting out international airfare, commissions, etc., that do not enter Ecuador). The foreign tourist column, in turn, allocates the tourist's expenditures across tourism activities.

Economic Growth and its Composition in the Galapagos, 1999-2005

Our key findings are reported in Table 5. The numbers in the table represent the estimated total economy-wide impacts of the exogenous changes and updated expenditure shares for 2005 that were introduced into the island SAMs.

Total and Per-Capita Income Growth

The results indicate that the Galapagos Islands had one of the fastest growing economies in the world between 1999 and 2005. Our conservative estimates, based on changes in tourism, fishing, and government and conservation expenditures, indicate that total income in the archipelago increased 78%, to $73.2 million, over this 6-year period, for an average annual growth rate of 9.6%.

Despite this striking increase in total income, per-capita income increased at a rate of only 1.8% annually. The relatively small contribution of rapid income growth to average living standards in the Galapagos was due to a highly elastic migration response. As illustrated in Figure 2, the number of island inhabitants rose 60% over this period. Taylor, et al (2003) modeled the link between island income growth and migration. Their

findings, based on a CGE model, imply an elasticity of migration with respect to total income in excess of 1.0. The findings presented here suggest that the migration elasticity remained high during the 1999-2005 period: population increased by 60%, while income rose by 78%. If the Galapagos had had the same total income growth without migration, income per capita in 2005 would have been $4,783 instead of $2,989. This hypothetical scenario is not realistic, however, because population growth on the islands contributed not only to labor supply but also to the demand for goods and services. In real terms, that is, adjusting for inflation, it is likely that per-capita income on the islands decreased.[11]

Components of Economic Expansion in the Galapagos

Tourism is the main motor driving economic growth in the Galapagos. Increases of 92.9% and 61.6% in expenditures by international and domestic tourists, respectively, explain 68% of the increase in total income in the archipelago between 1999 and 2005. Besides contributing US$62.9 million to income on the islands, Galapagos tourism generated more than US$113.9 million for the rest of Ecuador, via the island demand for goods and services from the mainland.[12]

The three other drivers of growth in the islands were government, conservation, and fishing. Twenty percent of income growth is attributable to increases in government spending. Another 8% is explained by spending on conservation, primarily by foreign non-government organizations (NGOs) and bilateral and multilateral aid programs. Just under 4% can be attributed to sales of fish (principally sea cucumbers) off-island. Between 1999 and 2005, a sharp increase in sales of sea cucumbers easily offset the effects of a decrease in lobster sales.

Both total income and its components vary among the three principal islands of Santa Cruz, San Cristóbal and Isabela. Table 6 presents a breakdown of value added or gross island product. The numbers in the upper panel are estimates of total value added on each island. The lower panel presents the percentage contribution of each sector. These are conventional value-added shares, which give a static snapshot of the structure of the three islands' economies. They do not reflect linkages that are captured by our income multipliers, e.g., the effect of tourism on value-added in other sectors. The island of Santa Cruz dominates the archipelago in terms of production, with a gross island product (GIP) of $41 million, or $3,107 per capita in 2005. GIPs are lower on the other two islands. The tourism sector directly accounts for more than 27% of total value added on Santa Cruz but only 11.9% on Isabela, where the principal income source is fishing.

[11] The U.S. consumer price index rose 17% during this period. Reliable information on inflation in the Galapagos is not available. The Charles Darwin Foundation, centered on the island of Santa Cruz, noted that *"dollarization...is still causing important adjustments in prices in Ecuador. According to INEC (National Institute of Statistics and the Census), the official reported inflation for 2002 is 9.36% (http://www.inec.gov.ec), however the rate in Galapagos is even higher*."

[12] This figure represents total sales by the mainland to the islands. It does not reflect multiplier effects of these sales in the rest of Ecuador.

Other production, including commerce, is the largest value added component on the other two islands.

Despite a restructuring of the cruise ship and hotel sectors, the multiplier effect of tourist expenditures on economic growth and incomes did not change appreciably between 1999 and 2005. The majority of foreign tourists purchased tour packages abroad. Nevertheless, demand linkages within the Galapagos economy continued to generate a multiplier effect on income and employment on the islands. Even when tourists do not spend money in island businesses, tourist expenditures have a far-reaching effect on the local economy. Taking linkages into account, each foreign tourist generated $1,150 in new income for island residents in 2005. Calculations using the updated SAM indicate that total income in the Galapagos would have been $21.8 million, or 29%, lower in 2005 if the number of foreign and domestic tourists had not changed from their 1999 levels. Considering that immigration effectively broke the link between total and per-capita income growth, it is not unreasonable to conclude that every three additional tourists per year brought one new immigrant to the islands during this period.[13]

A Comparison of Income Multipliers

The impacts of tourist expenditures, fish sales, conservation spending, and government on income growth depend on the size of changes in these income injections as well as on the multipliers these injections create within the island economy. Income multipliers resulting from a $1,000 increase in each of these exogenous income sources are presented in Table 7.[14]

A $1,000 increase in foreign tourist expenditures raises island income by $218. The international tourist multiplier is the lowest of all multipliers in the table, because foreign tourists spend most of their budgets off the islands, limiting their direct impact. Nevertheless, it is evident that the indirect effects of tourism exceed the direct effects. Despite the fact that only 8 cents out of every foreign tourist dollar are spent on the islands (Table 4), total income increases by 21.8 cents. The dominant effect of this type of tourism on economic growth, despite its relatively low multiplier, is due to the large magnitude of foreign tourist expenditures compared with other income sources.

Although the total expenditure per domestic tourist is smaller than that of foreign tourists, the effect of a $1,000 increase in domestic tourist spending is larger, because domestic tourists spend a larger percentage of their budgets on the island. Each $1,000 of domestic tourist expenditure is associated with a $429 increase in island total income.

[13] This because the income generated by three additional tourists, 3*$1,150 = $3,450, exceeds the 2005 average per-capita income on the islands of $2,989, which, as indicated earlier, grew only modestly despite substantial growth in total income between 1999 and 2005.

[14] By "multiplier" we mean the total effect of a given income injection, once all linkages are taken into account. Because a large share of tourist, government, and conservation expenditures do not enter the island economy directly, the multipliers of these income injections are less than 1; that is, a $1 increase in these injections is associated with a less-than-$1 increase in total income. A multiplier matrix typically contains some values that are less than 1 and others that are greater than 1. In the Galapagos, multipliers of direct income transfers to households, like fishing income, are always greater than 1.

Nevertheless, because total spending by domestic tourists is relatively small, its effect on economic growth is also small compared with international tourism.

Tourism multipliers (though not the overall contributions of tourism to income growth) are higher if one nets out airfares, travel agent commissions, and spending en route to and from the islands. Although these represent a major share of the cost of visiting the Galapagos, they are incurred entirely outside the island economy. Netting out these items makes the tourism multiplier more comparable to multipliers produced by other types of expenditures that do not have such large off-island components. The estimated effect of $1,000 of tourist expenditures net of these costs is $467 for international tourism and $654 for domestic tourism.

Conservation expenditures and off-island fish sales produce larger income multipliers. A $1,000 increase in spending by research and conservation agencies raises island income by $803. The largest multiplier is for fishing. This is because, when fish sales increase, income in fishing households increases by nearly the same amount (minus the cost of variable inputs including fuel and labor). This, in turn, stimulates growth elsewhere in the economic system, via the demand linkages that emanate from fishing households. A $1,000 increase in fish sales off-island raises total income in the Galapagos by $1,010 if the fisherman lives on Santa Cruz, $1,156 if on San Cristóbol, and $1,282 if on the more remote island of Isabela. Despite the size of these multipliers, off-island fish sales account for only 4% of total income growth in the Galapagos, because the increase in gross value of these sales is small compared with other income sources, especially tourism. Significant international attention has focused on off-island sales of sea cucumbers and (illicit sales) of shark fins. Nevertheless, much of the growth in fishing is driven by the endogenous demand for fish on the islands, which in turn depends on income generated by tourism and other activities.

A $1,000 increase in spending by municipal and provincial governments raises income on the islands by $243. Government spending (not including the National Park Service), particularly on public works projects, has significant leakages associated with the off-island purchase of building materials, consulting services, etc. Leakages limit the multiplier effects of spending on the islands. Nevertheless, significant growth in public spending made government second only to tourism in terms of its contribution to Galapagos income growth.

The largest source of public spending on research and conservation is by the Galapagos National Park Service (GNPS). It entails smaller leakages than other types of government spending and has a large salary component (including for NPS guides). As a result, a $1,000 increase in GNPS spending contributes $688 to total income on the islands.

Sensitivity Analysis

The lack of data from new surveys of households and businesses (except for fishing) raises some concerns about the estimates presented above. The most important concerns have to do with possible changes in spending patterns by households and in production technologies by Galapagos businesses between 1999 and 2005. Sensitivity

analysis with respect to these parameters finds marginal changes in estimated multipliers and growth estimates, but in no case do our findings change in a meaningful way. The results presented above are robust to all but unrealistically large changes in SAM coefficients.

A second limitation of this study is the lack of reliable information on illegal fishing, currently dominated by the harvest and sale of shark fins for Asian markets. Henderson, et al. (2005), based on their 2005 survey of fishermen, concluded that 34% of Galapagos fishermen participated in shark finning, earning an average of $4,000 annually from this activity. The reliability of these numbers is likely to be tainted by fishermen's reluctance to reveal their participation in this illicit activity. We tested the sensitivity of our conclusions presented above to alternative assumptions about the intensity of illegal fishing. The most extreme scenario assumes that every one of the 993 fishermen in the Galapagos sold $4,000 of shark fins in 2005. Under this obviously unrealistic scenario, total income on the islands increases by $38 million between 1999 and 2005, instead of the $32.1 million reported in Table 5, and off-island sales of fish explain 17% of total income growth on the islands, compared with 53% for tourism. In short, under any reasonable assumptions concerning contraband marine extraction, tourism remains far and away the most important driver of economic growth in the archipelago.

A final concern is related to the increasing use of temporary workers from the mainland in some tourist activities. Salaries paid to temporary workers whose families live (and spend their income) on the mainland represent a leakage rather than a stimulus to growth on the islands. That is, the use of temporary workers shifts part of the island multiplier to the mainland. Based on a survey of cruise ship tour operators, Hardner and Gomez (2004) found that temporary workers who did not live in the islands represented as much as 40% of the skilled workforce (secondary schooling or higher) and 25% of the less-skilled workforce of tourist operations in 2005. Lacking surveys of temporary workers, it is not known how much of this group's income is spent on the islands or on board the cruise ships.

We explored the sensitivity of our findings to the presence of temporary workers by removing 40% of all salaries paid to skilled workers and 25% paid to unskilled workers by the cruise ship sector. The tourism multipliers decrease, but the conclusions presented above do not change. Netting out all salaries paid to temporary workers in the cruise ship sector, the estimated increase in Galapagos total income between 1999 and 2005 drops from $32.1 million to $31.1 million. The change in per-capita income is $266 instead of $303, and the average annual growth rate of per-capita income is 1.6% instead of 1.8%.

Conclusions

The key findings of this research include the following:

1) The Galapagos Islands experienced an economic boom between 1999 and 2005. Total income increased by an estimated 78%, or 9.6% annually, placing the Galapagos among the fastest growing economies in the world.[15]

2) This rapid income growth did not significantly improve living standards on the islands. Per-capita income increased by only 1.8% annually, due to migration-induced population growth. In real terms, income per capita almost certainly declined.

3) Tourism continued to be the principal contributor to economic growth in the Galapagos, explaining three fourths of the total increase in gross island product over this period. The majority of the effect of tourism is indirect, the result of complex linkages within the island economy.

4) Fish sales off island, a focus of international and local attention, explained only a small part of total economic growth in the Galapagos between 1999 and 2005. Nevertheless, economic growth on the islands created a rising demand for fish and stimulated fish production to meet local demand. Fishing is a source of income for an important group of households on the islands, including a disproportionate number of poor islanders.

5) Independent of the source or its magnitude, the injection of new money into the Galapagos economic system stimulates economic growth. Given a high migration elasticity, every increase of $3,000 in total income on the islands resulted in the addition of approximately one additional person to the island population, via migration from mainland Ecuador, between 1999 and 2005.

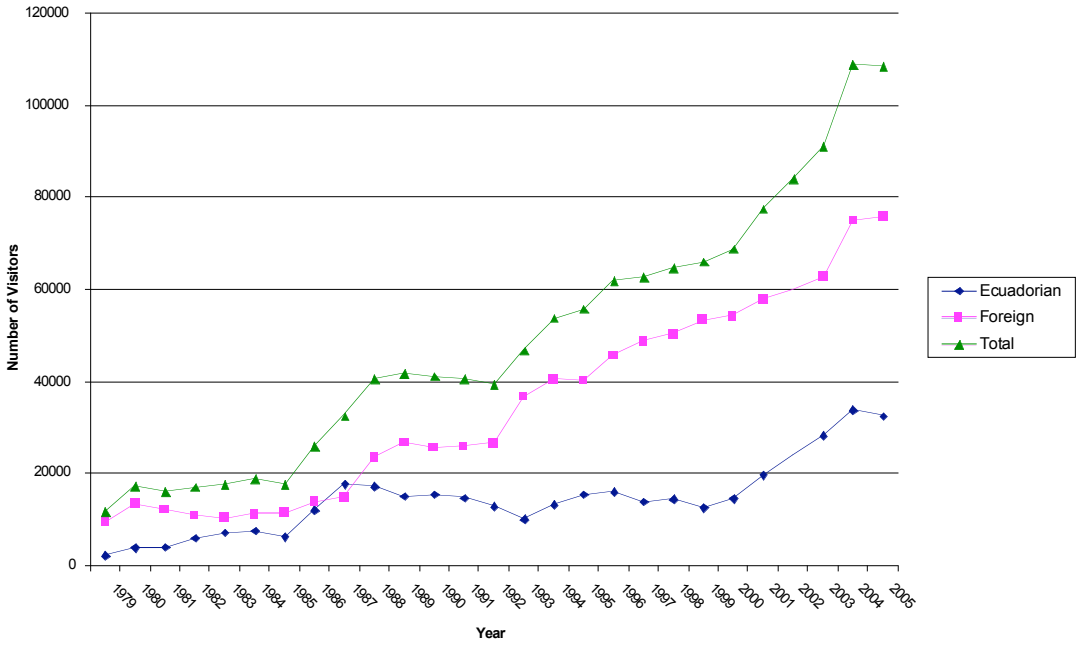
Our analysis of income growth in the Galapagos Islands produces results that are strikingly similar to those of the hypothetical example of tourism and immigration presented in Part 2 of this paper. In both cases total income and population nearly double while per-capita income increases by only 11%. Lacking new household survey data, distributional impacts of recent island development cannot be ascertained. However, anecdotal and ethnographic evidence suggest that they, too, are increasing, as in our example.

These findings raise questions concerning the compatibility of local income growth with conservation goals in the Galapagos and suggest that government and donor policies for the Galapagos (and other sensitive conservation areas) should be re-evaluated. An economy-wide perspective is critical when thinking about the likely consequences of new injections of income into the economies of fragile ecological zones. In the Galapagos, and most likely in other open demographic systems, any injection of new income stimulates demographic as well as economic growth. Efforts to restrict population growth have failed to overcome the powerful economic stimulus for

[15] Total income in China grew between 7% and 10% annually during this period.

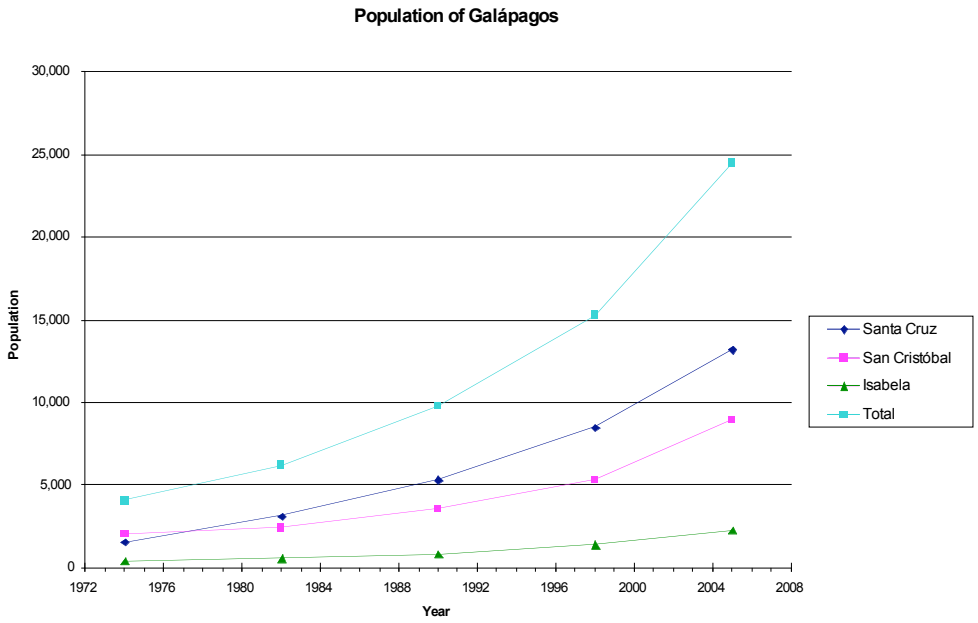
immigration from the mainland, where incomes are far lower than on the islands. Immigration, in turn, has diminished the effect of economic growth on household income, creating political pressure to find even more economic development options for Galapagos residents, including commercial fishing. Our analysis highlights the importance of gathering socio-economic as well as biological data on the islands, as well as new research initiatives linking economic with environmental outcomes.

Figure 1. Trends in the Number of Visitors to the Galapagos, 1979 - 2005



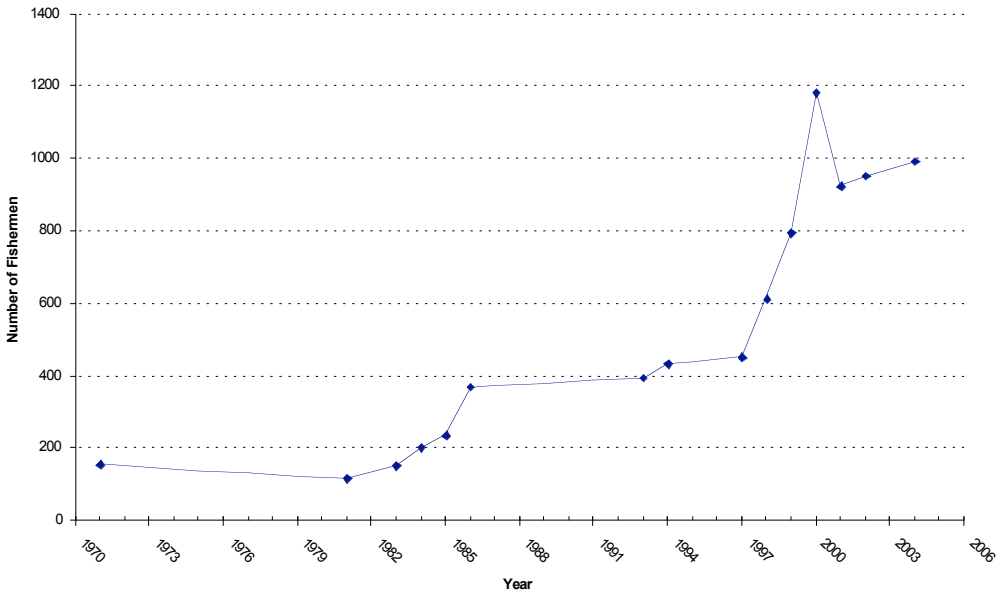
Source: PNG, Sector de Turismo

Figure 2. Demographic growth in the Galapagos, 1974 – 2005



Sources: INEC, Censo de Población, 1974, 1982, 1990, 1998. INGALA, 2005.

Figure 3. Growth of the Galapagos Fishing Population, 1970 - 2005



Sources: Informe Galapagos 2001, data from SPNG and FCD 1999, Martínez 2004 (UGAFIP)

Table 1. Distribution of Berths on Cruise Ships, By Island, Class and Owner

Island	Number of Vessels		Berths		% with Owner on Mainland Ecuador		% with Foreign Owner	
	1998	2005	1998	2005	1998	2005	1998	2005
SANTA CRUZ								
Luxury	19	26	632	870	66.8	54.2	6.3	17.3
Standard	14	15	194	208	43.6	41.3	0	6.7
Economy	10	12	108	139	25	20.8	0	0
Day Tours	4	8	68	156	0	18.7	0	0
Total	47	61	1002	1373	45.3	39.8	2.6	0
SAN CRISTÓBAL								
Luxury	22	23	498	386	86	91.7	2.2	2.1
Standard	5	6	68	80	72	76.7	0	3.3
Economy	7	4	89	52	24.3	45	0	0
Day Tours	0	1	0	16	0	0	0	0
Total	34	34	655	534	71.2	80.9	1.5	2.1
GALAPAGOS								
Luxury	41	49	1130	1256	77.1	71.8	4.1	10.2
Standard	19	21	262	288	51	51.4	0	5.7
Economy	17	16	197	191	24.7	26.9	0	0
Day Tours	4	9	68	172	0	16.7	0	0
Total	81	94	1657	1897	56.2	54.5	2.1	6.5

Sources: Data from SPNG 1999, 2005, CAPTURGAL 2005

Table 2. Public Expenditures in Galapagos, 2004-05

Agency	Amount
PNG*	$7,600,000
Municipal Governments	
Santa Cruz	$3,000,000
San Cristóbal	$1,500,000
Isabela	$600,000
Ministry of Tourism	$84,386
Agriculture and Fishing	$19,771
Total	$12,804,157

*Includes $380,000 to the Island Quarantine System
Source: Budgets obtained from listed agencies.

Table 3. Galapagos Fish Sales Off Island, 1998 and 2005*

Island	1998			
	Lobster	Sea Cucumber	Dry-Salted	Total
Santa Cruz	$1,181,314	NA	NA	$1,181,314
San Cristóbal	$313,706	NA	NA	$313,706
Isabela	$10,464	NA	NA	$10,464
Total	$1,505,484	NA	$5,868	$1,505,484

Island	2005			
	Lobster	Sea Cucumber	Dry-Salted	Total
Santa Cruz	$523,500	$783,764	NA	$1,307,264
San Cristóbal	$240,280	$334,360	NA	$574,640
Isabela	$282,690	$272,559	NA	$555,249
Total	$1,046,470	$1,390,683	$496,000	$2,437,153

*Sea cucumber sales are not available for 1998, when extraction was illegal. Sales of dried-salted fish are available for Galapagos but not for each island. There is no reliable information on sales of shark fins or other illicit products. Fresh fish are produced for local consumption, not for export; thus, it is not included in this table.
Source: Murillo 2005, Programa de Monitoreo Pesquero FCD and PNG

Table 4. Breakdown of Average Expenditures Per Galapagos Visitor, 1998 and 2005

Average Expenditures (in US dollars)	Foreign				Ecuadoran			
	1998		2005		1998		2005	
	$	%	$	%	$	%	$	%
Total Expenditures on the Islands	**242.56**	6.60%	**355.24**	8.50%	**199.28**	21.60%	**240.89**	35.00%
On Santa Cruz†	132.97	3.60%	217.22	5.20%	175.5	19.00%	180.84	26.30%
On San Cristóbal†	12.32	0.30%	21.93	0.50%	4.77	0.50%	40.26	5.80%
On Isabela†	1.26	0.00%	15.02	0.40%	5.41	0.60%	9.75	1.40%
Donations and Support for Park Maintenance and Conservation	2.82	0.10%	13.62	0.30%	1.96	0.20%	0	0.00%
Park Entrance Fees	93.19	2.50%	87.45	2.10%	11.66	1.30%	10.04	1.50%
Off-Island Purchases								
Total Discretionary Spending on Cruise Ships	**87.41**	2.40%	**61.47**	1.50%	**40.97**	4.40%	**21.17**	3.10%
Purchases on Board*	36.52	1.00%			29.38	3.20%		
Tips to Guides and Crew	50.89	1.40%	61.67	1.50%	11.59	1.30%	21.17	3.10%
Total of Tourist Packages Purchased in Ecuador	**220.64**	6.00%	**229.72**	5.50%	**381.95**	41.40%	**251.65**	36.60%
Cruise Ship Packages Purchased on Mainland	195.7	5.30%	171.1	4.10%	333.55	36.10%	105.2	15.30%
Galapagos (land) Portion of Ecuador Tourist Packages	4.62	0.10%	8.01	0.20%	25.15	2.70%	84.45	12.30%
Mainland Tour Packages	5.47	0.10%	2.82	0.10%	0	0.00%	0	0.00%

Airfare Portion	14.85	0.40%	16.92	0.40%	23.26	2.50%	62	9.00%
International Portion**			25.19	0.60%				
International Air Fares**			5.68	0.10%				
Expenditures, Rest of Ecuador	**678.33**	18.40%	**316.49**	7.60%	**43.48**	4.70%	**33.75**	4.90%
Direct Purchase of Domestic Air Travel	**255.77**	7.00%	**129.81**	3.10%	**202.07**	21.90%	**140.9**	20.50%
International Air Travel	**921.04**	25.10%	**988.66**	23.70%	**40.69**	4.40%	**0**	0.00%
Total of Tourist Packages Purchased Abroad	**1270.9**	34.60%	**2098.2**	50.20%	**14.89**	1.60%	**0**	0.00%
Cruise Ship Packages	740.56	20.10%	1280.5	30.60%	14.89	1.60%	0	0.00%
Park Entrance Fees***			6.27	0.20%				
Domestic Air Fare	47.25	1.30%	220.44	5.30%	0	0.00%	0	0.00%
Galapagos (land) Portion of Foreign Tourist Packages	5.21	0.10%	69.92	1.70%	0	0.00%	0	0.00%
Mainland Tour Portion	379.35	10.30%	332.7	8.00%	0	0.00%	0	0.00%
International Portion	98.55	2.70%	188.32	4.50%	0	0.00%	0	0.00%
TOTAL EXPENDITURES (Sum of Expenditures in Bold)	**3676.7**	**100%**	**4179.6**	**100%**	**923.33**	**100%**	**688.36**	**100%**

Source: Original surveys of Galapagos visitors, 1998 and 2005.
†Trips on cruise ships, hotels, meals, souvenirs, etc., purchased on the islands.
* Not deteailed in 2005 survey. ** Not detailed in 1998 survey. *** The PNG entrance fee was not included in tourist packages in 1998.

Table 5. Income Growth and its Decomposition in the Galapagos, 1999 to 2005

Growth Component	Change in Gross Island Product (GIP), 1999-2005 (US$)	Percentage-point Change Attributable to Component	Percentage Contribution of Component to Total Change
Total	$32,099,726	78.04%	100.00%
Tourism	$21,769,234	67.82%	67.82%
Off-Island Fish Sales	$1,231,134	3.84%	3.84%
Conservation and Research	$2,545,096	7.93%	7.93%
Government	$6,554,263	20.42%	20.42%
Total GIP, 2005 (millions of dollars)			$73.23
Income Per Capita (dollars)			$2,989
Change in GIP Per Capita, 1999-2005			$302.61
Percentage Change, 1999-2005			11.26%
Annual Growth in Per-Capita Income			1.78%

Table 6. Galapagos Island Value Added (GIP) and Its Composition, 1999 and 2005

Income or Sector	Santa Cruz	San Cristóbal	Isabela	Galapagos
Income				
1999				
Total	$23,954,981	$6,507,049	$2,061,003	$32,523,034
2005				
Total	$41,068,643	$11,258,826	$3,564,343	$55,891,812
Sector Contributions to Total Value Added in 2005				
Agriculture	12.14%	17.94%	6.02%	12.08%
Fishing	15.25%	12.80%	55.42%	19.80%
Tourism	27.23%	8.73%	11.88%	23.20%
Others	45.38%	60.53%	26.69%	44.92%
Total	100.00%	100.00%	100.00%	100.00%

Table 7. Estimated Effect of a $1,000 Income Injection into the Galapagos Economy, By Source

Origin of $1,000	Impact on total income in the Galapagos
Tourism	
Foreign	$218
Domestic	$429
Conservation	$803
National Parks	$688
Government	$243
Fishing	
Santa Cruz	$1,010
San Cristobal	$1,156
Isabella	$1,282

References

Charles Darwin Foundation. 2002. Annual Report. Quito: Charles Darwin Foundation (http://www.darwinfoundation.org/downloads/ar2002eng.pdf).

Fundación Natura. 2002. Informe Galapagos 2001-2002. Quito: Fundación Natura y World Wildlife Fund.

Hardner, J y P. Gomez. 2004. Incorporación de la Mano de Obra del Sector Pesquero Artesenal en las Actividades Turísticas de Galapagos. Quito, Ecuador: Banco Internacional de Desarrollo (BID)

Henderson, Scott, Patricia Zurita and Jared Hardner. 2005. Conservation Incentive Agreements in the Galapagos Marine Reserve: Feasibility Study for the Reduction of Fishing Pressure. Washington DC: USAID.

Keynes, John M. 1936. The General Theory of Employment, Interest and Money. Cambridge: Macmillan Cambridge University Press.

Martínez I., Camilo. 2004. "Estudio Sobre la Sostenibilidad de la Pesca Blanca Vinculada a los Centros de Acopio de Galapagos." Programa de Manejo Ambiental de las Islas Galapagos. UGAFIP. Banco Interamericano de Desarrollo.

Murillo, Juan Carlos. 2002. "Indicadores socio-económicos de la pesca." En Reserva Marina de Galapagos: Linea Base de la Biodiversidad. E. Danulat y G.J. Edgar, eds. Puerto Ayora, Ecuador: Fundación Charles Darwin y Servicio Parque Nacional Galapagos.

Ospina, Pablo P. 2006. Galapagos Naturaleza y Sociedad: Actores Sociales y Conflictos Ambientales. Quito: Corporación Editora Nacional and Universidad Andina Simon Bolivar.

Presidencia de la República del Ecuador. 1992. Plan de Manejo de la Reserva de Recursos Marinos de Galápagos. Quito: Presidencia de la República, Comisión Permanente para las Islas Galápagos.

Robinson, Sherman, Andrea Cattaneo and Moataz El-Said. 2001. "Updating and Estimating a Socia Accounting Matrix Using Cross Entropy Methods." Economic Systems Research 13(1):47-64.

Stark, O. and J. E. Taylor. 1991. "Migration Incentives, Migration Types: The Role of Relative Deprivation." The Economic Journal 101:1163-78.

Stark, O. and S. Yitzhaki. 1988. "Labor Migration as a Response to Relative Deprivation." Journal of Population Economics 1(1):37-70.

Taylor, J. Edward, Antonio Yúnez-Naude, George Dyer, Sergio Ardila y Micki Stewart. 2003. "The Economics of "Eco-Tourism:" A Galapagos Island Economy-wide Perspective." Economic Development and Cultural Change 51(4):977-97 (July).

Taylor, J.Edward y Antonio Yúnez-Naude. 1999. Estudio Económico de Galapagos, Informe Final. Washington, DC: Banco Interamericano de Desarrollo (BID).

Wyss, Jim. 2000. Turmoil in Paradise. Galapagos fishermen revolt against strict quota on lobster. San Francisco Chronicle, December 10 (http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2000/12/10/MN42716.DTL).

Appendix. Accounts in Galapagos Economy-wide Model

Activities	*Factors*	*Households*	*Shared Accounts*
ENDOGENOUS ACCOUNTS			
Agriculture and Livestock	Family Factors	Agricultural and Livestock	Locally Based Cruise Ships
Fishing (Lobster, Cod, White Fish, Deep-sea)	Skilled Wage Labor	Fishing	Mainland Based Cruise
Fishing Cooperatives	Unskilled Wage Labor	Commercial	Cruise Ships
Household Resource Extraction (Hunting,	Physical Capital	Salaried, Private Sector	Domestic Tourists
Forestry)	Land	Salaried, Public Sector	Foreign Tourists
Water Collection and Processing			Tourist Services, Ecuador
Other Production Activities			Foreign Tourist Services
Restaurants and Bars			
Hotels			
Commerce			
Local Tourist Services (Equipment Rental and			
Day Tours, Travel Agencies)			
Transport			
Other Services			

EXOGENOUS ACCOUNTS				
Government	*Private Environmental*	*Savings*	*Rest of Ecuador*	*Rest of World*
Environmental	Conservation and	Physical Capital	Rest of Ecuador	Air Transport (Foreign)
National Park	Research Agencies	Human Capital	Air Transport (Ecuador)	Commercial Flows
INGALA			Other Tourist	
(Desalinized			Expenditures	
Water, Other			Commercial Flows	
Services)				
Regional				
Municipal (Water,				
Other Services)				
Provincial				
National				