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Galapagos as a laboratory for sustainability: Lessons from the International Workshop on Sustainability of Islands in a Globalized World, Santa Cruz Island, Galapagos, 22-26 March 2010

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"As never before in history, common destiny beckons us to seek a new beginning..."

(The Earth Charter, 2000)

When the Charles Darwin Foundation asked me to facilitate a workshop on sustainability, I believed that the workshop would produce new knowledge and contributions to help understand the situation in Galapagos and to help initiate a different process towards sustainability. The presentations by international experts on the sustainability of other islands in the world demonstrated new concepts and examples to better understand what is happening in Galapagos. Presentations by local professionals on various economic, social, biophysical, institutional, and environmental themes related to Galapagos brought us up to date on the current situation in the archipelago. Workgroups, which involved all of the workshop participants, generated new and different ways to understand where the balance between nature and humans is headed in such a fragile and unique place in the world. This article synthesizes the presentations and results of the workgroups, which were focused on systematically understanding the social, cultural, natural, and economic components of Galapagos. It ends with recommendations and suggested next steps to begin a new chapter on how to achieve sustainability in the Galapagos Islands.

The vulnerability of islands and insular geodiversity

International fora, such as the United Nations Earth Summit in Rio in 1992, the 1994 Barbados Program of Action for the Sustainable Development of Small Island Developing States, and the United Nations Conference on Small Islands in Mauritius in 2005, have slowly advanced the implementation of actions to avoid social, cultural, and ecological catastrophes in islands around the world. Unfortunately, in the more than 15 years since Barbados 1994, efforts to research and discover the best options for achieving an equilibrium for insular systems worldwide have been weak and have not received sufficient resources (López, 2010).

The lives of human populations that live and depend on resources available on islands or in their surrounding waters are often negatively affected by demands for the same resources by large, external consumers. The geographic opening of the islands (see Grenier, *The geographic opening of Galapagos*, this volume) to aggressive external markets has resulted in ongoing changes in the dynamics of the insular system (McKee and Tisdell, 1990). Uncontrolled development, made possible by new forms of communication and transportation, has caused irreversible damage to the unique biological, cultural, social, and geographic diversity of many islands around the world, such as Hawaii and the Azores.

Biological, cultural, social, and geologic characteristics combine with geographical characteristics to form what has recently been called "geodiversity." The original physical characteristics of a place, determined by its geology and geography, along with its biological, anthropological, sociological, and cultural characteristics unite to generate a special identity in a specific geographic space. Geodiversity can be defined as the measure of the geographic variations or the "footprint" made by humans on Earth's habitats ("Geo") at the local and regional levels (Grenier, 2010). Insular geodiversity describes the evolution of islands from their physical formation to their colonization and use by humans, and identifies which factors affect their sustainability. According to Jost (2010), geodiversity requires that natural resource management is carried out within a complex geographical system with subsystems of landscape (natural space), territory (space used by stakeholders), and social factors (perceptions).

The Galapagos Archipelago provides an excellent opportunity to study the dynamics of geodiversity. Such studies will contribute to sustainability in Galapagos and other islands. The unique and fragile natural characteristics of Galapagos, combined with its recent colonization and its consumer-oriented economic model, have generated considerable scientific interest to better understand the dynamics of sustainability in this context.

Evolution of cultural identities and geographic isolation

The cultures on the islands of New Guinea, Vanuatu, Cook, Marquesas, Hawaii, and other islands of the Pacific are the product of hundreds or thousands of years of interactions of communities (as opposed to individuals) with near and distant cultures via migration processes. Various factors, such as environmental and climatic conditions, or being located in areas prone to earthquakes, cyclones, etc., have forced groups of humans to search for other geographic locations to live and share. The migration of communities is structured with a long-term vision, where the interests in resources and territory are shared among all. In contrast, individual migration is focused on personal interests, is less organized, and generally reflects a short-term vision and little community organization (Waddell, 2010). These fundamental differences help explain where the term "immigrant" ends and the term "indigenous" begins.

Waddell (2010) also illustrates that all islands or insular systems confront immigration influences known as "transportation of landscapes," "roots and resources," and impacts due to "geographic isolation." "Transportation of landscapes" refers to the behavior that immigrants bring with them from their place of origin. In Galapagos it is easy to observe behavior and cultures brought from mainland Ecuador and other places. "Roots and resources" refers to inherited practices and cultural roots and how they are applied to the available resources in the insular context. In Galapagos, a variety of roots and inherited practices are brought from foreign landscapes to the fragile insular environment.

Human communities in the Pacific have survived in part due to their contact with other islands, where survival knowledge was shared and learned among cultures, rather than due to complete geographic isolation. In the case of Galapagos, geographic isolation has been applied more to the natural environment, particularly in terms of the evolution of species. We



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now know that geographic isolation has important social and economic implications that are intimately related to the natural aspects of the islands. Geographic isolation is the opposite of geographic opening, a situation that also impacts the geodiversity of the islands in a globalized world.

Geographic opening and globalization

Telecommunications and efficient and rapid transportation are having an unprecedented affect on the sustainability of islands (Jacob *et al.*, 2004). These forces bring with them new ways of thinking about accumulation of material wealth that are geared more towards individual stability than collective stability. They transform the geodiversity of islands with established indigenous cultures in ways that drive these cultures to unsustainability and their eventual demise. This phenomenon, in which insular attributes are subjugated by those of nearby continents, is known as “continentalization of islands” (Grenier, 2010). As in the case of geographic isolation, continentalization can have negative impacts for cultures, making it necessary to find an intermediate point between the extremes of insular isolation (geographic isolation), on the one hand, and excessive opening to other regions (geographic opening), on the other (Waddell, 2010).

To achieve this balance and the sustainability of islands in a globalized world, various elements must be considered. Lessons learned from other islands (Seychelles, Azores, Canary Islands, New Caledonia, Fiji, Chausey, Porquerolles, Glenan, New Zealand, and San Andrés, among others) were shared during the workshop and can be applied to the case of

Galapagos. Today the islands of the world share similar problems, which could be resolved or reduced with similar methods and actions, adapted to each island’s realities (Cruz, 2010).

Kerr (2010) believes that controlled migratory flows accompanied by knowledge transfer and sharing are important to help respond to deficits in labor and knowledge and thus strengthen insular economies. Such mechanisms are being used successfully in San Andrés, Colombia (Bent, 2010), to import needed “brain power” and knowledge.

Another concept connected to sustainability is economic wealth related to shared resources, or the case of the “tragedy of the commons,” where multiple individuals, acting independently and solely and rationally consulting their own self-interest, will ultimately deplete a shared limited resource even when it is clear that it is not in anyone’s long-term interest for this to happen. When an economy is based on the natural characteristics of common property, as in the case of Galapagos, it is imperative that the “tragedy of the commons” be avoided. In Galapagos the shared resource is the national park. While everyone knows that controlled visits are key to ensuring that the resource endures, many people take visitors into the park without authorization, knowing that others will do the same. The same applies to the Galapagos Marine Reserve (GMR) where unauthorized fishermen extract resources until their combined actions result in negative repercussions on the resource.

From 1999 to 2005, economic growth in Galapagos exceeded 9% per year (Ospina, 2010). There is concern about how long this growth will continue and what its consequences might be. Kerr (2010) argues that the economic system should

involve rewards and incentives for private and local government investments in natural and social capital, as well as penalties for those who act outside established norms. This type of system is supported by Lorenz and Simkins (2010) who also recommend creating taxes that will provide disincentives for new investments and promote incentives for Galapagos residents to invest in continental Ecuador. This could help to de-accelerate the economic growth mentioned by Ospina. In addition, alternative energy applications should be viewed as potentially profitable investment opportunities that are environmentally friendly and compatible with the insular reality (Sawyer, 2010). Sawyer proposes the generation of electricity from organic waste generated by the population as a source of income and clean and inexpensive electricity.

Kerr shared examples of areas that could be improved in Galapagos, such as: local control and regulations; communication and active participation; institutional capacity building; social, economic, and natural dynamics; economic monitoring and research; and conflict resolution capacity. Given that transportation is one of the key factors determining the isolation and/or geographic opening of the islands, Brigand (2010) considers it critical to clearly establish how the geographic space of the islands will be used by various stakeholders from a social point of view. This will help to establish a new geography of the archipelago based on human movements and use of both marine and terrestrial areas (Marrou, 2010). Expansion of visits to protected areas in places such as Galapagos requires an integrated monitoring system that is technically and scientifically sound and involves local participation. Brigand (2010) considers it important to balance economic development and the preservation of natural areas through the use of management tools that measure and monitor the flow of tourists and the impacts on both marine and terrestrial areas.

Elements that influence sustainability must be viewed as interdependent components of a system. David (2010) recommends a model based on a triangle comprised of economic, political, and social environments, where the terrestrial and marine areas depend on the dynamics of these environments. In other words, one cannot tackle any element within the system without considering the others. To understand the dynamics of sustainability and be able to make the best decisions at the local and regional levels, it is necessary to generate scientifically-based

information (natural, social, economic) with the participation of local communities (Huchery and Izurieta, 2010). The use of and access to this information must be transparent and contribute to understanding the different parts of the system, and should be accompanied by capacity building and both formal and informal education. This information can be used to generate a series of possible scenarios that will allow the visualization of possible future outcomes prior to making final decisions. However, none of these tools, including the integrated observation and monitoring system (Brigand, 2010), will be established without a serious commitment of authorities and the local community to develop a long-term shared vision for Galapagos.

What can we say and learn about the sustainability of islands that can be applied to Galapagos?

- Galapagos does not possess its own cultural identity. As a result of the nature of the population (many recently arrived residents from different parts of Ecuador), behavior often reflects strong elements of the continental landscape. The evolution of Galapagos culture is recent and has not yet resulted in homogeneous behavior. In many ways, access to new means of communication (Internet, satellite television, mobile phones, etc.) makes it difficult to form a unique sense of insular culture. Even so, these tools can be used creatively by the local population, non-governmental organizations, and local and national governments to foster a cultural identity based on respect for natural capital as the foundation for the development of social capital.
- While striving for a Galapagos culture, flexibility should be used to allow for the arrival of new knowledge and skills through a system that will allow the migration of individuals with the potential to enrich and strengthen the local knowledge base and improve competition and initiative. Equally important is a stronger emphasis on improving both formal and informal education and avoiding loss of local social capital.
- Galapagos and other insular systems are impacted by economic globalization, as external market pressures tend to dominate local economic activity. This situation is not difficult to

change. It requires clear lines of action based on strategic local participation to establish which economic opportunities to offer and where to drive the market. It is important to define strategies to regulate markets that utilize natural resources (national park and marine reserve), services (transportation, hotels, restaurants, communications, health care, naturalist guides, etc.), and products (food, souvenirs, construction material, etc.).

- Galapagos has more than two decades of experience with participatory processes, through the Participatory Management Board of the Galapagos Marine Reserve and regional planning activities. This experience makes it possible to begin to generate and organize information related to the social, economic, and natural components of the Galapagos system. The process of generating and organizing information must be participatory from the start in order to foster a sense of ownership of knowledge. Knowledge is power and this power must be based in the local community to achieve decision-making that is consistent with a shared vision for the future of Galapagos.

Next steps toward sustainability

The workgroups and plenary sessions recommended the development of a participatory process with local buy-in to construct a model to understand Galapagos as a "system." This system should give equal weight to socio-cultural, economic, and natural components. While the process could take a number of years to complete, it will lead to the identification of and agreement on common objectives for Galapagos and will generate a long-term national policy regarding what Ecuador wants from and for Galapagos that is not dependent upon the party in power.

The workshop identified three projects that will catalyze a move toward sustainability.

Island Identity Project (education): Education has been identified as the principal means to promote an insular identity that will use the protection of the natural capital as a starting point for developing human capital. Achieving a change in the mindset, attitudes, and sense of responsibility for Galapagos sustainability among the local population requires understanding the "landscape diversity" brought from the conti-

nent to Galapagos by its current inhabitants. An initial workshop will be held to promote a clear and structured process, with clear goals and objectives, to work toward a unique insular identity for Galapagos.

Project for improving and changing the insular economic system: Many variables have been identified that impact economic flows to, from, and within the islands. It is necessary to analyze all of the information available on the current economic system of Galapagos in order to determine if additional information is needed prior to holding a series of participatory workshops with local stakeholders to formulate viable economic scenarios, which include the concept of economic incentives and disincentives.

Knowledge management project to systematize and provide access to information to support decision-making: The systematization of all aspects of knowledge related to the social, economic, and natural components of "sustainable systems" is increasingly important, as is access to this knowledge by the local community, organizations, and institutions. This is a cross-cutting initiative that will impact other projects in areas such as education, economics, etc. The project must be carried out in a way that promotes participation and a sense of ownership of the information generated through a series of workshops on various aspects of sustainability. This project should work to connect the social, economic, and natural components of the Galapagos system, foster an understanding and sense of ownership of these concepts, and ensure better decision-making based on solid information.

Conclusions

The islands of the world confront common challenges of accelerated globalization. Their survival depends on how their inhabitants act when confronted with these pressures and the extent to which they do not compromise the natural integrity of the islands in which they live. But the responsibility for sustainability falls not only on those who live in the islands, but also on the rest of the world. Local and international declarations, agreements, laws, and regulations are not sufficient if we do not assume individual and collective responsibility for how we behave toward what remains of our planet. The Earth Charter (2000) invites us to reflect and change our thinking and behavior in ways that will allow us to live in harmony with all that surrounds us. International pro-island organizations,

such as the Alliance of Small Island States (AOSIS), the Islands Initiative of the International Union for Conservation of Nature (IUCN), and fora such as the International Workshop on the Sustainability of Islands, hosted by the Charles Darwin Foundation, should be viewed as instruments that will generate tangible changes in behavior in insular regions such as Galapagos. The generation of knowledge through scientific research and citizen participation, the organization of and access to this information, and the consolidation of a unique insular identity, will result in a more promising future for Galapagos.

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