



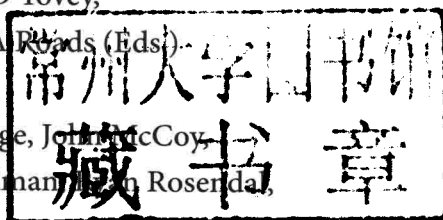
Ecosystem Science and Applications

# **The River of Life**

## **Sustainable Practices of Native Americans and Indigenous Peoples**

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# Preface

Sustainability is a concept that really registered on the consciousness of global societies in the late 1980s [1]. This word defines the need for society to live within the constraints of the land's capacity to deliver the fossil and natural resources that society consumes. Since volumes of materials have been written on "sustainability" by a multitude of authors, and all with different views, one can ask the logical question: "Why has a robust road map to implement 'sustainable practices' not evolved from all this knowledge?" Do we need another book on this topic? We argue that the answer to this question is a resounding **Yes, Yes, Yes**. But such a book should not repeat and summarize what has already been so eloquently authored.

Our belief is that sustainability practices need to include the diversity of nature practices and cultural norms that are passed down inter-generationally by native peoples. When global communities industrialize, they lose their cultural practices and inter-generational knowledge that retains their connections to nature. We contend for industrializing countries to be "real" sustainable practitioners, they need to re-establish their cultural links to nature. They should not completely transform themselves to look, speak and write like a "global citizen" who is computer and technology savvy but has no local culture linked to nature. An industrial country citizen is a person who has joined the **melting pot** to become a generic citizen of the world, e.g., someone who dresses the same way, eats the same foods, lives in the same style housing, owns a cell phone with the latest technology, etc. A global citizen suffers from a "nature deficit" syndrome, lacks knowledge of the impacts of their land-use activities on nature and nature is either desired for its economic benefits or for its ecosystem services.

The western world citizen is decoupled from nature and uses their engineering ingenuity to harvest resources from nature during times of plenty and scarcity. Technology allows western societies to push nature beyond its thresholds and for people to live comfortably under climate-controlled conditions. Scarcity is less of a problem for society to deal with. Society is less worried about making competitive and difficult choices since natural resources or their substitutes are abundant and do not limit economic development. Inter-generational knowledge is not needed since human engineering can always design a machine or produce a chemical to make life easier for people.

The western world life is becoming more complicated and difficult to live today. Some of the technologies have social and environmental impacts that society is unable to avoid. These unintended environmental and social consequences were not on societies radar screen when the wonders of new technology were initially introduced. Now the industrialized citizen is vulnerable to land-use and climate change introduced by some of these technologies. Today, society cannot move elsewhere to avoid the impacts of these technologies. Furthermore, taking resources from someone else during periods of scarcity does not work anymore.

Today, resource scarcity and environmental degradation is on the western worlds radar screen. Now an industrialized world citizen has to collect and consume resources during both nature's boom and bust cycles. A toolkit dependent only on technology solutions and economic models does not work when resource abundance is cyclic. Fortunately for the western world, native people are adapted to nature's boom and bust cycles. Native people also use a holistic approach to simultaneously make environmental, social and economic decisions. They adapt to and respect nature's cycles of resource abundance and scarcity (see section 10). They have much to teach the western world.

Humanizing sustainable practices are not going to be easy for the western world citizen. The need to "ensure a balance between economic development, social development and environmental protections as interdependent and mutually reinforcing pillars of sustainable development" requires each person to become a holistic thinker and planner [2]. Even though the debates and discussions are occurring on sustainable practices, the western world is still at the conceptual stage to humanize sustainability practices.

The western world has mostly developed a multitude of robust economic models to make economic trade-offs [1]. But the story cannot end here. Economic assessments appear to provide clear options for decision-makers but inevitably someone gains from selling resources while someone else loses when these transactions occur. This is not an equitable use of resources and, when economics dictate decision-making, nature is generally ignored in the process. It is not uncommon for decision-making to be riddled with conflicts and debates. This situation increases the possibility that valid opposing viewpoints are not heard. Instead, decisions are made using selective data sources, i.e., decision-making by special interest groups.

Special interest groups are effective at using economic data in quantitative models to support their views. For example, costs and benefits are routinely calculated as part of economic models. It appears that all the options are sufficiently vetted by the experts conducting these assessments because mathematics makes economic tools credible. This does not address the problem that mathematical decision models are limited to comparing three different variables at one time [3]. This means that someone has to decide which variables are included in these analyses and therefore what data are selected for input into these models.



When economic models are the dominant tool used to assess sustainable practices, it is not uncommon for people living in developing countries (particularly indigenous peoples) to receive fewer benefits. This situation can occur even when these people are the suppliers of resources to the industrialized countries. The logical assumption would be that people who own the resources would receive more benefits than those societies that distribute or consume resources. This rarely happens since the western world economic models are structured to benefit industrialized- and technology-based societies.

The International Forum on Globalization (IFG) claims that globalization is not merely a question of marginalizing indigenous peoples but is a multi-pronged attack on the very foundation of their existence and livelihoods [4]. Indigenous people mainly bear the brunt of the costs (low compensation and degrading environments) when nature is harvested for economic gain. The environmental and social repercussions are felt more strongly by the resource-supplier countries. These countries retain fewer viable options when their lands are over-exploited for resources since they still depend upon these same lands for their sustenance and survival. Resource scarcity becomes even a greater problem if the health of the lands decreases following over-exploitation.

Scarcity of resources is not a new issue for society to deal with. It was debated more than one hundred years ago. Then western societies predicted resource scarcity was going to cause the collapse of the global population and economies. However, this gloom and doom did not happen. Human ingenuity and technological developments increased food production yields from the same piece of land. Technological developments allowed societies to increase resource supplies beyond the land's capacity to grow it naturally; e.g., fossil fuel-based fertilizers and herbicides allowed crop yields to increase beyond the natural productive capacity of each land and the limits of each soil and climate. Western societies also used resources more efficiently. This meant that a larger population could be fed and the predicted gloom and doom cycles became a thing of the past.

Scarcity of resources is not just a problem of the past. It will reoccur to impact societies when poor trade-off decisions are made. In the past, technological advancements did not consider the societal and environmental externalities of implementing a new technology. The technology is not bad but how it is used can become bad for the environment and society. A common source of negative externalities is over-exploitation of nature's resource capital or enhancing a land's productive capacity using technology that decreases the land's resilience. There may be a point where technology is less able to compensate for the loss of lands resilience. We are not saying that we need to avoid technology but it needs to be implemented in a manner that does not reduce environmental and societal resilience.

Both the traditional and western world consider technology to be an important and necessary tool for improving society's livelihood and therefore enhancing

human survival. The tribes were, and are, readily adopting new technologies from bows to rifles, to computers, cell phones, etc. But the ethics of how and why tribal members use each technology is still constant and relatively unchanged. Tribes do not view technology as being “evil”; but how one uses it can be “good” or “bad”. This contrasts the western world thoughts on technology where it is either considered good or bad.

Unfortunately ensuring a balanced distribution of benefits and costs during economic development is hampered by the necessity of making trade-offs among competitive choices. Since scarcity of resources is real, making trade-offs is difficult. Competitive demands for resources appear to marginalize parts of society even when they own or live on the land where the resources are collected [5, 6]. If industrialized societies today continue their current approaches to resource over-exploitation, they will only accelerate the rate at which indigenous peoples have the opportunities of their livelihoods impaired. Collapse is a realistic endpoint for some groups as resource scarcity rears its ugly head. We need to consider a different approach when making resource decisions. We contend that the local to regional cultures and traditions of Native Americans, as well as global indigenous communities, can provide the road map to help refine tools and practices needed to become a sustainable practitioner (see sections 5–8).

Today, scarcity is not a choice and technology by itself will not give us a better life. Climate change has hung a large dark cloud over making sustainable decisions [2, 7] and will further exacerbate resource scarcity for some. This again points out differences in western societies versus tribal and/or indigenous societies perspectives on nature. Most tribal and indigenous societies are more dependent upon their lands for sustenance and thus more directly sensitive to disturbances such as climate change. Hence, most indigenous communities are not waiting for these changes to happen but are planning for a future that includes the impacts of climate change. They cannot afford to wait for climate change impacts to occur and then figure out how to survive in a new environment. They are dependent upon healthy rivers and lands to provide subsistence and cultural resources. These groups also have fewer options when the lands and rivers are not healthy. They are already experiencing the impacts of record floods which make each community more vulnerable to climate change (e.g.,// [nwifc.org](http://nwifc.org); <http://cifor.org>). Climate change impacts the social and environmental resilience of communities who have few options to survive when their land’s ability to deliver resources decreases.

Resource managers, including forest farmers and fishermen, and sellers of ecosystem services/products need to behave like holistic managers who have a strong vein of humanistic behavior, without solely making nature into an economic commodity. This behavior is found in indigenous communities with a nature-based culture. This is a daunting task for industrialized societies to mimic because of the need to integrate all parts of the ecosystem. We need to

practice adaptive strategies and not assume that our economic models are adequate to make resource choices. No one ever said being sustainable was easy! If this was easy to practice, all societies would probably already be doing it.

In industrialized countries, resource managers and politicians still struggle to include humans equitably in the resource management process while protecting nature and its ecosystem services. This difficulty arises because **“Human Equity”** and **“Nature”** and **“Ecosystem Services”** are considered **separate entities**. If you understand that they are one and the same, becoming a sustainable practitioner is more tenable. In this book we introduce our ideas on how to link nature and society to make sustainable choices. Our contention is that to be sustainable, nature and its endowment needs to be linked to human behavior similar to the practices of indigenous peoples. Human behavior can be examined through a cultural lens such as by the stories that a group of people tell each other.

We are also using a water metaphor to provide insights to the complexity that surrounds a scarce resource and as a metaphor to describe the connections between human and nature as practiced by indigenous communities. This is also very appropriate since water is considered the first of First Nation foods. Native Americans’ view on water is that all things come and go through water, both naturally and spiritually. Also “kush” (Nez Perce for water, and similar words in other related languages) means “amen” and is said at the end of prayers.

We want to thank Cal Mukumoto and Toral Patel-Weynand for numerous insightful discussions and being part of workshops that helped the authors to develop the themes of this book. We had many invaluable discussions with both individuals and they really helped us to think through our ideas and how we wanted to write this book. We couldn’t have started writing this book without their discussions and thoughtful inputs. We also want to thank Myrna Tovey, John D Tovey’s grandmother, and the many conversations that John had with her about the ideas written in this book.

Melody Starya Mobley (Cherokee) contributed considerably to the editing and writing of materials for this book. She is a Natural and Non-Renewable Resource Conservation Planner. She is a lifetime member of the National Congress of the American Indian; is included on Wall of Honor in the National Museum of Native Americans, Smithsonian Institution. Starya, Ms. Mobley’s Native American name, is derived from the Cherokee language term “Stah-yu” which means “Stay strong.”

The Authors  
31 December 2012



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**Sustainability:**

**Learning from the Past**



## **Chapter 1**

# **The Context for Our Sustainability Story**

### **1.1 Post-1492: European Colonialism Impacts on Peoples of the Americas**

We cannot cover in this book the multiple impacts of the European colonialists' practices on the peoples of the Americas. We do encourage the reader to go into the literature and read many excellent volumes of materials that have been written on different aspects of this topic. In this book we want to introduce the idea of how the American populations collapsed upon the arrival of the Europeans and will include some of the battles faced by Native Americans in section 2. We encourage the reader to read Charles Mann's excellent books written on this topic for the Americas.

When these European countries began their conquest more than 500 years ago, the lands were not vacant and many indigenous people had built highly complex societies. These societies were not uncivilized or undeveloped. However the European's still treated these indigenous people as the upriver people as we describe in our river metaphor (section 1.3). European colonialists did not care whether the civilizations they conquered were sophisticated or civilized since these peoples did not practice the European models of what it meant to be civilized. Of course, underlying all of this was the simple fact that Europeans wanted to exploit resources that did not belong to them for their own benefit. It was easy to justify taking someone else's resources if you could rationalize in your own mind that they were not "civilized" and you knew better how to use their resources. Of course, it didn't hurt that the Europeans also desperately needed these resources.

The civilizations conquered by the Europeans were sophisticated and highly complex societies that collapsed upon the arrival of the Europeans [8]. William R Fowler described how sophisticated and civilized the Inca Empire was when the Spaniards first arrived in his contribution to the Microsoft Encarta in 2000 [9]:

“...The Incas built a wealthy and complex civilization that ruled more than 9 million people. The Inca system of government was among the most complex political organizations of any Native American people. Although the Incas lacked both a written language and the concept of the wheel, they accomplished feats of engineering that were unequaled elsewhere in the Americas. They built large stone structures without mortar and constructed suspension bridges and roads that crossed the steep mountain valleys of the Andes.”

Initially these indigenous civilizations cautiously welcomed these “white people”, e.g., the Spanish explorer Francisco Pizarro, and his 180 soldiers, when they landed in 1532 on the Peruvian coast [9]. The Incas also had a prophecy that linked a white person as being their God returning to this world. These were the first white people the Inca had met. Fowler wrote

“...The Incas at first believed Pizarro to be their creator god Viracocha, just as the Aztecs of Mexico had associated the Spanish explorer Hernán Cortés with their god Quetzalcoatl...”

Spaniards were so god-like in their appearance that this perception was not unrealistic. The Inca had never seen horses and guns that the Spaniards brought with them. Large horses were an extraordinary sight. The horses even obeyed their Spanish riders. Spanish guns also produced a lot of smoke, made a lot of noise and killed so well.

By the time these civilizations realized that the European colonialists were not gods, it was too late. The dramatic transformation of the cultures and civilizations of North, Central and South Americans had begun.

The Europeans introduced new diseases to these lands which decimated indigenous populations. Millions of people died. For the Inca civilization, it took less than 30 years before these new diseases killed the rulers of the lands [9]:

“About 1525 both Huayna Capac and his appointed heir died ... probably from one of the European diseases that accompanied the arrival of the Spaniards...”

In central Mexico, the arrival of the Spaniards introduced many new diseases and significantly reduced this region's population [10]. Mann [18] summarized how the population in central Mexico decreased from about 25.2 million in 1518 to 6.3 million by 1545 and finally to 0.7 million by 1623. In only 30 years, only a quarter of the population of central Mexico was still alive. These population losses were the result of diseases like smallpox, measles,ocoliziti, plaque, and influenza [10]. This story was repeated throughout the Americas and was an