Ecosystem Services xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Ecosystem Services

journal homepage: www.elsevier.com/locate/ecoser

Ecosystem service valuation framework applied to a legal case in the Anchicaya region of Colombia

David Toledo[a,*,1], Tania Briceño[b], German Ospina[c]

[a] At the time of research D. Toledo was a Scientific Advisor for the United Nations High Commissioner for Human Rights, Colombia
[b] Senior Ecological Economist at Earth Economics, 107 N Tacoma Avenue, Tacoma, WA 98403, United States
[c] Attorney specialized in maritime and commercial law, Cali, Colombia

ARTICLE INFO

Keywords:
Ecosystem Service Valuation
Legal case
Ecosystem Valuation Toolkit
Value transfer
Colombia

ABSTRACT

Lack of explicit value for ecosystem services has resulted in great damage being imposed on the poor when engineering projects of wealthy corporations impose externalities on local communities. Such communities are rarely in a position to extract payment for damages from the well-healed corporations. The case study reported in this manuscript is a classic example of such social injustice. The Anchicaya region in the Colombian Pacific coast is characterized by its rich cultural and biological diversity. The primary inhabitants of this region are Afro-descendant communities who are directly dependent on the surrounding natural environment. On July 21st, 2001 there was an illegal discharge of approximately 500,000 m^3 of accumulated sediment from a hydroelectric dam on the Anchicaya River, which gravely affected those inhabiting the region downstream of the dam. In 2002, the communities of the Lower Anchicaya region began a class action suit against the energy company in charge of the dam. After years of deliberations favoring the downstream communities, on April of 2012 the Constitutional Court of Colombia ruled in favor of the energy company in charge of the dam, overruling 10 years of deliberations. Through Judgment T-274, the Constitutional Court of Colombia declared that direct valuation studies that had been made in 2002, shortly after the spill, were inadmissible due to lack of objectivity and rigor and ordered that the studies be repeated. In order to value damage that had happened more than 10 years before, we determined that a land cover based ecosystem service valuation would provide the best science-based approach to conduct the valuation. For this we used historical data from geographic information systems, data collected in the affected areas, surveys, and the Ecosystem Valuation Toolkit created by Earth Economics. Several valuation methodologies were used including direct valuation, replacement costs, and benefit transfer. We used the ecosystem service valuation framework to quantify the material and non-material damages recognized under the Colombian legal framework. The total value for the valuation of material damages was of COP $356,688,589,331 (approximately $100 million USD). For the non-material damages, which we classified as cultural ecosystem services, we noted that the loss was high as the victims lost something invaluable and critical for their identity and their well-being. According to the Colombian judicial system, the judge who presides over the case will determine the amount to be paid for these non-material damages. In 2015, the Constitutional Court of Colombia ruled in favor of the Anchicaya community and ordered that the communities be indemnified; however a final value has not been decided to date. We provide a broad classification of valuation methodologies of ecosystem services that can, and has been, aptly used within a legal framework. It is also important to note that this study provides a valuation of services for a subsistence economy, with communities operating outside monetary markets, much like many other remote communities rich in supporting and regulating ecosystem services.

1. Introduction

The Anchicaya region in the Colombian Pacific coast is characterized by its immense biological and cultural richness. The primary inhabitants of this region are Afro-descendant communities who are directly dependent on the surrounding natural environment. These Afro-descendant communities are under special constitutional protection by the Colombian government, which granted them a collective

* Corresponding author.
E-mail addresses: david.toledo@ars.usda.gov (D. Toledo), tbriceno@eartheconomics.org (T. Briceño), Germanospinam@gmail.com (G. Ospina).
[1] Present address: USDA-ARS 1701, 10th Ave. SW, Mandan, ND, United States.

http://dx.doi.org/10.1016/j.ecoser.2017.02.022
Received 5 July 2016; Received in revised form 10 February 2017; Accepted 15 February 2017
2212-0416/ Published by Elsevier B.V.

title for their lands. This collective title demonstrates how many of the lands in the affected region were used for subsistence agriculture as well as commercial agricultural production (CCMRA, 2008). On July 21st, 2001 there was an illegal discharge of approximately 500,000 m^3 of accumulated sediment from a hydroelectric dam on the Anchicaya River, which affected those inhabiting the region downstream of the dam. In 2002, the communities of the Lower Anchicaya region began a class action suit against the energy company in charge of the dam. After years of deliberations favoring the downstream communities, on April of 2012 the Constitutional Court of Colombia ruled in favor of the energy company in charge of the dam, overruling 10 years of deliberations.

Through Judgment T-274 (CCC, 2012), the Constitutional Court of Colombia declared that direct valuation studies that had been made in 2002, shortly after the spill, were inadmissible due to lack of objectivity and rigor and ordered that the studies be repeated. In order to value the damage that had happened more than 10 years before, it was determined that a land cover based ecosystem service valuation would provide the best science-based approach to recalculate the damage (Gongora Fuentemayor and Gongora Rosero, 2008; Olander and Segura Zuniga, 1994; World Bank, 2013). The ecosystems service valuation framework was used to quantify the material and non-material damages caused by the sediment release. While this framework has been widely used to evaluate ecosystem services (e. g. de Groot et al., 2002; Costanza et al., 2014), it is has not been widely adopted throughout the world in environmental litigation (Kistenkas, 2014). Over the last 15 years, considerable progress has been made in the development of the ecosystem service framework for valuation processes. The work of de Groot et al. (2002), the Millennium Ecosystem Assessment (UNEP, 2005) and The Economics of Ecosystems and Biodiversity (ESP, 2013) marked key advancements in this effort. Valuations have become more sophisticated and widespread and are being increasingly recognized and adopted across the world (Richardson et al., 2015). In Colombia, the ecosystem services framework is part of the National Policy for the Integral Management of Biodiversity and its Ecosystem Services (MESD, 2012) developed by the Ministry of the Environment and Sustainable Development of the Republic of Colombia.

The methodology used in this study builds on previous studies that objectively assess the environmental, social, and economic impact of management actions and provide a way of fairly and efficiently incorporating multiple criteria into valuations related to environmental policy (e.g. Costanza, and Folke, 1997; Costanza, 2008; de Groot et al., 2002; Mauerhofer, 2008; Zhao et al., 2004). For this valuation we used historical data from geographic information systems, data collected in the affected areas immediately after the disaster and prior to it, community surveys, and the Ecosystem Valuation Toolkit created by Earth Economics. Several valuation methodologies were used including direct valuation, replacement costs, and benefit transfer.

The objective of this valuation was to determine the direct and indirect value of the economic losses that were caused by the sediment release from the hydroelectric dam on the lower Anchicaya River. This case study shows how the adoption and application of the ecosystem service concept can be used in litigation and policy development. Our case study uses combined valuation approaches that address multiple ecosystem services. Ecosystem services valued included provisioning of food and water, transportation, biological control, disturbance buffering, soil retention, nutrient regulation, pollination, waste-water treatment, soil formation, habitat and biodiversity, gas and climate regulation, raw materials, aesthetic, cultural, and recreation services. This valuation adheres to existing legal practices and terminology of the country where it was applied, contributing to the development of valuation methodologies that can be practically applied to address legal disputes.

1.1. Legal context

In 2002, after the 2001 sediment release, the communities of the lower Anchicaya River started a class action suit against the energy company in charge of the hydroelectric dam. Through this suit, the community was asking for payment for the damages caused by the sediment release. It took seven years of information gathering to prove that the electric company had caused the said damages. By then, there had been 11 judicial favorable resolutions for the communities. In May of 2009 the judge of the first administrative court of Buenaventura, where the suit was filed, declared that the electric company had to indemnify the inhabitants of the Anchicaya region and determined that the economic sanction would amass to $160,000 million Colombian pesos (COP). Soon thereafter, the lawyers for the electric company filed an appeal but their appeal was lost on September 7th of that same year. This defeat led the lawyers for the electric company to opt for two legal strategies. One was to take this case to a National Court and on February 2nd of 2010 they did so; the second strategy consisted in going to this same National Court and suing because of supposed short sights in due diligence related to an erroneous interpretation of a study that served as evidence of the damage made to the community. Both of the strategies failed with the courts, again ruling in favor of the communities and arguing that the electric company had all the procedural opportunities to question the studies ahead of the previous ruling. However on September 25th of 2011, a working group of the Colombian Constitutional Court chose the suit filed by the energy company for review. Then on April of 2012 the Magistrates of the Constitutional Court who reviewed the lawsuit, through Judgement T-274 (CCC, 2012) declared that the valuation that determined compensation estimates, conducted by the office of the Secretary of Agriculture of the “Gobernacion del Valle” right after the disaster, was invalid. This revoked the previous ruling and nullified the progress made by the communities during the previous 10 years. Through Judgement T-274 (CCC, 2012), it was ordered that a new valuation be made (10 years after the damage), that the community pay for this new valuation, and that the community do so in 60 working days.

The above affected the economic valuation, but did not affect the ruling where the courts accepted the extent of the physical damage. Given this, the community was faced with having to provide a separate valuation that would be acceptable for the court but not having to prove again the physical damage because that had already been proved. Faced with the need to value the damage more than a decade later, a team of outside researchers were contacted to assist in the valuation. It was determined by this group of researchers that land-based ecosystem services valuation framework would provide the best available science that could be used to value such a case. This valuation is described in this paper.

On November of 2015, the Constitutional Court of Colombia, through Judgement SU-686/15 (CCC, 2015), reviewed its 2012 decision and again ratified the initial ruling made in 2009 ordering the electric company to pay close to $160,000 million Colombian pesos for damage compensation to the communities. This case represents a legal challenge without precedent in Colombia due to the technical, scientific and juridical advancements that have occurred through the 15 years of litigation. In Colombia, there are certain types of legal evidence that are referred to as “diabolic” due to their overall complexity. Up to this point, valuations were made based on direct observation of the victims. This methodology is very expensive, is time consuming and can be vulnerable to attacks from the defense due to the potential for bias, conflicts of interest, and lack of scientific and technical rigor. Indeed, such attacks happened in this case and a suit was brought forward to invalidate the direct valuation that was made through visits to the affected areas and inhabitant surveys performed by experts from government agencies (Gongora Fuentemayor and Gongora Rosero, 2008; SAPGV, 2004, 2008). These attacks resulted in a call for other valid methodologies to value environmental impacts in a way that