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The Socioecological Evolution Of a Biological Corridor: A 15-year Case Study of the Alexander Skutch Biological Corridor in Southern Costa Rica

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Abstract

Concerns around the isolation of protected areas led to the establishment of Biological Corridors in Central America two decades ago. Created by executive decree and within the National Framework of Biological Corridors in Costa Rica, the Alexander Skutch Biological Corridor has become an example of collective actions and imaginaries that provides alternative models of rural community development. Multiple lessons arise from this 'lived experiment' in Southern Costa Rica, where differing ideologies, agendas, and paradigms converge and where place and a sense of place shape social interactions, both discursive and material. The Biological Corridor becomes a framework with guiding principles for stakeholders, where biodiversity conservation and sustainable development are intertwined in both a local and regional project of global significance.

Keywords: Biological Corridors, socioecological wellbeing, community-based conservation, rural livelihoods, imaginaries, Buen Vivir

1.0 Introduction

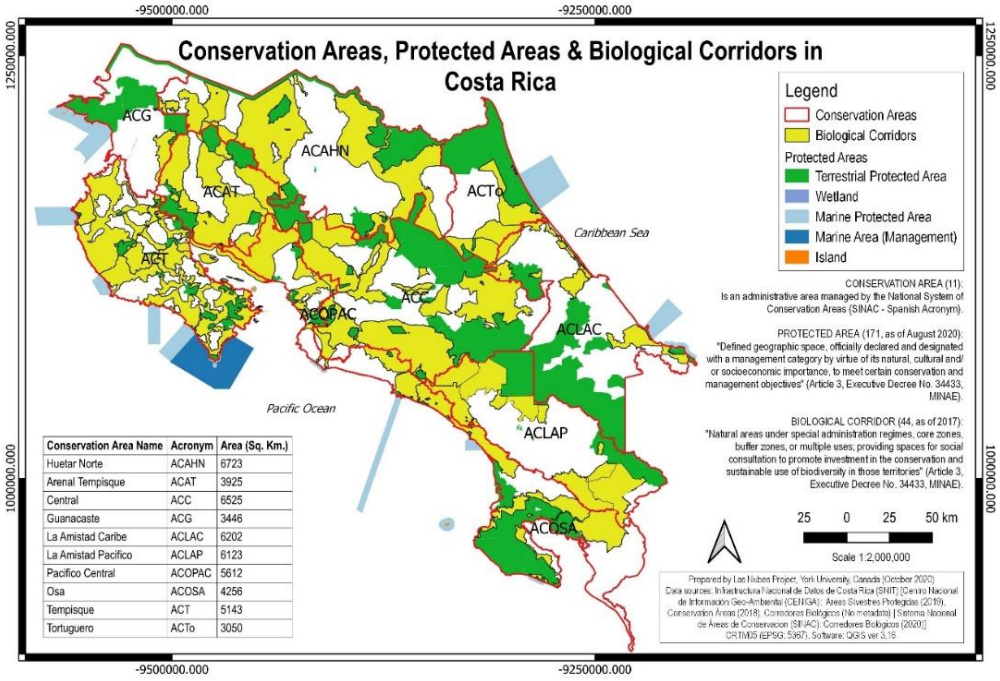
In Costa Rica, the management and conservation of natural resources, protected areas, watersheds, forests, and water are overseen by the National System of Conservation Areas (SINAC, Spanish acronym), a government agency created in 1994 as a decentralized and independent arm of the Ministry of Environment and Energy (MINAE). There are 11 Conservation Areas in the country (See a complete list in Figure 1, the Cocos Marine Conservation Area is not included), each with an organizational structure that includes a technical-scientific committee, regional management offices, and commissioners (SINAC, 2020).

Each Conservation Area is in charge of the administration of all Protected Areas that fall within their boundaries. According to Article 3 of Executive Decree No. 34433 (Regulation to the Biodiversity Law), Protected Areas in Costa Rica are defined as "geographic spaces, officially declared and designated with a management category

by virtue of their natural, cultural and/or socioeconomic importance, to meet certain conservation and management objectives" (Procuraduría General de la República [PGR], 2008). As of August 2020, there are 171 Protected Areas in Costa Rica categorized under one of the following types of management regimes: National Parks, Biological Reserves, Protective Zones, Forest Reserves, National Wildlife Refuges (state-owned, private, or mixed), Absolute National Refuges, Wetlands, Mangrove Areas, Marine Management Areas, and National Monuments (SINAC, 2020).

At the XIX Summit of Central American Presidents held in Panama City in July 1997, the heads of six states signed a resolution to create a 'Mesoamerican Biological Corridor' as part of the Central American Alliance for Sustainable Development (Sistema de la Integración Centroamericana [SICA], 1997).

Figure 1. Conservation Areas, Protected Areas and Biological Corridors in Costa Rica.



Source: Author.

Following this commitment, in 2006, the Costa Rican President created the 'National Program of Biological Corridors' through Executive Decree N°33106-MINAE, to meet the international conservation strategies through a network of Protected Areas and a defined management framework for initiatives and projects undertaken in buffer zones around them (PGR, 2006) (See Figure 1). The main objective of these Biological Corridors is to:

> Provide connectivity between landscapes, ecosystems and habitats, natural or modified, to ensure the maintenance of biodiversity and ecological and evolutionary processes. They are made up of natural areas under special administration regimes, core zones, buffer zones, or multiple uses;

> providing spaces for social consultation to promote investment in the conservation and sustainable use of biodiversity in those territories" (Article 3, Executive Decree N°34433-MINAE, PGR, 2008).

Furthermore, Biological Corridors are conceived as dynamic territorial units influenced by internal and external processes, whether natural or anthropogenic, which determine their connectivity's functionality:

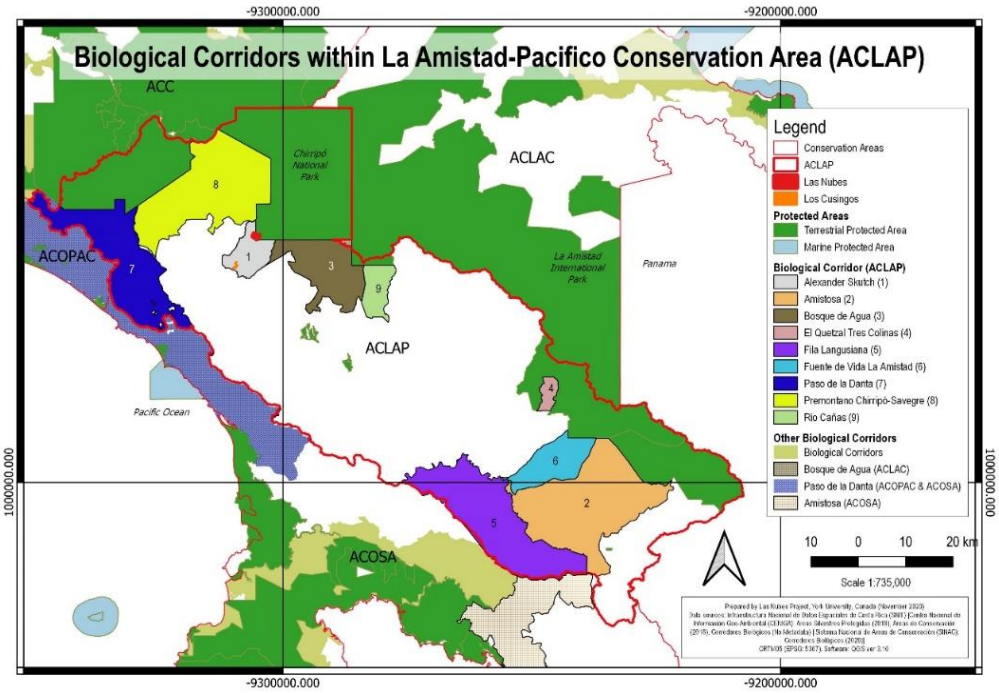
> The landscape structure is made up of different elements and attributes, which have characteristics that affect or benefit the movement of species that inhabit the Biological Corridor, determining variables that show connectivity and connectivity capacity present in the COBAS landscape mosaic. Therefore, the functionality involves of clusters of land-use coverage with the following elements: source areas of dispersal of species, spaces that promote the flow of matter, energy, and information, and finally, territories that due to their degree of disturbance constitute potential barriers to the movement of species (Morera, Pinto, & Romero, 2007, as cited in Acuña Prado, Molina Jimenez, & Rodriguez Vindas, 2017, p. 107).

In 2016, through Executive Decree N°40043 of MINAE, the National Program of Biological Corridors is further regulated, establishing objectives, definitions and an organizational structure that includes: (1) the National Program of Biological Corridors managed by SINAC; (2) a regional program for each one of the 11 conservation areas that are managed by a technical body at SINAC; and (3) local councils for each Biological Corridor composed of local stakeholders and a representative of SINAC (PGR, 2016).

Terrestrial protected areas in Costa Rica comprise 26.56% (13,544.488 km^2) of its national territory (SINAC, 2015), and by 2016, 44 Biological Corridors around and/or connecting protected areas had been established, covering nearly 16,927 km^2 (33.1% of the national territory) (SINAC, 2008; SINAC, 2018b; SINAC, 2020; MINAE, 2020).

La Amistad Pacific Conservation Area (ACLAP), located in the South Pacific region of Costa Rica, is the fourth largest Conservation Area in the country, with an extension of 6,123 km^2. As of May 2020, ACLAP has nine official Biological Corridors (See Figure 2), which represent approximately 27% of the ACLAP's territory. Three of these corridors are also part of and managed in collaboration with other Conservation Areas: Amistosa (ACOSA), Paso de la Danta (ACOSA and ACOPAC), and Bosque de Agua (ACLAC). An application for an additional Biological Corridor, the 'Mono Tití', located in Potrero Grande, Buenos Aires, is currently being processed (O.V. Esquivel Garrote, personal communication, May 4, 2020).

Figure 2. Biological Corridors within La Amistad Pacific Conservation Area (ACLAP).



Source: Author.

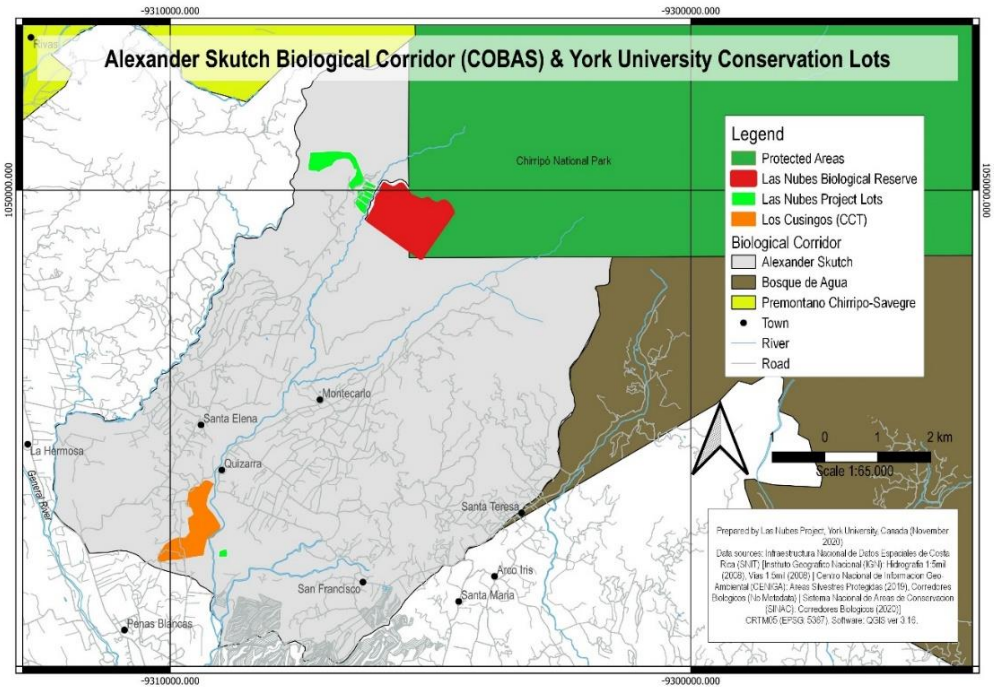
The Alexander Skutch Biological Corridor (COBAS, Spanish acronym), officially created in 2006, is located in ACLAP (See Figure 3). It connects the highland forests of the Las Nubes Biological Reserve, a 124-ha area of mostly primary mountain rainforest ranging in elevation from 1,100 to 1,500 MASL, and the lowland forests of Los Cusingos, a 77-ha area at around 700 MASL and former homestead of Alexander Skutch (renowned naturalist and namesake of the corridor). The Corridor provides linkages between high elevation areas from the Mesoamerican Biological Corridor and lowland areas towards the Pacific coast, which makes it especially favourable for seasonal migrant species (Powell, Barborak, & Rodriguez, 2000; Daugherty, 2005; Canet-Desanti, 2005; Rapson, 2008).

COBAS has experienced rapid and significant land-use changes in the last two decades. A landscape analysis between 1998 and 2008 showed a 19% decrease in forest cover due to the expansion of pineapple farms—currently encroaching its Southern borders—and the conversion of coffee farms into pasturelands. In fact, during that decade, the former alone accounts for "the loss of over 100 ha of primary lowland rainforest" (Rapson, Bunch, & Daugherty, 2012, p. 43).

A more recent analysis shows an increase of 5.6% in dense forest cover between 2005 and 2016, with primary forests representing 35% of the corridor. While pasturelands and coffee farms decreased during the same period (the former representing 12.4% and the latter 11.3% of COBAS in 2016), sugar cane and pineapple farms have increased, representing 5.2% of the corridor. Other changes, such as infrastructure associated with new access roads, have had a minor increase of 1.3% between the same period. A patch analysis in the same study showed a significant increase in fragmentation, especially in areas of semi-permanent farms, which according to Acuña Prado et al. (2017), suggests land-use changes due to

anthropogenic activities that are related to pineapple and sugarcane farming and livestock rearing.

Figure 3. Alexander Skutch Biological Corridor (COBAS).



Source: Author.

2.0 The Role of Las Nubes in the Corridor

One of the key actors with a particular set of actions and imaginaries in and around the COBAS, is York University´s Las Nubes Project, created in the late 1990s after the donation of the Las Nubes Biological Reserve to York University. By imaginaries, we adhere loosely to the definition proposed by Jasanoff (2015) as "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology" (p. 4), with a liberal understanding of the nature of institutions, and allowances for more-than-human conceptions of social life and social order, and a transdisciplinary, post-humanist, and decolonial perspective on science and technology, as espoused by Rodriguez (2019).

At the onset, the primary objective of the Las Nubes Project was "to restore and protect the biodiversity in the corridor through the promotion of sustainable agricultural practices on a regional landscape level" (Daugherty, 2005, p. 155). In the early 2010s, under a new director, the focus shifted to "improving rural livelihoods in ways that are conducive to environmental conservation" (York University, 2020). It is important to note that COBAS' conception preceded the establishment of the National Program of Biological Corridors and resulted from a joint effort between York University, the Tropical Science Center (CCT, Spanish acronym) and local stakeholders (mostly coffee farmers), who sought in the early 2000s to promote sustainable agricultural practices and the conversion of sun to shade-grown organic coffee (Daugherty, 2005; Canet-Desanti, 2005). The official

establishment of the COBAS enhanced the development of the social-environmental actions around the principles that have been central to the Las Nubes Project since its inception (also referred to as the project's three main pillars: research, education and community engagement). The following are some highlights of the research and education pillars, followed by a more in-depth overview of the pillar of community engagement.

2.1 Research

Research efforts undertaken by York University's graduate students in COBAS have been largely stimulated by the community's responses and needs to ongoing threats to the social and environmental stability of the region, as is the case of the proposed development of 18 hydroelectric plant projects in the Térraba Watershed (including one proposed for the Peñas Blancas River, which supplies clean freshwater to the entire Corridor). These projects are the result of the liberalization of the energy sector in Costa Rica, which allowed a return to the privatization of electricity production that had been exclusive to the government and managed by the Costa Rican Electricity Institute (ICE) between the 1940s to 1990s (Gutiérrez Arguedas & Villalobos Villalobos, 2020). Student projects range from the social, political and ecological analysis of the water and rivers and communities´ responses to political pressures and governmental management strategies (see Luffman, 2014; Umaña-Kinitzki, 2017; Rodriguez, 2019; Bolaños Dávila, 2020).

2.2 Education

Based on principles of experiential education, the Las Nubes Project hosted originally by the Faculty of Environmental Studies (FES) and now the Faculty of Environmental and Urban Change (EUC) at York University, created a Summer field course open to students from all disciplines and focused on conservation and sustainable development that ran between 2006 and 2016. Between 2014 and 2016, FES offered an additional course focused on Indigenous issues. Finally, in 2017, FES created a full Summer Semester Study Abroad program with six courses ranging from the arts to humanities to natural sciences. Other courses have been offered during the Winter semester break since 2018. To date, over 500 York University students have participated in one or more courses, with the largest sustained influx of students in the last three years. All York University students who take these field courses live during the length of the course(s) with local families in the COBAS. In 2010, FES also created the Howard Daugherty International Fellowship to support Costa Rican students to further their graduate studies at York University.

2.3 Community Engagement

Smallholder coffee production has been and continues to be one of the main economic activities in Pérez Zeledón, the county in which the COBAS is located (Hall, 1976; Samper, 2001; ICAFE, 2019). In the early 2000s, sun-grown coffee farming was prevalent in COBAS (Daugherty, 2005; Orozco, López, Rojas, & Somarriba, 2005; Hernández, 2010). The idea of building a sustainable Biological Corridor that would allow ecological integrity and connectivity was coupled with a clever venture that offered CoopeAgri's (a Pérez Zeledón-based cooperative) farmers who were producing sustainable shade-grown coffee in COBAS, to market their coffee as Las Nubes Coffee through Timothy's World of Coffee (a Toronto-

based roaster) in Canada. This partnership, started in 2003, was spearheaded by Las Nubes and CoopeAgri. The coffee was mainly produced on two farms (Grano Tico and San Pedro), which were certified as 'Sustainable' by the Costa Rican Ministry of Agriculture and Livestock (MAG, Spanish acronym) in partnership with the Costa Rican Institute of Coffee (ICAFE, Spanish acronym). This certification, the 'Sustainable Coffee Seal,' was created in 2002 by Executive Decree 30938-MAG with no added costs to producers and to guarantee to consumers that coffee production is both socially just and environmentally sustainable (PGR, 2002; ICAFE, 2020). In addition to this, the coffee was also 'Fair Trade' certified. Between 2003 and 2010, CoopeAgri sold 1,892 quintals (189,200 kg) of coffee to Timothy's. From this arrangement, Timothy's donated $1 out of every pound sold in Canada to the Fisher Fund for Neotropical Conservation at York University, a fund created by FES to support research at Las Nubes and COBAS; and CoopeAgri donated $2.5 per quintal to the CCT to support their conservation work in COBAS. The project eventually expired in 2010 due to a series of corporate buyouts (R. Zuñiga, personal communication, May 25, 2020).

While the Las Nubes Coffee initiative faded due to a lack of support from the new corporation, the community engagement component of the Las Nubes Project continued to grow, especially through the expanded presence of Canadian students in the area. As part of a policy established under the new Las Nubes director in the mid-2010s, students were (and continue to be) required to stay with local COBAS families throughout the length of the field course. This small change has had a significant impact in the area not only by contributing to the local economy, where a large number of vetted households (over 50 houses to date) provide room and board to students, but also by pushing a new-to-the-area venture in the form of rural community tourism, as a viable option for local livelihood improvement (COBAS, 2014).

In the early 2010s, after noticing that the existence of the 'Biological Corridor' was not yet internalized as a shared imaginary by the majority of residents of the communities contained within the Corridor's borders, the Las Nubes Project and participant students in the 2013 Summer field course organized a festival over a weekend to celebrate the figure of Alexander Skutch, to create awareness of the corridor and to offer a window into the community's wealth (natural, cultural, scientific, artistic, and agricultural), as a way of igniting a sense of identity and belonging to the COBAS among the local population. Moreover, the festival was also conceived as an opportunity for residents to exhibit and sell their products and meet prospective clients while interacting with their international visitors. This festival was soon taken over by local organizers, becoming a renowned festival and renamed ExpoCOBAS, attracting thousands of attendees and celebrated every year on the weekend closest to Alexander Skutch's birthday on May 20 (except for 2020, the year in which the festival was suspended due to the COVID-19 pandemic).

3.0 Intersecting Imaginaries and Agency

As with the ExpoCOBAS, which was rightly appropriated by members of local communities and organizations, local initiatives guided by their imaginaries linked to the COBAS induced community members and organizations to make use of the official structures and potentialities offered by the Biological Corridor. After the officialization of the Corridor and with the formation of the COBAS Local Council, in which York University sits as a member, the Local Council developed a Strategic

Plan for the Corridor (COBAS, 2014) which includes five priority areas: (1) Environmental Conservation, (2) Sustainable Production, (3) Research, (4) Environmental Education, and (5) Corridor Administration and Management, with each priority area coordinated by a subcommittee (SINAC, 2018a). York University representation was assigned to a number of these sub-committees, including the ones on research, education and sustainable production, which contained a special sub-committee on tourism. Responding to needs expressed by the Local Council, Las Nubes has recruited graduate students to carry out research and advance a greater knowledge of the COBAS in areas such as potential tourism ventures and links between productive stakeholders in the area (El-Osta, 2015), plant production and potential markets (Grundy, 2015), peasants' visions of livelihoods and wellbeing (Ortiz Imlach, 2014), community management (Jiménez, 2018), women empowerment through art (Diaz, 2015), and environmental education programs for local schools (Caravaggio, 2017; Cummins, 2017), among others. Having supported its creation as one of the permanent institutions in COBAS and with specific goals guiding its activities, Las Nubes was also transformed by the evolution of this Biological Corridor and other actors' visions of it.

Community organizations and local stakeholders became increasingly engaged in harnessing the ideals around the COBAS to improve local ecological, social and economic wellbeing. Participating within the official structure of the COBAS Local Council, a small farmer organization ASOCUENCA presented a project to the National Institute of Rural Development (INDER, Spanish acronym) for the cultivation and processing of non-conventional crops, such as pepper, turmeric, cacao and ginger, among others (Montero, 2018). The Association of Active Women of the Alexander Skutch Biological Corridor (AMACOBAS, Spanish acronym), along with ASOCUENCA also successfully presented projects to funding agencies, such as the UNDP for reforestation of the Corridor, to ACICAFOC (Asociación Coordinadora Indígena y Campesina de Agroforestería Comunitaria Centroamericana) for building greenhouses, to INDER for a Rural Community Tourism initiative, to the National Learning Institute (INA, Spanish acronym) for capacity building in various areas (Picado, 2019).

As a heuristic device to explore the evolution of the COBAS during the last 15 years, we use Daugherty´s (2005) article as a baseline with an enunciated blueprint and a set of recommended actions for the Corridor. He stated then that to succeed in the protection of its biological diversity and integrity while allowing its communities to sustainably develop and use its resources, the Biological Corridor depends on "several critical elements" shaping its development (p. 157). Among these critical elements were: (1) the development of both the Las Nubes Coffee initiative and a model of demonstrative farms; (2) the recovery of the riparian forests along the rivers Peñas Blancas and Peñas Blanquitas; (3) the reforestation of degraded pasture lands, as well as the improvement of pasture varieties; (4) the reforestation of non-pasture degraded lands; (5) the purchase of forested land for conservation; (6) the municipal provision of land to Non-Governmental Organizations (NGOs) for protection and reforestation; (7) the participation of local community groups in small business activities; and (8) the construction of a community environmental centre. The following is a synopsis of the role played by these 'critical elements' and how they have been transformed during the past 15 years of the COBAS existence.

3.1 Las Nubes Coffee

The Las Nubes Coffee initiative, as described above, succumbed to adverse events in the global supply chain when the Las Nubes Coffee brand roaster Timothy's was sold to Green Mountain Coffee Roasters in 2009 (CBC, 2009). In 2014, the company acquired Keurig and became Keurig Green Mountain, and in 2018 acquired Dr. Pepper Snapple to become a publicly-traded multimillion American-beverage conglomerate currently known as Keurig Dr. Pepper (Keurig Green Mountain, 2018). Throughout this process, Las Nubes Coffee became increasingly insignificant to the company, and the original arrangement carved out with Timothy´s was simply forgotten or ignored. Las Nubes Coffee has not been ordered from CoopeAgri in over ten years (CoopeAgri Director of Research, Roger Zuñiga, personal communication, May 25, 2020), and efforts to pursue answers regarding the brand within changing corporations have been null.

The initial partnership with CoopeAgri included demonstrative farms, one of which, Grano Tico, was located in the COBAS. But partially because of the global supply chain problems faced by Las Nubes Coffee, the demonstrative farms did not provide the expected results, failing to become models to emulate. The farmers involved in the initiative had to weigh the cost-benefit of working on a collective demonstrative farm under the failed premises of better international prices for their collective and sustainable practices to keep the Fair Trade and Sustainable certificates, versus working on their farms with less stringent cultivation requirements. Eventually, Grano Tico was leased out to independent farmers who implemented their own criteria for production.

Las Nubes Coffee aside, coffee production in COBAS has continued to be an important economic activity; however, it has not been immune to the compounding pressures of climate change (Gay, Estrada, Conde, Eakin, & Villers, 2006; Läderach, Ramirez-Villegas, Navarro-Racines, Zelaya, Martinez-Valle, & Jarvis, 2017; Vignola, Walter, Poveda, & y Vargas, 2018) and a disadvantaged position in challenging global markets (Daviron & Ponte, 2005; Pongratz-Chander, 2017). First, during these last 15 years, coffee production was hit by a devastating Roya epidemic that spanned the entire continent, reaching Central America in the early 2010s and reducing overall coffee production by around 10%, compared to previous years (Avelino, et al., 2015). Second, the cost of production has been affected by high input and fixed costs, as well as low global market prices that are speculatively set by Wall Street (Babin, 2015; ICO, 2019). Third, value-added market certification mechanisms that subject farmers "to the not-inconsequential costs of certification [and which] often do not trickle down to the farm-household level" (Babin, 2015, p. 105), has not helped coffee producers to overcome ongoing indebtedness to creditors. And fourth, neoliberal globalized tendencies that govern corporate practices and allow for the monopolization of markets ultimately affect local producers (Pongratz-Chander, 2017; Babin, 2020).

With these difficult conditions, some local farming families in the COBAS have sought to diversify their production and income-generating activities, which allow them to continue managing their traditional farms of cattle grazing, sugar cane, and coffee while expanding their production by planting other crops, such as cacao, tropical fruits, and pepper, among others; by processing their crops in-house and developing home industries; by intensifying their marketing strategies; and by tapping into other industries such as 'rural community tourism' that have also become guiding options, as expressed in the COBAS Strategic Plan (COBAS, 2014).

Some individual innovative farmers in the COBAS effectively implemented a farmer-to-farmer methodology by sharing their empirical knowledge about diverse varieties of Roya-resistant coffee and the cultivation of other crops, including cacao, pepper, and fruit trees (M. Arias, personal communication, February 17, 2020). CoopeAgri has maintained a key role in this process, while the Las Nubes Project, under the new director, moved away from expecting to provide guidance in the area of tropical production to farmers whose own knowledge and praxis surpass that of Las Nubes students, academics and/or researchers, focusing instead on searching for ways to rekindle commercial connections with Canadian roasters. In the meantime, a pilot group of CoopeAgri's coffee farmers have become 'organic certified' under Costa Rica's organic seal Eco-LOGICA (Eco-Logica, 2020), seeking to expand the marketability of a COBAS' brand of coffee (R. Zúñiga, personal communication, February 19, 2020).

3.2 Riparian Forests and Rivers

An initial goal with the development of the COBAS was to advance the recovery of the riparian forest (Daugherty, 2005; SINAC, 2018b). At the turn of the decade, the urge to protect the forest along the Peñas Blancas River and its main tributary, the Peñas Blanquitas, was not only directed at the protection of biodiversity but at protecting the river itself. For several years, and as explained above, protecting the river from developers became a central activity of the local communities and the Las Nubes Project, often outshining other actions (Rodríguez, 2019; Umaña-Kinitzki, 2017; Bolaños-Dávila, 2020). Nonetheless, efforts to protect both biodiversity and the river continued, and at times, both battles converged onto the same point. While the search for the Neotropical river otter became a first attempt at finding an endangered species in the Corridor as a deterrent for the construction of hydroelectric dams, Las Nubes research failed to produce conclusive evidence of its presence around the Peñas Blancas River (Butera, 2016).

Meanwhile, however, local sightings of an already declared extinct species, the Harlequin Toad (*Atelopus varius*), occurred. This toad had not been spotted in the area for approximately 50 years, and it had practically disappeared in all the national territory. A team of York University researchers, in collaboration with researchers from the University of Costa Rica, and with support from community members, discovered and described a new population of the Harlequin Toad for the area (Jiménez-Monge, Montoya-Greenheck, Bolaños, & Alvarado, 2019). This provided incontrovertible proof of the presence of an endangered species in the Corridor, making any large-scale development that might impact their habitat very difficult to justify before the National Environmental Technical Secretariat (SETENA, Spanish acronym) in charge of vetting environmental impact assessments for large scale projects.

In 2005 the major concern expressed by technical and academic documents around the rivers of the COBAS was its riparian forests (Daugherty, 2005; Canet-Desanti, 2005), but as evidenced in the ensuing 15 years, for the local populations the river itself has become a protagonist that agglutinates and mobilizes diverse communities, as threats to the river of privatization and commodification ignited collective responses.

The grassroots movement "Rios Vivos" emerged as a key actor to protect the rivers (Bolaños-Dávila, 2020). In addition to the technical arguments which they wielded and were well versed in, the movement also managed local perceptions that included

the social, economic and environmental roles of the rivers. As expressed on their Facebook page:

> We are not ´fanatical ecologists´ our group is diverse, there are farmers, teachers, lawyers, artists, housewives, students, grocers, masseurs, biologists, grocery store owners, and to top it off we are also of different ages and religious creeds. We fight because it is our duty to protect water and the well-being of future generations. OUR RIVERS ARE MORE THAN ELECTRICITY! They are fundamental for life, recreation, for our agricultural and tourist activities, the health of the environment and our consumption. The HP [hydroelectric projects] are incompatible with all these uses since these projects would take 90% of the flow and this would condemn our rivers and communities to death! (Rios Vivos, 2020).

3.3 Reforestation and Pastures

Reforestation of degraded pasture lands, as well as the improvement of pasture varieties, were also identified as important in the creation of the Corridor (Canet-Desanti, 2005; Daugherty, 2005). Reforestation continues to be a growing practice among community members and local organizations, as degraded pasture lands remain a concern for the Local Council, whose requests for a land-use assessment in COBAS is continuously voiced (SINAC, 2018a). A few graduate students have carried out limited land-use assessments in the Corridor and established key spots for maximizing the effectiveness of tree planting to enhance connectivity (Young, 2001; Rapson, 2008). An in-depth analysis and work in this area are still pending. Regarding pasture varieties, the Las Nubes Project has not ventured to explore this option; however, it did facilitate meetings between local farmers and local entrepreneurs who were developing high-protein feeds from local leguminous species. Other initiatives independent from Las Nubes began to explore the possibilities of feedlots and improved grass varieties for local production. The COBAS Local Council developed a project with international funding from the German Corporation for International Cooperation (GIZ) for helping small farmers with cattle to improve their practices for better yields and fewer environmental impacts, for example, by providing drinking troughs to avoid cattle from accessing and contaminating the rivers, and by providing cattle owners with trees for reforestation of degraded grasslands and gaps in the riparian forests (SINAC, 2018a).

3.4 Purchasing Land for Conservation

In the 1980s and 1990s, large land purchases for conservation was a prevailing ideology and promising practice for individuals, institutions, and environmental NGOs with abundant financing (Campbell, 2002). Indeed, this ideology was what allowed York University to acquire the Las Nubes Biological Reserve in 1998. While Las Nubes did not actively pursue expanding its estate under the new director, who operated with an alternative conception regarding conservation and private property, ironically, this original donation prompted subsequent land donations by

Canadian philanthropists as a way of protecting valuable tropical rainforests. In the last decade, the Las Nubes Project has established the only campus of a Canadian University in Costa Rica, called the Las Nubes EcoCampus, which includes the Las Nubes Biological Reserve, a series of plots within a Canadian residential development called Vistas del Chirripó, a lot near Los Cusingos, and a former farm, for a grand total of 414 acres of mostly forested land.

It is important to note that while acquiring land has permitted institutions such as York University to recover and conserve forests, what has mostly contributed to protecting forest cover has actually been a robust Costa Rican legislation established in the 1990s (Law No. 7575) that prohibited land-use changes of any forest patch greater than two hectares in size (PGR, 1997; MINAE, 2018). This came to transform serious tendencies of deforestation in earlier decades. Fuelled by high international prices of beef, by the 1980s "Costa Rica had one of the highest rates of deforestation in Latin America" (Edwards & Timmons Roberts, 2015, p. 153) and had been depicted by Myers (1981) as the extreme illustration of the "hamburger connection," (p. 6) where pasture areas went from representing one-eighth to one-third of the national territory between the 1950s and the 1980s. Additionally, other mechanisms have contributed to incentivizing the maintenance of the forests in Costa Rica, such as the Payments for Environmental Services to those landowners who protected their forests (MINAE, 2018).

In the last 15 years in the COBAS, there have been persistent economic difficulties with the constantly rising prices of fertilizers and pesticides, the extreme difficulties for accessing soft credits, as well as the difficulties in securing and affording labourers. These difficulties have been exacerbated by an unpredictable regional climate with current models projecting a significant decrease in precipitation levels for the Costa Rican Pacific Region (see Mendez, Maathuis, Hein-Griggs, & Alvarado-Gamboa, 2020) in addition to the sudden arrival of devastating plagues. All these factors have compelled some local farmers to sell portions of their lands to make ends meet, even though most families continue to live in the Corridor (L.A. Rojas, Personal communication, February 17, 2020). According to the National Institute of Statistics and Census of Costa Rica (INEC), the two districts, Cajón and General, that are part of COBAS saw a significant increase in their populations during the last two decades, compared to other districts in the county of Pérez Zeledón, with an increase of 23.9% and 28.2%, respectively, between 1998 and 2018 (INEC, 2007; INEC, 2013; INEC, 2015; INEC, 2017; INEC, 2018).

An important point to highlight is that a significant number of these lands (barely productive cattle farms or struggling coffee farms) have been sold to foreigners, some of whom have become captivated by the possibility of having a property in a 'Biological Corridor' in Costa Rica. Many of these new landowners who commune with conservation ideals end up "abandoning" the farms to natural succession, where the local forests are quick to recover. A few others arrive with fixed notions of fencing and subdividing properties, which in turn disrupts the continuity of the Corridor and mobility of terrestrial species. Although fencing per se is not a significant factor yet, fragmentation due to land-use changes in the Corridor increased by 16% between 2005 and 2016, according to Acuña Prado et al. (2017). Furthermore, in 2016 areas considered as barriers to species mobility and ecosystem functioning, such as agricultural areas (permanent or semi-permanent), open areas, infrastructure, and pasture lands represented 34% of COBAS (Acuña Prado et al., 2017).

While forest cover might be recovering, employment opportunities for coffee pickers and cattle hands have begun to wane, and subsequently, traditional rural livelihoods are transformed. As expressed by a local peasant to a York University graduate student doing research on local livelihoods:

> Well, truly, what I like the least, to be honest with you, is that North Americans, gringos, they buy up the land and become like landlords and they give nothing…..they don't provide jobs (Ortiz-Imlach, 2014, p.70).

Changes in land ownership in the COBAS have had a substantial impact on the land price and have altered the demographic composition in the Corridor (for which, unfortunately, there is no detailed statistical data available). For instance, the 1-ha Squirrel Monkey Reserve (SMR) purchased by York University students to protect a troop of Squirrel Monkeys in 2009 cost US$12,000, whereas today an adjacent property to the SMR of 1.5-ha costs around US$60,000 to $80,000 on the low end (L.A. Rojas, personal communication, May 22, 2020). Rising land prices and lower economic and employment opportunities continue to feed the parcelling of larger properties and the piecemeal sale of lands, often to foreigners whose environmentalist ideals compel them to contribute to the connectivity of the Biological Corridor by allowing parts of their new properties to revert back to forests, but ignoring the social and economic needs of residents who find in agricultural landscapes a major source of their livelihoods.

3.5 Municipal Lands

The provision of municipal land by the Municipality of Pérez Zeledón for reforestation and environmental protection to NGOs or local communities has been both successful in the early stages and full of contention in the last few years. As part of the Development Association of Quizarrá, a local conservation group known as CocoForest in the early 2000s approached the then Pérez Zeledón mayor, Alexis Zamora, with the idea of developing a reforestation program in a lot (over 1-ha) owned by the Municipality and located east of Los Cusingos, on the Peñas Blancas River. The mayor provisioned the lot to CocoForest for an initial period of five years and extended it for five more years. During this period, Las Nubes supported CocoForest by donating organic compost, native trees and materials to reforest the lot and create a tree nursery there. York University students, local schools, and CocoForest also built a trail with the goal of transforming the land into a thematic park. By the early 2010s, the management of the lot had become politicized and other stakeholders began to show interest in managing it, especially after the mayor had offered 150 million colones (around US$260,000) to develop the thematic park. However, the mayor was fired for corruption (on matters unrelated to the lot), and the lot remained unallocated to any specific group.

In 2017, another local group, AMACOBAS applied to the Municipality to manage the land and to create a center for community rural tourism, which would include a souvenir shop and a greenhouse. The proposed construction included clearing areas that had been reforested two decades earlier by CocoForest. The plan was approved by the Municipal Council and the early stages of the construction went ahead. However, contentions among some members of the community, who interpreted these construction efforts as violating provisions in the Forest Law, No. 7575 (1997) and Water Law, No. 276 (1942) against alterations of forested areas in riparian

zones, brought this initiative to a standstill, kindling persistent resentments among some of the community organizations in the COBAS, despite sharing similar perceptions around the social and environmental goals for the Biological Corridor (PGR, 1942; PGR, 1997).

3.6 Small Businesses

The participation of local community groups in small businesses is an activity that has increased significantly. Local organizations represented in the Local Council, such as AMACOBAS and ASOCUENCA, have developed numerous proposals with the support of the German Development Organization (GIZ), the United Nations Development Program (UNDP), the National Institute for Rural Development (INDER), among others, to meet priorities established by the Local Council's Strategic Plan by exploring opportunities for added value to their traditional agricultural practices. These projects have allowed them to diversify their crops, establish home industries for processing, packaging and marketing of cacao, pepper, turmeric and ginger, within other crops, as well as to explore opportunities in rural community tourism.

Interestingly, in the context of the COVID-19 pandemic for which Costa Rica has imposed social distancing norms, extended quarantines, and lockdowns has provoked the creation of an online marketplace using social media (Facebook) for the sale and exchange of local products and services. A page called 'Productores Auténticos Generaleños Organizados (PAGO PZ)' within a month of creation had over 23,000 members offering their goods and services and currently boasts over 34,000 members. PAGO PZ services the municipal area of Pérez Zeledón, as well as the neighbouring Municipality of Buenos Aires, and the coastal communities of Dominical and Uvita. This initiative also reveals an emerging strategy of the community as a solution to livelihood challenges:

> We are already more than 34,000 members! Thanks to each one of you, for your participation in the group. "Thank you," is what we can say for helping each other, and for something that was born in the middle of a pandemic, which caused pain and hardship to many, you gave a step forward and supported us in this project. We keep moving forward, accommodating the loads, making it possible for the incomes of many to improve every day. Without hesitation, we will move forward because we have the support of each one of you, who make this group your favourite, and we find relief and response to the needs of many. God bless you! (PAGO PZ, 2020).

3.7 Community Centre

Instead of investing in building a new facility, as envisioned by Daugherty (2005), Las Nubes and the York University Libraries entered in a collaborative agreement with the local Aqueduct Administrator Association of Santa Elena (ASADA, Spanish acronym), to share their facilities to run a local library and resource centre with computers, internet and a meeting room. Las Nubes hired a local librarian and 'Casita Azul' (the little blue house) became a local hub of training opportunities,

provided mostly through agreements with the National Institute of Learning (INA). Casita Azul offers access to computers, books, and the internet to local students to do their schoolwork. York University students also created preschool programs, which have been carried out by Casita Azul as part of the weekly programming. Training in the use of computers, and other abilities, such as sewing and cooking, organic agriculture, food processing, accounting, English language, among others, are also organized by Casita Azul using local resources and expertise.

4.0 Revisiting Paradigms

Due to changing circumstances and imaginaries, some of the initial ideas expressed by Daugherty (2005) regarding critical elements for the success of the Biological Corridor and the role of Las Nubes, have evolved in the last 15 years. Global and local conversations have shifted, local capacities have evolved, new actors have appeared on the scene. These transformations have allowed new ideas and strategies to emerge, and in the case of the Las Nubes Project, to employ decolonizing methodologies allowing a more integrated democratic and participatory approach towards community engagement. Some of what seemed like 'innovative' strategies at the turn of the 21st century, such as training farmers or ideas around 'payments for ecosystem services' (PES) have either already been integrated, revisited, modified, or discarded.

4.1 Green Economies

Green consumerism was already a global ideology (UNEP, 2004) when Daugherty (2005) expressed his faith in it:

> [E]cological production and green consumerism, together with other forms of alternative conservation practice and financing, will contribute toward saving tropical biota at the regional level. Furthermore, the successful marketing of green products yields other societal benefits such as forest protection, hydrological stabilization, and pollution reduction. (p.159).

Framed as a shift towards 'green consumerism,' much of the efforts of Las Nubes at that time was to promote shade-grown coffee to produce high-quality coffee for niche markets, and in this way guarantee the environmental benefits of the agroforestry production system, as well as guarantee profits from a higher value product (Daugherty, Hall, Zúñiga, & Pelaz, 2005). The faith had at the time in the promise of "reinvestment of profits from green products into research, improved farm efficiency, conservation practices, and in social services in local farm communities" (Daugherty, 2005, p. 161), reveals a green market utopia that has failed to materialize, surely around the world, but in the corridor, as well. As the so-called 'green products' are hard to define, it is difficult to determine what their profits have been. Moreover, reinvestment into research, improved efficiency, conservation practices and social services in local farm communities, is in general surrounded by a lack of transparency, verification, and accountability (Ivanko & Kivirist, 2008; Durif, Boivin, & Julien, 2010; Salleh, 2012; Pasaribu, Vanclay, & Zhao, 2020).

The direct line between green products, green profits, and reinvestment for socio-ecological improvement in COBAS is not conspicuous. What has occurred, in

contrast, is that local farmers and community organizations have been able to mobilize their energies to find support for their research projects, conservation efforts, initiatives for added value to their products, and social services for their communities (SINAC, 2018a). It is the "participation of local communities in landscape decision-making and small business" (Daugherty, 2005, p. 161) that has taken the lead in responding to the creation of COBAS as an opportunity to make of it a model of socio-ecological wellbeing.

Nonetheless, notions around green products persist, with the demand for organic Costa Rican coffee continuing to be voiced among consumers. CoopeAgri has moved in this direction and were it not for the closure of international borders due to the COVID-19 global pandemic, it was likely that in "late 2020 the first container of organic coffee from the region would have arrived in Canada to rebuild that vision of having sustainable coffee be one of the avenues for local sustainable development and environmental conservation" (personal communication, Róger Zúñiga, July 8, 2020).

Conversely, in the last 15 years, the concept of green consumerism has come into question as to whether it is a feasible solution to the social and environmental problems of rural communities in the Global South or is perceived as 'more of the same,' simply disguised capitalist consumerism, normally referred to as greenwashing (Akenji, 2014; Guckian, De Young, & Harbo, 2017). This is an ongoing debate beyond the scope of this paper. However, it is interesting to note how the current COVID-19 pandemic has introduced a wedge into the 'normal' economic practices, revealing 'new normals' with new challenges, but also with possible socio-environmental benefits, albeit temporary, such as the reduction of greenhouse gas emissions, the recovery of biodiversity around the globe, and initiatives such as PAGO PZ, where local production and consumption is spontaneously prioritized as a viable, sustainable and even a desirable way of organizing the economy, potentially showing the path toward a grassroots-generated green economy.

4.2 Payments for Environmental Services

Costa Rica has been recognized as a pioneer and leader in implementing PES to protect existing forests, to regenerate degraded areas and secondary forests (Porras, Barton, Miranda, & Chaćon-Cascante, 2013). The National Fund for Financing Forest Protection (FONAFIFO) is the administrator of this program and receives funds from different sources, including the private sector, international banks, bilateral agencies, and government funds which are collected as tax revenues from hydropower generation and fossil fuel sales, and as carbon offset bonds by corporations in industrialized countries, who by doing so can comply with their commitments to the Kyoto Protocol (Porras et al., 2013).

Such practices, however, have also been criticized as the commodification of nature, as just another practice that conforms to the depredatory tendencies of capitalism (Redford & Adams, 2009). It is also seen as a way for countries with excessive greenhouse gas emissions to continue spewing out these gasses from their industrial production, as long as they pay poorer and less industrialized countries for maintaining their tropical forests intact (Pardy, 2014; Wilkinson, 2014). This simply consolidates economic inequities, reinforces the continuity of contaminating practices, and in the long term, is not environmentally sustainable. Even though some landowners with forest cover in rural communities may benefit from PES, this

overwhelmingly favours large landowners who can benefit from the relatively small payments per hectare, whereas it does not serve small landowners to even apply for such payments that are around US$600 per hectare per year for forest protection (ONF, 2020). For those who have one or two hectares, this payment is negligible and the paperwork extensive; however, for those with 100+ ha, this payment can be significant (Kwayu, Sallu, & Paavola, 2014; Page & Bellotti, 2015). On the other hand, it is important to recognize that PES has contributed to increasing forest cover in the country (Barquero & Hernández, 2015), that forest cover does indeed provide environmental services, and that the recognition of environmental services should promote and encourage the expansion and continuity of forested lands.

For rural residents of the COBAS, the notions around PES and the implications of reforestation and conservation appears not to be linked to monetary considerations but rather to life-affirming principles, as expressed by a COBAS farmer to a York University graduate student:

> When looking at the mountains, you'll see many different birds. If you look at my land, you'll see that I chose to plant some trees specifically to attract birds to visit my place. Watching them makes me feel very happy. I have been seeing them since I was a child. Watching nature, trees, animals… this has been part of most of my life (Ortiz-Imlach, 2014, p.96-97).

4.3 Buen Vivir

Missing from the above-mentioned proposals (green economies and PES), that are more aligned with market-based ideas, is a paradigm shift away from the economistic rationality that is directly implicated in the current environmental crises, toward one more in line with a logic attuned to the values of life and generalized wellbeing, both human and nonhuman (Acosta & Martínez-Abarca, 2018). The "Development" project, originating in the 1950s, and the subsequent "Sustainable Development" project, emerging in the 1980s, while ostensibly searching for improved human quality of life, have consistently included economic growth as a fundamental element of their equations (WCED, 1987; Mensah, 2019).

A paradigm change is beginning to emerge, where infinite growth is recognized as untenable in a finite world and as causative of some of the looming crises before us (OECD, 2019). The concept of '*Buen Vivir*' (good living), emerging in Latin America, challenges the development doctrine based on the values of economic growth and modernity, by placing emphasis on (1) nature as community, instead of nature as commodity; (2) actions that lead to vitalizing and expanding the commons, rather than the extractivist practices of enclosure and the privatization of the commons, which include land, minerals, water, seeds, and knowledge, among others; (3) a vision of wellbeing that includes communities both human and nonhuman, respect for nature in all its diversity, as well as a recognition of the rights of nature; and, (4) an effort to reaffirm the importance of traditional knowledge and practices, especially those of indigenous and peasant communities, and a reaffirmation, as well, of the importance of full-fledged participation in self determination of women and all marginalized communities (Gudynas, 2011; Merino, 2016; Domínguez, Cariab, & Leónc, 2017; Lyall, Colloredo-Mansfield, & Rousseau, 2018).

In the COBAS, while the term "Buen Vivir" is not of common usage, it has begun to make brief appearances as a unifying concept among peasant communities. A bimonthly collective initiative organized by community members and sociocultural organizations of the region, the "Encounters for Feeling and Thinking about Buen Vivir in the South," possibly inspired by intellectual developments in Latin America around the concept of Buen Vivir (Escobar, 2016; Chaves, Macintyre, Verschoor, & Wals, 2018; Latorre & Malo-Larrea, 2019), seek "to generate an articulated network around the solidarity economy, community living culture and Buen Vivir" (Proyecto Espora, 2018). These Encounters serve to critique the dominant economic system, as one small farmer of the COBAS expressed:

> We are tired of producing raw materials so that others are the ones who make the products and are the ones who develop. Two hundred years after (independence) we continue to export coffee as it was exported that first time. (...) We must turn around that injustice that has been done for a long time, of being farmers or producers of raw materials, so that others can become millionaires (Proyecto Espora, 2018).

Despite not being part of the local lexicon, in the COBAS one often encounters expressions by the people, reminiscent of much that is espoused in the Buen Vivir literature, such as 'our being one with nature.' In the words of some residents, recorded by a Las Nubes graduate student during her research on the relationship between the people and the river in the Corridor,"Water is life; Creeks and springs are the blood of the river; Rivers are the veins of the world; Water has no price, it is the lifeblood of our veins; Without water, we are nothing." (Umaña-Kinitzki, 2017, p.72).

These expressions notwithstanding, the dominant ideologies of the 'Development' and 'Sustainable Development' projects continue to form part of the local imaginaries while economic conditions continue to be challenging and limiting for achieving Buen Vivir.

5.0 Conclusions

The Alexander Skutch Biological Corridor, created 15 years ago, is "conceived as a delimited territory, whose purpose is to provide connectivity between landscapes, ecosystems and habitats—natural or modified—to ensure the maintenance of biodiversity and ecological and evolutionary processes" (Arauz-Beita & Arias-Navarro, 2016, p. 69), while "favoring the economic and social standard of living of people living in this space" (Canet-Desanti, 2005, p. 22). We have been able to examine the evolution of the COBAS, as a geographic and biophysical space, as well as a space transected by converging and at times, contending imaginaries, all of which present a complex matrix that impinges on local livelihoods and socioecological wellbeing. Our analysis puts in the balance the power of imaginaries that affect conservation and local livelihoods, with a final reflection on the role of Las Nubes in this evolving matrix.

5.1 The Power of Imaginaries

The Alexander Skutch Biological Corridor is a space with its particular biophysical characteristics, but also one that includes humans and their social, economic, political, ideological, and spiritual institutions, with rules and practices that are constantly at play. Its designated status as a Biological Corridor has propitiated ideas and ideals that are manifested in social and discursive interactions, in material and productive practices. York University has invested in creating the Las Nubes EcoCampus in the COBAS; national and international development and funding agencies such as INDER (National Institute for Rural Development), UNDP (United Nations Development Program), and GIZ (German Society for International Cooperation) have lent an ear and provided financial support to the projects developed by community organizations under the auspices of the COBAS Local Council (SINAC, 2018a). Community members have incorporated the Biological Corridor into their equations of wellbeing, "What would we do without nature? Having a Biological Corridor helps people follow through with the idea of preserving the trees and the sources of life for all beings" (Ortiz-Imlach, 2014, p. 97).

The official creation of the Biological Corridor in this geographical space did not in and of itself inject economic resources for community development and environmental conservation. However, with the creation of this official category, the different actors in this space have made use of it to inform and transform their practices, their social and economic relations within and beyond the COBAS, and their attitudes and actions towards their ecosystems and fellow creatures. This official category has also served to attract outside actors and kindle supportive actions from them. It has also been used as a weapon to fend off outside forces, such as the hydroelectric dam developers, whose own ideologies around profit from "natural resources," while ostensibly in line with some of the principles of the Biological Corridor, come directly in conflict with other principles more dearly espoused by residents and stewards of the COBAS.

The construct of a Biological Corridor has not necessarily made the COBAS a model for socioecological wellbeing, as there are probably no such models. But it has, however, created a framework that offers the opportunity to think in different ways, reminding us of the need to modify our practices in ways that respect the principles of this space, principles that include ecological integrity and connectivity, the wellbeing of non-human animals and their coexistence with us, and the enduring social and economic wellbeing of the human communities in the COBAS.

5.2 Conservation

The driving philosophy around the creation of Biological Corridors is its capacity to restore and expand the ecosystems for the benefit of its biodiversity. Institutional actors, community organizations, and residents of the seven communities within the COBAS, as well as foreign amenity migrants, have engaged in practices directed at creating ecological connectivity. While PES have been a star contributor to the recovery and increase of forest cover in the country (Barquero & Hernández, 2015; MINAE, 2018), in the COBAS, participation among local farmers in PES mechanisms has not been significant, possibly because the majority of them are smallholders, making their properties either ineligible due to their size, or not worth the trouble, for the limited income they would represent. The institutional mechanism that has had an impact in maintaining and increasing the forest cover in the country, and most likely in the COBAS has been the Forestry Law that prohibits

land-use change of forested patches larger than two hectares (MINAE, 2018). Anecdotal evidence of various farmers in the COBAS attests to this fact (L. A. Rojas M. Arias, personal communication, 2012-2020). While some farmers consider that this law impinges negatively on their livelihood opportunities, they essentially all agree on its environmental benefits.

Local residents and organizations, members of the COBAS Local Council, have engaged during the last 15 years, since the creation of the Corridor, in initiatives to grow trees in greenhouses, distribute these for free among COBAS residents, plant trees in degraded pasture lands and gaps in the riparian vegetation, protect existing forest patches in their properties, as well as denounce occasional hunting in neighbouring protected areas. Most of these activities have been the result of collective initiatives to obtain support from national and international funding agencies (SINAC, 2018a).

Foreign amenity migrants who have chosen to build their homes in the COBAS have also contributed to increasing the forest cover in the Corridor, especially those who have bought larger properties from struggling farmers whose land represented economic losses (L. A. Rojas, personal communication, May 18, 2019). With the ideal of contributing to the ecological connectivity in the Corridor, some of these foreign residents have abandoned the original crops on their purchased land, allowing them to revert to forest. Once these secondary forests are established, the Law demands that they remain forest. As seen above, the common clashes between conservation and production, still common to the rest of Costa Rica (Fletcher, Dowd-Uribe, & Aistara, 2020), continue to be found in the COBAS.

5.3 Peasant Livelihoods

With difficult economic conditions prevailing in the COBAS, some local farming families have pursued the idea of 'diversification' as their guiding strategy for their production and income-generating activities. This has allowed them to continue managing their traditional farms of cattle grazing, sugar cane, and coffee while expanding their production by planting other crops (such as cacao, tropical fruits, and pepper, among others), by processing in-house these crops and developing 'home industries,' by intensifying their marketing strategies, and by tapping into other industries such as 'rural community tourism' (COBAS, 2014; Ortiz-Imlach, 2014; El-Osta, 2015).

Increasingly, there are collective initiatives facilitated by the COBAS Local Council for capacity building in sustainable agroecological production, community rural tourism, home industries for adding value to crops, and the uses of social media for marketing their products. Examples of these initiatives include agroecological farm "CAPICACOA," originally dedicated to sugarcane and coffee, now a diversified, home-industrialized, virtually-marketed enterprise with its name brand. It appears on the Brunca Region Chamber of Commerce website as, "Finca CAPICACOA: "We offer pepper, achiote, turmeric, chocolate, cassava flour, kambucha. The farm is open to rural community tourism, we produce raw materials to make artisan products, without additives or preservatives." (Camarabrunca, 2020).

Other small coffee growers in COBAS have begun to roast, package and market their coffee, as in the case of Glosbe Coffee in its Facebook page:

> Café Glosbe was born in the mountains of Santa Elena, San Isidro de El General, Costa Rica as an independent business, integrated into the Costa Rican coffee model, recognized as environmentally sustainable, uniting a quality product with a unique and exquisite flavour, ideal for daily living. (Café Glosbe, 2020).

Diversification of activities and resources is common of peasant strategies and a fundamental source of their resilience (Ellis, 1998; Samper, 2010; Van der Ploeg, 2012; Babin, 2020). Unsurprisingly in COBAS, diversification is a ubiquitous element of peoples' livelihoods, reflected on the collective expansion of crops to include fruits, spices, ornamentals, forage and food staples, along with their traditional cash crops such as coffee and sugarcane. They also increasingly diversify their sources of knowledge and their social capital, both important elements of peasant empowerment and resilience (Montoya, 1999).

Sustained relationships of local farmers with research organizations such as the CCT, Costa Rican Universities, and Las Nubes, offer them valuable opportunities for capacity building and innovative means of income diversification, as some have done with Canadian student homestays, for example. Being in a Biological Corridor has also become an opportunity for diversification and improved livelihoods, as local producers make use of the environmental benefits of the Corridor to enhance their standing in the marketing of their products and their services.

5.4 Las Nubes in the COBAS

The Las Nubes Project of York University, along with the CCT and local farmer organizations were among those promoting the creation of COBAS. Each arrived with their ideals of what the COBAS should be or could become (Canet-Desanti, 2005; Daugherty, 2005). The Las Nubes Project's proposals for COBAS at the time were expressed as a series of critical elements that envisaged a determining role of Las Nubes for the success of the Corridor. These focused primarily on specific technical solutions embedded in a green economy framework to improve environmental and livelihood needs: the transition from sun-grown to shade-grown coffee; establishment of a demonstrative farm of certifiably sustainable coffee; restoration of the riparian forests; the transition from degraded pasturelands to agroforestry systems; introduction of improved pasture varieties; reforestation of degraded croplands; acquisition of land by external agents, particularly NGOs, for ecosystem conservation; and the construction of an environmental community center for outreach and training activities. While there is a nominal mention of local participation in restoration efforts and small business activities, local community members are seen fundamentally as recipients of outreach and extension efforts rather than as stakeholders with their own agendas and agency (Daugherty, 2005).

The Las Nubes Project, however, transitioned from a technical-economic perspective to a transdisciplinary approach that saw local community members and organizations as interlocutors of knowledge creation, as agents of their destinies and livelihoods, as the stewards of the land on which they live, and ultimately as the caretakers of the ecological integrity of the Corridor. From a Green Consumerism perspective, formulated at the onset of the creation of the COBAS, Las Nubes moved in the direction of a decolonial shift (Mignolo, 2011), with a focus on

socioecological wellbeing and sustainable livelihoods, perhaps akin to some of the principles of Buen Vivir, but aware that the ideals managed in the COBAS have their own genesis and express their own particular aspirations and proposals.

The research projects carried out under this transformed Las Nubes responded to the priorities of the COBAS Strategic Plan (COBAS, 2014). Citizen science formed part of species monitoring in the Corridor (Jiménez-Monge et al., 2019). Education opportunities were offered not only to Canadian students to study in the COBAS but also to local residents to study in Canada (Bolaños Dávila, 2020), as well as the teaching of English and computer skills to local children at the Casita Azul, a collaborative initiative between York University and the local Aqueduct Administrator Association (ASADA) of Santa Elena. The ExpoCOBAS festival, while begun by Las Nubes, was quickly appropriated by local residents. The homestay initiative of the Las Nubes Study Abroad program has provided economic inputs to the local economy as well as opportunities to cultivate significant intercultural relationships.

How this epistemological and methodological shift of Las Nubes, as compared to its initial perspective and approach, has contributed to the goals of the Corridor, is difficult to quantify in a complex system such as the COBAS. There are some signals that the presence of Las Nubes continues to benefit socioecological wellbeing and local livelihood improvement, not as the agent of change but as a collaborator of increasingly proactive local initiatives.

COBAS, as one of approximately 44 Biological Corridors in Costa Rica, has created opportunities for collaborative initiatives and capacity building for many stakeholders, including York University, local organizations, and members of local communities, many of which have come together in the COBAS Local Council. While some of the initiatives have diminished or halted altogether, due to a multitude of circumstances, others have emerged or become increasingly active, generating some socioecological benefits.

Most initiatives emerged from the local communities themselves, possibly sparked by conversations and exchanges among local farmers, NGOs, academics, students, researchers, that for various reasons converged in the COBAS, not least of which was the formal establishment of the Biological Corridor. While the formal declaration did not enact specific laws or regulations of stricter conservation, because the COBAS exists within a mosaic of private properties whose owners are not forced to make extra efforts of conservation, it did create alternative ways of thinking about the place that evoke the need to foster connectivity and promote sustainable production alternatives for improved socioecological wellbeing.

In this time of the COVID-19 pandemic, where it is impossible not to come into some kind of dialogue with it, or some kind of teaching from it, where the dictates of home confinement for much of humanity provide, among other things, a metaphor for our confinement to a single planet, the COBAS is for the local communities, their home writ large, or the planet writ small. At any rate, it is a socioecological and imagined place to be cared for, to be considered in productive choices, and respected in instituting policies. The COBAS has as much potential as its ecosystems and the ideals held by its inhabitants can offer. Las Nubes has envisaged some of this potential and has acted on it. But, most significantly, the local communities have internalized the Biological Corridor; they have identified with this first imagined and later manifested entity and have most assuredly acted on its potentialities. In this

way, the COBAS has become a reality for many stakeholders, serving as a crucible for continued imagining and pursuing of options to improve socioecological wellbeing, perhaps moving closer to one of the ideals of Buen Vivir, of becoming "*a world where many worlds can fit*" (Mignolo, 2011, p. 48).

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