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# STORIES OF REGENERATION

A new breed of sustainable entrepreneurs



Pablo Muñoz & Carola Hargreaves

# Authors

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**academia** **B**

Regenerative organisations are interconnected with nature. Working together, organisations and nature create value in nature and help restore life in vulnerable ecosystems. By doing so, they contribute to the resilience and well-being of the communities supported by these ecosystems.





Holistic Management at Fundo El Reinal

## Foreword

Isidora Molina, Founder Efecto Manada

We have enough information, technologies, methodologies, and ways of interacting with nature, yet we are not using them in a way that creates positive impacts. Currently, we are witnessing the unintended consequences of our decisions. The point of no return seems to have arrived. However, the scarcity economy does not have to exist. Our resources are abundant, and this is how we should understand the economy, with the powerful essence of abundance. There is enough for everyone, if we work with nature. As observers and managers of the land we touch, we have been learning that it is possible to regenerate the soil, and we know that we can produce rich and nutritious food by imitating nature.

Today, more than ever, regenerating nature is crucial, and the challenges are equal to the opportunities ahead. We can return health to the land, to the grasslands, to the fruits and animals. As a result, we can bring health back to humanity in physical, economical, psychological, and emotional terms. It is indeed a spiritual opportunity because human beings are a part of nature. Being able to live off the land is an honour and a right that we all should be grateful for.

Nature is a complex whole, and humans are a part of it. So, if we continue to view symptoms as problems and attend to them with linear solutions, we should not be surprised by the consequences.



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It is not a utopia! Of course, we need to involve everyone in this change effort, from producers to consumers, to the market and governments. The commitment and action of the new regenerative movement are fundamental, which need to be supported by public policies that reward and encourage the transition and adoption of this regenerative knowledge.

People believe that it is fair to have access to information without compromising interests. It is also fair to have access to responsible markets. From the consumers' point of view, it is necessary to know the origin of what we are buying and how it is produced. It matters how the animals are treated and how food is produced. It must be produced naturally and regeneratively – with no chemicals and in a way that life is brought back to nature. This is what we should deem as normal. That is what the planet needs: to have soils available to sequester CO<sub>2</sub>, absorb and retain water, maintain habitats, and regulate temperatures.

Regeneration can occur at different levels, and the Latin American stories that follow show the tremendous impact of immersing ourselves in the perfect cycles of nature. Also, of understanding the times of nature and when to get close to it. This must be present in both the way we live and the way we work.



EOV fieldwork

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In our work, we can see how the nature of nature and the nature of human beings are the same. We are part of each other and the changes that are seen on the ground are also seen in our behaviour. Specifically, those who are joining the regenerative movement recognise that collaboration is far better than competition, that the flow of energy is as important as the flow of communications, that the cycle of nutrients is like the cycle of our experiences. They enrich the entire system.

Financial problems were nothing more than the mistake of covering up symptoms through inputs that put us in a vicious circle. Letting go and choosing other indicators will lead us, sooner rather than later, to realise that the possibility of regeneration exists and will bring benefits that we never thought possible.

We understand that there are factors that we cannot manage as individuals, such as the price of the dollar, fuel, taxes, and the amount of rain. With this comes the understanding that there are things that do depend on us, such as planning, organisation, trust, supporting the ability of the earth to use the rain and how we treat our peers, including animals and vegetation. This is challenging but motivating as well.

This perspective can be learned and comes from the experiences that have given hope to those who depend on natural ecosystems. We can look at the future through a different lens and continue to evolve with nature. There is no need for more innovation or more technology, nor do we have to go to other continents for new knowledge. We are intertwined with nature, and humans being humans can by themselves find the answer.



EOV fieldwork





Camino Verde



Oceanus AC

**Sustainability is no longer enough, if people become sustainable or begin to recycle, we are not going to make it, we must regenerate.**

Matías Undurraga



Pasticultores del Desierto



Emiliana Organic Wines





# Stories of Regeneration

Regenerative Organisations	10
El Reinal, Chile	14
Camino Verde, Peru	18
Inka Moss, Peru	22
Procoreef, Colombia	26
Manada, Chile	31
Siembra Viva, Colombia	35
Oceanus AC, Mexico	39
Pasticultores del Desierto, Mexico	44
La Cristina, Uruguay	49
Punta Callao, Chile	52
Asoamaime, Colombia	59





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# Regenerative Organisations

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The relationship between humans and nature is strange. We need each other, but humans tend to pretend that we do not and thus the distance between humans and other living and non-living beings is increasing to the point of developing fears and phobias of non-predatory species such as spiders, snakes and even nettles.

This distance is not innocuous. On one side, the way modern human life is organised is ecologically damaging. With human progress, our ecosystems have undergone radical changes. Biodiversity has been lost and temperatures continue to rise, threatening the existence of entire ecological systems.

## **Connection with nature**

However, humans have an innate tendency to seek connections with nature and other life forms. Neglecting that connection puts us in a precarious position. Most of us are aware that the loss of biodiversity, caused by humans, could substantially diminish the benefits that people derive from nature. Therefore, humans are putting themselves in danger, not only as a result of a changing climate but because a defining part of the human evolutionary experience is declining, rapidly.

Welcome to the Anthropocene.

The industrial revolution has endowed humanity with superpowers. We believe we exist over and beyond nature, which has led us to play a new central role in the geology and ecology of Earth. In this new era, for the first time, humans are leaving permanent geological markers in the planet's stratospheric record. Linear thinking, a siloed understanding of the world, and human-nature dualism are at the centre of anthropocentrism. This has been fuelled by misleading convictions regarding human intelligence, technological dominance, and anthropocentric organisational orientation.

## **Business sustainability**

In business management, our efforts are mostly focused on finding efficient formulas for resource management, which are still guiding our analyses of human-nature relationships, which are primarily focused on understanding how those relationships impact businesses, industries, and organisational environments.

More recently, an interesting shift in perspective is moving the conversation towards considering nature as nature, and to new areas focused on how we build connections with natural environments, in ways that do not destroy the foundations that sustain life.



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While relevant, this is far from sufficient. Literature remains piecemeal and dualistic. It is argued that the debate on sustainable development is far from being a paradigm shift, as it is still based on economic, not ecological, rationality.

A deeper commitment to sustainability would require a transition from a shallow ecological orientation to a movement that fosters a deeper, long-term ecological orientation. Such a transition would require reconsidering other living species and systems based on their inherent value, regardless of their instrumental usefulness to humans. This would involve rearranging our relationships with the natural environment and a radical rethinking of how modern human companies organise and operate. This is essential to regenerate and sustain our innate tendency to seek connections with nature.

Conversations about ecological restoration and regeneration have grown rapidly in environmental sciences. The debate on ecological restoration has revolved around returning ecosystems to pre-European settlement conditions. These ideas have close links with environmental justice movements, as they propose a form of eco-cultural reconstruction that redefines spaces and restores degraded ecosystems within human environments. Its excessive emphasis on ecological protection has been criticised because it neglects social justice issues, which end up alienating disadvantaged communities living with those surroundings.

### **The idea of regeneration**

Regeneration takes a different approach. A system is regenerative when it has the inherent ability to exist once more. It is not only about revitalising, reactivating or restoring a system but also about allowing changes so that the system can be transformed into something new and improved.

Regeneration is a central attribute of living systems, as it increases the capability of a system to organise itself and continually evolve. From an ecological perspective, regenerative development involves expanding the capacity of human and non-human living beings to co-evolve in ways that foster diversity, creativity, complexity and life. Regeneration is an interconnected process, where the healthy development of one form of life is inseparably connected with the healthy development of all others.



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The ideas of regeneration and regenerative development have given way to a variety of new concepts, for example, regenerative agriculture, regenerative culture, regenerative design, regenerative capitalism, regenerative leadership and regenerative business.

Business management research and practice are slowly letting their guard down to engage more deeply with new, non-dualistic approaches. Perhaps inspired by traditional ecological practices, organisation and management studies have begun to consider the possibility of deeper levels of connection. This includes, for example, industrial symbiosis, organisational synchronicity, biomimetics, regeneration of socio-ecological spaces; relationality and decompression of time and space.

Sustainable land management practices are changing and with it, the narratives and meanings related to "managing" and "organising". We have also begun to revisit and care for our relationships with non-human animals, towards a new ethic of business care.

This involves the gradual reintegration of some organisations into socio-ecological systems and the surge of new forms of ecocentric organisations. It is possible, then, that biodiversity adaptation, mitigation and conservation initiatives are not driven only by necessity, threat and survival.


Some organisations have started working with nature on regenerative processes. The regenerative movement covers a wide variety of areas, such as agriculture, energy, business, culture, and others. Currently, however, this deeper connection can be evidenced mainly in food systems, based on agroecological practices, for example, permaculture, biodynamic agriculture, holistic management and planned grazing. They all promise, and have so far achieved, ecological restoration, carbon sequestration and food security while ensuring the financial viability of the communities that these ecosystems support. These new ways of organising and creating value are what the following stories of regeneration begin to reveal.

Opportunity fragments, ProCoReef





# **Stories of regeneration**



You are the administrator of an area of the planet, there won't be another planet for anyone, we have to leave a better version of what we have inherited, something more productive.

Matías Undurraga

## El Reinal

### Chile

In the south of Chile, there is a town called Fresia, which is unique in terms of climate and geographical conditions. Fresia is an area of fruitful soils with abundant and unique biodiversity. In 1986, Carlos Undurraga decided to buy his first ranch for livestock production. Since then, the ranch has grown and today covers 1,500 hectares, 700 of which are grassland. Matías Undurraga, Carlos's son and his family were not happy with their city lifestyle. Convinced that they needed a better environment for their children, they decided to change their lives and move to Puerto Varas, 50 kilometres from Fresia, in 2013.

While Matías was looking for work he began to help in one of his parents' farms, Fundo El Reinal. It has 200 hectares of grasslands and 400 of native forest that they intend to preserve. Many trees have a diameter of 2 to 3 metres and there is a cold forest underneath. Matías, committed to his family, land and animals, has been gradually getting involved in the livestock industry. Following his intuition, Matías introduced the first changes to the farm's production system. They eliminated the use of agrochemicals and herbicides in the fields, the animals stopped receiving growth hormones and corn grains as a food supplement. The natural grass began to be the cattle's only source of food. They were the beginnings of what, years later would be known as Holistic Management.



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**When I learned about the vices of the meat industry, I realised that there was no way of producing the meat I wanted my children to eat. The more one learns about food, the fewer food sources one finds. We produced and sold meat, and I couldn't dare give it to my children. I am from a generation that is aware of these issues and I already knew the consequences that this had on the environment and people's health.**

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In his search for a new agricultural and livestock production system, Matías came across Allan Savory's work. Allan is an ecologist and founder of the Savory Institute. The system developed and promoted by Savory seeks to fight desertification and reverse the effects of climate change. Savory is convinced that the only alternative to regenerating degraded ecosystems is by grouping and constantly moving the cattle, which imitates the ancient movements of herds and predators. This is called holistic grazing management, which considers environmental, social, and economic variables. Holistic management allows for regenerating soils and ecosystems, ensuring an improvement in carbon capture and greater storage of organic matter.

### **A new production system**

In 2017, El Reinal changed its production system, trained its employees, and began to move towards Grass-Fed certification. He was proud of his work towards regenerative livestock management and convinced that Chile's farmers can go to international markets with world-class natural and regenerative products. At that point, Matías decided to work full time at El Reinal. Holistic management recognises that nature works as a system and planning must be adapted to the context. There are no fixed guidelines, and it involves constant learning. Pasture's natural rest times must be respected. It involves moving livestock from one sector to another, considering the animal load and the time of year.

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The results are visible in the short term. Many farmers who have implemented holistic management as a grazing system have evidenced a grass explosion. They continue to learn how to manage the abundance of food using grass conservation techniques that complement the feeding of animals in the winter. On the other hand, this abundance allows for an increase in the animal population that translates into an increase in profitability for the producer.

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**Another change that was immediately noticed by them was that, since the grazing cycle is longer than conventional techniques, birds now have the chance to nest. With a rotation of 30 days, they are unable to nest. On the contrary, in 50 to 100 days, nesting takes place and flocks of birds, native flora species and balanced and natural meadows can be seen. These flora species do not need fertilization because they get along very well with each other.**

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At El Reinal, animal welfare is very important, they have more than 1,200 animals under regenerative management. Livestock is handled in its natural herbivorous condition. Their diet is 100% based on natural grass, they are not crowded, thus not stressed. They are raised in a healthy way respecting their ecosystem and seeking their happiness. In 2019, Global Animal Partnership awarded the Animal Welfare certification to El Reinal.



**Prairie production meat tastes of grass, you can teach people to recognise it. This is a good thing. The good things are behind the relationship between animals and their environment.**

Natural grass meat is leaner, with an intense red hue. Its fat has a distinct colour between yellow and green since it comes from beta-carotene and chlorophyll. It contains 50% more Omega 3 and has high nutritional value. El Reinal currently offers beef to the Chilean market and, through an online distribution centre for products of regenerative origin, their beef is exported to California. Locally, they are also offering other regenerative products such as chickens, wild boars, prairie eggs, cheese, and honey.

In 2019, they officially launched the 'El Reinal' brand, to reach the final consumer. The idea is to work directly with cooks and butchers so that they get to know each other and work together. Regenerative livestock farming has become very attractive for a wide range of people. Dairy and meat producers, academics and even final consumers visit the field weekly to get to know holistic management up close and those who proudly practice it.



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**It is our generation that has to give hope to future generations so that they can move forward. As things stand, in 10 years we won't be able to help in any way.**

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The Undurraga family seems to be interconnected with nature. They have spent years working in regenerative livestock, monitoring its management, learning and implementing new practices and techniques. They have seen positive results and are proud of them. Among the many challenges they face there is the improvement of El Reinal's water retention infrastructure.

Fresia is an area that has many rivers, springs and a native forest that, in addition to being an important carbon reservoir, plays an important hydrological role as it accumulates a lot of water and gradually delivers it. With this, El Reinal prevents soil erosion and presents abundant biodiversity. Every year, El Reinal plants a tree for every cow they own, this is more than 400 trees annually. They are now planning to restore the grasslands with native forest. To do that, they are bringing the Coihue back to the area.

Current invasive and extractive practices are degrading the planet, the environmental impact is evident and future generations will suffer the consequences. El Reinal is reverting this trend, demonstrating how wonderful and efficient nature is in its ability to regenerate, restore interconnections of complex living systems, and maintain its balance. The human being must be part of this.



Undurraga Family

**Our greatest incentive is to make a very strong turn in the industry, we farmers and landowners can change the behaviour of millions of families through the products we make.**



# Camino Verde

Peru

**We experiment, improve and disseminate holistic reforestation strategies that are regenerative for the human community and other biological communities.**

Robin Van Loon

The Peruvian Amazon has lost 7.7 million of the 73 million hectares of its tropical humid forests, because of extractive economic development. This includes logging and other illegal activities such as mining and drug trafficking as well as losses resulting from climate change, for example, heavy rains followed by long periods of drought.

In the province of Tambopata, southeast of the Peruvian Amazon, there are some initiatives for the conservation of native species and the restoration of degraded ecosystems. Agroforestry, reforestation and agroecology are some of the practices that regenerate biodiversity and strengthen communities that cohabit with nature.



Regeneration at Camino Verde's Reforestation Centre



**Our work falls on the intersection between communities and forests. We know that Amazon can be restored in less than a human's lifespan.**

Camino Verde emerged to tackle these problems. Founded in 2007 by Robin Van Loon, Camino Verde is a non-profit organisation dedicated to understanding and protecting the biodiversity of the Peruvian Amazon. It seeks to develop regenerative systems, preserve native species in Peru and create conditions that favour sustainable lifestyles.

#### **A new seed bank**

Robin came to live in the Peruvian Amazon at the age of 20 and was fascinated by the richness of its biodiversity and the beauty of the landscape. He had the privilege of meeting and spending time with the native communities of Madre de Dios and even got to be a part of the board of directors of an agricultural association. Robin learned about medicinal plants, the value of wood, food and about unique species on the planet, many of them currently endangered. This is fundamental since indigenous people depend on the resources that the forest provides to cover their basic needs and to sustain themselves. Robin was dreaming of creating an agricultural farm to grow and harvest his own food, where he could experiment with new seeds and plants but was unsuccessful in finding a nursery or seed bank to produce them.

In 2006 he left the community and found the perfect place to settle. Not satisfied with this reality and immersed in the heart of the Tambopata, Robin began to look for seeds and information on native species, which at that point had not been studied, for the creation of a living seed bank. Camino Verde's Reforestation Centre was born.

It was not easy at first. The communities in this region did not have much information available. People who cohabit with the forest were not able to recognise some of the seeds, they were unaware of their growth and development, as well as their economic potential as a non-timber resource. Robin highlights the case of Rosewood seeds. This is a highly threatened species, considered a luxury for its aroma and for being one of the best woods for guitars. It took him about eight years to find those seeds. Despite the difficulty of harvesting seeds in challenging conditions, in 2007 Camino Verde began to sow all kinds of species experimentally. They were trying to imitate the natural forest conditions at the Centre in a flooded Amazon forest. Furthermore, they were surrounded by people who distrusted the success of the sowing and germination of these seeds.

**After having lived in a native community and seeing the loss rate of these species in the natural forest, I realised that there was nobody to propagate those species that provide seeds or seedlings; it was very shocking.**



Camino Verde's local team

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**People didn't have the habit of planting native species, but rather carried out extractive activities. In many cases, we sow species thinking that we would not be successful. But even under farm conditions, reforestation, under a different environment from the forest where it reproduces naturally, we have been impressed with the success of its growth and development.**

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### **New regenerative systems**

In the first ten years, 400 Amazon tree species were planted at the Reforestation Centre to experiment with their resilience, develop the most successful planting designs and propagate native species that have been so far exploited. Camino Verde has developed successful agroforestry systems in terms of forest conservation, restoration and regeneration. They are capable of restoring ecosystems and enriching biodiversity. In addition, their sustainable production systems allow the generation of short-term economic benefits for the farmers.

Ten people work full time, plus hundreds of volunteers, farmers and forest communities of Madre de Dios and Loreto. Together, they have made it possible for Camino Verde to have more than 20 reforested hectares, with more than 25,000 trees of 400 different species. Also, there are 100 hectares of primary forest conservation, where the seeds are harvested.

Robin defines Camino Verde's Baltimori as a paradise and it is here where he began his productive activity. Cultivated together with native communities and farmers, they sell seedlings that can grow in places where others cannot, they are regenerators capable of returning biodiversity where nature has been degraded.

Camino Verde's Baltimori can only be accessed by a river, therefore the transportation of these seedlings and other products was not easy. In response, in 2015 they founded La Joya, to produce seedlings of different species of native trees.

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**We measure success in terms of how well we are imitating the forest, how well we are restoring the ecological functionality of an area that is no longer a farm but more like a forest, and it also has to generate income for the person who runs it.**

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**We are fulfilling one of the original purposes of Camino Verde, which is to be a source of seeds and seedlings of species that are not available elsewhere or that are of less common species.**

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At Camino Verde's La Joya Forest Nursery, around 60,000 seedlings are produced annually with a variety of over 100 species each year. In this, the Amazon Scientific Innovation Centre at Wake Forest University has played an important role. In La Joya, a demonstration scheme was created with an Amazon regeneration programme. It has regenerative plantation systems with high biodiversity and the presence of native species, which present a balance between the possibility of restoring forests and their productivity.

**Botánica Camino Verde**

Taking advantage of the benefits provided by the tropical forest, Botánica Camino Verde was born, which has developed non-timber forest products that finance part of the programmes and activities at Camino Verde. It distils and produces high-quality essential oils and soaps from unique aromatic species, such as Moena Alcanfor, which they sell to firms in the natural cosmetics, aromatherapy, and perfume industries. In turn, they provide a source of income for farmers and an incentive for reforestation. Botánica Camino Verde is in the process of obtaining B Corp Certification, given its sustainable practices and triple impact.

The Peruvian Amazon is a natural paradise. Aromas, sounds, colours and miniature creatures coexist in harmony and mutual respect with native communities and farmers in the region. Shockingly, this wonderful ecosystem is being degraded, compromising the well-being of future generations. People like Robin Van Loon and organisations like Camino Verde are working to regenerate the region and preserve native and endemic species.

**We try to find a harmony between how we imitate the forest in its diversity of forms and structures, in its morphology, and how we justify this activity economically; understanding that a small farmer or a native community, which has little resources, will not choose to implement a system that does not offer an economic benefit.**



Aniba Rosaedora

We start by observing nature, how it does so that the water is safe to drink

Marco Piñatelli



Peruvian Andes

## Inka Moss

Peru

In the Junin region, at more than 3,000 metres above sea level, the most vulnerable communities in the country live in conditions of isolation and extreme poverty. In this beautiful highland landscape grows the Sphagnum Moss or White Moss, a unique natural resource with valuable properties unknown to the community members. They were unaware of its potential; they even destroyed it by burning it to clear the land and grow food, mainly potatoes.

Marco Piñatelli was intrigued and researched the Sphagnum Moss.

This was an attractive opportunity for commercialisation due to its great international demand and little existing supply. Also, the environmental impact that its sustainable production would bring to the area was evident.

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**It was a fairly original idea, little is known in reality and that had, fundamentally, a social impact, environmental impact and it was also sustainable.**

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Reversing the burning and destruction of this valuable natural resource would stop land degradation, recover burned soils and bring back the Andean landscapes. In terms of social impact, these Andean communities would see employment opportunities with the consequent increase in their income and improvement in their quality of life.

In addition, their land would be revalued thanks to the cultivation of this species, improving the local economy. Finally, it would give government officials an alternative to avoid burning and maintaining environmentally effective control. This is important because there were no resources available, nor people who could take over this area.

### **Ecological Moss in Peru**

In 2010, Marco founded Inka Moss, a social enterprise dedicated to the ecological and sustainable production of the Peruvian Sphagnum Moss. They would deliver a high-quality product to its clients, whilst generating a social and environmental impact in the communities they work in.

Inka Moss has developed collaborative educational activities linked to the cultivation of this resource with 20 Andean communities. This, whilst respecting their routines, lifestyles, and activities. Women have a fundamental role since, in their majority, they are the ones in charge of the harvest.

Sphagnum Moss is a natural and organic resource with a tremendous environmental impact. It is mainly used as a vegetable substrate for plants that require high levels of humidity, given its unique properties of excellent water absorption. It is highly demanded by the orchid, berry and hydroponic crop production industry, as it allows producers to save water. This 100% biodegradable product is an effective antibacterial and fungicide, ideal for organic crops, as it allows them to develop without the need for chemical inputs. In addition to this, its thermal and acoustic insulation properties make it attractive for modern architectural projects, which is used in the construction of vertical gardens and as an insulating material in housing construction.

Peruvian Sphagnum Moss



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**We began by observing nature, which, through its mosses, has the ability to filter the contaminating metals of rainwater and can then purify it. Moss is capable of absorbing, in addition to bacteria, heavy metals such as iron.**

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### **The benefits of the Sphagnum Moss**

Inka Moss is starting to explore another benefit of this moss: its ability to purify water. The company, concerned about the needs of its communities, has established natural water treatment plants. They arrange the moss in blocks to purify the water and supply the population. The chlorine used in pool filters is currently being replaced by the Sphagnum moss.

The development of a forest management plan together with SERFOR - Peru's National Forestry Service - is one of Inka Moss's most outstanding environmental practices. They work with various communities and have created different access routes to the harvesting areas, in response to climate change which has affected them on more than one occasion with landslides and roadblocks.

Inka Moss regularly provides training to community members on sustainable resource management. This includes techniques for land management, the measurement of its biomass and the importance of harvesting without uprooting the moss so that the plant can regenerate and maintain its production without degrading the land.



**The area where the moss is present is subdivided into zones and we create a rotational harvest plan. In other words, during the first year, zone one is harvested, then in the second year we move to zone two, the third year to zone three, the fourth year to zone four and in the fifth year, we return to zone one. The management plan is tailored to each community.**







Peruvian Llamas

**Llamas, native animals of that region, possess non-invasive unique physical features. Their legs are designed to not damage the ground, unlike those of the horse for example. On the other hand, the llamas, when grazing, extract only the upper part of the plant. So, they prune it without taking the root out.**

### **The impact of regeneration**


Over time, Inka Moss has been optimising its production with the lowest possible environmental impact. Marco explains that the harvest of the moss is done based on one's knowledge that allows the moss to expand while uncontaminated.

Dehydration happens naturally, we do not use polluting energy, we only need the wind and the sun. Moss is dehydrated in the harvest area to reduce the weight of the bags, which must be taken down from the hills.

Inka Moss has implemented a pulley system, using cables that prevent routes forming on the road which would alter the local geography. They use llamas, instead of horses, to transfer the bags to the town.

Inka Moss is a triple impact company with significant growth and expansion challenges. Inka Moss will continue to support the formalisation of community projects, while investing in improving the working conditions of its collaborators, promoting the empowerment of women and advising communities so they can optimise the benefit of their lands.

**The supply and production process directly involves the inhabitants of the communities living in extreme poverty, allowing them to generate additional income in a sustainable way without having to abandon their lands and culture.**

A diver in a white shirt and blue fins is seen from above, working on a large, star-shaped coral nursery structure on the seabed. The structure consists of several long, thin lines radiating from a central point, with small coral fragments attached to them. The water is a clear, light green color.

It is still possible  
to reduce the  
speed of climate  
change. It is not  
too late for coral  
reefs and many  
other ecosystems  
facing current  
challenges

Fabio Gómez Delgado

ProCoReef's pyramidal nurseries

## ProCoReef

### Colombia

The ocean is an imperceptible ecological structure largely unknown to humans. It is a universe made up of complex ecosystems that are part of a fascinating biological mechanism, the formation of these ecosystems has taken millions of years and will never stop to surprise us. The ocean acts as a reservoir for the planet's blue carbon, capable of absorbing gases and carbon dioxide and supplying between 50% and 85% of the oxygen to the atmosphere. It can regulate the Earth's temperature and climate throughout the planet, providing a fundamental environmental balance for our survival.

Ecosystems of high biological diversity such as coral reefs, mangroves, and seagrass meadows allow for the interaction of multiple species that coexist in tropical marine-coastal environments. Under healthy conditions, this ecosystem trilogy protects the coasts from extreme weather events. It also provides resources that work as food and economic sustenance to thousands of communities. Unfortunately, "coral reefs are being boiled alive," says Gabriel Grimsditch of the Marine Ecosystems Division of the United Nations Environment Programme. More than 50% of the planet's corals have collapsed in the last 30 years and by 2050, between 70% and 90% of the world's corals will be lost.



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Corals are animals that are vulnerable and sensitive to changes. As a result of global warming and the increase in ocean temperature, coral bleaching has been evidenced. This occurs when the coral is stressed and expels the microalgae from their tissues, with which they live in symbiosis. When this happens, they not only lose their colour but also their main source of energy.

Acidification of water is highly corrosive for the calcareous structure of corals, which is what allows them to settle and grow. Extreme weather phenomena, overexploitation and mismanagement of resources, predatory tourism and pollution, threaten not only corals but also 25% of other ocean species that depend on coral reefs for their livelihoods.

They began by identifying some diseases and then categorised the most resistant coral species: those with the potential to recover, those species that capture and store much more carbon than others without deteriorating communities and populations of natural reefs. They experimented with all known coral restoration techniques while evaluating their feasibility and viability.

### **A new regeneration technique**

One of the coral reef restoration techniques consists of fragmenting a coral colony, where each fragment is raised in a coral nursery and then transferred to a healthy reef, like a rehabilitation strategy for this ecosystem. Fabio designed a new regeneration technique, which is neither extractive nor aggressive, which he calls opportunity fragments.

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**In the 19 years that I have worked on the island, I have been permanently monitoring coral reefs, with the work of my students and with field trips, we have unfortunately discovered the same thing that many have already seen: that corals are dying.**

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Fabio Gómez Delgado is a Research Professor at the Faculty of Sciences of the Pontificia Universidad Javeriana in Bogotá. He has dedicated his career to studying corals and other species on Isla Fuerte, a small island sitting on a platform of fossilized corals in the Colombian Caribbean. In 2000, Fabio and his students developed the Isla Fuerte Species Conservation Project.

Opportunity fragments are pieces of coral that have detached from the reef and are found on the ocean floor with little growth potential. These fragments are transferred to a nursery, a pyramidal structure made up of 15 ropes where the corals are hung. In this way, the coral does not have to invest energy for its initial regeneration process but instead invests energy exclusively in its growth.

**The fragmentation technique of a coral colony began to bother me because I felt that I was doing more harm than good, it was a wound in a healthy colony. It was painful to experience, and I was worried because I knew that, because of that wound, the diseases that I was studying were going to infect the coral.**

### **A new coral regeneration model**

In nurseries, growth rates and the amount of carbon that each colony, with six different species fixes, are monitored and recorded. This allows them to determine how much atmospheric carbon they are removing and how much of that carbon is going to be attached to the coral structure. After a year, the coral has grown enough to be moved and planted on the restoration reef. Their transplantation is key in the recovery of biodiversity, in the increase in biomass and in the productivity of the species that depend on the reef. The natural recovery of these ecosystems is not immediate. We now have evidence of the success of the Conservation Project in Isla Fuerte, but it has taken years of experimentation. The results have been surprising. Currently, 80% of transplanted corals survive. Local communities have benefited from the recovery, and more and more people are interested in participating and learning from this process.

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**One of the great problems of restoration is that nobody finances it; restoration is expensive, it is slow, it needs very specialised assistance, it needs to be managed by experts.**

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ProCoReef's pyramidal nurseries

Olga Lucía Caro was one of these people. Fascinated by the planting of corals, she wanted to learn more about the work that Fabio was doing. Olga Lucía is an ecologist and expert in conservation project management. She was determined to solve specific environmental challenges and found in this experience an ingenious business opportunity where the restoration of a complete ecosystem was viable.

By the end of 2017, Olga and Fabio founded ProCoReef, an organisation that has developed a model for the conservation and restoration of marine-coastal ecosystems that is sustainable, participatory, and highly scalable.



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## Regenerative tourism

In Colombia, there are around 2,800 square kilometres of coral reefs with 90% of the country's reef area in the Colombian Caribbean, which offers a tourist attraction that has allowed the industry to diversify and increase its income. The increase in tourism demand brings extensive coastal development, but also an overload of population and maritime transport, depredation, and an increase in the pollution in the water, which puts the survival of the entire ecosystem at risk.

ProCoReef has become the voice of the reefs through its regenerative tourism model, involving local communities, experts, and tourists. La Ruta del Coral was born in Isla Fuerte in February 2018, a tourist project that invites people to travel with a purpose. This offers the public and companies the opportunity to learn about the origins, interdependencies, and importance of marine-coastal ecosystems as well as understand the problems that the reefs face and actively participate in the regeneration process. ProCoReef offers Coral Planting, an underwater adventure where the company transfers its scientific knowledge in regeneration techniques to tourists, and the tourists, in turn, participate in the collection, cleaning and transfer of coral fragments to ProCoReef's nurseries for its potential growth.

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**The technique is so easy that anyone can do it, you don't have to be an expert. We have found that people learn, not only to understand the problem but become part of the solution and connect with the reef.**

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Since 2018, almost 12,000 coral fragments have been planted by ProCoReef collaborators and clients. ProCoReef has twelve nurseries, each housing 1,000 coral fragments, which is equivalent to a quarter of a hectare of the reef. The location of these nurseries has been part of the experiment. They take advantage of unique conditions, such as the movement of the tides, adequate depths for freediving/breath-hold diving and areas of sandy plains where there are fewer coral predatory organisms.

In addition to focusing on the conservation and restoration of marine ecology, ProCoReef is committed to the formation of local and scientific communities. ProCoReef has developed an ecosystem impact measurement model, whereby they monitor and compare the reef areas that have been intervened with those that have not been intervened while recording incremental values in terms of biodiversity. In 2020, Olga received the Women and the Ocean Award: Changemakers challenge, recognising the importance of ProCoReef's work.

Preparation of ropes



## COVID-19 and 2021

The Covid-19 pandemic during 2020 demonstrated the impact that unsustainable economic practices bring to the health of the planet and our health and the health of the economy. One of the most affected economic sectors was tourism. Due to the lockdowns, their activities in Isla Fuerte were suspended. During the closure, they reinforced their commitment to the necessary systemic transformation that reefs require to survive over time. It was a very productive period, which has allowed them to pivot to explore financial instruments as opportunities to finance coral reef restoration. This starts from their understanding of regeneration as a process of sharing knowledge that seeks to reconnect tourists and local communities with reef ecosystems. They wanted to bring this knowledge to a greater number of people through social networks and alliances with local entrepreneurs.

Partner companies were selected for offering sustainable products and services aimed at reducing the major drivers of ocean degradation. The entrepreneurs, in addition to contributing money for restoration activities, shared their knowledge inviting consumers to change habits and take action to care for the ocean from home.

This strategy, aimed at creating a culture of sustainability, led ProCoReef to be selected as one of the 50 founding initiatives of the United Nations Decade of Restoration.

This is also aligned with the #GeneraciónRestauración (regeneration generation), a communication strategy that aims to create and articulate a movement that connects restoration with all citizens, seeking changes in consumer behaviour to support value chains and sustainable restoration.

Regenerative tourism





The basis of regenerative livestock management is to mimic the co-evolution of herbivores with grasslands and the effect that, as a herd, has on their next growth cycle.

Cristóbal Gatica



Los Ulmos Ranch

## Manada

### Chile

It is known that livestock and agricultural activity are important factors responsible for the environmental problems the world is facing today. The development of extensive and extractive practices of industrial agriculture and livestock production in the last 50 years has put the health of the land and animals at risk. Over-grazing has degraded soils and water resources and has decertified large areas of the planet, thus destroying one of the main natural sinks for carbon sequestration and storage.

Aware of the environmental impact he was generating as a livestock producer, Cristobal Gatica decided to implement a new regenerative livestock system in the Los Ulmos ranch, based on the principles of Holistic Management. Holistic Management requires the definition of a Holistic Context and is made up of three planning processes: grazing, financial and land planning. Holistic Management is a system capable of regenerating eroded and desert soils, producing more natural food in a healthy and harmonious ecosystem, and increasing business profitability.

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There is no recipe; it requires constant monitoring of the ecosystem, and through that, it can become a powerful learning tool.

In 2015, Cristóbal decided to take Holistic Management one step further and founded Carnes Manada, together with his brother Sebastián, Patricio Olavarría and Tomás de la Fuente. Carnes Manada is a certified B Corp that emerged to transform the industry into a space for collaboration and inclusion of all the actors in the beef production chain.

Manada sits on three pillars for decision-making and development. First, the use of Regenerative Management as the baseline for the production and elimination system of agrochemicals and chemical fertilizers, which enhances the biological activity of the soil to be used as a carbon sink. Second, they promote animal welfare through pasture grazing, which means animals can express their natural gregarious behaviour and that their diet is 100% forage, without using concentrates and grains in their diet. Finally, they apply Fair Trade principles, with a commitment to all actors in the beef production chain.

### **Regenerative knowledge**

Manada transfers knowledge about holistic management, playing a role in education and training. It has engaged in active collaboration with Universidad Católica in Santiago and Universidad Austral in Valdivia, developing lines of work linking academia with beef production.

Regarding consumption, the trend worldwide shows a consumer increasingly concerned about the traceability of products, which gives more value to those made under sustainability or regeneration models. However, there are aspects of the production chain that have not been responsibly communicated by some industry players. Slowly, consumers are beginning to put pressure on decision-makers, choosing more natural products, which are processed responsibly.

Carnes Manada seeks to fulfil a role, providing the consumer with information about these production systems, their impact and their importance in environmental, social and economic terms.

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**We believe that moving the industry to another place and generating a much more positive impact in environmental terms is not a task for a single actor. Manada is a platform to include other actors who are interested in regenerative livestock management, who believe that we must form a large herd of producers, consumers and actors who are willing to adopt these practices.**

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**We seek to transform the Chilean countryside into space for sustainable development, seeking to put people, the environment and animals at the centre.**

### **The Natural Beef Node**

In 2016, Manada Chile formed the El Nudo de Carnes Naturales (the Natural Beef Node) of the Los Ríos Region, together with SAVAL and the Universidad Austral. It is a collaborative network that opens a space in the national industry offering natural, healthier food products with a positive environmental, social and economic impact. The Node seeks to promote changes by introducing 23 producers to the regenerative production system, thus adding around 3,000 hectares of potential grasslands to be managed under regenerative systems. Some of the producers of this Node have been working for two years with a regenerative livestock system.

Results can already be seen, and, in the future, Carnes Manada could integrate them into its production chain as suppliers. Los Ulmos, a supplier of Carnes Manada, is one of the two farms in Chile with a GRASS certification (Regenerative and Sustainable Grazing Standard developed by OVIS 21 in conjunction with The Nature Conservancy). Now they are waiting to obtain the EOVC certification - Ecological Outcome Verification, built on the GRASS standard.



GRASS certification

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**We want to communicate and educate consumers about the differences between natural meats and meats produced under a regenerative system; we want to educate and inform consumers about parts of the process that are invisible in the product so that they can make conscious decisions.**

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In Los Ulmos, ruminants are treated as such. Cristóbal explains that "it is thousands of years of evolution that have allowed an animal to generate an internal ecosystem to take advantage of fibre to feed, that is the wonder of evolution and we will not go back in its nature". The diet of his cattle consists of 100% natural grass, which allows them to offer healthier products with higher nutritional value.

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In line with its principles, Manada is beginning to replace part of its packaging materials with reusable materials, thus encouraging recycling. In terms of forage conservation, in Los Ulmos they have reduced boluses, which translates into lower oil consumption and reduced plastic use.

Manada invites producers, consumers and all industry players to come together to promote regenerative productive activity, to inform themselves and change the paradigm towards one where the livestock industry can be a positive tool in terms of environmental impact.

The industry is indeed capable of changing. If it commits to the health of the environment, it can help reverse the effects of climate change through well-managed planning models and secure the well-being of our animals and future generations.

**For every kilo of meat that we are placing on the market, we are displacing a kilo of meat that has a much higher carbon footprint than our product.**

Los Ulmos Ranch





# Siembra Viva

Colombia

**We will not stop until all the food you have in refrigerators is fresh, has been produced by local producers and cultivated in regenerated soil.**

Diego Benítez

Siembra Viva is convinced that its regenerative agriculture project can transform the lives of local producers, protect the environment and offer consumers a healthy alternative at their doorstep.

Siembra Viva offers small farmers in Colombia a novel alternative to traditional agriculture. Taking advantage of the potential of the soil in Latin America, and Colombia in particular, they developed a regenerative agriculture model that allows the producer to be technologically empowered, which favours the standardised and constant production of organic food.



Siembra Viva's Green House

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**All the risks of the agricultural production chain in Latin America is assumed by the weakest link, which is the small producer, two risks in particular: the volatility of quality and supply. The SiembraViva project, established as a company in 2014, aims to solve the intermediation problem, not from the simplification of intermediation as we believed, but precisely from guaranteeing the quality and standardization of the product accompanying the producer from the start.**

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The Siembra Viva model has delivered good results. It creates a triple impact, guarantees the producer that all its crops will be sold, and pays regularly at a fair price. This, together with the B Corp certification, and its alliance with Salvaterra, an NGO with experience in mineralised agriculture, gives Siembra Viva credibility and makes the model attractive enough for the producers to decide to adopt it. The Siembra Viva producer network comprises 17 units for agricultural production exclusively dedicated to organic crops, with agroecological practices.

### **A collaborative project**

It is a collaborative project where the producer must dedicate at least six to seven hours a day to cultivation, development and harvest.

Siembra Viva provides seedlings, supplies and final products in ready-to-eat, selected, washed, disinfected, chopped, portioned packages.

The products are then sold on Siembra Viva's online platform. Clients receive orders of fresh and healthy products within 48 hours of harvest.



Siembra Viva's Green House



Training initiatives



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**The results vary depending on the type of soil evaluated, but in general, we have a 50% increase of the initial value in organic matter. In some soils, with average organic matter values, it has gone from 9% to 19.8% in a few months by using techniques such as the incorporation of crop residues and application of compost.**

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In addition to the units for agricultural production, they have a farm known as La Ciudadela, located in Santa Elena, a rural area in the outskirts of Medellín. They have ten hectares under production and a part of this land is used to train producers four times a year in new farming techniques.

At La Ciudadela, they also test new machines and processes, which must be validated before taking them to producers. Siembra Viva has a greenhouse that protects vegetables from frosts, heavy rains, hail, animals and pests.

They also have a drip irrigation system and sensors to measure temperature, relative humidity, soil humidity and degrees of irradiation. With this, the sensor emits an alert that tells the producer when to start or stop watering, optimizing water consumption by more than 90% and standardizing producers' work.

Siembra Viva has ruled out monoculture in its organic agriculture and is in a constant search for natural harmony. It uses a portfolio of 20 to 25 varieties of products capable of controlling pests.



Regenerative produce



They let the ground rest at least three months a year and use inputs from non-synthetic sources, such as rock dust, which are added to the compost and serve as natural fertilizers. Although rock dust is slower to absorb than chemical fertilizers, it is capable of regenerating soils and ensuring long-term production. Rock dust adds nutrients and helps restore the correct mineral balance in the soil, with the consequent improvement in its quality. It also generates an increase in nutrients, carbon capture and greater resistance in plants against diseases among other benefits.

Part of their waste reduction strategy, which is difficult for many to understand, is the use of plastic in their packaging processes. This material is the only one that allows complete safety. For example, a basil bush can remain in perfect condition and preserve all its nutrients, packed for up to seven days in this way.

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**Beyond regenerative agriculture, our main impact is that we are significantly reducing the waste that is generated in the crop. We have a waste of 10%, unlike the more than 55% generated by the industry in Colombia.**

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Unlike the paper bag, in which food begins to decompose after two days and must be discarded.

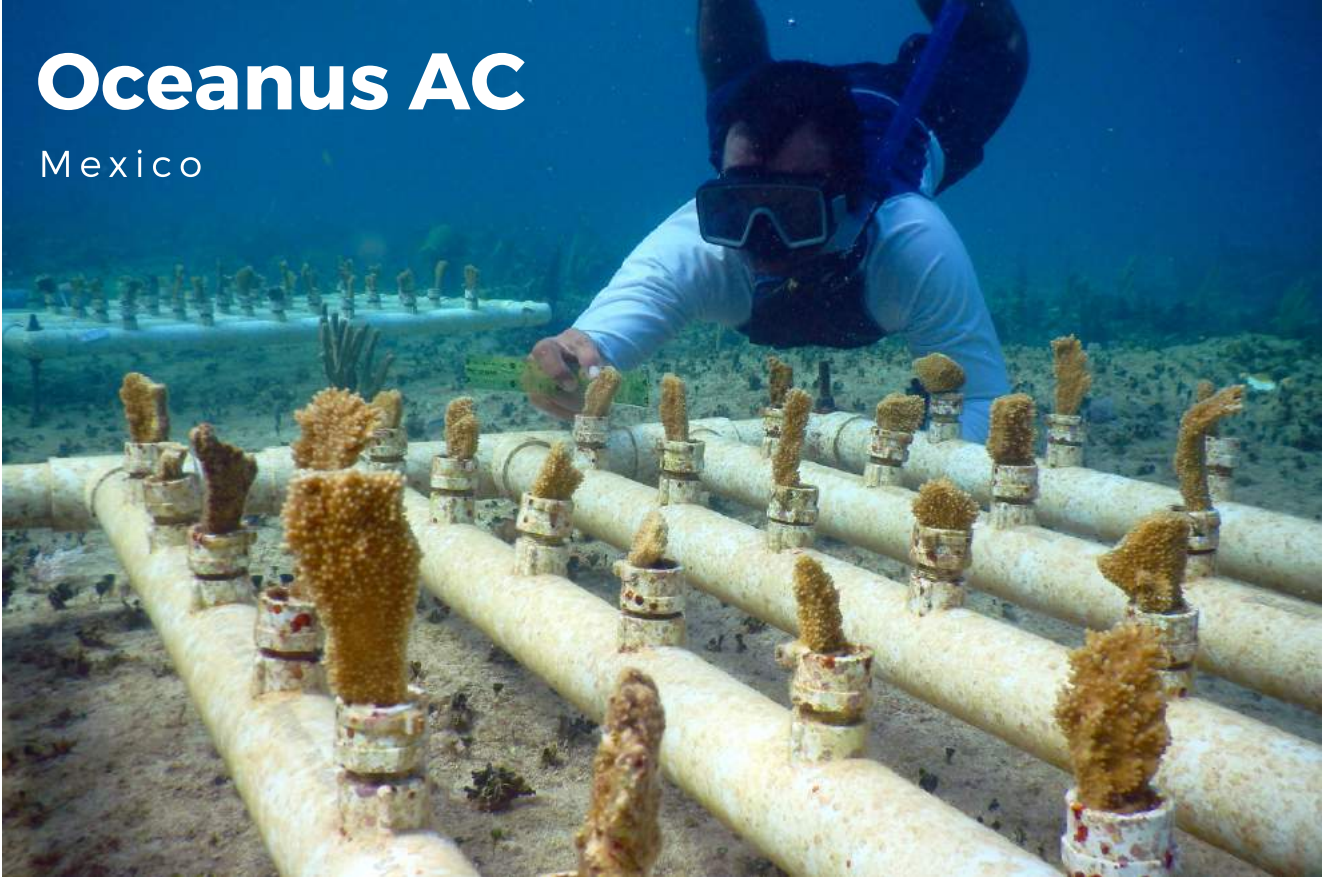
The Colombian consumer does not lean towards wonky produce; small producers cannot sell them, and they end up discarding them. Aware of the need to find an alternative to plastic, SiembraViva seeks to give these types of products a chance by packaging them and selling them in pieces or as base marinades for their recipes, so they do not go to waste.

**Organic agriculture practices mitigate the environmental impact generated by agricultural work. It does not use chemical or synthetic inputs and does not pollute the air, soil and water sources. It uses fewer inputs than conventional agriculture, protects all forms of life and takes care of the macro and microfauna of the soil.**



# Oceanus AC

Mexico



Coral nurseries

## We want to leave a new world, with healthier reefs for future generations.

Gabriela Nava & Miguel García

The Mesoamerican Barrier Reef System (MBRS) is the largest cross-boundary reef in the world and contains the second-longest reef worldwide, after the Great Barrier Reef in Australia. With 1,000 kilometres of coastline, the MBRS has a central role in protecting marine biodiversity. There are more than 65 species of stony corals, around 350 species of molluscs and 500 species of fish, as well as sea turtles, American crocodiles, moose horn corals, black corals, and the Caribbean manatee, some of which are endangered.

Coral reefs offer local coastal communities many ecological services, which are essential for their well-being and social and economic development.

Approximately 75% of the coral reefs worldwide are threatened. If we do not take concrete actions to reverse this situation, this percentage will increase to 90% in 2030 and almost 100% in 2050. Currently, the situation of other marine-coastal ecosystems, mangroves, seagrasses, estuaries and coastal lagoons is equally problematic.

The 2020 Mesoamerican Reef Health Report, an initiative of Healthy Reefs for Healthy People, indicates that the Reef Health Index (ISA) decreased for the first time in 12 years, from 2.8 in 2016 to 2.5 in 2018, which is classified as 'bad'.

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## Ecosystem degradation

Among the causes of the degradation of these ecosystems is the growth in carbon dioxide emissions resulting from human activities. Also, unsustainable fishing, tourism, sedimentation, unregulated coastal development, pollution and the white syndrome - a disease that killed more than 30% of 22 coral species in Mexico during 2018. This had led to a substantial increase in water temperature and acidity, both detrimental to the survival of corals.

Gabriela Nava and Miguel García, both marine biologists, witnessed the deterioration of the reefs and mangroves whilst working in monitoring the MBRS, in collaboration with the National Commission for Protected Areas of Mexico. In Cozumel, Cancun and later in Belize, they warned about the difficulty of recovering the reef ecosystem. The deterioration was evident and required urgent attention, not only because of what it means to lose the natural life in reef ecosystems but also because the lack of biodiversity threatens the survival of coastal communities.

## Coral reef regeneration

In 2006, Gabriela and Miguel founded Oceanus AC, an organisation that seeks to raise awareness about the degradation and develop strategies and new programmes for the restoration and conservation of marine coastal ecosystems. Their work began in Veracruz, one of the most important ports in the Gulf of Mexico. The increase in maritime traffic, fishing overload and tourist activities, and the stranding of deep-sea vessels have brought disastrous ecological consequences, threatening entire marine-coastal ecosystems.

Oceanus AC has concentrated its efforts on the recovery of the reef ridge, one of the most affected habitats. Here, the *Acropora Palmata* is the most dominant coral species. It is known as the Elkhorn coral because of its complex structure with many branches which resemble that of elk antlers. The objective is to increase the recovery potential of coral reefs by increasing the number of living, healthy and genetically diverse colonies in sites that have been impacted the most. This will rehabilitate and reconnect coral patches to achieve successful sexual reproduction.

Coral Colonies





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Restoration projects are carried out in different locations through the Reef Restoration Programme and in liaison with the National Commission for Natural Protected Areas and other local partners: Veracruz, Puerto Morelos, Xcalak, Sian Ka'an, Playa del Carmen (in conjunction with the Mayakobá Hotel), Cancun and Cozumel.

In these places, they have dedicated themselves to studying and facilitating restoration, transplanting thousands of colonies every year. The technique developed by Oceanus AC involves the installation of coral nurseries in protected areas along the Mesoamerican Reef and the Gulf of Mexico. They use PVC in the construction of the nurseries, arranged as a grill with seven lines, with the connectors specially adapted to facilitate the installation and relocation of the coral fragment. The fragment is placed in the connectors with an external cord and, depending on the locality, they can stay between two to five months in the nursery before they can be transferred to the restoration sites.

A nursery can stabilise up to 100 colonies per structure and at least five structures per site are required to achieve a successful restoration rate. With the selection of strategic restoration sites and the constant increase in genetically diverse and healthy colonies, they hope that the effects of restoration through sexual and asexual reproduction will have a multiplier effect for reef recovery at a local and regional scale.

They are constantly evaluating and looking for sites that have substrate availability, trying to lessen the number of other threats. Oceanus AC has seven experts in charge of the transplantation process, it is a delicate procedure and requires specialised training. To multiply the restoration efforts, they have created Local Restoration Groups, training volunteers, fishermen, divers, hotel personnel and local inhabitants in the techniques that they use through theoretical and practical sessions at sea. To date, six local groups have been trained and remain active.

Although growth was slow in the first three years, Gabriela and Miguel saw that the colonies were surviving, even when they did not grow much. In the third year of work, they observed that the growth was exponential. The *Acropora Palmata* colonies, when seeded in small fragments, recovered the tissue, and began to branch.

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**We rescue fragments that are already broken by currents or storms and fragment them into smaller pieces, maximizing living tissue; what we do is put them in the nurseries where they will recover that tissue and they will begin to branch out, forming a new colony. Then we can transplant these new colonies to sites that are susceptible to restoration.**

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**Some programmes start the restoration technique next to a healthy reef, and there is obviously a higher chance of a faster restoration, but nowadays it is rare for you can find a completely healthy reef to restore an attached site. On damaged sites, the whole process requires more work. We transplant colonies in different periods to the same site. We transplant, for example, 200 colonies, then 300, then 500, to have different generations of reefs in the same site. If the site is closer to a healthy reef, the survival rate is higher and you can expect faster growth; If you go to areas that have been hit and devastated and there is nothing nearby, it is more complex, but it can be done.**

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Once they create the cup, they grow fast. Between the third and fifth years, they observed an impressive growth of the colonies. There they realized that the efforts paid off and that having integrated other generations contributed to the survival of the colonies. Planting only coral colonies facilitates the regeneration of the reef, attracts other species searching for healthy habitats, as well as their predators.

Gabriela and Miguel have noticed the appearance of other coral species and other invertebrates that they have not previously introduced. They found the cleanest substrate because there are now sea hedgehogs and other organisms that came to clean.

#### **Changes in costal ecosystems**

They have observed important changes in the reefs due to cumulative effects. The reef in the Port of Veracruz, for example, had a serious sediment accumulation problem. Coral development has been reduced in some parts in the deep areas, yet still, the middle part remains in good condition with a high coral cover.

It is interesting how these corals, which have been exposed to environmental impacts for more than 200 years, are among the most resistant and resilient of all species. The donor population, which Oceanus AC works with, grows three to five times faster than in the Caribbean. The reefs are growing and adapting to new conditions.





Coral restoration site

As of December 2019, Oceanus AC had transplanted over 62,000 colonies. In 2020, they planted more than 10,000 colonies and have more than 10 sites catering along the Mexican Mesoamerican reef. Given the complexity of the restoration, the Oceanus AC model uses various financing and operating mechanisms. Restoration financing, monitoring and research programmes and activities such as the cleaning, transporting, and planting of colonies are obtained through donations from individuals along with national and international organisations, as well as with the collaboration of local public and private partners.

Two organisations have supported them since 2014, the Summit Foundation and the Mesoamerican Reef Fund. In the private sector, the hotels of the Mayakobá complex were the first to join to support the Programme and have supported a reef site since 2016.

To complement their income and bring new people on board, they developed the Adopt a Coral programme, which has proven successful: 782 colonies have been adopted as of March 2020. Committed to its goal, Oceanus AC has continued to grow in its restoration efforts. In 2018-2019, they initiated restoration work in the Rio El Dorado mangrove, led by Israel López.

Despite being less known than reefs, mangroves play a key role in restoring marine ecosystems. These twisted trees grow in areas where freshwater meets saltwater and is considered one of the most productive and complex ecosystems on the planet. Mangroves house and connect various species of fish and other animals on the coral reef.

Many shorebirds find a refuge for nesting, which are built on upper branches. Mangroves protect the coasts from erosion and strong waves from storms and hurricanes. This natural barrier has reduced the impact of natural phenomena compared to other coastal areas where there are no mangroves.

In the Mesoamerican Reef System, mangrove coverage decreased by an estimated 20% between 2010 and 2018, according to The Healthy Reefs. Mexico is among the four countries with the largest extension of mangroves worldwide, along with Indonesia, Brazil and Australia. With more than 7,600 square kilometres, the mangroves of Mexico represent 5% of the world total.

# Pasticultores del Desierto

Mexico



One does not cease to be amazed by the changes we see each year: more species, more coverage, the green season is extended, and the drought does not affect us as much.

Alejandro Carrillo

The Chihuahuan Desert is the largest in North America, with an extension of 630,000 square kilometres. This territory, shared by Mexico and the United States, hosts many terrestrial and aquatic ecosystems making it one of the most biologically diverse areas in the world.

Grasslands predominate in this area, which is capable of mitigating the effects of climate change and reversing soil desertification. Considered one of the most important carbon sinks on the planet, grasslands have excellent carbon and water storage and retention capacity, which is essential for an arid and low rainfall ecosystem.



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The grasslands of the Chihuahua Desert and the endemic species with which they cohabit are being threatened by traditional agricultural and livestock activities. To increase production and generate more income, some ranchers overload the grasslands with a large number of animals that feed in the same place for long periods. The grasses do not rest, they do not have time to recover and consequently lose nutritional properties.

In the area, they have witnessed ranches going bankrupt, and the ranchers are constantly on the verge of economic and social crises. They have evidenced the rupture of the semi-desertic ecosystem where native species have disappeared, and invasive species have come to dominate the landscape. Human beings' conventional practices cause droughts and torrential leading to erosion and desertification.



Regeneration of grasslands in the Chiguagua Desert

It also decreases the capacity of water infiltration, which creates the right conditions for the appearance of invasive species, making these species more resistant to adverse conditions, thus altering the natural ecosystem.

Traditional grazing systems, poor water management, and severe droughts are affecting desert soils. Currently, over 80% of the grasslands have been degraded and, by 2025, it is estimated that the grasslands could completely disappear. This has created a crisis among the ranchers who have devastated the species to cultivate the land.

Alarmed by the loss of biodiversity and the degradation of soils, ranchers, local organisations, investors and the government are working together on conservation and regeneration strategies. This includes sustainable practices for water management, livestock and agriculture. Some ranchers had begun to adopt more comprehensive livestock planning practices to reverse desertification. In this context, four ranchers from the Chihuahua Desert, Jesús Almeida, Alejandro Carrillo, Octavio Bermúdez and his son Octavio set out to take this impulse and promote Holistic Management.

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In 2015, they founded Pasticultores del Desierto, an organisation that promotes Holistic Management as a method for reversing the desertification of the Chihuahuan Desert and bringing ranchers out of the economic-social crisis in which they are immersed. Pasticultores del Desierto finds its inspiration in Guillermo “Billy” Finan, who was a mentor to Jesús Almeida and who, in the late '70s, met Allan Savory, becoming one of the first Desert ranchers to adopt this approach in his Valle de Colombia ranch.

### **Regeneration of the desert**

Currently managed by his grandson, Octavio “Tavo” Bermudez, they have obtained successful results thanks to this grazing system. Guillermo Finan dedicated himself to promoting this method among the ranchers of the region. At Pasticultores, they wanted to continue his work and decided to organise annual events where ranchers could meet and share knowledge about their practices, bovine genetics and soils. On these occasions, they also recognise the best farmer of the year.

The four friends have a common story to tell. Today, each one of them manages a ranch under holistic management. They respect nature and seek to be in constant communication and interconnection with it because they understand that they are part of the ecosystem and not above it. They share the desire to help the local community, “we want people to learn on their own and improve on their own.” Both the Las Damas and the Tepehuanes Ranches, owned by Alejandro and Jesús’ families have been in crisis for a long time, with implications for not only their families but also the local economy and the environment. This, mostly because of traditional practices with continuous overgrazing and the use of chemical fertilizers. They realised that they were destroying the ecosystem. If they had continued like this, they would end up selling the ranch. The regenerative grazing system using holistic management made sense to them because decision-making considers not only the economic side of livestock production but also its social and environmental impacts.

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**I believe we have done enough work in terms of promotion and capacity building at the local level, whilst acknowledging the efforts that some farmers have made who have been working very well.**

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Regeneration of grasslands in the Chiguagua Desert





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However, there was a lot to learn, we know how this type of grazing works in slightly more humid climates. Yet, in the desert things change and they must adapt the system to the local reality: “something important that my grandfather (Billy Finan) taught me was that we could always improve and for that, we just have to observe”. Imitating the natural behaviour and movement of animals and respecting the recovery time of pastures also have short-term benefits. In Las Damas, for example, they stopped using machinery and it was the cattle that came to fulfil its role. The seeds were not necessary, and the grass began to naturally spread throughout the ranch quickly.

After adopting holistic grazing, ranchers have begun to respect nature and imitate the behaviour and natural movement of livestock in the territory. In doing so, they avoid overgrazing and respect the rest periods and recovery of paddocks. Thus, they have begun to minimise the loss of nutrients, repair the imbalance of the ecosystem, and improve the infiltration and storage of water and carbon. At Pasticultores del Desierto, they have also evidenced the improvement in the people’s quality of life, they are happier when working with nature, not fighting against it.

They have also evidenced the return of native species, which had declined and even disappeared under conventional practices. The black bear was seen at the Rancho de Los Bermúdez and they have seen an increase in species such as the prairie dog or the golden eagle among other bird species.

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**There was a time when we had two kinds of neighbours, those who thought we were crazy and those who knew we were crazy.**

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One of the biggest challenges is to convince ranchers to go from traditional to regenerative farming, “it is difficult to change the cowboys, they thought that was the only way.” The organisation has set out to support those who want to train and encourage other ranchers to follow the same path. Alejandro believes that people using alternative methods are alone and have no one to share their practices with and that people who start must be mentally strong to withstand pressure from their peers still using conventional methods.



Grass naturally spreading throughout the ranch

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**I don't know if it was the birds, the cows or the whole thing, but grass species like the giant grass, which is more than two meters high, returned to the desert.**

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Giant grass



People's interest in holistic grazing and regeneration has increased, and Chihuahua has become the benchmark for regenerative management in Mexico. Currently, between two to three annual regenerative management seminars are organised at a local level, and the number of attendees grows every year. There are already more than ten instructors in regenerative management who support the work of the organisation and who open the doors of their ranches for visits and demonstrations.

Pasticultores del Desierto was accredited with the United Nations Convention to Combat Desertification (UNCCD), becoming the focal point for the Land Degradation Neutrality programme in Mexico. They are members of International Regeneration and have also become a benchmark for organisations that protect migratory birds, such as the Bird Conservancy of the Rockies or the American Bird Conservancy. In addition, they have an alliance with the World Resources Institute (WRI) for their 20x20 initiative, which seeks to restore 20 million degraded hectares in Latin America and the Caribbean. Along with promoting regenerative management in the desert, they seek to deliver a message of hope for future generations.

Pasticultores del Desierto continues to involve people and organisations that support and sponsor them. In the northern region of Mexico, there are already over 500 thousand hectares under holistic management belonging to the Pasticultores del Desierto's network, and they expect that by 2030, more than one million hectares will be managed under regenerative management.



It is the perfect balance between production  
and sustainability, it really works.

Alejandro Wells



La Cristina Estate

## La Cristina

### Uruguay

Unbalanced and depressed ecosystems, over-grazed, bare, compacted, and eroded soils, devoid of organic matter, remote native species and contaminated basins are some of the consequences associated with conventional industrial farming and livestock systems. In Colonia, Uruguay, continuous grazing has been practised for decades in areas that are not suitable for agriculture and planting has taken place on the most fertile land.

In continuous grazing, animals always select the same species of grass which tend to disappear over time, causing desertification and soil compaction.

On the other hand, agriculture, through tillage and agrochemicals, destroys life in the soil and humus with the consequent emission of carbon into the atmosphere. There is a hidden trap in traditional livestock and industrial agriculture, which is the search for productivity without measuring the monetary and ecological costs of that system. In Uruguay and other countries, this system has led to the disappearance of many rural establishments over the years. Aware of the profound environmental impact, Cristina and Alejandro Wells decided to implement a regenerative livestock management system in their farm, La Cristina, applying the principles of André Voisin.

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This system was designed as a solution to fight climate change, which simplifies and makes livestock and agricultural production more profitable. Voisin, and more recently his followers like Piñeiro Machado, promote the idea of having high loads of cattle for shorter periods. This prevents animals from eating regrowing grass and returning to a field before a period has ended, which goes from 30 to 90 days depending on the time of year and location of the field. Hence the need to divide a stay into the same number of paddocks as rest days are required for the recovery of pastures. This implies that with an average rest of 60 days, the paddocks are occupied no more than five or six days throughout the year, and they can rest the other 360 days. Much can be achieved using this land management approach. Plants reach their maximum expression after this period of rest; their roots penetrate deep into the soil which decomposes it.

### **A virtuous spiral**

The soil is constantly covered and retains moisture. It develops a spongier structure that absorbs and retains water better, which in turn minimises droughts and floods.

This is a virtuous spiral that promotes the appearance of native species, thus increasing biodiversity. Monoculture has the opposite effect. This new biological balance goes hand in hand with carbon sequestration that the humus regenerates. We have regenerated soils, hence the word regenerative livestock, with a forage supply that allows us to multiply the existing production by three or four times. The best of all this is that it is all provided by nature with zero costs and the only condition being that they respect nature's times. Without any external input, profitability is higher from increased production with lower production costs.

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**In La Cristina there were monocultures, the soil was ploughed which led to the loss of all the life there was, and organic matter was oxidized into the atmosphere. Chemical fertilizers, fungicides, and herbicides were added and went directly to the groundwater and streams. This is the production of poison-based food. In some areas there was nothing left, it was bare ground; there was no soil, it was dust.**

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**Voisin's Rational Grazing aims to return profitability to small and large livestock and dairy establishments, slowing and perhaps reversing the rural exodus. On a larger scale, it is thought that if half the world's pastures were handled in this way, carbon could be sequestered and the concentration of carbon dioxide in the atmosphere could be lowered to pre-industrial levels.**

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Guillermo Rossi, an agricultural engineer, has overseen the design and implementation of this grazing system since 2015. The property of 227 grazing hectares was divided into 128 paddocks of approximately 1.7 hectares each, all with water on the plot. The water is carried through solar pumping to a large Australian tank, located in the highest part of the field where it is distributed to the cattle through the force of gravity. The livestock spends a day on each paddock in herds of about 200 animals. This allows cattle to leave their urine and faeces, both natural fertilizers, evenly distributed. Chemical fertilizers, unlike the natural ones mentioned above, do not provide fertility to the soil and instead consume the existing humus.

Within the planning of the PRV is the reincorporation of native species. This process has not been easy and the expected results have not always been obtained. However, two years after project implementation, they have produced over 400 grass species, and the ground is already practically covered. Not only has meat production improved, but the increase in biodiversity goes hand in hand with greater biological activity in the soil meaning an increase in insects, birds and other animals. They have recorded a considerable increase in organic matter; therefore, there is a true regeneration of the field carpet.

With this, new species of animals have emerged, providing natural control of pests and invasive species. La Cristina also promotes beekeeping, which has been particularly affected by agrochemicals

La Cristina was the first Ranch in the world awarded B Corp certification. B Corps are triple impact companies that seek to have a social, environmental, and economic. La Cristina is committed to promoting regenerative grazing through talks, internships and exchanges with national and international academics and media. As of 2020, through these activities, they have managed to reach over 5,000 people.

In 2021, they installed a regenerative grazing system in Expoactiva, the largest rural fair in the country, achieving a record performance of 1,200 USD per hectare, much more than any other traditional grazing method. They do not want to grow but instead reinvest in local family businesses, so locals can stay in the countryside and not migrate to the cities. They are also campaigning to change the B Corp Certification metrics, to include items such as carbon capture (instead of emissions) and the absolute absence of polluting inputs. Not surprisingly, in 2021 La Cristina was named Best for World as one of the most important B Corps leading the way towards a more regenerative planet

# Punta Callao

Chile

We became aware of how regeneration works, the forest responds alone, we have been trying to grow with it, to recover what had been lost, so that it works with greater autonomy.

Tomas Álvarez

The Rupanco lake is in the Los Lagos Region, at the bottom of the Andes Mountains. Rupanco, also known as Aguas Revueltas in mapudungún, is surrounded by large extensions of ancient forests, accompanied by snow-capped volcanoes and mountain ranges, with mighty rivers, waterfalls, lakes, and thermal baths. Sergio Álvarez fell in love with this landscape and, in 2010, he bought the Fundo Punta Callao, which is located on the shores of Lake Rupanco and the Callao River, with 33 hectares of native forest and 56 hectares of Pampa.

For their buildings, they aimed to maintain a connection between the aesthetics of the natural environment and the structural aesthetics of the terrain, so any intervention or construction would be beautiful. Sergio commissioned this part of the landscape architecture to his son Tomás, who designed the foreman's cabin and their family with materials from the region.



Bernardo San Martin



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They understood that the human being is part of an ecosystem and is related to other species. The conservation of the environment in Punta Callao was a priority, guided by respect for native flora and fauna and local communities. Thus, they decide to restore the forest and meadows that had been damaged by unsustainable practices since the end of the nineteenth century.

Since 1850, the region has suffered from excessive exploitation of its raw materials, mainly forest resources. German and Chilean settlers to the Los Lagos region in 1845 expropriated indigenous Mapuche and Huilliche lands in the name of development and accelerated population growth.

Selective burning and the falling of endemic and native species weakened their forests. At the same time, urban, agricultural, aquaculture and livestock development compromised the balance of the entire lake ecosystem.

This has been accompanied by major natural disasters such as volcanic eruptions and the 1960 earthquake. Due to the natural disasters, the peasant and settler houses were destroyed, entire families disappeared, and landslides dragged forests to the bottom of the lake.

### **Cleaning Punta Callao**

To restore the forest in Punta Callao, they first cleaned and cleared the surface. This was entirely covered by the Chusquea Quila, a species of climbing bamboo endemic to Chile and Argentina, which had invaded the forest making it dense and impenetrable.

This work was entrusted to Bernardo San Martín, a native of the area, who has witnessed the degradation of the land and the lake. Bernardo has seen the loss of insects, birds and fish, and the deforestation of endemic species such as Olivillo, and native species such as Ulmo in addition to tepa, a native tree similar to Laurel.



His connection with nature, nostalgia for the landscape, and love for his land have accompanied him for his entire life. The accumulated knowledge and inspiration from his father turned Bernardo into the perfect person to oversee forest restoration in Punta Callao. Since 2017, Bernardo and his son, have been dedicated to manually removing Chusquea Quila in the forest to allow the trees that sprout under its shade to grow; if they do not have enough space, they transplant the species to areas of lower density.

As of 2019, over 20 hectares of forest have been recovered with access, trails and sprouts of native trees. In Punta Callao they have witnessed the emergence of a forest at different levels; mosses and creeping plants began to grow in the understory, those closest to the ground. Native trees gained strength, thickened, and began to fight invasive species. Bernardo and his son have learned to recognise areas where the tree transplant will be more successful.

Bernardo San Martin



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**My father once told me: one day, when I'm no longer here, I would like you to continue this tradition by planting small trees where there are none and giving life to the forest, otherwise, over the years, this forest will disappear.**

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This is how they have planted around 2,000 native trees in the last six years, some have already reached two, and even three meters in height. Biodiversity has increased and they have seen how bird species have returned to the area: "I know this land. I teach my son why we are going to plant this tree seedling here, I explain it to him, for example, I tell him the type of soil that this tree needs". Regarding the regeneration of grasslands to feed the animals, the initial solution was to replant perennial ryegrass with the help of synthetic fertilizers. This type of grass is the most common species used as pasture grass in southern Chile. The ryegrass grew quickly and covered the land. The Álvarez family was happy with the result, but not with the way they did it because monoculture and the use of chemicals is not a sustainable solution and harms biodiversity.

**We have seen how the chucaos (bird species) or the güargüetas, that we call it, once we clear the forest, they collect seeds from the trees and take them to other places where they can grow.**



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The regeneration of the native forest in Punta Callao recalls the work of a similar type in a different region in the Amazon practised by Ernst Gotsch, a Swiss agricultural researcher, doctor and international reference in 'Successive agroforestry systems'. He has developed a refined technique of planting with principles and practices that can be applied to different ecosystems.



This syntropic system is based on a systemic approach to agroforestry production, generating economic, social and environmental sustainability. Syntropy uses vegetative succession and spacing in time and space together with strategic pruning to incorporate organic matter into the soil, regenerating it, improving its physical structure and its ability to capture water and carbon while producing healthy food and increasing the biodiversity and the ecosystem services of the territory.

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In search of alternatives, the Álvarez family learned about regenerative grazing. This sustainable grazing practice stimulates the natural development of the ecosystem and allows the recovery of soils and biodiversity. In 2018, they began to formally work on the regeneration of the forest and grasslands with Isidora Molina, Holistic Management educator and founder of Efecto Manada, and Hub of the Savory Global Network in Chile. Just like in El Reinal and Manada, regenerative grazing is used to combat the desertification of grasslands and mitigate the effects of climate change.

In nature, migrations of large herds have existed for millions of years. Recreating these natural events, Holistic Management promotes the planned movement of herbivores through the land intended for livestock, granting adequate recovery time for the area that has been grazed. This avoids overgrazing, grasses sprout firmly, roots continue to grow and the capacity to absorb water and carbon, as well as biodiversity, increases.

In Punta Callao the results were instant, it took only one winter for nature to begin to reconnect and the forest was reunited with the pampa. Different species of grass, with high nutritional value for the animals, began to grow.

Insects like the dung beetle proliferated, more pollinating species appeared, an increase in biodiversity was observed and nature began to repair itself.

Currently, the 57 hectares of pampa are operational under holistic management and are in the process of obtaining the EOVC certification - Ecological Outcome Verification. This methodology measures the health of the land, its biodiversity and ecosystem functions, and thus verifies the ecological results.

### **Growth in sustainable tourism**

The region has experienced tourism growth and Punta Callao has joined the effort. By using materials from the region, three cabins were designed and built on the farm. Thanks to this project they have increased their income, created jobs for the community and have received people from various parts of the world who have experienced this history of regeneration and have become aware of nature. Punta Callao has been involved with nature and the community.

There is a sense of belonging and a close relationship based on respect. The family and the workers have spent these years learning from nature, listening to it, and allowing it to reconnect.

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**We began to have grass in winter, we left some areas without being sown or fertilized and the grass grew the same, or even better than in the pastures on the side. We have seen more animals than in past winters because there is more grass. In the winter of 2018, we gave fodder and silage to our animals in a muddy paddock, a year later the animals were eating green grass and silage in solid paddocks and with much less mud compared to last year.**

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**One of the benefits of using regenerative techniques is a reduction of 42% in production costs. We have not yet increased income, but the profitability is growing, in addition to reductions in cost, time and environmental impact of using seeds, profiling agents and herbicides.**

In 2021, they have continued to grow with the native forest, mainly through the creation of biological corridors that connect previously isolated forests. They estimate that Bernardo has planted more than 2,000 in the last two winters. They are collaborating with Range Patagonian Meats that export meat with different regenerative certifications, such as EO, to the United States. They hope this will also allow them to obtain other certifications such as GAP's animal welfare.

In terms of measurement, they are now collaborating with Robin Hölzcke, a PhD researcher, who is using satellite photos to measure the radiation capacity of the grasslands that are managed using regenerative techniques, in comparison to others that are being handled in a conventional way. The results are positive.

Regeneration of the Rupanco Lake





# Asoamaime

Colombia

Amame Valley

The geographical Valley of Cauca is one of the regions with the greatest natural wealth and economic development in Colombia. It has very fertile lands that have been used in agricultural and livestock production. Sugarcane is the main crop that can be planted and harvested during the whole year, thanks to the agro-climatic conditions of the valley, unlike most other producing countries.

In Colombia, over 12.5 tons of sugar are produced per hectare every year, making them world leaders in productivity. However, the natural resources of the area have been threatened by the expansion of agriculture, extensive ranching, deforestation of native forests, monocultures, variability, and climate change.

**The landscape management tools and silvopastoral systems have helped us break the air currents that erode the soil and reduce biodiversity, hedgerows and create biological corridors that generate functional connectivity.**

Magda Ortiz



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## The Amaime river

In the Las Herosas paramo, in the Central Cordillera, there is the source of the Amaime river and the five tributaries that supply it. It is the main water source for the municipalities of Palmira and El Cerrito, Valle del Cauca. The development of extensive livestock farming has become one of the main causes of the deterioration of the ecosystems of Páramo and Bosque Alto Andino. The loss of endemic biodiversity, a decrease in water supply, loss of soil and contamination of water sources have been altered and the topography has been altered.

Facing this complex scenario, the conservation, protection, and efficient management of water resources has become a fundamental issue for the region. New groups, such as water user associations, have started to work on the development of environmental initiatives that have improved the conditions of the valley basin.

In October 1994, Asoamaime was born, the Association of Users of the Amaime and Nima Rivers. The Association is made up of the Manuelita, Providencia, Mayagüez and La Cabaña Sugar Mills together with cane producers and farmers from the lower Amaime and Nima rivers, who voluntarily contribute funds equivalent to the volume of water assigned by the environmental authority. They invest these funds in the protection, recovery, conservation, use and adequate management of the natural resources of the Amaime river basin.

Asoamaime's work is focused on the Amaime River Basin, covering 104,290 hectares from the Central Cordillera to its mouth on the Cauca River. The distribution of water resources in the lower zone of the Amaime River basin is quite technical, through investments and different management and distribution strategies, a 40% reduction in irrigation water has been achieved in sugar cane crops.

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**It is a small area of 243,200 hectares, but the world's leading producer of sugar cane and sucrose, by tons of cane per hectare.**

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Regeneration of native species in the Amaime River

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## The Yellow Line

By the end of 1994, Asoamaime implemented an ecological restoration program called Línea Amarilla (Yellow Line). This includes the protection and conservation of biodiversity in water sources in the middle and upper areas of the basin. In addition, they provide support in the process of regeneration of the natural ecosystem of the high-Andean Forest and Páramos. The Association has an agreement with the farm owners, whereby the implementation of actions is aimed at the protection and conservation of areas with great environmental value for the territory.

The Línea Amarilla establishes isolation zones delimited by a fence of yellow-painted posts that prevent livestock from entering these zones destined for the regeneration of the ecosystem.

**Extensive farming was our concern. That cattle entered areas of humid forests through which rivers with small flows descended, which is what we wanted to protect. Thus, our macro project called Línea Amarilla was born.**

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This allows the natural germination of seeds that fall from the trees and with this the dynamization of the seasonal states of forests.

What each owner must do is hand over the area so that we can carry out the isolations. The Association offers farm owners the technical preparation and oversees the implementation of the restoration program. They are trained in conservation practices and landscape management tools. Together, they seek the best management of water and soil resources, their conservation and biodiversity.



Línea Amarilla (Yellow Line) project



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**Restoration through isolation enables the natural ecosystem to regenerate, as there is no access for the cattle, nor community interventions. The germination of native trees and the arrival of other species are permitted. We have seen it a lot with the Wax Palm, one gets there, and all the seedlings are regenerating, the same with the Black Cedar, which is also one of the trees in danger of extinction.**

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Sugar cane production

Asoamaime supports the acquisition of seedlings of native species. It is responsible for the transport of material, the construction of fences, the maintenance and irrigation of the seedlings for two years until they can defend themselves, which then continue to regenerate naturally. Asoamaime has formalised alliances and agreements with Asocaña (through the Water for Life and Sustainability Fund Foundation and the Valle del Cauca Regional Autonomous Corporation) to implement various landscape management tools.

As of 2019, the conservation of 2,203 hectares of natural forest and the protection of 718 water sources have been achieved through the establishment of 688 kilometres of protective fences. Through the programme, they have increased the flow of water in the Amaime river to approximately 400 litres per second, on average.

**The Línea Amarilla programme has allowed us to gain some regularity in the summer season and, despite the decrease in water flow, we can provide water to all the users of the Amaime River.**

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Between 2012 and 2014, water simply did not reach the lower part of the basin, due to the impact of the El Niño. The situation has changed, and they can now observe the positive impact of the regeneration programme during El Niño and La Niña. From the summer of 2016, water resources can be guaranteed to users in the lower part of the basin. For Asoamaime, it has been very satisfactory to witness that the restoration programme is working.

The programme has also positively impacted the resilience of natural systems. The implementation of conservation strategies has resulted in more effective water retention in the root system of the plants, allowing the infiltration water retained in summer to be released slowly and continuously into the channels that flow into the Amaime River. Magda indicated that the area used to flood where the river carried everything in its path. Sudden overflows are now noticeable, but these do not exceed 11 cubic meters per second, and they drain quickly.

Asoamaime continues to develop new environmental initiatives. The socio-environmental programme called Friends with the Environment seeks to promote community participation in the conservation of natural resources. The Water Resource Management Programme Water Care is Everyone's Business seeks to improve the conditions of distribution and proper management of water in Valle del Cauca.

In 2021, Asoamaime is working in an articulated manner with grassroots organisations, territorial and environmental entities with the technical support of USAID's Paramos y Bosques Programme. This is allowing them to articulate a territorial alliance for the hydrographic basin of the Amaime River.

This new alliance is led by Asoamaime, through which a further 6,840 hectares will be integrated into the system for conservation, restoration and productive environmental reconversion in the ecosystems of El Páramo and high Andean Forest of the Páramo Las Hermosas. This has been a great achievement for water governance in the area.

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**We have seen an increase in fauna, the Andean bear, which was difficult to find before; now it is more common, you can see the bear's feeders or the torn trees where he has been. They have sighted the white-tailed deer, the cougar, the coatis and several birds that are still being identified. The toucan was recently seen. There is a project for the conservation of the Cauca Guan, an endemic species, which has also been spotted.**

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