

Evaluating Local Currencies to Strengthen the Co-Design Process for a Future Monteverde Currency



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Abstract

The COVID-19 pandemic caused an economic recession and resulted in a decline of participation in the local currency, Verdes. The goal was to facilitate a co-design process for relaunching Verdes by researching successful and unsuccessful local currencies from around the world, gathering information on initiatives, approaches, successes, failures, and co-design processes. Based on the findings, we recommended that the Verdes administration contact founders of other successful local currencies, improve website accessibility, advertise and educate the community on Verdes, and shift the local currency type to increase participation and ensure the success of the program in Monteverde. These have been combined and tailored to recommend a co-design process for the Verdes management.

Executive Summary

Background

Monteverde is a small town in Costa Rica comprised of 6,000 residents who are surrounded by lush rainforests, mountains, pastures, and fields. The townspeople are notable for their environmentally conscientious actions and sustainable living choices. As a result, ecotourism serves as a crucial element of Monteverde’s community and the foundation of the town’s economic structure, providing jobs and improving the goods and services available in the town. (Monteverde Costa Rica, 2022). Due to Monteverde’s popularity, the nation has recognized the town and voted it the seventh wonder of Costa Rica (Monteverde Costa Rica, 2022).

Unfortunately, this setting has been compromised. During the pandemic, Monteverde lost 250,000 tourists. As a result, restaurants folded, local attractions closed, and hostels and homestays emptied (Shah, 2020). These kinds of effects occurred across the world, and left many people jobless, with no other job opportunities. Clearly, life adjustments had to be made.

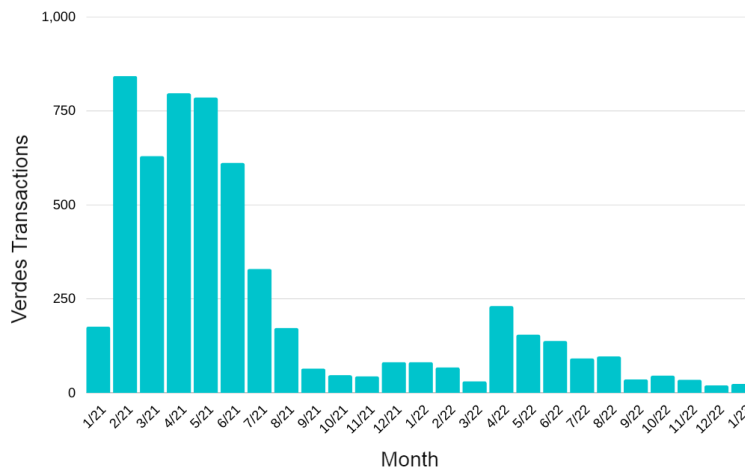


Figure 0.1 Verdes Transactions (1/21-1/23)

Like other small communities, Monteverde sought alternative methods to combat the economic downturn. One of these methods, a local currency, “Verdes”, was created to keep a sustainable level of wealth within the community and provide economic and social stability for residents (Seyfang, 2001). Verdes, aims to 1) ensure community solidarity 2) secure economic stability, and 3) promote prosocial and environmental behavior (Lenis Escobar et al., 2020). During COVID-19, there were more than 2,500 active members and 470 vendors who sought to rebuild the economy and practice conscientious actions. The desired outcome was a strengthened community based on a more self-sufficient economy.

The Verdes platform was well managed at first, and allowed the economy to work fluidly, especially during the Covid-19 pandemic because of the high unemployment rates within the community. However, there have been recent issues regarding its flow throughout the community. In some local businesses, the sellers that accept Verdes, including Taco Taco, farmers market, and a thrift store have an accumulation of Verdes. This stems from a lack of buying options for community members to spend their Verdes on, leading to a lack of participation in the program. This issue poses a threat to the Verdes economy, as it impedes the flow of the currency that creates the economic stability assisting Monteverde. To continue the flow and provide the community with sustainability and security, these inefficiencies must be solved.

Approach

To assist in solving the inefficiencies with the Verdes system and promote a relaunch of a local currency in Monteverde, we aimed to accomplish three objectives: 1.) Gain an in-depth understanding of the characteristics of local currencies, both Verdes and others, and evaluate them using SWOT categories, 2.) Investigate a co-design process, and 3.) Combine the information from objectives one and two, and tailor them to recommend a co-design process to the Verdes management to revive a Monteverde local currency

Results

The first objective is divided into parts 1a and 1b. In part 1a, we identified the key elements that made local currencies successful, and evaluated where and why they failed by using SWOT analyses, then created a SWOT summary, shown below, that serves as a compilation of the trends we examined between the eight SWOT analyses. It displays the most common trends among the most relevant local currencies we looked into and provides important insight to provide to our sponsors for future use.

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Bristol Pay	<ul style="list-style-type: none"> - Started currency in 2019, have all the knowledge and information from the previous, successful local currency. - Focuses on the community, provides for everyone. - Not entirely focused on purchasing power or rewards, focuses on helping people. 	<ul style="list-style-type: none"> - Not entirely focused on money, and having the initial appearance of currency can be dangerous. 	<ul style="list-style-type: none"> - Change purchasing behavior to be in favor of local independent businesses and create a localized supply chain - Keeping money in the local economy, for local reinvestment - Provides a payment platform to reduce digital financial exclusion and to raise money for the voluntary sector. - Reduce dependency on others financially, but introduce social cohesion. 	<ul style="list-style-type: none"> - New, need to build on failures of previous currency that failed or risk repeating the past initiative.

Figure 0.2 Bristol Pay SWOT example

In part 1b, when meeting with our sponsors, we came to find that many people did not know how the Verdes currency works, and the current users have a hard time accessing the web-app. The website and sign-up process is difficult for those who do not have a good understanding of technology. Current users, on the other hand, have difficulty accessing their accounts and signing in due to the complexity of the login process using the Cambiatus website. The process of signing in includes generating codes, inputting 10 different words to serve as an authenticator, and finally inputting one's password. Considering the Verdes administration informed us that their biggest supporters are the older generation (as they like the idea of a barter economy), this tricky website process is particularly difficult for these older individuals, who are not as familiar with current technology compared to the newer generation (Sponsor interview).

For the second objective, we found that co-design is an entirely organization process. As an organizational process, there needs to be an established leadership group consisting of anywhere from 3 to 10 people that can organize the sequence of meetings, topics for agendas for meetings, can identify who the players in the entire process may be, and can think of the strategy for when these players come together. In the early stages of a co-design process, it is necessary to outline the ideas necessary for success in the process. Overall, goals, established methods and objectives, and important deadlines are all important to include in this collaborative process. Additionally, it is important to understand the knowledge level of those involved in the process, especially in the early stages, so as not to leave out any participation in the process of providing and discussing ideas and proposals. Once we researched a

co-design process in, we included the information detailing the length of time, number of people, organization, and functionality into a proposal alongside our currency research.

The information gathered allows us to combine and tailor the two objectives, in order to create and execute the third, which is to help implement a co-design process for the relaunch of the Verdes program. For this third objective, we combined and tailored the information from objectives 1 and 2 to create a comprehensive proposal. Once the local currencies were examined, we drew parallels and identified themes between the local currencies that were successful, failed, or failing, to provide the Verdes management with a comprehensive view of how these differing systems function(ed). With this

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Summary SWOT	<ul style="list-style-type: none"> - Many initial users, strong developmental process - Legal, economic, and practical feasibility - Focuses on the community, provides for everyone. 	<ul style="list-style-type: none"> - Rushed co-design process of creation - Having the appearance of money while not serving truly as currency is dangerous 	<ul style="list-style-type: none"> - Create a Resilient economy - Promote Local spending and local businesses - More wealth maintained within the local economy - More opportunities for people and a more diverse economy. 	<ul style="list-style-type: none"> - Limited scope of demographic

Figure 0.3 SWOT Summary

information, we created a SWOT summary, shown above.

Recommendations

This section has four recommendations for the Verdes administration. Accompanying each objective are supporting comments.

The Verdes administration should contact founders of successful local currencies. The list of founders includes Christian Gelleri, Diana Finch, and the mayor of Monteverde. Christian Gelleri and Diana Finch have many years of experience starting, revising, managing, and evaluating local currencies. The Mayor of Montverde can lend political support and even economic support in the way, for example, that the Mayor of Bristol allowed municipal taxes to be paid with the local currency.

The Verdes administration needs to improve accessibility to their website so that the website is more user friendly. User friendly means that all types of users can easily sign-up and access their funds. The administration also needs to create a mobile application so that a participant can easily check on their account from their phone rather than go to a web browser.

The Verdes administration needs to advertise Verdes and inform people of its purpose and function. To advertise there should be door-to-door campaigns and flyers. To inform them there should be community meetings with slide show presentations and testimonials. Weekly meetings and presentations should inform potential participants and provide a platform to share ideas. The Verdes administration should also solicit business owners' viewpoints since the currency will circulate within their markets.

Verdes economy needs to adapt to a different local currency model. There are two alternatives: Reserve Backed Complementary Currency or Sectoral Currency.

Reserve Backed Complementary Currency will work far more effectively than the current Verdes model. This replacement will 1) encourage members to buy it at a 1:1 ratio with the national currency 2) solves the problem of businesses struggling to get goods and services outside the community. This currency's advantage is its similarity to money, something that people understand and trust. However, this approach will reduce local autonomy and weaken the desire for a barter system. Nevertheless, this tradeoff will be more sustainable and efficient.

Alternatively, Verdes can become a Sectoral Currency that will 1) incentivize locals to participate and 2) make it easier for businesses to acquire outside goods and services. The advantage of the Sectoral Currency is that it maintains local autonomy. Examples of sectoral currencies from the currency analysis include Surflimpo and Agelgil. These examples respectively promote a clean beach and fight poverty within the community.

In sum whether Reserve Backed or Sectoral Currency, the Verdes economy will profit from a substitution.

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Table Of Contents

Abstract	3
Executive Summary	4
Acknowledgements	7
Table Of Contents	8
2.0 Background	15
2.1 Monteverde, Costa Rica	15
2.2 COVID-19 and Monteverde’s Local Economy	16
2.3 What is a Local Currency?	16
2.3.1 Local Currencies Around the World	17
2.3.2 The Local Currency of Concern, Verdes	22
2.4 How does Verdes Function	22
2.5 How to Earn Verdes	22
2.5.1 How Verdes Functions as a Currency	23
2.6 Cambiatus Platform	24
2.7 Challenges with the Functionality of the Verdes Economy	24
2.7.1 What is a SWOT Analysis?	26
2.8 The Co-Design Process	26
3.0 Methodology	27
3.1 Objective 1: Gain an In-depth Understanding of the Characteristics of Local Currencies, Both Verdes and others, and Evaluate Them Using SWOT Categories	28
3.1.1 Gathering Information	29
3.2 Objective 2: Investigate a Co-Design Process	29
3.2.1 How a Co-Design Works in the Early Stages	30
3.2.2 How Many People Are Involved	31
3.2.3 Duration of Time a Co-Design Usually Takes Before Official Launch	31
3.3 Objective 3: Combine the Information from Objectives One and Two, and Tailor Them to Recommend a Co-Design Process to the Verdes Management to Revive a Monteverde Local Currency	32
4.0 Results and Analysis	32
4.1 Results	33
4.1.1 Analysis of Local Currencies	33
4.1.1.1 SWOT Categories of Local currencies (Objective 1a)	33
4.1.1.2 An Expert’s Analysis of local currencies (Objective 1a)	33
4.1.2 Verdes Analysis (Objective 1b)	34
4.1.3 Co-Design Findings (Objective 2)	35
4.1.4 SWOT Summary (Objective 3)	36
4.2 Discussion	37

4.2.1 Local Currency Discussions	37
4.2.1.1 Bristol Pay	37
4.2.1.2 Chiemgauer	38
4.2.2 Investigating a Co-Design	38
4.2.3 Revised implementation of a co-design	39
5.0 Recommendations	39
5.1. Contact Founders of Successful Local Currencies	39
5.2 Improve Accessibility	40
5.3 Advertise and Inform	40
5.4 Change Local Currency Type	40
References	42
Appendices	45
Appendix A: Oral Consent Script for Interviews	45
Appendix B: Interview Questions for Local Currencies	46
Appendix C: All SWOT Categories	48
Appendix D: IRB Approval Letter and IRB Oral Consent Script	52

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2.3.1	Local Currencies Around the World	Amar Worden	Elias Gonzalez and Amar Worden
2.3.2	The Local Currency of Concern, Verdes	Amar Worden	Elias Gonzalez and Amar Worden
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3.0	Methodology	Elias Gonzalez and Amar Worden	Elias Gonzalez and Amar Worden
3.1	Objective 1: Gain an In-depth Understanding of the Characteristics of Local Currencies, Both Verdes and Others, and Evaluate Them Using SWOT Categories	Elias Gonzalez	Elias Gonzalez and Amar Worden
3.1.1	Gathering Information	Elias Gonzalez	Elias Gonzalez and Amar Worden
3.2	Objective 2: Investigate a Co-Design Process	Amar Worden	Elias Gonzalez and Amar Worden
3.2.1	How a Co-Design Works in the Early Stages	Amar Worden	Elias Gonzalez and Amar Worden
3.2.2	How Many People Are Involved	Amar Worden	Elias Gonzalez and Amar Worden
3.2.3	Duration of Time a Co-Design Usually Takes Before Official Launch	Amar Worden	Elias Gonzalez and Amar Worden
3.3	Objective 3: Combine the Information from Objectives One and Two, and Tailor Them to Recommend a Co-Design Process to the Verdes Management to Revive a Monteverde Local Currency	Amar Worden	Elias Gonzalez and Amar Worden
4.0	Results and Analysis	Elias Gonzalez	Elias Gonzalez and Amar Worden
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4.1.1.2	An Expert's Analysis of local currencies (Objective 1a)	Elias Gonzalez	Elias Gonzalez and Amar Worden
4.1.2	Verdes Analysis (Objective 1b)	Elias Gonzalez & Amar Worden	Elias Gonzalez and Amar Worden
4.1.3	Co-Design Findings (Objective 2)	Amar Worden	Elias Gonzalez and Amar Worden
4.1.4	SWOT Summary (Objective 3)	Elias Gonzalez & Amar Worden	Elias Gonzalez and Amar Worden
4.2	Discussion	Amar Worden	Elias Gonzalez and Amar Worden
4.2.1	Local Currency Discussions	Elias Gonzalez & Amar Worden	Elias Gonzalez and Amar Worden
4.2.1.1	Bristol Pay	Elias Gonzalez	Elias Gonzalez and Amar Worden
4.2.1.2	Chiemgauer	Elias Gonzalez	Elias Gonzalez and Amar Worden
4.2.2	Investigating a Co-Design	Amar Worden	Elias Gonzalez and Amar Worden

4.2.3	Revised Implementation of a Co-Design	Amar Worden	Elias Gonzalez and Amar Worden
4.2.4	Our Thoughts	Amar Worden	Elias Gonzalez and Amar Worden
5.0	Recommendations	Maya Vartabedian	Elias Gonzalez and Amar Worden
5.1	Contact Founders of Successful Local Currencies	Elias Gonzalez	Elias Gonzalez and Amar Worden
5.2	Improve Accessibility	Elias Gonzalez	Elias Gonzalez and Amar Worden
5.3	Advertise and Inform	Elias Gonzalez	Elias Gonzalez and Amar Worden
5.4	Change Local Currency Type	Elias Gonzalez	Elias Gonzalez and Amar Worden
References		Elias Gonzalez	Elias Gonzalez and Amar Worden
Appendix A	Oral Consent Script for Interviews	Maya Vartabedian	Elias Gonzalez and Amar Worden
Appendix B	Interview Questions for Local Currencies	Elias Gonzalez	Elias Gonzalez and Amar Worden
Appendix C	All SWOT Categories	Elias Gonzalez and Amar Worden	Elias Gonzalez and Amar Worden
Appendix D	IRB Approval Letter and IRB Oral Consent Script	Elias Gonzalez	Elias Gonzalez and Amar Worden

1.0 Introduction

In December 2019, the COVID-19 virus emerged in China, causing global upheaval and devastation. As of November 2022, the virus killed over 6.6 million people and disrupted communities and livelihoods across the globe (Centers for Disease Control and Prevention, 2022; World Health Organization, 2022). Due to the rapid spread of COVID, an abrupt lockdown occurred in many nations, preventing international travel and causing negative economic and devastating social impacts (World Health Organization, 2022). Even developed nations, such as the United States, endured economic and social consequences. For developing nations, where tourism can account for 20% or more of their gross domestic product (UNWTO Staff, 2020), the lack of international travel caused economic disruption.

Considering its status as a developing nation, Costa Rica's tourism suffered major losses, causing communities throughout the country to experience economic hardship. Costa Rica's GDP dropped by 50% from 2019 to 2021. The region of Monteverde was particularly affected, due to its location as a prime ecotourism destination.

The deficit of tourists severely dampened the flow of income to this community, resulting in major setbacks for many local businesses (Cesconetto, 2020a). To fight against the negative impacts of COVID-19, a local currency, Verdes, was developed by Enlace Monteverde to promote a circular flow of wealth within the community. Verdes benefits the community by incentivizing local exchanges, providing economic stability, and promoting conscious actions (Cesconetto, 2020a).

Although the currency succeeded in many ways, we identified issues that led to the program's deterioration. The issues were a lack of participation and broken trust model (a collection of rules that ensure the legitimacy of an idea). These two issues resulted in some local

businesses having an accumulation of Verdes, outlining the necessity for more businesses and additional participation.

Verdes accumulated at a few local businesses due to the inability of these businesses to cycle Verdes back into the economy, and the lack of business options for locals to spend their Verdes at. This accumulation led to the flow of the economy becoming stagnant, hindering the many positives the local currency brought to the area. This static economy brought about the necessity to identify the issues that led up to and occurred during the implementation and performance of the currency. Identifying the problems within the currency and the community involves researching and interviewing the founders of other local currencies from around the world. Upon investigation, the information gathered was analyzed using SWOT analysis thus resulting in the creation of a proposal to the administration of the Verdes currency. Using this information, we then evaluated and structured a co-design process for the Verdes administration to utilize in their efforts to revive or relaunch a local currency in Monteverde.

2.0 Background

In this chapter, we discuss Monteverde, detailing the effects of COVID-19 on its economy, then explain the function and purpose of its local currency, other local currencies around the world, and finally offer insight into the analysis tools we used to do so.

2.1 Monteverde, Costa Rica

Monteverde, a small town in Costa Rica, boasts of 6,000 residents who reside in a lush environment surrounded by rainforests, mountains, pastures, and fields. Notably, the town's residents prioritize environmentally friendly actions and sustainable living choices. This unique

environment, which features a thriving biodiversity, serves as a major tourist attraction, drawing visitors from all corners of the world. As a result, ecotourism plays a significant role in the town's economy, providing employment opportunities and enhancing the goods and services available in the area (Monteverde Costa Rica, 2022). The town's popularity earned the distinction of being the seventh wonder of Costa Rica (Monteverde Costa Rica, 2022). However, the pandemic negatively impacted Monteverde's economy, leading to the loss of 250,000 tourists. Consequently, restaurants closed down, local attractions ceased operation, and hostels and homestays emptied out, leaving many without employment opportunities (Shah, 2020). This was a global occurrence that forced significant life adjustments.

2.2 COVID-19 and Monteverde's Local Economy

Like other small communities, Monteverde sought alternative methods to combat the economic downturn. One of these methods, a local currency, "Verdes", was created to keep a sustainable level of wealth within the community and provide economic and social stability for residents (Seyfang, 2001).

2.3 What is a Local Currency?

The definition of a local currency is subject to various interpretations, including lofty goals such as promoting freedom for a creative, cultural, and spiritual life, democracy in defining rules for communities and individuals, and solidarity in the economy, working cooperatively regionally and globally (Gelleri, 2009). At a more practical level, local currency can facilitate exchanges between Self Help Group (SHG) members, supporting their businesses, sharing skills, insights, connections, and products/services, with the result that there is a more resilient

economy (Cesconetto 2020b). A third interpretation includes aspects of the first two and additionally accelerates the ecological transition, support for regional languages, and strengthened citizen power in the currency region, including associations, local economy, and local commerce (Eusko).

Overall, local currency can be defined as a currency system that circulates within a limited geographical area, characterized by an asset-based community development program and documented throughout its history to show considerable socioeconomic benefits for community members. Local currencies use physical or digital tokens that local businesses accept in exchange for goods and services (Seyfang, 2001; Gregory, 2009). However, local currency scholars acknowledge that it is a challenging definition to pin down (Lenis Escobar et al., 2020).

Despite these varying interpretations, local currencies tend to promote solidarity, maintain wealth within the community, and encourage prosocial behavior, such as donating, cooperating, and volunteering (Lenis Escobar et al., 2020). This feature allows local currencies to form circular economies, where wealth accumulates and distributes throughout the community, rather than leaving for an outside economy (Cohen, 2017; Brown, 2018). In the next section, local currencies worldwide will be detailed, providing a better understanding of how they operate.

2.3.1 Local Currencies Around the World

There are numerous local currencies around the world. Seven of these, that are more or less similar to Verdes, are 1) Muda, of Rio De Janeiro 2) Agelgil, of Adama City 3) Eusko, of the Basque Country 4) Surflimpo, of Brazil 5) Chiemgauer, of Germany, 6) Bristol Pound and 7) Bristol Pay, of England. A review follows:



MUDA
Rio De Janeiro, Brazil

Muda, of Rio De Janeiro, Brazil, was formed to combat the “governmental shift and subsequent economic crisis and fiscal adjustment in recent years” (Cesconetto, 2020). This economic change has affected the cultural and artistic activities present in Rio De Janeiro as a result of cut funding. The goal of Muda is to incentivize conscious actions towards the community and the environment and promote the exchange of goods and services within the community. To re-establish these activities and groups, Muda was created. Currently, there are over 5,000 members actively participating and around 17,000 transactions since its creation (Cesconetto, 2020b).



Agegil
Adama City, Ethiopia

Another local currency that operates for the good of the community is Agegil, formed in Adama City, Ethiopia, to assist self-help groups and to form strong relationships between members of their communities (Cesconetto, 2020b). The goal of Agegil is to “encourage support and relationship building between members of self-help groups (SHGs), including sharing insight and business knowledge to encourage the creation and growth of local businesses, strengthening their local economies” (Cesconetto, 2020b). These initiatives succeeded in the establishment of a circular flow of wealth within their local communities, displaying the success that a local currency can bring to a region. Currently, the group has around 750 members with over 30,000 coins in circulation (Cesconetto, 2020b).



Eusko
Basque Country, France

Eusko was formed in the Basque Country, Spain in 2013, after 2 years of preparation, research, and development, with a pre-registered team of over a hundred professionals. Currently, the group has 1000+ companies, 300+ associations, and 4000+ individuals using and accepting it. Eusko has many different objectives, primarily to promote a sustainable economy, accelerate the ecological transition, support the Basque language, culture, and solidarity with the territory, and support the local economy and commerce, therefore strengthening citizen power. There is no individual incentive, but a collective incentive to encourage collaboration. Each member of the local currency chooses an association to sponsor. When this association reaches 30 sponsors, it enters the 3% Eusko Donation scheme. A donation will then be made each year, equivalent to 3% of the euros exchanged into Eusko by all the sponsors, therefore providing for everyone within the economy, and promoting a sustainable method of transaction. Essentially, this process consists of people sponsoring associations, and when enough people sponsor one, a portion of the value of the Eusko they purchased is donated to the association. This long rooted local currency has succeeded through its initiatives in providing the Basque country with a solidified and reliable basis of circular flow of wealth, heightened citizen power, and a more sustainable and solidarity-focused region.



Surflimpo
Rio De Janeiro, Brazil

Surflimpo is a local currency initiative formed with the purpose of cleaning the beaches of Brazil, spreading awareness and education about care for the oceans, and promoting the exchange of services and products. Members participating in the initiative earn the currency by doing these activities; cleaning the beaches and educating others and are able to spend the currency at businesses that accept the currency. Many of these businesses are happy to accept the currency since it means the beaches near their establishments will be clean. Currently, the program has over 100 members, 3600 coins in circulation, and 28 businesses that accept the currency.



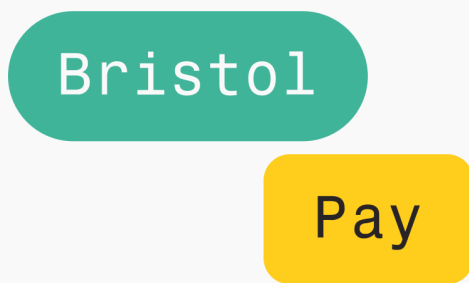
Chiemgauer
Germany

Chiemgaur is an initiative initially formed as a school project in Germany, and later developed in 2005 as a fully functional local currency system. It aims to promote freedom for a creative, spiritual, cultural life, democracy in all parts of defining rules for communities and individuals, and solidarity in the economy; working together cooperatively in the region and globally. The larger the community grows, the more possibilities there are to spend. More possibilities make the network more attractive and let the community grow. This serves as a positive self-strengthening cycle. This currency has been operating smoothly for over 18 years, and is now accepted across the nation of Germany.



Bristol Pound
Bristol, England

Bristol pound was an initiative that was launched in Bristol, England in 2012. Its purpose was to create a resilient and sustainable city economy following economic turmoil. It also aimed to localize supply chains, maintain wealth in the local economy, create more and better opportunities for citizens, and diversify the economy. It functioned as a reserved-backed currency, where the currency was acquired by exchanging the national currency for it. Unfortunately, the currency failed for multiple reasons, despite its success over the years. Some of these reasons include: alienating normal, uneducated people as well as bigger businesses, included no real value propositions, costly tech, and credit union restrictions. At its most successful point, it was the largest UK local currency, included over 1300 members, 580 businesses, and around £B1,000,000 circulated per year.



Bristol Pay
Bristol, England

Bristol Pay is a venture formed in 2019 with the goal of reviving what Bristol Pound should have been. Bristol Pay aims to insulate the city of Bristol from global economic trends, change purchasing behavior in favor of local independent businesses, and create a localized supply train. It also seeks to promote local reinvestment and to serve as a tool to shift social norms for the better. In order to succeed, Bristol Pay recognizes that it must have a low bar for entry, a clear value proposition for businesses and individuals, be engaging, and make life easier for individuals and businesses.

2.3.2 The Local Currency of Concern, Verdes

Like the preceding currencies, the local currency of Monteverde, Verdes, aims to 1) ensure community solidarity, 2) secure economic stability, and 3) promote prosocial and environmental behavior (Lenis Escobar et al., 2020). During COVID-19, there were more than 2,500 active members and 470 vendors who sought to rebuild the economy and practice environmentally conscientious actions. The desired outcome was a strengthened community based on a more self-sufficient economy.

2.4 How does Verdes Function

Verdes is an online-based local currency that enables users to store and trade currency digitally. Users can earn Verdes by taking sustainable actions, documenting them with photos and videos, and having them verified by the administration. Verdes can be used to purchase goods and services at local businesses that accept the currency. It's worth noting that while Verdes uses the term currency, it functions more like a credit, exchange, or bartering system, and not like traditional money.

2.5 How to Earn Verdes

To earn Verdes, one can complete a variety of pro-social and environmental actions. The first step to earning Verdes entails membership. To become a member, one must register on the Verdes website (<https://verdes.cambiatus.io/join?redirect=%2Fdashboard>). The website handles all the trading and management components of the currency. Once a member, the rewardable actions include, for example, taking a bike to work instead of driving a car, volunteering in a local socially and environmentally progressive organization, and decreasing water consumption

(Cesconetto, 2020). The website lists more than 500 actions that can earn any of a varying amount of Verdes. Once a sustainable action has been completed, the member reports it to their account, and the administrators enter the system to verify its completion. If the member gets approved, Verdes will be deposited to their account.

2.5.1 How Verdes Functions as a Currency



Figure 1 Verdes logo

Community members can exchange Verdes for goods and services, such as food, clothing, and other merchandise, at local businesses that accept the currency. The Verdes economy involves three main groups: the administration, sellers, and buyers. The administration comprises eight community members who manage the currency and website, oversee factors such as the amount of Verdes in circulation, the value of green actions completed by users, and more. Sellers are local businesses that choose to accept Verdes in exchange for their products or services, while buyers are community members who earn and spend the currency.

2.6 Cambiatus Platform

Verdes, the local currency of Monteverde, utilizes blockchain technology through Cambiatus, allowing for secure and cost-effective transactions (Marvin, 2017). While blockchain has benefits, such as security and fast transactions, it also requires host servers and software development. Alianza Verdes chose Cambiatus for Verdes due to its free initial hosting, low cost, and high-speed capabilities, all of which allow for the growth of the currency should it exceed initial expectations (Cesconetto, n.d.-b). Currently, Verdes has more than 2,800 active members and 470 vendors accepting the currency, with more than 24 million virtual coins in circulation and 6,000 recorded transactions.

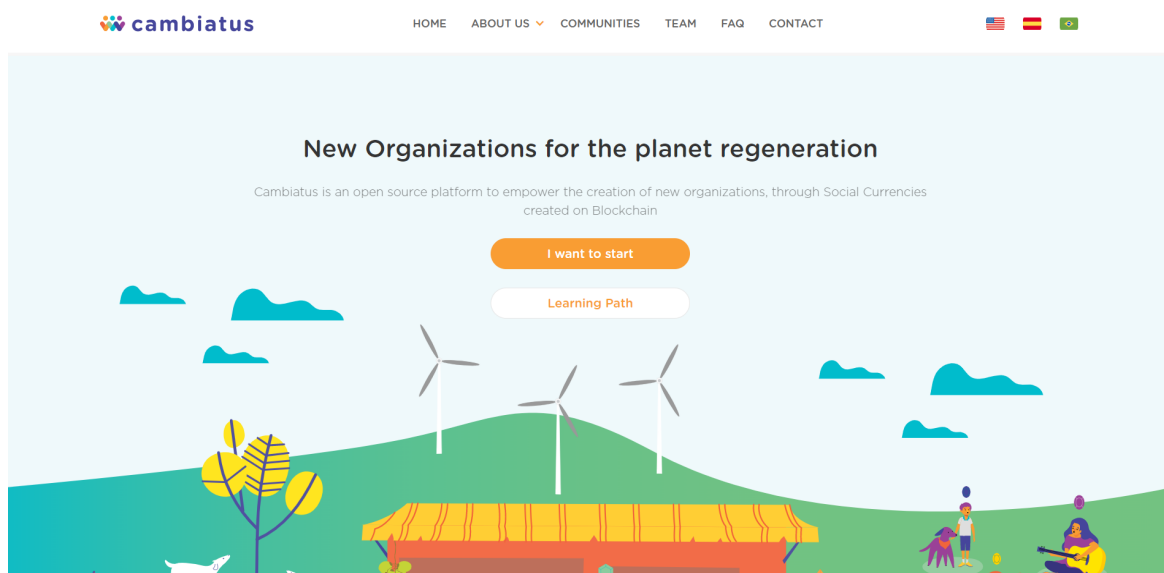


Figure 2 Cambiatus logo and website

2.7 Challenges with the Functionality of the Verdes Economy

Cambiatus has been instrumental in managing the Verdes platform and currency, allowing for a seamless economy, especially during the COVID-19 pandemic when unemployment rates were high within the community (Sponsor interview). However, there have

been recent concerns regarding the circulation of Verdes within the community. Some local businesses, such as Taco Taco, the farmers market, and a thrift store, have accumulated significant amounts of Verdes due to limited spending options for these businesses and for community members. This lack of markets threatens the Verdes economy, as it disrupts the flow of the currency that underpins the economic stability of Monteverde. To ensure continued sustainability and security for the community, these inefficiencies must be identified and addressed. Below shows the initial boom and fall of Verdes during covid when tourists returned.

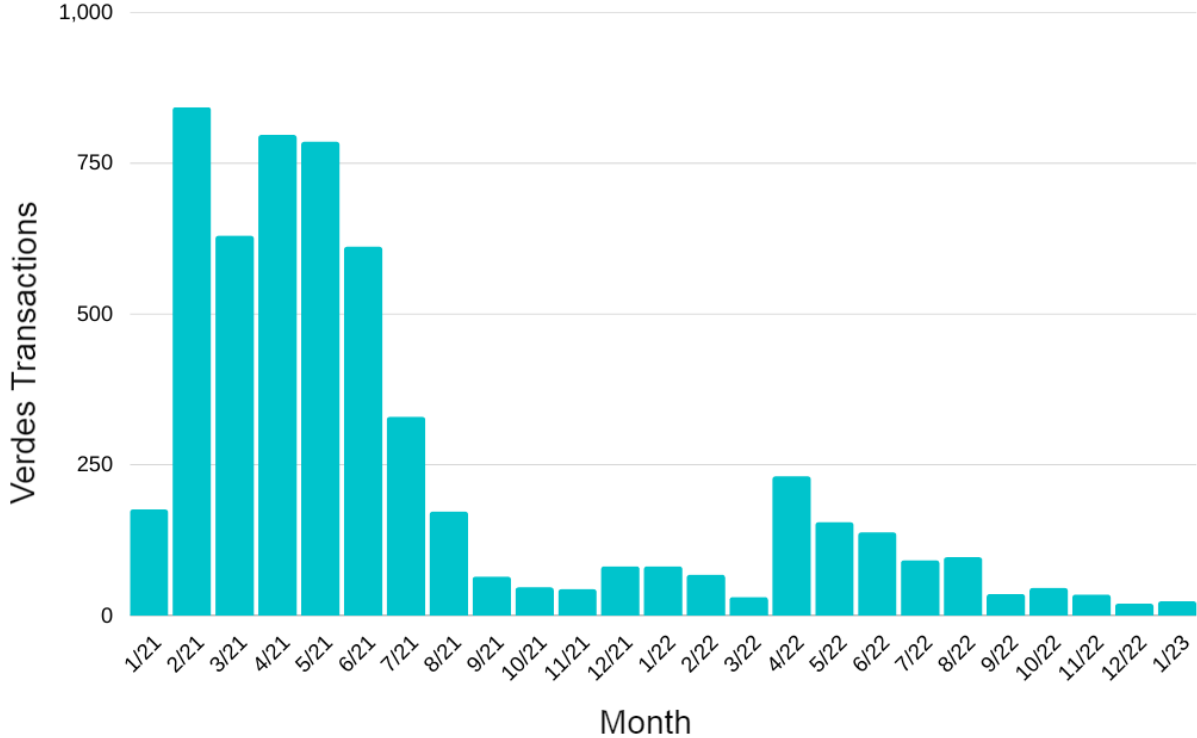


Figure 3 Verdes transactions (1/21-1/23)

In addition to the unforeseen accumulation of Verdes among a few businesses, two other problems emerged. An error in the way enrollment was recorded allowed individuals to establish multiple accounts, thereby allowing one person to present their Verdes activity multiple times (double, double counting) and amass large amounts of the currency. The second involved the purchase of large quantities of goods using Verdes at a participating store, then reselling those goods for the national currency, Colones, at another store, thereby undermining the program's ethical integrity and breaking the trust model. As a result, the legitimacy of the Verdes program became suspect, contributing to its downfall. To address these issues, the team sought in-depth historical information from the sponsor. To conduct the analysis and provide recommendations to the Verdes administration, the team employed various analytical tools. These are discussed next to provide context for their application.

2.7.1 What is a SWOT Analysis?

A SWOT Analysis is a planning and management tool primarily used to identify four key aspects of an initiative or business. It describes their strengths, weaknesses, opportunities, and threats (SWOT). These categories help with comparative analysis when creating and applying SWOT diagrams for multiple, different initiatives, as comparison leads to the identification of trends.

2.8 The Co-Design Process

A co-design process is a powerful procedure for planning new community-wide initiatives. As a planning process, it identifies and develops important initiatives and ideas that are co-created through the groupthink of many and varied participants. With regard to local

currencies, no alternative currency that the team examined specified the use of a co-design process, but successful local currencies clearly used elements of a co-design process to begin their initiatives.

3.0 Methodology

The methodology section gathers, analyzes and presents information about successes and challenges of local currencies from around the world, and the application of this information to the analysis and redesign of the local Monteverdes currency. There are three objectives.

Objectives

1. Gain an in-depth understanding of the characteristics of local currencies, both Verdes and others, and evaluate them using SWOT categories,
2. Investigate a co-design process, and
3. Combine the information from objectives one and two, and tailor them to recommend a co-design process to the Verdes management to revive a Monteverde local currency.

A visual representation of our methodology follows:

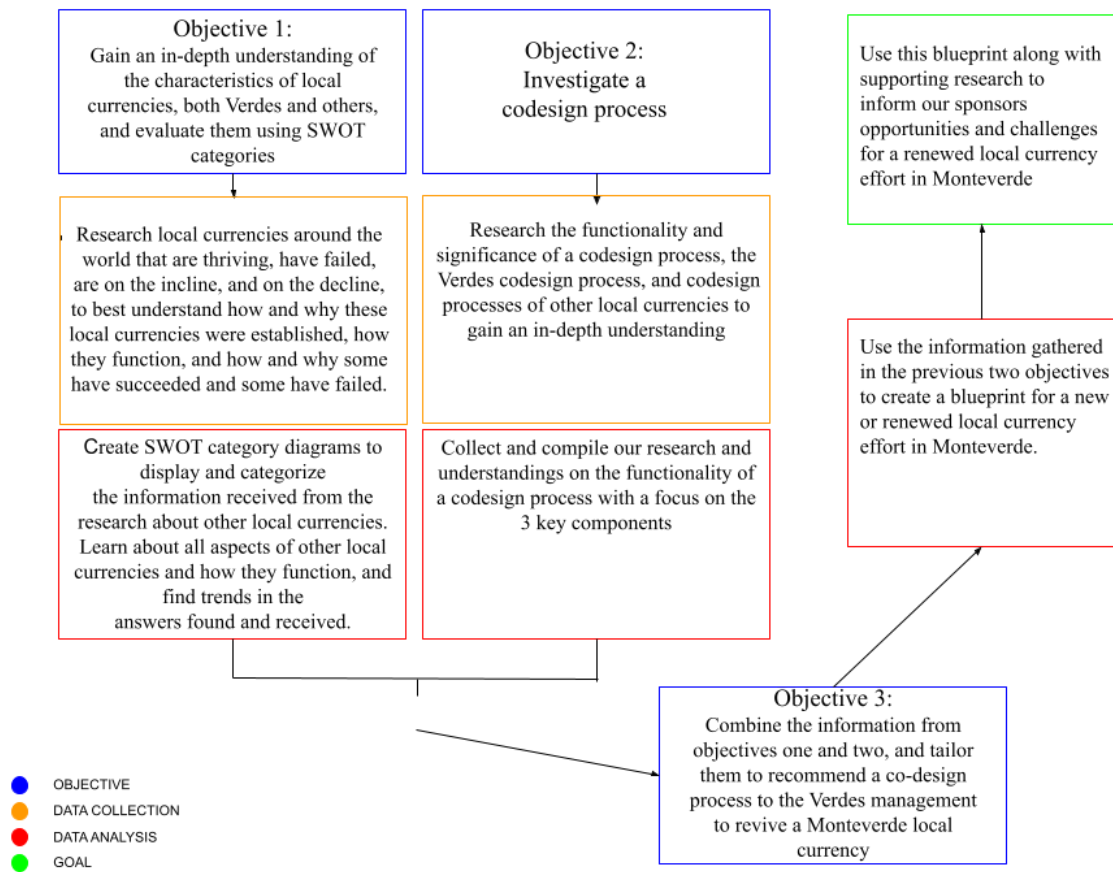


Figure 4 Visual Methodology

3.1 Objective 1: Gain an In-depth Understanding of the Characteristics of Local Currencies, Both Verdes and others, and Evaluate Them Using SWOT Categories

To gain a comprehensive understanding of local currencies, objective 1 entails two parts, namely, objective 1a and objective 1b. First, we conducted research and interviews to gather information on the topic. Then, we analyzed several alternative currencies, including Verdes, using the SWOT analysis (objective 1a and objective 1b). This analytical tool helps identify

successful strategies used by other currencies to engage the community and evaluate factors contributing to their decline or failure. Our findings from the SWOT analysis will inform the implementation of a co-design process for the relaunch of the Verdes program, as outlined in objective 3.

3.1.1 Gathering Information

We conducted an online search using the keywords "local" and "currency" to identify relevant local currencies, resulting in a list of eight: Muda, Agelgil, Surflimpo, Verdes, Eusko, Chiemgauer, Bristol Pound, and Bristol Pay. We then reviewed each currency's website and contacted website administrators via email to request an interview with the currency managers. The interviews focused on five topics. These appear in Appendix B along with specific question topics: 1) currency functionality, 2) objectives, 3) overall goals, 4) transaction methods within the community, and 5) current state. We recorded the resulting information in an Excel sheet. Verdes was analyzed using the same methodology as the other local currencies.

3.2 Objective 2: Investigate a Co-Design Process

The co-design process involves a collaborative approach between developers and users to design a platform or service through a combination of developmental design and exploratory research. There are three main components to the process: how the co-design works in the early stages, the number of participants involved, and the duration of the process before the official launch. We obtained information about the co-design process by reviewing relevant websites.

3.2.1 How a Co-Design Works in the Early Stages

The investigation of the co-design process involved conducting online research using relevant keywords such as "Co-design", "Co-design process", and "number of participants in a co-design process". The research revealed that effective organization is crucial in the early stages of a co-design process. This involves establishing a leadership group consisting of 3 to 10 people who can organize meetings, set agendas, identify key players, and develop a strategy for the process. Defining overall goals, methods, objectives, and deadlines is also essential in this collaborative process. Moreover, it is important to consider the knowledge level of participants to ensure their full participation in providing and discussing ideas and proposals. Below is a diagram of a generalized co-design process:

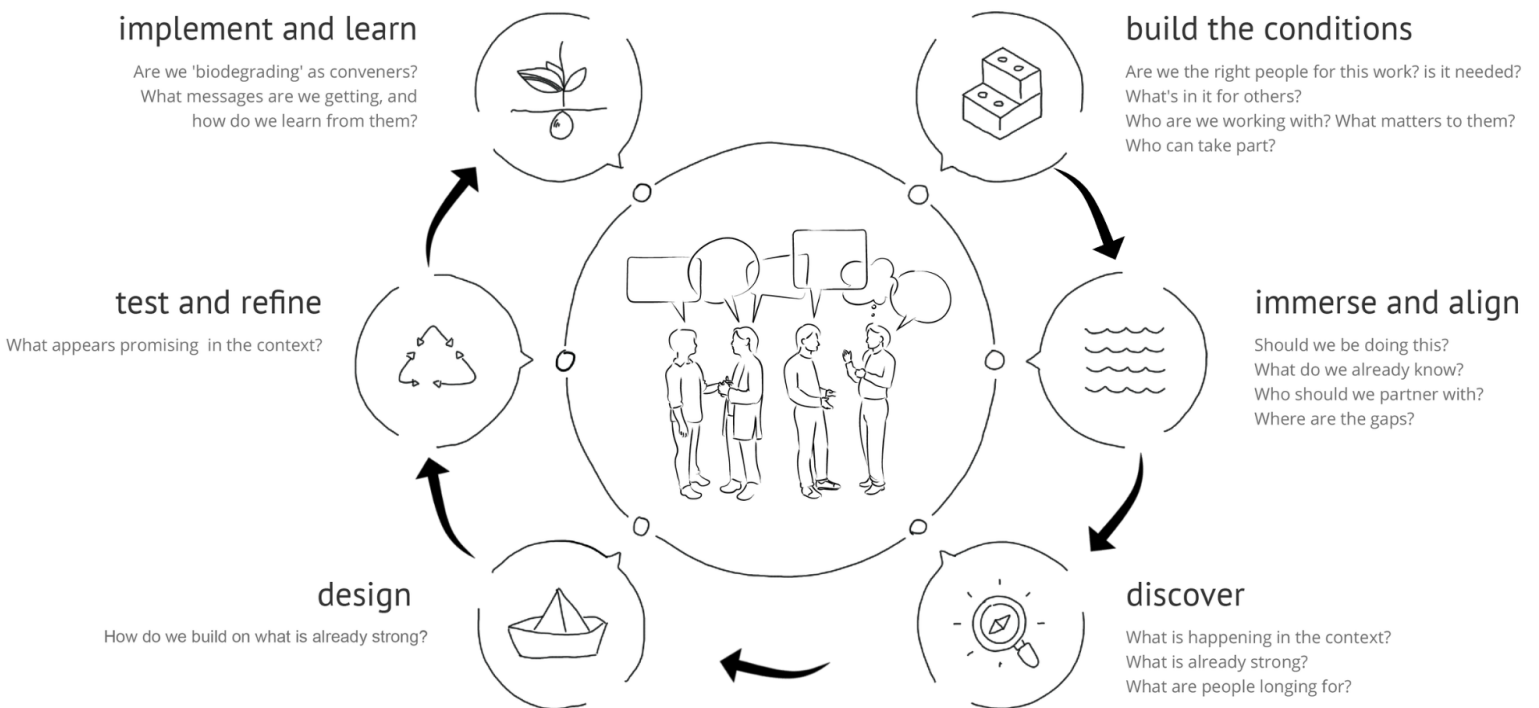


Figure 5 Co-design Process diagram

3.2.2 How Many People Are Involved

The investigation of the co-design process showed that the number of ideal participants varies because each co-design process tackles different objectives and elements. Whatever the number, anyone with a stake in the initiative or venture should have a role in the co-design process. This can lead to membership ranging from 10 to 80 individuals. Typically, several workshops, meetings, and discussions spanning a significant period are held to involve as many participants as possible. Incorporating a broad range of ideas and perspectives in a co-design session is crucial, especially in a close-knit community such as Monteverde.

3.2.3 Duration of Time a Co-Design Usually Takes Before Official Launch

Research shows that the time for preparation to launch largely depends on the scale and complexity of the project. For smaller projects with fewer participants, the co-design session may last anywhere from 2 weeks to 3 months. However, for larger and more complex projects, it may take several months to a year. The findings enable us to outline a co-design process for the Verdes program, which will be elaborated on in Objective 3: to facilitate the implementation of a co-design process for the relaunch of the Verdes program.

3.3 Objective 3: Combine the Information from Objectives One and Two, and Tailor Them to Recommend a Co-Design Process to the Verdes Management to Revive a Monteverde Local Currency

After examining the characteristics of local currencies and the co-design process, the team explored how these concepts could be combined to help relaunch the Verdes currency. We conducted a SWOT analysis and identified key factors in the categories of Strengths, Weaknesses, Opportunities, and Threats. Combining these details, we created a "Summary SWOT" analysis to identify what a successful local currency requires. Leveraging our understanding of the co-design process, including the early stages, number of participants, and timeline, we developed a proposal for the Verdes currency administration.

4.0 Results and Analysis

We present the findings of our inquiry and analysis to aid in the implementation of a co-design for the Verdes currency relaunch. Our results encompass the outcomes of all interviews, SWOT and database analyses, and the investigation into co-design processes. Through the interview data, we gained a deeper understanding of how local currencies best serve their purpose. We analyzed various currency initiatives to identify successes, failures, and reasons for both. This allowed us to identify trends and parallels between currencies and create useful guidelines for our sponsor. Our research produced three main findings that will inform the Verdes administration on how to implement a co-design for the currency relaunch: SWOT analysis of local currencies, co-design discoveries, and a SWOT summary.

4.1 Results

The results section comprises the investigation of local currencies including the SWOT of local currencies, the SWOT summary of these local currencies, and expert analysis.

4.1.1 Analysis of Local Currencies

The analysis of local currencies contains the SWOT analysis of local currencies, the SWOT summary, and the expert analysis. The eight local currencies were analyzed with the 4 SWOT categories. The 8 local currencies are 1) Muda 2) Agelgil 3) Surflimpo 4) Eusko 5) Verdes 6) Chiemgauer 7) Bristol Pound 8) Bristol Pay. The four categories are strengths, weaknesses, opportunities, and threats.

4.1.1.1 SWOT Categories of Local currencies (Objective 1a)

We identified the key elements that made local currencies successful, and evaluated where and why they failed by using SWOT categories. Once the local currencies had been examined, it becomes important to draw parallels and identify themes between the local currencies that were successful, failed, or failing, to provide the Verdes management with a comprehensive view of how these differing systems functioned. This will allow our sponsors to revise or reinstate a Monteverde local currency system. All eight SWOT analysis of individual local currencies can be seen in Appendix C.

4.1.1.2 An Expert's Analysis of local currencies (Objective 1a)

Christian Gelleri, the founder of Chiemgauer, and an expert in business, economy, and local currency, provided information and insight that were used by the team to analyze the Verdes currency from an experienced practitioner's perspective. Gelleri's information and insight detailed five different types of "Complementary currencies" (Gelleri, 2021). Two of these,

Mutual credit currencies, and Fiat complementary currencies are not relevant to the project. The three remaining, Reserve backed complementary currencies, Digital Peer-to-Peer currencies and Sectoral currencies provide rich examples of currencies relevant to the project.

1. Reserve backed complementary currencies: “operate with the national currency or certain goods functioning as a reserve in order to enhance confidence in the complementary currency.” (Gelleri, 2021)

2. Digital Peer-to-Peer Currencies

“are the youngest type of complementary currencies... with decentralized money creation and circulation... derive their value from the participants’ trust. The model is cash passed from one person (peer) to another person (peer).” (Gelleri, 2021)

3. Sectoral currencies

“are issue-specific currencies aiming, for example, to finance care for the elderly, environmental protection, youth work and incentive schemes... In times of disasters, sectoral currencies have been used repeatedly, for example within refugee camps to organise mutual aid.” (Gelleri, 2021)

Based on Gelleri’s paper, it appears that the Verdes economy is most similar to a Digital Peer-to-Peer Currency. The similarities include 1) decentralized money creation and circulation, 2) cryptocurrency, and 3) addresses social challenges such as promote solidarity and reduce carbon footprint.

4.1.2 Verdes Analysis (Objective 1b)

When meeting with our sponsors, we came to find that many people did not know how the Verdes currency works, and the current users have a hard time accessing the web-app. The website and sign-up process is difficult for those who do not have a good understanding of technology. Current users, on the other hand, have difficulty accessing their accounts and signing in due to the complexity of the login process provided by the Cambiatus website. The process of signing in includes generating codes, inputting 10 different words to serve as an authenticator,

and finally inputting one's password. Considering the Verdes administration informed us that their biggest supporters are the older generation (as they like the idea of a barter economy), this tricky website process is particularly difficult for these older individuals who are not as familiar with current technology compared to younger generations (Sponsor interview).

4.1.3 Co-Design Findings (Objective 2)

Co-design is an entirely organization process. As an organizational process, there needs to be an established leadership group consisting of anywhere from 3 to 10 people that can organize the sequence of meetings, topics for agendas for meetings, can identify who the players in the entire process may be, and can think of the strategy for when these players come together. In the early stages of a co-design process, it is necessary to outline the ideas necessary for success in the process. Overall, goals, established methods and objectives, and important deadlines are all important to include in this collaborative process. Additionally, it is important to understand the knowledge level of those involved in the process, especially in the early stages, so that no one is left out any participation in the process of providing and discussing ideas and proposals.

When looking at the number of people that should be involved in a co-design process, we found numerous different answers, as most co-design processes deal with very different elements and objectives. Although we were not clear on an exact number that best fits a co-design process, we did find that everyone who has some stake in the initiative or venture should play a role. Research in the design of co-design stakeholders yields numbers anywhere from 10 to 80. There is a leadership team comprised of 3-10 people, and there are usually several workshops, meetings, and discussions over a substantial amount of time that will include as many people as possible who are involved in the process. We found that it is important to try to incorporate as

many ideas and brains as possible in a co-design session, and especially when considering the tight-knit community of Monteverde, it is important to take this into consideration.

When looking into the time necessary for a co-design session to take place before launch, we found that it largely depends on the parameters of strategic planning necessary. For small co-design sessions with a small number of participants for a small project, the necessary length of time for a successful co-design session can range anywhere from 2 weeks to 3 months. For larger and more complex projects, the necessary amount of time in a co-design process may take anywhere from a few months to a year. We observed the small amount of time the Verdes group took in their co-design session before launch, and recognized that with more planning and time within this process, the currency would currently have a better chance at success.

The information gathered allows us to combine and tailor the two objectives, in order to create and implement the third, which is to help implement a co-design process for the relaunch of the Verdes program.

4.1.4 SWOT Summary (Objective 3)

This SWOT summary serves as a compilation of the trends we examined between the eight SWOT analyses we completed for the local currencies researched. It displays the most common trends among the most relevant local currencies and provides important insight to

provide to our sponsors for future use.

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Summary SWOT	<ul style="list-style-type: none"> - Many initial users, strong developmental process - Legal, economic, and practical feasibility - Focuses on the community, provides for everyone. 	<ul style="list-style-type: none"> - Rushed co-design process of creation - Having the appearance of money while not serving truly as currency is dangerous 	<ul style="list-style-type: none"> - Create a Resilient economy - Promote Local spending and local businesses - More wealth maintained within the local economy - More opportunities for people and a more diverse economy. 	<ul style="list-style-type: none"> - Limited scope of demographic

Figure 6 SWOT Summary

4.2 Discussion

The discussion focuses on three main objectives: analyze local currencies in addition to Verdes, investigate a generalized co-design process, and combine and tailor these two to facilitate a revised implementation of a co-design for Verdes. The discussion section focuses on objective one because the research and interviews yielded a lot of information that requires extended consideration. Objectives two and three gave results that were more straightforward.

4.2.1 Local Currency Discussions

Two local currencies will be examined in this section: Bristol Pay and Chiemgauer.

4.2.1.1 Bristol Pay

The Bristol Pay discussion focuses on an interview with Dianna Finch. Dianna Finch is an important member of Bristol Pay, formerly Bristol Pound. The interview with Finch primarily examines the problems of Bristol Pound, the predecessor of Bristol Pay. In particular, Finch covered the dangers of a lack of sufficient advertising and education. Bristol Pound's advertising

strategy targeted only like-minded, educated individuals and neglected to include the rest of the community, which ultimately excluded many potential users. Additionally, Bristol Pound initially promised businesses that the currency would bring them more customers, but it only introduced a new way to pay for the same individuals.

In spite of Bristol Pound's failures, knowledge gained from a decade of experience and redesign and relaunch of Bristol Pound as Bristol Pay, the Bristol Pay administration offers a tremendous wealth of information that can serve the Verdes administration.

4.2.1.2 Chiemgauer

Chiemgauer was founded by Christian Gelleri, who has over 20 years of experience in business, economics, and local currencies. Gelleri's successful school project in 2003 eventually grew to become a regional currency, and his expertise has been presented and documented (Gelleri, 2009).

Christian Gelleri's research paper (Gelleri, 2021) highlighted the different types of local currencies. One of these, a Digital Peer-to-Peer currency, is particularly relevant to the current study because Verdes seems to be an example. This type of currency is a new form because it is digitized. Unfortunately, the currency's recent introduction means that there is limited information on how to properly integrate it into a community.

4.2.2 Investigating a Co-Design

A review of the co-design did not yield any conceptual difficulties. Nevertheless, there are problems with how to operationalize the idea. Two, in particular, stand out, the amount of time that is needed for the process and the extent or scope of the initiative. In the end, these were not insurmountable challenges, and the application of common sense makes it possible to

accommodate these findings. Perhaps most important among these is that in spite of the demands of a crisis, a hurried procedure will result in large, often fatal mistakes.

4.2.3 Revised implementation of a co-design

The discussion of objective one together with the discussion of objective two showed that a codesign informed by local currency research can be tailored to a specific client. In particular, for the Verdes context, the following need to be considered: scope of project, people to involve, what leadership team to construct (skills, knowledge, commitment), what currency type to operate under, how to design a user-friendly website, lessons from the history of the use of Verdes, the amount of demand for the currency, and mentor or consultant availability.

When all things are considered, Verdes can be reinvigorated with a combination of external and internal forces. External, there must be an economic demand for the currency. Internally, there needs to be dedicated leadership willing to make the currency work. Without these characteristics, Verdes faces a limited future.

5.0 Recommendations

There are four recommendations. Each recommendation is stated and supported by a short rationale.

5.1. Contact Founders of Successful Local Currencies

The Verdes administration should contact founders of successful local currencies. The list of founders includes Christian Gelleri, Diana Finch, and the mayor of Monteverde. Christian Gelleri and Diana Finch have many years of experience, starting, revising, managing, and

evaluating local currencies. The Mayor of Montverde can lend political support and even economic support in the way that the Mayor of Bristol, for example, allowed municipal taxes to be paid with the local currency.

5.2 Improve Accessibility

The Verdes administration needs to improve accessibility to their website so that the website is more user friendly. User friendly means that all types of users can easily sign up and access their funds. The administration also needs to create a mobile application so that a participant can easily check on their account from their phone rather than go to a web browser.

5.3 Advertise and Inform

The Verdes administration needs to advertise Verdes and inform people of its purpose and function. To advertise there should be door-to-door campaigns and flyers. To inform there should be community meetings with slide show presentations and testimonials. Weekly meetings and presentations should inform potential participants and provide a platform to share ideas. The Verdes administration should also solicit business owners' viewpoints since the currency will only work with their support.

5.4 Change Local Currency Type

Verdes economy needs to adopt a different local currency model. There are two alternatives: Reserve Backed Complementary Currency or Sectoral Currency.

Reserve Backed Complementary Currency will work far more effectively than the current Verdes model. This replacement will 1) encourage members to buy it at a 1:1 ratio with the

national currency and 2) solve the problem of businesses struggling to get goods and services outside the community. This currency's advantage is its similarity to money, something that people understand and trust. However, this approach will reduce local autonomy and weaken the desire for a barter system. Nevertheless, this tradeoff will be more sustainable and efficient.

Alternatively, Verdes can become a Sectoral Currency that will 1) incentivize locals to participate and 2) make it easier for businesses to acquire outside goods and services. The advantage of the Sectoral Currency is that it maintains local autonomy. Examples from the currency analysis include Surflimpo and Agelgil. These examples respectively promote a clean beach and fight poverty within the community.

In sum whether Reserve Backed or Sectoral Currency the Verdes economy will benefit from a substitution.

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Appendices

Appendix A: Oral Consent Script for Interviews

English version:

We are students from Worcester Polytechnic Institute and are doing research to help increase the number of businesses in Monteverde that accept the Verdes currency. For this interview we want to ask you about your opinion on the currency of Verdes and your role in the Verdes economy. We would like to voice record our conversation for note taking purposes, is that okay? We won't use your name unless you give us permission to do so. This is all voluntary and you can skip any questions you don't want to answer. You can also stop the interview at any time. Our research will be available to the public through the WPI Library. Please feel free to ask any questions at any time. Our names are Elias Gonzalez and Amar Worden and we can be contacted via email at gr-MV23-Verdes@wpi.edu. We can also provide you with our advisors' email if you want to contact them with questions.

Spanish version:

Somos estudiantes del Instituto Politécnico de Worcester y estamos investigando para ayudar a aumentar la cantidad de negocios en Monteverde que aceptan la moneda Verdes. Para esta entrevista queremos preguntarle sobre su opinión sobre la moneda de Verdes y su papel en la economía de Verdes. Nos gustaría grabar nuestra conversación para tomar notas, ¿está bien? No

usaremos su nombre a menos que nos dé permiso para hacerlo. Todo esto es voluntario y puede omitir cualquier pregunta que no desee responder. También puede detener la entrevista en cualquier momento. Nuestra investigación estará disponible para el público a través de la Biblioteca WPI. Por favor, siéntase libre de hacer cualquier pregunta en cualquier momento. Nuestros nombres son Elias Gonzalez y Amar Worden y pueden ser contactados por correo electrónico a gr-MV23-Verdes@wpi.edu. También podemos proporcionarle el correo electrónico de nuestros asesores si desea contactarlos con preguntas.

Appendix B: Interview Questions for Local Currencies

Semi-Structured Interview Guide

This guide is for the local currencies

Questions
- What year did this currency start?
- How many years was the currency in the planning stage before launching to the community?
- What was your launch process like? How did it go in your opinion?
- Were there more users at the beginning than you expected? - If so, how did you combat this?
- Was there a core group that designed the currency? - If so, how many people were in this group? - If not, how was the currency created?
- Does this currency use Cambiatus? If not, what host platform (if any) does it use?
- What was the main goal or reason this currency started?
- Does it currently have the same goal?

- Was this currency created to focus on a specific group of people or the community as a whole?
- How many active users does this currency have currently?
- How many businesses currently accept this currency?
- What are some incentives this currency offers its users? <ul style="list-style-type: none"> - Can people use the currency when acquiring raw materials? If so, how does this work? If not, explain the challenges.
- How do you earn the currency?
If Currency Was Around Before Covid
- How did the pandemic affect your local currency, if it did at all?
If the Currency Failed
- What was the main reason for this currency to not work?
- If you could redo the launching of your local currency, what would you do differently?
If the Currency Willingly Stopped Operations
- Was the main goal of the currency fulfilled?
- Who decided to stop the local currency? Residents or administration?

Appendix C: All SWOT Categories

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Agelgil	<ul style="list-style-type: none"> - Plan for action post-pandemic - Structured to not solely assist during times of hardship, can exist and benefit the community independently - Creates coalition - Creates positive action in the community - Bi-weekly meetings 	<ul style="list-style-type: none"> - Initially created during COVID to assist in diversification of exchange within the economy, have to adapt post-pandemic - Only 2 months of planning - Some necessary materials do not exist within the Agegil store 	<ul style="list-style-type: none"> - Create a Resilient economy - Promote Local spending via online shopping - Promote Vaccinations - Educate users on technology - Adds a platform for additional exchanges in the community - Promotes digitalization 	<ul style="list-style-type: none"> -Use national currency to pay for items not in Agelgil store (comes out of personal pocket)

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Eusko	<ul style="list-style-type: none"> - Began in 2013, long established roots and structure - Studied similar initiatives prior to creation - Legal, economic, and practical feasibility - Pre-registered network of 100+ professionals, operational network from the commencement 	<ul style="list-style-type: none"> - Only targets inhabitants of North Basque Country - Impossible to buy raw materials with Eusko that are not produced locally, such as computer parts and textiles. 	<ul style="list-style-type: none"> - Relocation of economy - Acceleration of the ecological transition - Support for the Basque language - Solidarity with the Basque territory and associations - Support for local economy and commerce - Strengthens citizen power 	

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Chiemgauer	<ul style="list-style-type: none"> - Started currency in 2003 - Long established roots and development - Began as a concept in school, developed for years before separating from the school program in 2005 to establish offices, still active today. 		<ul style="list-style-type: none"> - Freedom for a creative, spiritual, and cultural life - Democracy in all parts of defining rules for communities and individuals - Solidarity in the economy - Working together cooperatively in the region and globally 	

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Bristol Pound	<ul style="list-style-type: none"> - Started currency in 2012, the design process began in 2010. - Long established roots and development - Large interest at launch began with many members on board. - £B 1m circulated per year. - Largest UK local currency within 3 years of launch. 	<ul style="list-style-type: none"> - 1:1 to the British pound, (Why not just use the British pound?) - Only way to acquire currency was to exchange British pounds for the currency. - Had to spare money and time to be involved in the currency and group. - Many businesses joined hoping for new customers, but the Bristol pound mainly ended up just changing how customers paid. - Backed by costly and clunky technology - Credit union regulation leads to limitations in accessing data and regulating the back end of the currency. 	<ul style="list-style-type: none"> - Create a resilient, inclusive, sustainable city economy. - More wealth maintained within the local economy - Localized supply chains, reduces CO2 emissions. - More opportunities for people and a more diverse economy. - Local reinvestment. 	<ul style="list-style-type: none"> - People began to see risk in changing suppliers of currency for something worth and acquired the same way as the national currency. - Changing of the supply chain - As costs outweigh benefits, staff began to leave, as booking and cash flow management - Primarily targeted those familiar with the economy, neglecting an entire demographic - Began to be harder and harder to spend the Bristol pound.

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Bristol Pay	<ul style="list-style-type: none"> - Started currency in 2019, have all the knowledge and information from the previous, successful local currency. - Focuses on the community, provides for everyone. - Not entirely focused on purchasing power or rewards, focuses on helping people. 	<ul style="list-style-type: none"> - Not entirely focused on money, and having the initial appearance of currency can be dangerous. 	<ul style="list-style-type: none"> - Change purchasing behavior to be in favor of local independent businesses and create a localized supply chain - Keeping money in the local economy, for local reinvestment - Provides a payment platform to reduce digital financial exclusion and to raise money for the voluntary sector. - Reduce dependency on others financially, but introduce social cohesion. 	<ul style="list-style-type: none"> - New, need to build on failures of previous currency that failed or risk repeating the past initiative.

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Surflimpo	<ul style="list-style-type: none"> - Wide expanse of actions that are rewarded with the currency 	<ul style="list-style-type: none"> - Recently began currency, has had small growth since its conception. 	<ul style="list-style-type: none"> - Clean the beaches of Brazil - Spread awareness and education about taking care of the oceans - Promote the exchange of services and products - Create a dynamic between businesses who want to see the beach cleaned and 	

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Muda	<ul style="list-style-type: none"> - Establishment of value among cultural activists - Promotes the exchange of products and services among this localized group - Co-creation of events, development of healthy practices 		<ul style="list-style-type: none"> - Create a Resilient economy - Incentivize conscious actions and community benefit - Increase local spending, especially at small businesses 	<ul style="list-style-type: none"> -Small targeted demographic

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Verdes	<ul style="list-style-type: none"> - Promotes values already prominent in the community - Many initial users, - Legal, economic, and practical feasibility 	<ul style="list-style-type: none"> - Rushed co-design process of creation - No plan for post-covid operation - Unsecured website - Availability of exploits 	<ul style="list-style-type: none"> - Create a Resilient economy - Promote Local spending and local businesses - Educate users on technology - Adds a platform for additional exchanges in the community 	<ul style="list-style-type: none"> - Reliance on tourism, once re-spike, currency tanks.

Appendix D: IRB Approval Letter and IRB Oral Consent Script

WORCESTER POLYTECHNIC INSTITUTE

100 INSTITUTE ROAD, WORCESTER MA 01609 USA

Institutional Review Board

FWA #00030698 - HHS #00007374

Notification of IRB Approval

Date: 11-Jan-2023

PI: Robert W Traver

Protocol Number: IRB-23-0352

Protocol Title: Monteverde's Local Currency: Understanding and Developing the Verdes Community to Promote Participation

Approved Study Personnel: Traver, Robert W~Stimmel, Carol Lee~Vartabedian, Maya R~Worden, Amar T~Gonzalez, Elias~

Effective Date: 11-Jan-2023

Exemption Category: 2

Sponsor*:

The WPI Institutional Review Board (IRB) has reviewed the materials submitted with regard to the above-mentioned protocol. We have determined that this research is exempt from further IRB review under 45 CFR § 46.104 (d). For a detailed description of the categories of exempt research, please refer to the [IRB website](#).

The study is approved indefinitely unless terminated sooner (in writing) by yourself or the WPI IRB. Amendments or changes to the research that might alter this specific approval must be submitted to the WPI IRB for review and may require a full IRB application in order for the research to continue. You are also required to report any adverse events with regard to your study subjects or their data.

Changes to the research which might affect its exempt status must be submitted to the WPI IRB for review and approval before such changes are put into practice. A full IRB application may be required in order for the research to continue.

Please contact the IRB at irb@wpi.edu if you have any questions.

