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Master in International Studies

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SOCIOLOGIA
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“What is required is a new imaginary creation, of a size unparalleled in the past, a creation that would put at the center of human life other significations besides the expansion of production and consumption, that would lay down different objectives for life, ones that might be recognized by human beings as worth pursuing… […] This is necessary not only in order to avoid the definitive destruction of the terrestrial environment but also and especially in order to escape from the psychical and moral poverty of contemporary human beings” (Castoradis, 1996, p. 143-144 apud D’Alisa et al., 2016, p. 120)

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Lívia Borges

Resumo

Em um contexto de desafios sociais e ambientais, o movimento do decrescimento visa propor novas alternativas para a premissa de crescimento infinito proveniente dos modelos econômicos vigentes. Durante os últimos 70 anos, esses modelos têm destacado as inovações como a principal ferramenta para o crescimento contínuo e maximização de lucros. Segundo a ótica Schumpeteriana, novos produtos e serviços devem ser constantemente inseridos nos mercados a fim de permitir o crescimento das economias. Por outro lado, o decrescimento propõe uma desaceleração das atividades econômicas até os limites do equilíbrio ambiental. O movimento argumenta que os objetivos das agendas econômicas e políticas sejam alterados de uma busca infinita por crescimento para uma economia baseada no cuidado e na solidariedade. Neste sentido, sociedades em decrescimento podem trazer novas perspectivas sobre o papel das inovações. Em um debate com as teorias de inovações sociais, esse trabalho irá explorar essas novas possibilidades, atores e seus impactos. Usando o estudo de caso do banco comunitário Mumbuca, esse trabalho busca capturar suas ações inovativas – como o uso de uma moeda social digital – na cidade de Maricá (Rio de Janeiro, Brasil). Através desse exemplo, é possível observar como inovações tecnológicas e sociais podem promover o aumento do bem-estar e da sustentabilidade para a comunidade local.

Palavras-chave: Decrescimento, Inovação, Inovação Social, Moedas Sociais, Bancos Comunitários, Economia Solidária.

Abstract

In the context of current social and environmental challenges, the degrowth movement aims to propose new alternatives for the assumption of infinite growth from the dominant economic models. For the past 70 years, these models have pointed innovations as the main driver of continuous growth and to achieve profit maximization. On one hand, and from a Schumpeterian perspective, innovation should constantly disturb markets with new products and services to allow the continued growth of economies. On the other hand, degrowth proposes a slowdown in economic activities to the limit of environmental balance. The movement advocates a change in the objectives of the economic and political agenda from the pursuit of growth to the economy of care and solidarity. In this sense, degrowth societies might open new perspectives on the role of innovations. Through a debate with social innovation theories, this work will explore these possibilities, new actors, and their impacts. Based on the case study of the Mumbuca community Bank, this research aims to capture its innovative actions – such as a digital social currency - in the city of Maricá (Rio de Janeiro, Brazil). Through this example, it is possible to observe how technological and social innovations can increase the well-being and sustainability of local communities.

Keywords: Degrowth, Innovation, Social Innovation, Social Currency, Community Banks, Solidarity Economy.

General Index

Glossary of Acronyms

CDB - Community Development Bank

GDP - Gross Domestic Product

GIM - Grassroots Innovation Movements

HDI - Human Development Index

PAT - Programa de Amparo ao Trabalhador (Worker Support Program)

POS - Ponto de Serviço (Service Point)

RBC - Renda Básica da Cidadania (Basic Citizenship Income)

SENAES - Secretaria Nacional de Economia Solidária (National Secretariat of Solidarity Economy)

SI - Social Innovation

SNA - System of National Accounts

1. Introduction

Since the 1970s, the degrowth movement has been debating the assumption of infinite growth and its impacts on societies (Fioramonti, 2013). In the last 50 years, the search for the continuous growth of economic activities has guided the political and social agenda and influenced the lifestyle of societies. This premise has also brought many negative externalities, mainly in the environmental and social aspects, as observed in the world nowadays (D'Alisa et al., 2016; Jackson, 2017). For this reason, the movement does not exclusively approach the slowdown in economic growth but proposes new directions for more sustainable and egalitarian societies.

In this context, the movement has been studying the hypotheses that support the growth-addicted paradigm, such as the role of innovations. Based on the Schumpeterian view, innovations have been the main engine for infinite growth by creating the business cycles and disturbing markets with new products and services (Lemanowicz, 2015; Schumpeter, 1942; Şener and Sarıdoğan, 2011). According to degrowth literature, innovations have also been identified as the element that will contribute to the restoration of the environmental balance. Through technological advances, some economists believe that is possible to replace the depletion of natural resources, to reduce carbon emissions, and to find alternative sources of energy, among other examples (D'Alisa et al., 2016).

The degrowth literature welcomes technological advances and their benefits to the environment. However, the movement criticizes the idea that innovations can be the solution for restoring ecological equilibrium and maintaining the growth paradigm (D'Alisa et al., 2016; Jackson, 2017). Despite their possible contributions, degrowth believes that new debates are needed regarding the concepts of development and how economies and societies are organized. In this sense, this works aims to answer the following research question: W*hat are the new roles of innovation in a degrowth scenario?* The objective is to study what are the possibilities and objectives of innovations in a scenario where generating growth is no longer the main guide.

To answer this question, this work brings the perspective of social innovation theories (Gupta et al., 2019; Moulaert and MacCallum, 2019; Mulgan et al., 2007). According to them, once understanding that innovation is not necessarily driven by market forces, it is possible to observe its contribution to the sort of policies advocated by degrowth. In other words, it reveals new perspectives on how these measures can contribute to the social sphere. To capture these elements, this study explores the case study of an innovative community bank in the city of Maricá (Rio de Janeiro, Brazil). Mumbuca bank shows multiple examples of how innovation

can bring together technological and social aspects to create a more sustainable economy for the residents of this city (Almeida, 2019; França Filho, 2020; N. Melo, 2020; Sciammarella, 2020). Through the partnership between degrowth and solidarity economy, this experience explores the use of digital social currency, the cooperation of the local government, and a mobile app to increase financial inclusion. These elements illustrate how innovations can be performed by new actors and to achieve new goals.

This work is divided into 5 chapters, starting from this introduction. The second chapter shows the literature review on degrowth and social innovation, and how they articulate in the scenario of the COVID-19 pandemic and in the context of developing countries. The third chapter introduces the methodology used to explore the case study of the Mumbuca bank. The fourth chapter presents the analysis of the case study in itself: it shows the origins of the bank, its innovations, and its future goals and challenges. Finally, chapter five presents how the bank articulates the concepts of degrowth and social innovations to answers the research question and conclusions on this debate.

2. Literature Review

2.1 Conceptualizing degrowth and the growth-addicted paradigm

The degrowth movement appeared in a context of environmental and social challenges associated with the economic models dominant over the past few centuries, such as industrialism, neoliberalism, and patriarchalism, among others (Escobar, 2015; Raworth, 2017). Research and Degrowth's association (2020) defines degrowth as a "downscaling of production and consumption that increases human well-being and enhances ecological conditions and equity on the planet". In other words, instead of focusing on ways to maintain consumption habits that generate ecological and social crises, degrowth seeks alternatives to ensure sustainability and social equality (Fioramonti, 2013).

The first discussions on the limits of growth emerged in the 1800s with Thomas Malthus and John Stuart Mill. These authors associated growth with progress and development but recognized its limits: from this perspective, a stationary state economy[1] will be inevitable (Kerschner, 2010). According to these classical authors, a steady-state outcome will be caused by population growth and decreasing returns. Malthus, in his Essay on the Principle of Population (1798), believed that population growth is potentially exponential, while the growth in food supply follows a linear increase. From the author's perspective, the human population will exponentially grow unless contested by external incidents, such as war and pestilence, or by 'moral restraint' (chastity and late marriage). As food grows less proportionately, subsistence crises will emerge (Kerschner, 2010). Later economists, such as John Stuart Mill, also agreed that *laissez-faire* economies will culminate in steady-state economic conditions. Though, Mill did not share the pessimistic view about the possible end of economic growth (Buckley, 2011). He welcomed this state by believing that giving up on pursuing material wealth will allow societies to develop moral, mental, and social aspects.

The origins of the degrowth movement itself started mainly with the publication of the book "The Limits to Growth" in 1972. According to Fioramonti (2013), the movement spread quickly, especially in France by the term *décroissance*, introduced by the economist Nicholas Georgescu-Roegen. This author advocated the change of traditional economic models for what he named "bioeconomics". The expression "degrowth" was formally adopted in 2008 at

[1] According to classical authors, stationary state refers to a condition of economic stagnation caused when the physical limits of growth are reached. In this scenario, the reproduction of wealth will be designed to maintain capital stocks and replace spent goods (Buckley, 2011).

the first official conference of the movement in Paris, which has been occurring biannually (Fioramonti, 2013).

The existing literature on degrowth is focused particularly on a change in the growth-addicted paradigm. The main criticism of the movement relies on the infinite growth assumption and the commodification of social products and services (Fioramonti, 2013). According to D'Alisa et al. (2016), the emphasis of the movement is not on doing less of the same but doing it differently. In their words, "the objective is not making the elephant thinner but to transform it into a snail" (D'Alisa et al., 2016, p. 24). With this goal, degrowth not only tackles economic relations, but also new social initiatives, energy sources, and the balance between remunerated and non-remunerated work, among others.

Criticisms of infinite growth are based on an observation of its consequences, mainly on the environmental and social aspects. There is a consensus among degrowth authors that growth can be uneconomic due to its negative externalities, such as depletion of natural resources, climate change, bad psychological health, long working shifts, pollution, and traffic congestion, among others (D'Alisa et al., 2016; Demaria et al., 2013; Fioramonti, 2013). These authors also stressed the unjust relationships reflected on growth, such as the gendered and non-remunerated household work and unequal changes between the core and periphery, especially within nations. In such cases, waste and pollutants resulting from the industrial activity usually end up in marginalized territories.

To date, several cross-sectoral studies have investigated the impacts of the infinite growth assumption in the social sphere. According to D'Alisa et al. (2016) and Demaria et al. (2013), after reaching a moderate level of income, additional increases in the Gross Domestic Product (GDP) are not perceived as additional happiness (known as the 'Easterlin Paradox'). In contrast, these extra incomes are destined to positional goods (ex. bigger house or faster car than their neighbors), which erodes social cooperation and increases competition (D'Alisa et al., 2016). From an ecological perspective, the strong connection among growth, carbon emissions, and depletion of natural resources highlights its impacts on climate change. Reductions in the stock of natural resources also impose relevant limits to growth, as already diagnosed nowadays. This way, Martínez-Alier et al. (2010) and Demaria et al. (2013) argue that degrowth initiatives aim to reduce human pressures on nature through a downscaling in terms of resources and energy flows to create areas for ecosystems regeneration.

In this sense, degrowth literature questions the role played by the growth in GDP as the main guidance for the development and prosperity of societies. The movement suggests a shift in the guidelines of economic and social policies from increasing GDP to establishing good lives within the ecological limits of the planet (Jackson, 2017; Raworth, 2017; Spratt et al., 2010).

For this reason, the movement intends to amplify this vision by highlighting economic relations based on reciprocity and put conviviality and social relations as the main guidance. Martínez-Alier et al. (2010) state:

> "In the eyes of the de-growth proponents, economic growth, even if disguised as sustainable development, will lead to social and ecological collapse. It is thus better to promote different social values and to start adapting to forced de-growths that are likely to occur, in order to find a prosperous way down" (Martínez-Alier et al., 2010, p. 1745)

In the literature, the term 'growth-addicted paradigm' has come to be used to refer to the power of GDP to influence or set political and economic agendas (Fioramonti, 2013). The origins of the index and the System of National Accounts (SNA) date back to the early 1930s in the United States, developed mainly by the economist Simon Kuznets. GDP measures the monetary value of the total amount of goods and services produced in a territory (usually a country) during a specific period (usually a year or a quarter), without considering the goods and services used in production (Lequiller and Blades, 2014; United Nations, 2003). The term "domestic" refers to the fact that it includes the production of goods and services from companies based in a specific country or region, including the ones for which most of the social capital is not national. The term "gross" has been used to indicated that GDP does not consider costs related to the depreciation and amortization of fixed capital, i.e., the wear of equipment and machines used in production (United Nations, 2003).

According to Fioramonti (2013), the growth-addicted paradigm spread globally, especially during the 1990s. GDP growth supremacy started to influence nations in many aspects, such as global governance. An example of this fact is the international economic clubs that define their members according to economic performance, such as the G8 or the G20[2], or the BRICS[3] for emerging powers. During the past 30 years, the indicator has been the key measure of the development of nations and had categorized them into two worlds: developing and developed

[2] The G8 group is a group of eight major economies able to impact the global governance. Its members are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. In 1998, Russia joined the group but - after the annexation of Crimea - the G8 turned into the G7. The G20 group, less exclusive than G7, is composed of 19 finance ministers and heads of the central bank of the largest economies in the world, plus the European Union. Its member countries are: South Africa, Germany, Saudi Arabia, Argentina, Australia, Brazil, Canada, China, South Korea, the United States, France, India, Indonesia, Italy, Japan, Mexico, United Kingdom, Russia, Turkey and the European Union.

[3] The term BRIC was used for the first time in 2001 by the economist Jim O'Neill from Goldman Sachs. It defines an economic group composed of Brazil, Russia, India, and China, listed as the next countries to assume the role of world leaders in economic aspects. In 2010, South Africa joined this group and transformed the acronym from BRIC to BRICS.

countries. According to the author, developing countries are the ones unable to achieve competitive GDP growth and which are eligible for long cycles of macroeconomic adjustments.

Fioramonti (2013) also discusses that its influences are not restricted to economic and governance aspects but also on social and cultural perspectives. Investments in social and development areas, for example, started to be perceived as a percentage of GDP in the same period. For this reason, less GDP means fewer social investments (process named by the author as a 'GDP-led development model'). Similarly, it has affected the consumption models of societies, including marketing strategies, lifestyle, and advertising (Fioramonti, 2013; Spratt et al., 2010). For this reason, most nations worldwide have defined their political goals based on the efforts to achieve a growing GDP indicator.

Conversely, Kallis et al. (2012) argue the correlation between the mainstream economic models and the presence of cyclic economic recessions. The quest for economic growth has led to some deliberate policies regarding the deregulation of markets and financial institutions. Political decisions have been made based on free-market assumptions and to guarantee the autonomy of financial markets. These assumptions have created short-term market decisions and accumulated debt systems, which usually results in cyclic multi-dimensional collapses. These models are also structured on the neoclassical concept of *homo economicus,* in which individuals have self-interest as the ultimate motivation and are guided by utility[4] maximization.

Moving to the ecological perspective, Fioramonti (2013) and D'Alisa et al. (2016) highlight the connection between the growth-addicted paradigm and environmental degradation. GDP has reduced socially productive assets as a two-factor model: labor and reproducible capital. Natural resources - the third factor - have been constantly dropped in this analysis. The authors believe that this omission relies on two premises generally adopted by economists: first, the assumption that there are no limits to growth based on the supply of non-human agents of production. Second, the belief that technology is a near-perfect substitute for any natural resource scarcity. The beliefs have the consequence of statistical distortions on National Accounts, especially in countries where GDP growth depends heavily on the exploitation of natural resources. As Fioramonti (2013) observes:

> "These statistical distortions encourage a policy of excessive reliance on short-term natural asset depreciation, with serious consequences for future environmental sustainability. […] Although human nature leads people to presume innocently that growth rates are linear, the ecological constraints of

[4] Utilitarianism, from the classical economic school, refers to the utility concept to describe the 'physic satisfaction' when the agent acquires a good or service and – due to difficulties to evaluate it – it is assumed that is equivalent to the price of the good negotiated in a free market (Jackson, 2017).

> our planet and the scarcity of natural resources may easily trigger uncontrollable processes" (Fioramonti, 2013, p. 74).

For this reason, many researchers, think-tanks, and even governments tried to look for an alternative indicator to GDP, especially after several studies about its inconsistencies. According to Fioramonti (2013), probably the best-known attempt to adopt an alternative to the index hegemony was the creation of the Human Development Index (HDI) by the United Nations in 1990. This measure considers the levels of national income as a mean to promote human development but not as a goal in itself. In other words, income levels were established as a necessary but not sufficient condition for achieving human development. Besides income, two new factors were added to this metric: health (based on life expectancy) and education (based on two education indicators). The HDI has been modified over the years, including a "new-inequality adjusted score" in 2010 and a "sustainable" HDI version in 2012. Nevertheless, other social and environmental circumstances not included in the HDI (migration, climate change, urbanization, etc.) began to grow and reduce its use (Fioramonti, idem).

More recently economists have focused on the provision of 'green accountability", in which are considered the costs of resource consumption and environmental damage in the official GDP numbers (Demaria et al., 2013; Fioramonti, 2013). An example of green accountability happened in China when the government introduced a "green" GDP version. This measure was published in 2006 (with 2004 numbers), and showed that the economic loss from environmental costs was equivalent to 55.09% percent of the total cost (Fioramonti, 2013). Despite this, China did not change its economic paradigm and the green GDP project was buried right after the publication of the first report. This alternative accountability contrasts with degrowth literature, which believes the current imbalances are not just a question of statistical reform. According to Demaria et al. (2013), D'Alisa et al. (2016) and Fioramonti (2013), degrowth is about changing the GDP-paradigm.

Fioramonti (2013) acknowledges that the steps taken into 'green' accountability have helped public opinion to recognize the flaws in the current index and open a discussion about it. On the other hand, efforts to make GDP more sustainable bring the idea that, after some adjustments, the indicator may continue operating as 'business as usual' (D'Alisa et al., 2016). This accountability demands pricing social and environmental assets according to market mindset – a process known as 'commodification'. This way, it might create a distorted view that these assets can be exchanged in markets, like any other regular product (D'Alisa et al., idem).

For this reason, the existing literature on degrowth focuses particularly on overcoming the GDP-addicted paradigm and to creating new structures to fill its gaps. On the constructive side,

degrowth brings alternatives to rethink the values and drivers of modern economies (D'Alisa et al., 2016; Demaria et al., 2013). Numerous studies have attempted to propose (D'Alisa et al., 2016; Demaria et al., 2013; Jackson, 2017) a change to the economy of care and new ecological investments. These new sectors add higher labor intensity and higher levels of work satisfaction (Kallis et al., 2012). According to these authors, the movement also debates on other dimensions, such as new forms of living and producing, a decrease in consuming patterns, rethinking the role of money, and work-sharing, among others. These alternatives will be further discussed in the next section, as well as the debate on how to achieve them in a planned transition strategy.

2.1.1 The transition to post-growth economies

Many studies since the mid-1990s have examined the negative impacts of giving up on the growth paradigm, such as the rising unemployment levels and the possible recessionary spiral (Spratt et al., 2010). For this reason, the literature on degrowth has investigated how to create an endogenous contraction by 'design' and not by 'disaster' (D'Alisa et al., 2016; Fioramonti, 2013). As suggested by Jackson (2017), this shift should occur through a set of coordinated voluntary micro and macro-level policies to replace GDP targets in political agendas. Likewise, D'Alisa et al. (2016) hold the view that degrowth discourse is not associated with negative growth and does not have to lead to instability. Thus, the movement evaluates how GDP reduction can become socially sustainable and how to achieve lasting and stable "post-growth" societies. Jackson (2017) uses the term "post-growth" to refer to societies in which neither decent employment nor economic stability relies on growth, and whose economic activity is below the environmental boundaries.

Much of the current literature on degrowth pays particular attention to the connection established between GDP and the prosperity of a nation (Fioramonti, 2013; Jackson, 2017). As presented by the mainstream economic models, prosperity is related to economic growth, and higher national income levels mean better quality of life for societies (Demaria et al., 2013; Spratt et al., 2010). Despite the consensus among these degrowth authors that some material dimensions are crucial to satisfy some basic human needs, the movement believes that above a certain level of income, well-being is improved by social equality instead of growth (Demaria et al., 2013; Raworth, 2017).

D'Alisa et al. (2016) and Jackson (2017) emphasize that, after reaching essential material security, social and psychological dimensions are also relevant to increase individual

happiness. It involves having a sense of belonging, contributing to useful work, health, and social relationships, among others. Historically, even classic economic theories recognize the limits of material dimensions on happiness by using the concept of 'diminishing marginal utility': according to this view, additional consumption of the same product will add fewer and fewer satisfaction levels (Jackson, 2017; Kerschner, 2010). This phenomenon is exemplified by the percentage of people that reported themselves as 'very happy' in annual surveys developed in advanced economies. Despite the fact that the real income per capita increased significantly, the percentage of 'very happy' individuals marginally increased compared to the 1950s (Jackson, 2017).

D'Alisa et al. (2016) believe that one central element perceived by degrowth is care, as a reference for daily actions made by individuals for their own and communities' welfare. Care actions include household services and the work demanded for the preservation and reproduction of human relations. According to the authors, in growing societies there is little time left to dedicate to care and conviviality, because of the long hours usually dedicated to work. For this reason, the movement advocates for the reduction of working shifts and for work-sharing on the positions available. The literature on degrowth believes that these actions might allow people to diminish the burden of care, especially on women, and increase access to paid job positions (D'Alisa et al., 2016). For this reason, D'Alisa et al. (2016) and Kallis et al. (2012) suggest that recentering societies around care would build the path to degrowth. The authors also add:

> "Production and market constantly expand, occupying spaces of care, social life and reciprocity, leading inevitably to the disintegration of relationships and engendering negative consequences on well-being. Care is outsourced outside the family sphere to the state or the market (e.g. child and elderly care) debasing its essence, which is reciprocity." (D'Alisa et al., 2016, p. 105).

Another relevant concern of this transition is the control of the unemployment levels. As mentioned, degrowth's authors (D'Alisa et al., 2016; Jackson, 2017; Kallis et al., 2012) suggest a move to a service-based economy. A service-based economy implies lower rates of economic growth, mainly because of lower labor productivity rates, but increases the capacity of creating more job positions. The 'work-sharing' alternative also appears as an important tool to redistribute the available work between employed and unemployed workers, through reduced working hours on shifts (D'Alisa et al., 2016; Kallis et al., 2012). Lastly, the State should play a relevant role in controlling unemployment rates by using, for example, job guarantee schemes and basic income programs. Job guarantee schemes refer to programs where the State works as an employer of last resort. These two alternatives represent a

significant change in the role of the State, usually based on the liberal and free-market approach where market interventions should be avoided and consumption encouraged (D'Alisa et al., idem).

D'Alisa et al. (2016) and Jackson (2017) discuss the use of a basic income program to reduce levels of inequality and to ensure that everyone has 'enough' to live without relying on growth. This program refers to a periodic payment made by the State to every person living permanently in a nation or region, independently of any labor activity. The amount paid provides a minimum and dignified standard of life for individuals, offering economic security to local citizens. Another positive effect of this measure is to prevent people from being forced to accept degrading and exploitative jobs to survive. A similar policy that is discussed, although less popular than a basic income, is the maximum income. As the name suggests, this program refers to establishing an income 'ceiling' for the upper limit of an individual's income. The idea is to avoid income concentration by a few 'super-rich' and to avoid the socially corrosive impacts of unequal societies. For this new role of governments, fiscal and monetary public policies are crucial for social investments and for working as an employer of last resort (D'Alisa et al., idem).

Jackson (2017) approaches another four dimensions of the transformation to post-growth societies: 1) the role of enterprises; 2) quality of work; 3) structure of investments; and 4) the role of money. First, the author considers that enterprises in the new scenario should be low in carbon emission, efficient in the use of resources, and afford decent livelihood for their employees. Another aspect suggested is the focus on services sectors (such as care, craft, and culture) rather than material output, as they are low carbon emission and employment-rich sectors. Regarding the quality of work, similarly to D'Alisa et al. (2016), the author points out the concept of the 'productivity trap'. This term refers to the fact that technology made each hour worked more productive (increasing labor productivity) and, consequently, it required fewer hours of labor to reach a certain level of output. For this reason, to keep the total number of employed hours, the demand must increase at the same rate as labor productivity. In other words, it is growth that keeps employment levels. An alternative to this dilemma is the reduction of working hours per employee to maintain the same levels of employment (D'Alisa et al., 2016; Kallis et al., 2012). This reduction and the prioritizing of employment-rich sectors reduce the pressure on jobs and benefits employees, as it increases time with family and for non-work-related activities (Jackson, idem).

Following Jackson's (2017) perspective, these changes in the profile of enterprises also demand a change in their investments. The investment portfolio in traditional economies aims to increase labor productivity, extract finite material resources, and create newer markets for

newer consumer products. The author believes in a change of this portfolio to investments that improve resources efficiencies (such as technologies on renewable energy), public good (schools, hospitals, museums, libraries, green spaces, parks, etc.), natural infrastructure (sustainable agriculture, oceans, forest), among others.

The last argument of Jackson (2017) refers to the role of money. Much of the current literature on degrowth pays particular attention to the current debt-based money systems, in which a large part of the money is created by commercial banks (rather than central banks) through loan emissions (Demaria et al., 2013; Jackson, 2017). As a result, the payment of debts with interest results in growth, and investments are motivated by higher returns in the short-term. The author uses the example of the financial crisis in 2008 in the United States to illustrate the fragilities of this debt-based monetary system. For this reason, D'Alisa et al. (2016) and Jackson (2017) suggest limiting the capacity of commercial banks to create new money and regaining control of money creation, named 'public money' (without any debt correspondence). Besides reducing financial instability, this public money can be used to support public needs, finance a basic income or job guarantee program, subsidize cooperatives, and environmental conservation, among other objectives.

Following the perspective about the role of money, D'Alisa et al. (2016) and Jackson (2017) point out an important institution on this transition: the Community Banks. These banks are a social initiative to capture money from ordinary people and use it to provide funds for social or environmental financing. This local institution allows local investments in their communities, reduces disparities, and improve solidarity (França Filho et al., 2012). The instruments for it include microcredits, community investments, and social currencies. The concept of community or social currencies is briefly defined by Dittmer (2013) as "alternatives or complements to legal tender money that are mostly created by civil society and sometimes by public authorities, and that circulate in a more limited space than conventional money" (Dittmer, 2013, p. 4)

According to Fioramonti (2013), the principles of the use of local currencies are connected to the objectives of degrowth. Social currencies allow the wealth to stay local, where it can be used more conscientiously and with less environmental impact. As communities consume within their neighborhoods, they will be more aware of the production process itself and its wastes. Social currencies also promote local production, reduce long-distance transport, and support regional development. The author also argues that, in contrast to the mainstream economic model that reinforces cash concentration, the circulation of money within the community strengthens cooperation and affirms the role of money as a means of exchange, not as an objective in itself.

Conversely, Seyfang and Longhurst (2013) and Fioramonti (2013) also approach the ability of social currencies to discourage money speculation, as it incentivizes trades and investments in local enterprises instead of being used for financial returns purposes. Interest-free currencies also are more likely to reduce inflation peaks, limit the risk of debt crisis, and create more autonomy for local communities. According to Fioramonti (2013), "these forms of locally-based money hold the promise of reducing capital flight, shielding against global economic cycles, reining in the power of commercial banks and supporting local economic activities" (Fioramonti, 2013, p. 137).

In addition, Kallis et al. (2012) and D'Alisa et al. (2016) bring examples of initiatives that are already operating based on the degrowth approach, such as eco-communities, cooperatives, and urban gardens, among others. These initiatives rely on five pillars: 1) production mainly for use; 2) voluntary activity; 3) circulation of goods motivated by reciprocal exchanges (as 'gifts'), instead of profit; 4) initiatives not designed to accumulate and expand, like traditional enterprises; 5) the relations between participants carry an intrinsic value for themselves, bringing a new form of commons (D'Alisa et al., 2016). Demaria et al. (2013) use the concept of 'nowtopia' to refer to these initiatives that develop alternatives outside conventional institutions, and whose strategies often intersect with degrowth.

Fioramonti (2013) refers to the example of local grassroots initiatives focused on public goods, such as food and energy. The author believes that these food initiatives try to identify sustainable ways to produce food to promote local ownership, reduce food miles, and encourage reusing and recycling. The same principle applies to energy production, by developing renewable energies to replace fossil fuel sources, reduce environmental damage, and adapt it to local small-scale projects. As the author states: "the emphasis on self-production and self-consumption, sharing, recycling and reusing is viewed in fundamental opposition to the GDP model of consumption, which requires things to be purchased, burned up, replaced and discarded at an ever-accelerating rate" (Fioramonti, 2013, p. 127). However, the author is critical of the capability of these social initiatives to stimulate changes on a macro level.

Concerning which indicator should be used to evaluate the transition to degrowth societies, much of the current degrowth literature warns on the inaccuracy of using GDP as a measure (D'Alisa et al., 2016; Kallis et al., 2012). As previously presented, this index incurs contradictions in the way it accounts for goods and services[5] and lack of information about

[5] GDP is unable to account for pleasant non-monetary activities enjoyed by individuals but includes expenditures and investments that may not be beneficial to societies, such as military expenses, and the tobacco industry, among others. Non-monetized activities are not reflected in national income.

income distribution. Therefore, the authors suggest the use of two sets of combined indicators: 1) biophysical indicators, to evaluate the environmental conditions of this change; and 2) social indicators, to measure social progress from different perspectives. Social indicators should include aspects like the sense of community, free time availability, the fulfillment of basic needs, unemployment levels, and subjective well-being, among other aspects (D'Alisa et al., 2016). The degrowth author Dan O'Neill created a set of indicators reflecting these two accounts. They allow classifying nations in the following categories: desirable growth, undesirable growth, desirable degrowth, undesirable degrowth, and steady economies. This 'dashboard' of indicators will allow the evaluation of how societies are transforming and their direction (Kallis et al., 2012).

To conclude this section, the transition to post-growth economies requires macro and micro policies to create a planned and sustainable transition for degrowth economies. These changes are not restricted to reviewing political and economic agendas but also transforming the mindset of societies, preserving jobs, and increasing well-being. It is important to highlight that this adjusting period may have some different characteristics depending on where it is implemented. In the next section, it will be presented how the movement should be explored in developing countries.

2.1.2 Degrowth discourse in developing countries

The literature on degrowth has presented some limitations of the movement to influence and spread its policies and principles in developing countries. According to Rodrígues-Labajos et al. (2019), degrowth is usually perceived as over-focused on overdeveloped economies in the Global North and does not relate to the reality of undeveloped and developing countries. Another concern about this approach refers to its failure to address cultural differences and the history of exploitation between these two regions. Critics have also argued that in some studies there is an understanding that the movement is at some level not applicable to these developing regions (Rodrígues-Labajos et al., 2019). For example, Martínez-Alier et al. (2010) present the view of Georgescu-Roegen, one of the 'fathers' of degrowth, in which he believes that the North should liberate ecological space to the growth of the South. Thus, while degrowth is expanding in the North, in the South the argument prevails that some sectors still need to grow. Rodrígues-Labajos et al. (2019) also affirm that "focusing the struggle on degrowth is

Additionally, other activities relevant for economic progress and well-being are not reflected in this index, such as household services, self-production and voluntary work (Fioramonti, 2013).

not only perceived as ‘missing the point’ but is also in some ways a ‘luxury’ debate” (Rodrígues-Labajos et al., 2019, p. 177).

On the other hand, other authors (D’Alisa et al., 2016; Dengler and Seebacher, 2019; Escobar, 2015) presents that the main relevance of degrowth in the region is to articulate a review of cultural, economic, and ecological traditional ways of thinking. In the words of Escobar: “It is important to avoid the idea that degrowth is ‘ok for the North’ but the South needs rapid growth, whether to catch up with rich countries, satisfy the needs of the poor, or reduce inequalities” (Escobar, 2015, p. 6). Different from Global North, where growth is interpreted as an objective in itself, in developing countries growth can be usually perceived as a preliminary step to achieve development and progress (Dengler and Seebacher, 2019).

Escobar (2015) is more concerned about redefining and updating the concept of development used in southern countries and the capacity of the movement to present some new alternatives. A notable example of this need is the case of the Asia region, where the globalization process has increased growth and economic debate but keeps secondary discussions on development concepts. The study of Escobar (2015) offers probably the most comprehensive analysis of the origins of western development concepts used in the countries of the South. The consequences of its use differ depending on the region: while Europe is experiencing a current crisis of capitalism, marked by the financial crisis and the downsizing of the welfare state, Latin America - for example - is facing an economic model with high environmental impacts to achieve growth. This region is, for example, more vulnerable to income concentration and social burdens, besides the impacts on the supply of natural resources and soil-water contamination (Escobar, 2015). In other words, the growth of rich economies is likely to come at the expense of an ecological burden on developing countries. For this reason, D’Alisa et al. (2016) state that “whatever form of ‘development’ or alternatives to development taken will have to involve more radical questionings of growth, extractivism, and even modernity than ever before” (D’Alisa et al., 2016, p. 61).

Besides, it is important to analyze which will be the effects in the South once northern countries start their transition to post-growth societies. D’Alisa et al. (2016) believe that once degrowth begins to occur in the North, this change will significantly reflect on demand and prices in the transactions with the South. The authors consider that this impact will not only create a financial burden in the region but will also open a ‘conceptual space’ for developing countries to find their development trajectories (D’Alisa et al., 2016; Dengler and Seebacher, 2019). The authors also believe that degrowth literature does not sufficiently tackle these potential impacts and highlight the importance of degrowth not to be perceived as a ‘neo-coloniality’ process (Dengler and Seebacher, 2019). They believe that it is important to avoid falling into the trap

where the Global North imposes this transformation on the Global South. Instead, D'Alisa et al. (2016) suggest that degrowth should seek support in the ideas and movements that already exists in this region, such as *Buen Vivir* and post-extractivism in Latin America, radical ecological democracy in India, and *Ubuntu* in South Africa.

The example of the solidarity economy in the Latin America region illustrates a possible and natural partner of degrowth in the region (Escobar, 2015). The author suggests that the movement should articulate with the solidarity economy initiatives in the region and their debates on efficiency, productivity, and new economic and social relationships. Another example is the *Buen Vivir* ("living well")[6] and its questioning of the current development models (Dengler and Seebacher, 2019). *Buen Vivir* criticizes their principles of industrialization, the duality between nature and societies, the pre-concepted development stages and consumerism. Alternatively, *Buen Vivir* advocates multiple possible development processes. About this movement, D'Alisa et al. (2016) state that "the dominance of Western ideas is replaced by a promotion of 'interculturality' under which Western ideas are not rejected but seen as one among many options" (D'Alisa et al., 2016, p. 261). The great influence of *Buen Vivir* appeared in the terms of the Constitution of Bolivia and Ecuador. Despite this important step, new laws and resolutions in both countries have limited their impact to create new development guidelines (D'Alisa et al., idem).

In summary, Dengler and Seebacher (2019) and D'Alisa et al. (2016) affirm that developing countries should count on degrowth to approach new development concepts. Instead of absorbing Northern discourses - that include macroeconomic adjustments, industrialism, free-market, and free-trade policies - they should find their own pathways to prosperity. In this way, degrowth and its principles might support the Global South transition from a pre-determined model to new and sustainable alternatives.

2.1.3 Degrowth and the COVID-19 pandemic

In early 2020, the world suffered an unprecedented health-social-economic crisis caused by the coronavirus pandemic. Economic crises are not new at all in human history: the Great Depression in the 1930s and the financial crisis in 2008, for example, have already tested the ability of governments to recover growth patterns and put the economy 'back on track'. However, this current global situation is testing resilience, not only from an economic

[6] The concept has its origins in some Andean indigenous groups and had its first reference in Peru in the late 1990s, followed by more significant expressions in Bolivia and Ecuador (D'Alisa et al., 2016).

perspective but also from social and political viewpoints. The pandemic has accelerated the debate on how the current economic models are resulting in imbalances mainly in environmental and social spheres. During this period, many policies advocated by degrowth were used to control the consequences of the pandemic and have demonstrated their contributions to reach more sustainable societies. In this sense, the pandemic opened space for the degrowth movement to show its visions of new possible futures.

According to Paulson et al. (2020), it is important to highlight that the COVID-19 pandemic does not reflect a degrowth process. Referring to the recession and impoverishment caused by the pandemic, the authors stated: “these are precisely the kind of phenomena that planned degrowth aims to avoid” (Paulson et al., 2020, p. 1). As this crisis is not challenging the growth-addicted paradigm in its roots, its effects might be temporary (The Degrowth.info editorial Team, 2020). Retaking growth can be the guideline to be exhaustively followed as soon as the pandemic is over. Consumption might be stimulated as never before as a strategy to increase GDP. Nevertheless, this global scenario has slowed the rhythm of nations while it has increased the perceptions on the challenges collectively faced.

The first aspect to be observed is the effect of the crisis from an ecological perspective. According to the Center of Research on Energy and Clean Air (CREA, 2020), between February 3rd to March 1st, 2020, carbon dioxide emissions dropped at least 25% in China. As the country represents 30% of the global emissions in a year, this impact represents a significant reduction in global emissions (Beals, 2020). These positive effects were mainly caused by reduced industrial activity, flight cancellations, and less use of cars and trains. Lower circulation of people and tourism has caused other less quantitative effects, such as the largely published example of cleaner waters and fishes in Venice canals. The lower interference of human presence also increased biodiversity and the presence of native species as observed in various regions worldwide.

According to Spratt et al. (2009) and Raworth (2017), the acceleration of climate change effects in recent years is mainly connected to fact that the current economic model is overstepping the planet’s environmental boundaries. In this sense, the pandemic expanded to a broader public the reflections on how an intense industrial activity is connected to current environmental conditions. This fact supported the degrowth arguments on the need for a slowdown in economic activities (and consequently less GDP). According to degrowth literature, this reduction in the production levels will open space to restore ecological balance (Demaria et al., 2013).

However, the changes in the economic sphere are not restricted to reducing the intensity and impacts of industrial production. According to Demaria et al. (2012) and Jackson (2017),

degrowth suggests a shift to service and care economy, which are employment-rich sectors with lower-carbon emissions. The movement also advocated for reduced working-shifts to maintain employment levels and to better allocate time between remunerated and non-remunerated work. In quarantine times, where most people are working from home, care work has appeared as a challenge to families. During these times, people have been struggling to care and support children and the elderly without relying on babysitters, nurses, and schools. Doing these activities while maintaining a full-time job (despite home office) has demanded a lot of effort to execute both roles simultaneously.

In this sense, this period brought reflections on the importance of care work for families' well-being. This debate emphasizes the importance of reduced working hours to increase time for non-work activities, such as unpaid care work and household services. According to D'Alisa et al. (2016) and Paulson et al. (2020), there is also a link between the distribution of care work and power across hierarchies of gender, class, and ethnicity. For this reason, a more balanced distribution of this work might be beneficial not only for increased well-being but for more egalitarian societies.

On the other hand, the changes in the roles during the quarantine were not restricted to individuals. The coronavirus crisis has exposed the structural inefficiencies of public health systems in many countries and initiated a debate about public investments. According to Kallis et al. (2012) and Jackson (2017), in degrowth societies, there is a change in the concept of "public money". For this reason, the authors believe in the importance of taking back control of money issuing as a strategy to finance public expenditure. In the context of a health crisis, prioritizing public investments to basic services has been demanded to restore equilibrium in these sectors.

Besides the discussion on investments in health systems, the pandemic brought the discussion on government expenditures to support financial losses from individuals and to control unemployment levels. According to D'Alisa et al. (2016) and Paulson et al. (2020), degrowth has suggested the use of a Basic Income program in this situation. This program refers to a periodic payment made by the State to all residents in a nation independently of their income or labor activity. This public policy provides a minimum basic living condition during - and eventually after - this period. This benefit proved to be especially relevant to provide economic security to individuals unable to work during the lockdown.

About the solidarity aspects, degrowthers also debate about the importance of community in this new economy proposal (Jackson, 2017; Paulson et al., 2020). Concerning a virus with great contamination power, the sense of community has been highlighted. Despite the political and security efforts to keep people in quarantine, the sense of community was the key element

to maintain citizens at home. Campaigns on social media, for example, spread worldwide the individual responsibility to stop the virus contamination. Citizens have perceived that – despite not being in the at-risk group – they have a social duty to act in solidarity with others at potential risk. Thus, it is possible to say that solidarity feelings have been one of the mechanisms to control the circulation of this disease. This fact correlates to the goals of the movement of rewording societies towards conviviality and care.

This section has reviewed how COVID-19 pandemic effects relate to the sort of policies suggested by degrowth. This historical rupture caused by the pandemic initiated a debate on alternatives to restore environmental balance and new social interactions. According to Paulson et al. 2020, it is possible to use the learning from this period to engage new actors to organize, protest, and vote for new arrangements (Paulson et al., 2020). In the words of Paulson et al. (2020), degrowth should be caused “by design and not by disaster” (Paulson et al., 2020, p. 3). It is important to highlight that, despite this positive opportunity for reviews, this article does not aim to reduce the magnitude of the negative impacts of the pandemic. As stated by Jackson (2017) and Paulson et al. (2020), collapsing economies threaten human prosperity and this recessionary scenario is precisely what degrowth has tried to avoid. However, uncertain moments can be worthwhile to reveal how new alternatives can be traced. It also strengthens the values of societies and what they should protect. This historical time expanded the debate on the need to restructure current economic models and how transition discourses can contribute to this process.

2.2 Innovation role in a degrowth scenario

2.2.1 Technological innovation as a fuel for growth

For many years, the concept of innovation was surprisingly neglected by most of the economic theories (Lemanowicz, 2015). Historically, classic economy models have this concept marginalized in its theories when compared to other inputs, such as land, capital, and labor. Technological change was usually determined exogenously, such as in the model of the well-known economist Robert Solow (Şener and Sarıdoğan, 2011). After the work of Schumpeter (1934), the study of innovations has gained a new perspective and this author examined the connection between innovations and economic growth. According to him, capitalism should never be stationary, and the economy should be continuously disturbed by technological innovation.

In the theory of business cycles, Schumpeter (1942, 1934) observed the ups and downs caused by innovations. These cycles start with the recovery phase, in which innovation is widespread and lasts until it reaches maturity. After this period, the resulting benefits start to diminish. Thus, this period is followed by an evitable depression that will endure until a new wave of innovation begins. These inventions should destroy previous institutional structures and replace them for new and more efficient conditions (Lemanowicz, 2015; Şener and Sarıdoğan, 2011). In his work, Schumpeter (1942) refers to this phenomenon as the term "creative destruction". The author also categorized innovation into five groups (Lemanowicz, 2015, p. 66):

- "The introduction of a new product, i.e. a product that consumers have not dealt with before;
- The introduction of a new method of production, i.e. a method that has not been tested in the industrial sector;
- The opening of a new market, i.e. a market in which the specific type of domestic industry has not operated before, whether or not such a market has previously existed;
- The acquisition of a new source of raw materials or semi-finished products, either previously existing or newly created;
- The introduction of a new organization in a specific industry, e.g. creating or breaking up a monopoly."

The study of Schumpeter (1934; 1942) continued to perpetuate for many years influencing most of the literature in the field. More recent definitions as the one in the Oslo Manual (2019) have defined innovation as a "new or improved product or process (or a combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)" (OECD and Eurostat, 2019, p. 20). In this definition, it is possible to observe that it still captures the Schumpeterian view on the topic and its impacts on business cycles (Lemanowicz, 2015; Şener and Sarıdoğan, 2011).

The link between growth and innovations observed by Schumpeter (1934; 1942) is based on its capacity to increase business competitiveness (Şener and Sarıdoğan, 2011). These technological changes, for example, can increase productivity, reduce costs, and raise the diversity of products. These elements together stimulate the demand of goods and services and result in economic growth. According to Seyfang and Smith (2007), this is the main objective of conventional innovations. In their words: "firms generate financial income commercially, from selling the products they innovate. The driving force is profit; firms seek to appropriate the benefits of innovation in order to move ahead of the competition and so capture

market rents" (Seyfang and Smith, 2007, p. 591). For this reason, countries and companies have been constantly focusing on investments in research and development (R&D) and science performance.

A large part of the literature on technological innovation has highlighted the importance of creating a positive environment for innovation processes, such as research in science, communication, technologies, and other aspects (Morrar et al., 2017; Şener and Sarıdoğan, 2011). The goal of these efforts is to obtain the highest number possible of registered patents, such as in the case of Japan and Korea. The run for new patents is stimulated by the competition for potential monopoly rents and their profits. In other words, technological progress has been the fuel for achieving long-term economic growth (Şener and Sarıdoğan, 2011).

The authors also connect the innovative efficiency of countries to their levels of competitiveness and stages of development. In this case, in early development phases, companies compete for basic inputs, such as natural resources and unskilled labor, and sell commodities or low-technology products. As countries become more efficient, they start to develop products with higher quality and complexity through more efficient processes. At this stage, higher productivity is driven by efficient goods markets, higher education and training, as well as developed financial markets, among others. Finally, countries move to an innovation-oriented stage, in which companies compete for new and exclusive products, using very sophisticated and technological production processes (Şener and Sarıdoğan, 2011).

This is the reason why business innovation or firm-led innovation has been so important for companies and nations (Gupta et al., 2019; Morrar et al., 2017; Pol and Ville, 2009). Following a Schumpeterian perspective, it can be translated into technological innovations (new product, service, or process) or by organizational innovation, where the focus is on increasing profits and development. From this view, infinite growth can be motivated by continuous innovation processes. However, as the degrowth movement proposes a new perspective beyond growth, this conventional concept of innovation might be challenged by other perspectives. In the next section, it will be observed what are the new alternatives that degrowth literature can add onto innovations.

2.2.2 Degrowth's perspectives on innovations

According to Latouche (2009), degrowth has a love-hate relationship with technological innovations (Kerschner et al., 2018). As presented in the last section, technological innovation

has by far been the main ingredient to the growth-addicted paradigm. It refers to a conventional linear narrative composed of investments in science, technological innovation, economic growth, job creation, welfare, and prosperity (Jackson, 2017; Kerschner et al., 2018; Pansera and Owen, 2018). This model has direct consequences on how investments and political efforts have been allocated over the years by companies and governments to create a positive environment for technological improvements.

According to Pansera and Owen (2018), technologies and innovation are socially, politically, and culturally developed, unintentionally or for purpose. Historically, private sectors have dominated the origins of technological innovation and have designed it mainly to meet the needs of the markets. For this reason, since the growth-addicted paradigm was threatened by ecological and social demands, the concepts of "sustainable growth" or "green growth" emerged as a possible solution (D'Alisa et al., 2016; Kerschner et al., 2018). These terms have been used to describe scenarios where technical innovations appear as a tool to restore environmental balance, also known as ecological modernization. This assumption is based on the understanding that more efficient technologies will result in lower emissions and less use of natural resources, allowing economies to continue pursuing growth (Demaria et al., 2013). These technologies are exemplified by solar panels, electric vehicles, and more efficient technological devices, among others.

Degrowth authors have contested this assumption in the last few years. According to D'Alisa et al. (2016), the movement does not consider that economic growth can be environmentally sustainable and that more efficient technologies are not enough to address current ecological impacts. They explain that while global growth still reaches 2-3% per year, the level of decarbonization needed is quite challenging to be reached. To further explain the reasons why technological efficiency is not satisfactory to restore environmental balance, Jackson (2017) uses the notion of "decoupling". The decoupling concept refers to innovations that can reduce material or emission intensity of economic outputs. Decoupling can be relative or absolute: absolute decoupling means that resources use and emission declines in absolute terms. For example, if the economy grows at 1% and carbon efficiency increases by 2% per year, overall carbon emissions will decline.

Jackson (2017) states that in global history there are many cases of relative decoupling, especially in advanced economies. However, the author highlights that absolute decoupling examples are not easy to obtain. The first skepticism on absolute decoupling is based on the necessary rates of technological productivity. According to him, to meet the 1.5°C targeted at

the Paris conference[7], the required average rates of technological efficiency are beyond the rate historically achieved. The author believes that there exists nowadays an urge for decoupling – with or without growth – but analyzes the concept of "sustainable growth" as an excuse for the perpetuation of the growth-paradigm.

Conversely, D'Alisa et al. (2016) and Demaria et al. (2013) also present the Jevons Paradox and the rebound effect of technological innovation on consumption. The scientist William Jevons observed during the Industrial Revolution two simultaneous phenomena: while the required coal per unit of smelted iron had been falling, the total coal consumed had been rising. Jevons called this a 'paradox' as the effect of the rise in efficiency by technological change reflected in the increase (not decrease) in the consumption of this resource. The paradox stresses the consequences of technological innovation on prices and demand. In cases where technological changes are not combined with reductions of supplies, the resources saved will be later consumed. This additional demand is named rebound consumption (D'Alisa et al., 2016). In other words, they believe that the savings created by technological innovation will be reinvested in new energy and material acquisition, offsetting the benefits of efficiency improvement.

In contrast, Pansera and Owen (2018) affirm that degrowth argues on "inclusive innovation systems", in which the term "inclusive" refers to a more equal distribution of the economic benefits of innovation. So, the authors suggest that degrowth should explore their 'non-technical' aspects to escape the market-driven and the depoliticized notion of innovation. In the next section, the concept of Social Innovation will be introduced to explore other possible interactions and ground experiments of social empowerment.

2.2.3 Social Innovation and new sorts of interactions

Social Innovation (SI) is defined by Moulaert and MacCallum (2019) as:

> "Innovation that improves society – in terms of equity, inclusion and opportunity, among others – rather than only that which accelerates economic growth, productivity and market-rational behavior. In addition, we claim that SI can act as a remedy to the negative social consequences – inequity, exclusion,

[7] 2015 United Nations Climate Change Conference or COP21 was held in Paris in 2015 and resulted in the Paris agreement, a global treaty on the reduction of climate change effects. In the agreement, the participant nations commit themselves to pursue efforts to limit the temperature increase to 1.5°C. Scientists explain that this goal requires a change from the current levels of carbon dioxide emissions to zero or close to zero between 2030 and 2050 (Jackson, 2017).

> marginalization – of growth-oriented innovation" (Moulaert and MacCallum, 2019, p. 11).

As presented in the definition, the main goal of SIs is to meet social needs in cases where existing capitalist relations fail to provide social justice and well-being. Mulgan et al. (2007) and Morrar et al. (2017) add that the SI concept is broad and can be presented in many formats, such as partnerships, new products and services, and technological improvements, among others. To exemplify, SI can include new learning models (such as open university systems), solutions to environmental unbalance, transportation facilities and microfinancing (such as Community Banks). Morrar et al. (2017) state that "the concept of social innovation denotes the process and factors that lead to a sustained positive transformation to the network society" (Morrar et al., 2017, p. 15).

According to Gupta et al. (2019), examples of social innovation became especially famous during the 1980s, for its capacity to provide new and fast solutions to multi-dimensional dilemmas. Instead of market-oriented innovations that reinforce the growth-addicted paradigm, the authors believe that social innovation opens pathways for creating new socio-political arrangements and more inclusive and sustainable development (Moulaert and MacCallum, 2019). In other words, Wittmayer et al. (2019) state that SI expands technology-oriented innovation standards. The literature on social innovation focuses particularly on the capacity of SIs to increase the quality of life and welfare of individuals through innovative solutions.

Besides, Gupta et al. (2019) and Pol and Ville (2009) assert that SI relies mainly on community power and individual creativity. It is exactly the social capital which is the tool that creates new structures, networks, and systems to allow the emergence of new arrangements. The actors in these movements are communities, individuals, government bodies, and social enterprises acting through activism and community practices. For this reason, Gupta et al. (2019) believe that investments in strengthening social connections, intersectoral partnerships, and relationships among different stakeholders are especially relevant to SIs. Like the principles of degrowth, SI is based on values of community, reciprocity, and solidarity (Moulaert and MacCallum, 2019).

According to Gupta et al. (2019) and Mulgan et al. (2007), the development of an SI initiative usually involves some steps, starting with the identification of the social problem and its requirements in terms of a change. Once these changes are mapped, it is possible to restructure innovation systems based on the needs to be achieved. The results can be expressed in management and policy practices, new products and services, or new technological solutions. Gupta et al. (2019) also add that SI is especially relevant in developing countries, due to its ability to propose novel solutions in places where inequalities put social

cohesion at risk. On this debate, Morrar et al. (2017) include: “social innovation flourished recently as a promising mechanism to tackle the inefficiency of the existing policies and models targeting the most pressing global issues such as chronic diseases, climate changes and inequalities” (Morrar et al., 2017, p. 15).

In contrast, a large body of the SI literature is critical about its ability to articulate resources without relying on subsidies. As previously mentioned, Gupta et al. (2019) and Poll and Ville (2009) highlight that these initiatives rely on support from other organizations, such as government bodies and private groups. These external incentives include financial funds, grants, technical and institutional support, among others (Gupta et al., 2019). However, other researchers like Moulaert and MacCallum (2019) argue that public investments in SI are relevant for nations for their capacity to support public policies on social inclusion, poverty reduction, employment, environmental justice, and a broad range of other social issues.

Moving to the different formats in which SI can be organized, Moulaert and MacCallum (2019) mentioned the grassroots initiatives, cooperative movements, solidarity economy, and agroecological movements, among others. Seyfang and Smith (2007) introduce the concept of Grassroots Innovation Movements (GIM). According to the authors, GIM can be defined as a “network of activists and organizations generating novel bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved” (Seyfang and Smith, 2007, p. 585). Thus, GIM is formed by civil society actors who establish community-based initiatives focused on developing local alternatives to energy systems, local food production, and community currencies, among others (Martin and Upham, 2016). The movement is also motivated by addressing social imbalances and can be organized in social enterprises, cooperatives, voluntary associations, and other initiatives (Martin and Upham, 2016; Seyfang and Smith, 2007).

According to Seyfang and Smith (2007), Grassroots Innovation Movements should benefit from the use of technologies in their civil society initiatives. Seyfang and Smith (2007) and Morrar et al. (2017) believe that social innovation and the diffusion of technological innovation are intricately connected. Using the concept of ‘social-technical’ innovation, the authors refer to the technological mediation in social relations as a highly social, collective, and beneficial process. Neder and Thomas (2010) also agreed on the use of technological improvements to meet social purposes, as they can contribute by increasing employment opportunities, social inclusion, savings in logistics and infrastructure costs, and expanding access to service facilities and communications systems. This new dynamic brings new horizons to social initiatives to provide solutions to various socio-political issues. In the words of Morrar et al.

(2017), “the same drive to innovate technologies to increase productivity can also be utilized to improve welfare and societal needs of the world population” (Morrar et al., 2017, p. 13).

Morrar et al. (2017) also believe that the current high-technological period that societies are living in has already significantly changed the way people work, consume, and do business. The authors believe that countries - especially the developing ones - should take advantage of this revolution to establish new opportunities that benefit society, reduce disparities, and create sustainable development. They also believe that technological development can positively affect the dissemination and reach of social innovation actions, including disruptive solutions, such as robotics, drones, artificial intelligence, and virtual reality.

To conclude this section, after the first approach of Schumpeter (1942, 1934) on innovations, many theories have orbited this concept based on the business innovation model. In this model, the objective is to achieve high-technological products and processes, register patents, and achieve profit maximization. Degrowth authors emphasize that these technological innovations have supported the growth-addicted paradigm for many years. Nowadays, threatened by an environmental disruption, technological improvements have also been presented as the key element to make growth and ecological balance coexist. However, as previously presented, degrowth literature has questioned the feasibility of this assumption and suggests using the transformative powers of innovations also in social aspects. For this reason, the concept of social innovations has a strong connection with the movement, mainly for its capacity to meet social needs in a local context. In other words, SI and degrowth share the principles and objectives of solidarity and care and might present other contributions to post-growth societies.

3. Methodology

To address the research questions previously presented, this work used a qualitative methodology based on the social constructivism approach to describe, contextualize, and interpret the roles of innovations from a non-technical perspective. In this way, the methodological approach selected for the development of this research was the Case Study (Flyvbjerg, 2011; Gerring, 2006). Gerring (2006, p. 20) states that "a case study may be understood as the intensive study of a single case where the purpose of that study is – at least in part – to shed light on a larger class of cases". According to Flick (2009), the methodology is based on a deep analysis of a case study before initiating a comparative analysis. Through this in-depth analysis, it is possible to build new concepts and/or questioned the existing ones.

Baxter and Jack (2008), using the definition of Stake (1995), refer to three possible types of case study that can be conducted: intrinsic, instrumental, or collective. The first refers to case studies that the researcher has a genuine interest in studying and aims to have a better understanding of. The second – instrumental - refers to an in-depth analysis of a study case to make some generalizations for other theories or aspects. In the words of Baxter and Jack (2008), an instrumental case study "plays a supportive role, facilitating our understanding of something else. The case is often looked in-depth, its contexts scrutinized, its ordinary activities detailed, and because it helps the researcher pursue the external interest" (Baxter and Jack, 2008, p. 549). Finally, the last category describes a study that has other collective similar cases and, for this reason, the inputs from this case can be extrapolated for the group as a whole.

This research selected an instrumental case study, due to its objective of obtaining external insights from an in-depth analysis of a relevant case in the field. For this reason, it was chosen the example of the Mumbuca Community Bank, located in Maricá, Rio de Janeiro, Brazil. The use of the Case Study methodology was based on the perception that the Mumbuca Bank is a single expression of a large phenomenon. For example, this case study uses technological innovation as a game-changer in the history of the bank, boosting its capacity to meet social needs. The bank also represents an unprecedented case of a CDB that counts on financial and technical support from local public policy. Finally, this case expresses a possible path for the sustainability of the Community Development Bank (CDB) network in Brazil, as will be presented.

The main objective of this case study is to observe how the use of an innovative digital social currency and the principle of solidarity economy connects with the values of degrowth, especially in the context of a developing country. In this analysis, it is intended to capture the

elements that this innovation brings and how to articulate them with the sort of policies suggested by the movement. It is possible to observe that this case shares in many aspects the same principles of degrowth, such as the use of social currency, solidarity initiatives, focus on local development, and the use of principles of solidarity finance.

Regarding data generation, this works uses as primary sources semi-structured interviews with actors from or connected to this organization (see annex A). Two of the three interviews were conducted at the Mumbuca Bank and the Secretary of Solidarity Economy of Maricá and lasted approximately 90 and 60 minutes, respectively. These two participants were selected based on their experience and leadership in these two institutions: Natália Sciamarella is the current president of the Mumbuca Bank and Nathan Melo in the head of the research department at the Secretariat of Solidarity Economy. The interviews were in Portuguese and recorded with the consent of the participants for the exclusive purpose of data analysis.

The first two interviews occurred in February 2020 *in-loco*. The purpose of these interviews was to gather more information about the digital currency, to understand its impacts on the socio-economic development of the city, the connections between these two institutions, and the role of the local public policy. The last interview happened in September 2020, online, with the professor Dr. Genauto França Filho, who has large research experience on the Brazilian CDB network. The main goal of this interview was to capture the contributions of the bank to the future of the CDB network in the country, a positional view of the bank, and how this partnership with the local public policy can bring further contributions.

All the interviews were developed using a semi-structured approach (Flick, 2009). During the interviews, questions about relevant topics were asked to guide the debate but interviewees have space to bring their topics and perspectives to the dialogue (see annex B). To express the contributions of this methodology, Flick (2009) states that “the general relevance of this approach is that the different types of questions allow the researchers to deal more explicitly with the presuppositions they bring to the interview in relation to aspects of the interviewee” (Flick, 2009, p. 160).

The choice of doing the interviews in person at these two institutions was part of the strategy of data collection. From these places, it was possible to observe the facilities of the bank and the Secretariat, their clients, services, and the dynamic between them. All this visual information was relevant to articulate and comprehend the case more profoundly. Besides, this direct observation also created a relevant material for the work, through the author’s notes and photographs (see annex C, D and E).

Secondary sources were also used in this investigation, such as academic literature on the case and other documents developed by the CDB network in Brazil (books, pamphlets,

interviews, videos, among others). From these sources, the author collected data on the Mumbuca social currency, technological innovation, and the link between the bank and local public policy. Besides, this work used some official websites, such as the website of Maricá City Hall, the *E-Dinheiro* website, and the page of the Secretary of Solidarity Economy of Maricá. These pages were used to check on updates and news from the bank, especially to observe the changes caused by the COVID-19 pandemic.

To process and analyze data, the interviews were transcribed and coded in the software Atlas.ti 8 to categorize the main themes and identify patterns. Each topic was analyzed to gain a deeper understanding of the interviewee's perspectives and their relevance to the case. These data were also compared with the content provided by secondary sources to observe similarities, divergences, and evolution over time. Additionally, images, pamphlets, and direct observations during the interviews were also used in this comparative analysis.

The case study methodology was suitable for studying a singular case with important insights for degrowth, solidary economy, and the Brazilian CDB network. It is important to highlight that is possible to find extensive literature approaching the degrowth movement and the Brazilian CDB network (especially the Palmas Bank). However, there is only a small literature body approaching the Mumbuca case study, mainly because of its recent history. This is the reason why the interviews added important materials and insights for the work. Through the interviews, it was possible to observe - for example - how fast occurred the transformations at the bank, the contributions of innovations in these changes, and have some insights about its future goals. It is also important to highlight that the in-person interviews were made before the COVID-19 pandemic and the lockdown in the city.

In the following chapter, it will be introduced the case study of the Mumbuca bank and its social currency. This community bank shows an example of how to articulate a socio-technical innovation with solidarity economy principles to boost the capacity of providing financial inclusion and local development in a region.

4. Case Study Analysis

4.1 The origins of the Maricá Community Bank and the social benefit

The history of the Community Development Banks (CBDs) in Brazil dates back to 1998, when the first initiative was created: the Palmas Bank. According to Girardi (2018), the history of this movement in the country can be described in three main phases, under different contexts and narratives. The first phase (1998 – 2005) refers to the period of the establishment of the first CDB initiative in Fortaleza (Ceará), and its fight for recognition. The second phase started in 2005 and is marked by the expansion phase of the CDBs network in Brazil, with the technical and financial support of SENAES (*Secretaria Nacional de Economia Solidária* or National Secretariat of Solidarity Economy) and partnerships with federal institutions. During this phase, more than 100 new community banks were created in different locations. The third phase started in 2015-2016, mainly after the impeachment of President Dilma Rousseff, marked by a severe economic crisis and a sharp rise in unemployment levels. All these factors contributed to a significant reduction in public investments and support provided to solidarity economy initiatives. In other words, these changes in the political scenario threatened not only the expansion of the CDBs but also the existence of those from phase two (Girardi, 2018).

In this context, a CDB case stands out for its innovative characteristics. The Maricá Community Bank, different from other CDB experiences, was the first initiative developed not by the local community but by the local government. Maricá is a coastal city located in the state of Rio de Janeiro (Brazil) and one of the first cities in the country to explore the pre-salt layer and to receive its royalties[8]. In 2013, the Maricá City Hall decided to distribute these resources through a cash-transfer program to benefit low-income families in the region (Almeida, 2019; N. Melo, 2020). This year, the city had around 139,000 inhabitants, with almost 10% living in poverty conditions (Aragao and Ansorena, 2020). Maricá was known at this time as a 'dormitory town', as most of its inhabitants worked and consumed in nearby cities. For this reason, the mayor, Washington Siqueira[9], opted to pay the benefit in social currency and encourage the creation of a CDB in the region (J. Melo, 2020). For this reason, they approved in June 2013 the municipal law 2.248 to create a Solidarity Economy Fund, a local community bank, and the issuing of local currency (Almeida, 2019). The choice of paying the benefit

[8] The pre-salt refers to a set of oil fields discovered in some Brazilian regions in 2006 by the national oil exploration company Petrobrás. Maricá reached the first position in royalties per capita in 2017 and is still the region with the highest amount of royalties received per local inhabitant (Almeida, 2019).
[9] Washington Siqueira, known as Washington Quaquá, is a Brazilian politician from the leftist party PT (*Partido dos Trabalhadores* or Workers Party). He was the mayor of Maricá from 2008 to 2016.

through a community bank instead of a commercial bank highlights the objective of the City Hall to create an endogenous and local economic activity (Almeida, 2019; N. Melo, 2020).

For this reason, the mayor invited the Palmas Institute[10] to support the creation of the bank and the currency. Thus, it was established the Maricá Popular Community Bank (fantasy name of Mumbuca Bank) in 2014 with the main goal of paying the benefit in social currency. The currency was named Mumbuca (name of a local river) and had the same parity in Brazilian reals - one Mumbuca is equivalent to one Brazilian real (Aragao and Ansorena, 2020; Instituto Banco Palmas, n.d.; Sciammarella, 2020). In the interview, Nathan Melo explained the origins of the bank and its correlation with the municipality[11]:

> The community bank Mumbuca was not created by a civil society organization. It was created by municipal law. It was the Executive power that sent a message to the Municipal Chamber, setting up the community bank ... proposing the community bank and saying that the City Hall wanted to promote and be financially responsible for it. So, that is where it started. It was the government itself that started to call people to gather around this association and created the Mumbuca bank. And for this purpose, we called and hired at that time - and still until today - the team of the Palmas institute. (N. Melo, 2020)

In January 2014, Palmas Institute and the Maricá Community Bank started to deliver the first 400 magnetic cards (Mumbuca card) charged with the amount of the social benefit in the local currency. The benefit was initially named *Bolsa Mumbuca* and paid M$ 70 (seventy Mumbucas) per month to 13,000 families. Although the benefit was created to be a Basic Income program, the local government opted to establish some income requirements (J. Melo, 2020). This way, the *Bolsa Mumbuca* was designed for families that receive up to one minimum wage. At the end of 2014, the program reached 14,000 families and was readjusted to M$ 85/month. In June 2015, its requirements changed from one minimum wage to up to three minimum wages, and the City Hall opened a new registration process (Almeida, 2019).

The bank also has an important connection with the Secretariat of Solidarity Economy, under the structure of Maricá City Hall. This organization has been mainly responsible for the administrative activities of the benefit (registration processes, database control, payment order, among others) and for supporting - technically and financially - the Mumbuca Bank (N. Melo, 2020). In 2016, this institution also launched two additional social programs paid in social currency: *Programa Renda Mínima Gestante* (Minimum Income Program for Pregnant

[10] This Institute is part of the Palmas Community Bank and was designed to support the development of new CDBs in Brazil.
[11] As all interviews were made in Portuguese, the quotations used in this work were translated by the author.

Women) and *Programa Renda Mínima Jovem Solidário* (Minimum Income Program for Solidarity Youth).

The first program was designed for pregnant women and paid monthly M$ 85 until the first year of the child. The second was intended for youths between 14 and 19 years old registered at the Secretariat in the same amount (M$ 85/month). In 2017, all benefits were adjusted for M$ 110 per month (Almeida, 2019; J. Melo, 2020; N. Melo, 2020). The City Hall also created another benefit paid in Mumbuca for indigenous communities living in Maricá. At the beginning of the program (2014), around 90 cards were delivered to members of these communities (comparing to 128 Indians in February 2020). In May 2018, the local government decided to increase this benefit for M$ 300/month per Indian living in the region for at least three years (Almeida, 2019).

The successor mayor Fabiano Horta was elected in 2017 from the same political party of Washington Siqueira. As mentioned in the interview, he was responsible for consolidating all programs into one: *Renda Básica da Cidadania* (RBC or Basic Citizenship Income) in 2019. The program was adjusted to M$ 130/month and included almost 27,000 beneficiaries at that time (Almeida, 2019; Prefeitura de Maricá, 2019a). Besides, another change occurred in the requirements of the program: the RBC benefit was specified for individuals instead of families. In Nathan's words: In 2019, we eliminated other Minimum Income programs. [...] There are no more seasonal programs. All of them are RBC now. And it is no longer for families. It is individual. Non-transferable, individual, paid per person. (N. Melo, 2020)

The Secretariat (2020) also mentioned that the RBC requirements included being registered in the Brazilian *Cadastro Único (CadÚnico)*[12] or Single Registration and to live in the city for at least three years. To be registered in the *CadÚnico* database, low-income families must receive monthly half of a minimum wage per person or a total monthly income of up to three minimum wages (Almeida, 2019). After this consolidation, the only benefit that remained beyond RBC was the program for indigenous communities, in the monthly amount of M$ 300 (N. Melo, 2020).

The local government has been periodically reviewing the amount of the social benefits and the number of beneficiaries. The Secretariat (2020) highlighted that the RBC registration process occurs during specific periods, according to political availability. The last registration process occurred in November 2019, when the City Hall of Maricá announced its goal of reaching 50,000 beneficiaries (LSM Notícias, 2019; N. Melo, 2020). Despite the efforts, the Secretariat reported in the interview 41,500 beneficiaries in February 2020. Thus, RBC injects

[12] Federal database that consolidates information from low-income families in the country eligible to participate in various social assistance programs.

monthly around 5.5 million Mumbucas into the local economy, paid through the Mumbuca Bank. It was also mentioned in the interview (February 2020) that they had no plans to increase the amount or the number of beneficiaries of the program in an electoral year (2020). However, the COVID-19 pandemic changed this situation, and the local government took some extra measures to avoid financial instability in the region.

In late March and early April 2020, the municipality of Maricá (through the Secretariat of Solidarity Economy) announced a non-recurring adjustment in the amount of the benefit from M$ 130 to M$ 300 for 3 consecutive months (Prefeitura de Maricá, 2020a). At the end of this period, they renewed this increase for another 3 months, with the possibility of further extensions. The government also took other measures, such as the anticipation of the Christmas bonus of M$ 130 per beneficiaries and the expansion of the credit supply for companies in financial difficulties.

To support local commerce, the government also launched the *Programa de Amparo ao Trabalhador* (PAT) or Worker Support Program for informal workers affected by the pandemic. This program paid in a social currency the equivalent of a minimum wage (M$ 1,045) for 3 months with the possibility of extension for another 3 months. This program is estimated to have benefited around 6,000 affected workers in the region. The Secretariat expected that these additional programs inject in the city over M$ 80 million Mumbucas (Prefeitura de Maricá, 2020b). As a result, the local press already announced in July 2020 that the city of Maricá was the municipality in Rio de Janeiro that lost fewer jobs during the four first months of the pandemic (Record TV, 2020).

4.2 The socio-technical innovation of the Mumbuca digital social currency

As previously mentioned, the choice of paying the benefit in social currency was intended to create a virtuous circle in the region. The additional income from RBC increases sales, employment and income levels, and its payment in Mumbucas helps maintain these positive effects in the city (França Filho et al., 2012; Girardi, 2018). As stated in the interview, at the beginning of the initiative (2013) the bank paid the *Bolsa Mumbuca* in social currency through a magnetic debit card (Sciammarella, 2020). This card was monthly charged with the amount of the program, and beneficiaries could only use it for consumption in the stores registered to negotiate in the currency.

These companies, in turn, received a card machine from the Mumbuca bank to record all transactions in Mumbucas. This POS machine (*ponto de serviço* or point of service) was

administrated by the outsourced company Valeshop and only worked in the city (Almeida, 2019). After 30-40 days, the stores received the sales discounted of the machine's maintenance fee (3% of the total). In the first years of the program, the number of accredited stores remained significantly low: only 30 businesses were initially listed in 2013 (Sciammarella, 2020). The main reason for this low participation was the requirements asked by Valeshop to register in this network. The bureaucracy of this company exclusively allowed the participation of formal stores, excluding much of the informal and small businesses in the region (Sciammarella, 2020).

In 2015, the Mumbuca Bank started seeking a technological solution in partnership with the Palmas Institute – which changed its name to *Instituto Banco da Periferia* in 2014. In 2016, the *Instituto Banco da Periferia* bought[13] the *E-Dinheiro* platform and designed the company *E-Dinheiro Brasil* to support the Brazilian CDBs network. This change benefited many CDBs who migrated to this online platform and were able to customize it according to their needs. In the interview, Natália mentioned that the CDB network adopted the *E-Dinheiro Brasil* in late 2017 to record and report transactions in different local currencies, as requested by the Brazilian Central Bank and the current CDB legislation (E-Dinheiro Maricá, n.d.; Sciammarella, 2020)

Therefore, Mumbuca Bank launched the *E-Dinheiro* platform in early 2018. According to the interview, the bank needed to replace the initial magnetic debit cards and the Valeshop machines for an application for mobile devices (Sciammarella, 2020). In this app, all transactions in social currency were made through the company's or customer's phone: when purchasing, the mobile device can read the Mumbuca card or it is possible to transfer the amount directly through the app (see annex C). After the sale, stores instantly receive the credit in their Mumbuca account, instead of the 30-40 days requested by Valeshop. The app also includes other features, such as payment of bills, bank transfers, cellphone recharge, and money-saving tools, among others (E-Dinheiro Maricá, n.d.). In other words, this innovation allowed Mumbuca Bank to offer a *digital* social currency, which can be defined as follows:

> It is a means of payment, where you can buy at local stores and make other financial transactions (e.g., make transfers, pay bills, cellphone recharges). It is called Social Currency for three reasons: a) It is only for buying and selling of products and cannot be kept in commercial banks for financial speculation (earning interest); b) Is community-owned - every Digital Social Currency is managed by a Community Bank whose owners are all residents of the neighborhood/municipality; c) Surpluses generated by the use of the currency

[13] *Instituto Banco da Periferia* is the custodian of all transactions made in the E-*dinheiro* platform.

> (fees charged in trade) are reinvested in the neighborhood/municipality in the form of productive credit or other services. (Instituto Periferia de Maricá-RJ, n.d.)

According to Sciamarella (2020), the launch of the platform *E-Dinheiro* in 2018 contributed to a reduction in the fees charged from the stores from 3% to 2%. After this change, the 3% maintenance fee paid to Valeshop turned to 2% paid to Mumbuca Bank. *E-Dinheiro* platform also made important flexibilities in the requirements to participate in the network. Informal businesses were able to join and the number of accredited companies increased significantly. In February 2020, Mumbuca Bank reported 3,050 businesses and this number is still growing in the region (Sciammarella, 2020). Since this change, local businesses have demonstrated an interest in accepting the social currency, especially due to the large flow of this money in the city. Currently, there is also a marketing effort from these stores to show their participation in the network (see Annex E).

Due to the change of platforms, the bank was able to offer a digital account at the bank[14] to all residents, regardless of the social benefit. This innovation brought to the residents the opportuning of having access to a digital and friendly app to manage their finances. The platform was customized according to the needs of the Mumbuca Bank and offers to their clients a high-tech tool like some fintech companies. Mumbuca bank also charges its clients a fee[15] of 1% from transactions to conventional bank accounts (in Brazilian reais). This is a 'penalty' for withdrawing money from the solidarity circle and to encourage the use of the card for consumption in the city. These positive impacts of the change to the *E-Dinheiro* can be described by Natália as follows:

> Everyone has now the right to use the social currency. In this way, what we did was to democratize it for companies and update the accounts of beneficiaries. We also started opening new checking accounts. Thus, we have now the account holders, a greater number of formal and informal businesses, and the [RBC] beneficiaries. (Sciammarella, 2020)

Besides, Mumbuca Bank has another characteristic that distinguishes it from other Brazilian CDBs: the technical and financial support from local public policy. As highlighted in both interviews, most CDBs' users of the *E-Dinheiro Brasil* receive only 1% of the 2% percent

[14] It is mandatory for RBC beneficiaries to have an account at the Mumbuca Bank (beneficiary account). However, non-beneficiaries can voluntary open an account in Mumbuca currency and have access to the app. The account number is the same number of the client's phone. There is also a third category of accounts: the salary account, intended for those who wish to receive their salary through Mumbuca Bank (Sciammarella, 2020)

[15] The tariff fee is not charged for bank transfers from the 1st to the 5th day of the month. Salary accounts are exempt from this fee (Sciammarella, 2020).

charged, as the other 1% goes to the platform as a maintenance fee. In the case of the Mumbuca Bank, there is a cooperation agreement between the bank and the City Hall to promote this initiative, guaranteed by municipal law. In this agreement, the Secretariat is responsible for paying the maintenance fee (1%) to *E-Dinheiro* and other administrative expenses of the bank, such as rent and payroll expenses, among others. This way, Mumbuca bank can save the total 2% charged on transactions in the currency. Considering 41,500 beneficiaries in February 2020, the bank has been able to save annually approximately M$ 1.3 million (N. Melo, 2020). In Nathan's words:

> Today, the Secretariat is the economic and financial promoter of the bank. It is the Secretariat, through the term of technical cooperation, that funds the operational expenses of the bank, from HR to the building rent... […] And this is guaranteed by law. [...] This is what makes possible, for example, to save the entire 2% for the Mumbuca bank. [In other CDB models] 1% is to the community bank and the other 1% goes to the Brazilian network [*E-dinheiro*]. And this 1% which goes to other banks has to pay the rent, electricity and other expenses. (N. Melo, 2020)

For this reason, the innovation of the platform *E-Dinheiro* had a relevant impact on the history of the bank. This new fundraising strategy allowed the bank to create a solidarity fund that has been used for microcredit initiatives and solidarity actions. The greater the use of Mumbuca currency, the greater the resources that the bank can raise. For this reason, the payment of the RBC benefit in Mumbuca is the main engine that stimulates the use of the currency and, consequently, increases the fundraising capacity of the bank. In the interview, França Filho (2020) mentioned the relevance of the digital currencies to the Brazilian CDBs: this change was significant because it opened a new horizon to the digital social currencies. This platform called E-Dinheiro allowed CDBs to make some revenues that, without a doubt, would guarantee the financial maintenance of the banks (França Filho, 2020).

In December 2019, the municipality of Maricá paid for the first time the Christmas bonus (M$ 130/person) to its public servants and RBC beneficiaries through Mumbuca Bank, totaling an additional income in the region of approximately M$ 5 million[16] (Prefeitura de Maricá, 2019b). These initiatives, according to Nathan (2020), reflect the efforts of local public policy to expand the use of the currency and its scope in the city. The Secretariat also encouraged the creation of new agencies in the city: the bank currently has 4 branches in different regions - Inoã, Itaipuaçu, Ponta Negra, and in the center of Maricá. The presence of the bank in different

[16] The Secretariat of Solidarity Economy cannot pay their payroll expenses through the Mumbuca bank as it depends on public bidding processes. However, all the staffs of Mumbuca Bank receive their salaries in a Mumbuca account, as well as the staffs from the program *Mumbuca Futuro* (N. Melo, 2020).

localities not only increases the use of the currency but allows the financial inclusion of more residents (Almeida, 2019; N. Melo, 2020).

4.3 The microcredit lines and other solidarity actions

Since 2018, the bank has been able to increase its solidarity fund with the fee of 2%. These resources have expanded the capacity of the bank to provide other financial instruments (such as microcredit lines and new solidarity actions) and to increase its financial sustainability. According to Natália (2020), the bank uses 60% of the resources at the fund for microcredit initiatives and the other 40% for social actions. During this period, Mumbuca Bank has launched nine microcredit lines in social currency, named Mumbucred (see annex D). These credit lines can be divided into two main categories: 1) productive credits, for equipment, machinery, and working capital needs (*Mumbucred Crédito Produtivo*); and 2) housing renovation, including expenses on construction materials and furniture (*Mumbucred Casa Melhor*). The *Mumbucred Crédito Produtivo* provides loans up to M$ 10,000. The bank charges a zero-interest rate for credits below M$ 2,000 and a monthly interest rate of 1% for credits above this amount. The second microcredit line (*Casa Melhor)* is available for people who wish to make small renovations in their houses, in the amount of M$ 600 at a zero interest rate (Instituto Periferia de Maricá-RJ, n.d.; Sciammarella, 2020). Natália also stated in the interview that the credit lines are today the main demand of the clients (Sciammarella, 2020).

All Mumbucred lines count on the solidarity assessment of the local community, like other Brazilian CDBs. To request a microcredit, 3 to 10 interested people need to form a group and determine a leader. This person is responsible for gathering the money from other members of the group and paying the bank in the agreed deadlines (from 4 to 10 installments). The group works as an important credit assessment tool, as its members are co-responsible for paying the debt in an event of default from one participant. For this reason, the group itself avoids the participation of people with a low financial reputation in the community. Additionally, all clients interested in microcredit services need to participate in advance in the *Cirandas*, a weekly event in all the four agencies to support participants to understand the impact of the credit in their budgets (E-Dinheiro Maricá, n.d.; Sciammarella, 2020).

According to the bank (2020), the community assessment is more relevant than other credit analysis developed by private rating agencies, such as the Brazilian institutions SPC and SERASA. The bank requires a positive credit analysis from 2/3 of the group and no other financial guarantees. To have access to new loans, beneficiaries must demonstrate growth in

their business or new needs of house renovations that justify the request. These criteria avoid high debt levels and potential defaults, as well as supports the financial health of the clients. In a case of default, the bank contacts the debtor to understand the reasons and see how they can support the client to pay off the debt. In cases where the negotiation is not sufficient to address the insolvency, the bank can contest the client's Brazilian tax registration number. However, this situation has never happened in the history of the bank, according to Natália (Sciammarella, 2020). She also recalls that:

> We always try to understand, comprehend, cooperate... And this is the way we give the credit: we do the *Cirandas*, we aim to get closer to the client. We build a really strong relationship with the bank: we go to the client's house; we go to their store... It results that... Sometimes they have nothing to do at the bank. The installments are paid, everything is fine... There is nothing to do at the bank. But they come by just to have coffee and kiss us. (Sciammarella, 2020)

The other credit line (*Mumbucred Casa Melhor)* is focused on repairing services for owned, rented, or ceded houses. In this case, borrowers need to present in advance a budget of construction materials in Mumbuca currency. In groups of 3 to 10 people, they can ask the maximum initial amount of M$ 600. As a progressive credit, the group can later request second or third loans in the respective amounts of M$ 1,000 and M$ 1,500. In the interview, Natália stressed that the *Mumbucred Casa Melhor* is especially important for victims of natural disasters and to increase the self-esteem and confidence of residents (Sciammarella, 2020). According to the *E-Dinheiro* Maricá website, the bank lent M$ 23,250 to 38 new entrepreneurs and R$ 12,186.37 to 23 families in 2018. All microcredit lines and bank account services are not restricted to RBC beneficiaries and support all residents.

Mumbuca Community Bank is also responsible for developing solidarity actions in the city, such as financial education workshops, events to support local entrepreneurs, and local carnival parades, among others. The social actions aim to publicize and expand the reach of the bank and the currency in the city while providing financial inclusion and education. The events include debates with women residents to approach their financial independence, workshops to promote financial education, and other events to create a network of local entrepreneurs. In 2018, the bank promoted 462 workshops of digital financial education and trained over 6,430 people (E-Dinheiro Maricá, n.d.). In the interview, Sciamarella also expressed the goal of developing in 2020 a competitive grant process to support local entrepreneurs who follow the principles of solidarity economy (Banco Mumbuca, n.d.).

The Secretariat also contributes to expanding the principles of solidarity economy in the region. In 2019, they created a program for students from the 6th to the last year of high school in local

public schools, named *Programa Mumbuca Futuro* (Future Mumbuca Program). The program added to the regular educational curriculum the debate on solidarity economy topics, including subjects like conscious consumption, sustainability, and financial education, among others. The program also includes the benefit of M$ 50/month per student and a deposit of M$ 1,200 per year per student in a solidarity fund. To receive the monthly benefit, students should reach a minimum attendance of 75% at the school and in the program. To access the total amount deposited over their studying years, students must present an entrepreneurial project using the principles learned in the program or use the resources for higher education (N. Melo, 2020). In the interview, Natália mentioned the importance of this project for the socio-economic development of the city: [the student] will be able to access the money only in one of these two cases. The idea is to use this background from *Mumbuca Futuro* to escape from underemployment and leave school with an idea of an enterprise among their colleagues (Sciammarella, 2020)

Therefore, this project aims to increase the perception of future generations about solidarity principles and invite the students to engage in these policies. The Secretariat is responsible for developing the program and financial sponsorship, while Mumbuca Bank is responsible for paying the benefit to the students (N. Melo, 2020). The pilot phase occurred in 2019 for students in the 6th year of elementary education and the Secretariat announced its plan to expand it in 2020 until the first year of high school. However, the program was suspended because of the pandemic and has plans to return when in-person classes are back (Prefeitura de Maricá, 2020c). In the interview, Nathan also mentioned other actions promoted by the Secretariat, such as the community fairs for trading in the currency, local schools of agroecology, and incentives for local cooperatives (N. Melo, 2020).

The initiatives of the Mumbuca bank and the Secretariat have already demonstrated some positive impacts in the city. According to the economist Mauro Osório (from the Federal University of Rio de Janeiro), the RBC program represents an additional 12% on the top of the total formal wage of Maricá residents from 2008 to 2019. In the same period, the program also represents an increase of 4,12x in the consumption in the city (N. Melo, 2020). The Secretariat also indicated in the interview, the intention of transforming the RBC into a Basic Income program for all residents, regardless of their employability conditions or income level. The Secretary of Solidarity Economy, Mr. José Carlos de Azevedo, announced at the 5th National Meeting of the Community Banks the objective of transforming the program into a Basic Income by 2022 (J. Melo, 2020). This discussion was especially accelerated after the COVID-19 pandemic and the larger use of this policy during the period.

In summary, the bank and the Secretariat have been working on initiatives to spread the use of the currency, its principles, and impacts. These measures are also important for financial education and inclusion and provide low-income families with the possibility to access credit at reduced rates. The next section will present the future goals and challenges of these organizations.

4.4 Future goals and challenges

The actions and impacts of the Mumbuca Bank and the Secretariat have already begun to influence other CDBs in different locations. In the interview, the bank mentioned their support to other CDBs, such as the Preventório Community Bank (Niterói, Rio de Janeiro). The bank has offered technical support in administrative activities and to expand the number of registered businesses (Sciammarella, 2020). The Secretariat also mentioned their support of other local governments. In 2020, they supported the municipality of Limoeiro de Anadia (Alagoas, Maceió) to create a new social benefit paid in local currency (*livre* or free) and to establish in the region a new Community Bank (J. Melo, 2020; N. Melo, 2020).

This new CDB model brings important insights to the future phases of the Brazilian CDB network. The political changes in 2015-2016 showed the need for new funding strategies without relying on federal financial support (Girardi, 2018). As mentioned by Genauto in the interview, the *E-Dinheiro* platform and the digital social currencies allowed new possible fundraising strategies (França Filho, 2020). CDBs observed that charging a percentage of the transactions in social currencies could be a possible and feasible solution to finance their operational expenses. Another difference of the Mumbuca Bank is the close participation of the local public policy. It can be said that the local public policy appropriates a model that was developed by Palmas Bank (the first CDB initiative in the country), adapts it, and helps to disseminate this initiative in a new format.

Regarding this topic, Genauto (2020) highlighted in the interview the importance of the bank to strengthen social mobilization and legitimacy. According to Aragao and Ansorena (2020), the association of the bank with the local public policy reduced its capacity for social mobilization and community engagement while added more transparency and publicity to the initiative (Aragao and Ansorena, 2020). Genauto (2020) mentioned the importance of increasing social engagement as a tool to expand the benefits of the use of the currency in the territory. This engagement refers, for example, to educating residents about the impacts of using Mumbucas and *E-Dinheiro* instead of other conventional banks. Also, a solid reputation

of the currency and the bank make it more resistant to changes in political will. In the words of Genauto:

> These CDBs must be politically sustainable both in terms of their ability to self-govern and in terms of the legitimacy they have in their respective territories. Because when people are aware of the importance of consuming locally, they will prefer to use the E-Dinheiro platform than to use some other platform. (França Filho, 2020)

In the interview, Natália also mentioned the challenge of engaging Maricá residents on the use and understanding of the currency. She stressed the efforts of the bank to detach the Mumbuca from the RBC benefit, as residents usually perceive the currency as exclusive for RBC beneficiaries (Almeida, 2019; Sciammarella, 2020). The main consequence of it is the lower use of the money from non-beneficiaries. Another challenge mentioned by Natália (2020) and Almeida (2019) is to clarify that the bank does not belong to Maricá City Hall. This belief also reduces the use of the currency, as residents see the bank as vulnerable to changes in the political scenario (Almeida, 2019). However, both institutions reinforced in the interviews that Mumbuca bank is an independent community bank, with its own board and fiscal number.

In summary, this chapter presented the experience of the Mumbuca bank and its multiple innovations on social and technological aspects. This case study has shown how a digital social currency can create positive impacts on the territory and to the future of the Brazilian CDB network. As can be seen, this unprecedented partnership with local public policy also creates a mechanism of scaling up the use of the currency through the payment of the social benefit. On the other hand, it adds new challenges to the initiative to reach community engagement. In the next chapter, it will be debated how these concepts articulate with the degrowth movement and its perspectives on innovations.

5. Discussions & Conclusions

In the previous chapter, the main dynamics and features of the Mumbuca case study were presented. The bank brings actions that articulate the degrowth approach and social innovation theories in practical terms. As mentioned, the innovation concept used by the bank involves a digital social currency to stimulate endogenous economic development and the use of technology to promote higher financial inclusion and fundraising alternatives. The aspects of this innovation can be analyzed from three main perspectives: 1) the payment of the benefit in digital social currency; 2) the use of technological innovation to increase financial inclusion and sustainability, and 3) the partnership of this CDB with the local government.

Regarding the first perspective, the experience of the Mumbuca Bank is not about a city of 362,480 km² that successfully implemented a social currency. It is a case of a community bank that uses a *digital* social currency to increase local socio-economic development and has the partnership of local public policy to boost the impacts. Since 2014, the municipality, through the Secretariat of Solidarity Economy, has paid a social benefit in local currency to over 42,000 residents. This benefit injects monthly around 5.5 million Mumbucas into the city and has been the main engine to the spread of the use of the currency.

It is possible to say that the RBC benefit has a double effect on local development. First, by providing financial support to low-income individuals to expand their consumption and preventing them to accept explorative jobs. This amount directly benefited these individuals with an extra income of M$ 130/month, which has been mainly used for consumption in local stores. It is important to highlight that the RBC relates to the Basic Income program advocated by degrowth as a tool to support individuals to achieve basic living standards. The debate about minimum income has received special attention during the pandemic for its use to reduce financial instability. This was the reason why the Maricá City Hall announced their intentions of transforming the RBC into a Basic Income Program until 2022. This expansion of the benefit will assist all residents of the city and scale-up, even more, the use of the currency. This fact shows that Maricá is adding a new perspective to the degrowth debate, by developing the first experience of a Brazilian Basic Income program paid in social currency - through a community bank.

The second effect of RBC is related to the use of a social currency. As explained, the choice of paying the benefit in Mumbucas was part of the strategy from the local government to maintain RBC income circulating within the city. The increase in consumption from these additional resources results in more sales and profits from local businesses. This increase in commercial activities creates opportunities for the expansion of businesses and new job

positions. In other words, this virtuous cycle – as named by Palmas Bank – from the use of the currency is expanded by the payment of the RBC benefit in Mumbucas. Currently, Mumbuca bank is the Brazilian CDB with the highest amount negotiated in social currency. The concept of local currencies is deeply approached by degrowth, as previously presented. The movement sees in this tool the possibility of local consumption with less ecological impact, recovering the money autonomy, and reducing vulnerability to the global financial markets, among others. In this case study, degrowth and solidarity economy use this tool to advocate their principles and to increase impact in the region.

Moving to the second innovative feature of this experience, it refers to the technological aspect of the change from the outsourced company Valeshop to the *E-Dinheiro* platform in 2018. As mentioned in the interviews, this fact radically changed the history of the Mumbuca Bank and brought positive impacts both on the use of technology and on the social perspective. This new technology of a customized financial platform allowed the Brazilian CDB network to expand and improve its services. After this change, the bank was able to offer checking accounts to all residents and to increase the participation of many informal stores and individuals that were before excluded from negotiating in Mumbucas. This new digital account offers to its clients a modern app where they can make many financial transactions 100% online, such as paying bills, recharging phones, and bank transfers, among others.

This change also contributed to the social aspect. First, by reducing the fees charges from local stores from 3% to 2% of the total transactions in the currency. This reduction not only increased their income but also allowed Mumbuca bank to initiate a solidarity fund with these resources. This way, the bank was able to establish nine microcredit lines to provide financial support to companies in their entrepreneurial activities and to individuals who need resources for housing renovations. All these credits follow the principles of solidarity economy, including solidarity assessment, zero or reduced interest rates, and no bank guarantees, among other aspects. Therefore, these new microcredit lines and account services contributed to financial inclusion mainly from low-income families. These individuals started to have financial opportunities that conventional banks were not able to deliver to this group of people.

For this reason, it is possible to say that the move to the *E-Dinheiro* platform is an example of a social-technical innovation. As debated by the degrowth movement, innovations can promote benefits that go beyond the discussion of technological improvements and gains. On the other hand, social innovation theories reinforce the ability to join these two aspects to increase the impact and reach. The example of Mumbuca bank shows in practical terms how a socio-technical innovation articulates the technological benefits of a modern app with the social impact of a greater capacity of financial inclusion.

Regarding the third innovative aspect, it is possible to mention the presence of a local government leading and participating in these initiatives. This CDB case study was the first initiative created not by a local community movement but by public policy. As presented, the municipality of Maricá used the experience of Palmas Banks to create both the currency and the bank in the city. As presented by degrowth, this represents an important change in the role of the State and public policy. The State has moved from a non-interventionist position based on neoliberal theories to closer participation in these efforts. This role was especially demanded during the pandemic and the City Hall responded with extra actions to keep economic stability and employment level in the period.

In this sense, the participation of the local government increases the capacity of the CDB and the currency to reach more people. Each time the Secretariat pays the RBC benefit, they scale up the use of the social currencies and the impacts of the virtuous cycle. From the perspective of the bank, the greater is the use of the currency, the greater is its capacity to save resources. These resources saved by the bank reflect on more possibilities of microcredit lines and other social actions. A solid solidarity fund also represents a strong and sustainable bank, more capable to resist to changes in political will.

This CDB model also reflects a social innovation for the Brazilian CDB network. Besides the partnership with the City Hall, it presents new fundraising alternatives based on the percentage fee charged on transactions in the currency. This way, the Mumbuca bank has been able to make revenues from its financial services and does not need to rely exclusively on external subsidies and grants. This experience has already traveled to new places in Brazil, through the technical support of the team from the bank and the Secretariat. This spread is important to replicate this CDB model in more regions and to create an articulated CDB network.

All these examples show how this case study articulates the concepts of degrowth and solidarity economy. As highlighted by França Filho (2020) in the interview, these two theories are convergent movements that share similar principles and goals. This is the reason why degrowth literature suggests partnerships between them to expand this discourse in developing countries. However, these movements also have some divergences, such as in their origins and some concepts regarding social currencies. For instance, solidarity economy – through community banks – suggests an increase in local consumption, mainly because its origin is associated with territories with high poverty levels. This increase in consumption reflects both an increase in the living standards and decentralization of consumption from large multinational conglomerates. On the other hand, degrowth has its origins in developed nations and advocates for a slowdown in consumption and economic activities. Although there are differences in their origins, degrowth believes that reaching a minimum income level is

necessary for low-income regions to increase well-being, which applies to the territories where Brazilian CDBs are created. Thus, these two discourses have found complementarities in each other to create links between their goals.

Regarding the innovative experience of Mumbuca bank, this case also expresses new possible roles of innovation in a degrowth scenario. As presented in the literature review, degrowth believes that innovations go beyond the debate on how technological improvements can produce infinite growth or compensate current environmental imbalances. In this sense, the movement connects with the concepts of social innovation, which aims to improve societies in terms of equity, opportunity, and inclusion. In the case of the Mumbuca Bank, it is possible to observe that the bank brings innovative characteristics that include the technological aspect but are not defined by them. The *E-Dinheiro* platform shows how technological improvement can contribute to social aspects while increasing the horizons of the bank. The partnership with the local government and the payment of a social benefit in Mumbucas show new actors participating in social innovations - and these innovations together are contributing to the city of Maricá to achieve a new socio-economic development standard, more focused on solidarity, conviviality, and local consumption.

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Annexes

Annex A – People Interviewed

Table 1. List of people interviewed

List of people interviewed	Institution	Role/Context	Time
Natália Sciammarella	Mumbuca Bank (Maricá, RJ)	President of the Bank	1h33m
Nathan Melo	Secretariat of Solidarity Economy (Maricá, RJ)	Head of the Research and Extension Department	1h6m
Dr. Genauto França Filho	Federal University of Bahia	Titular Professor and Researcher on Solidarity Economy, Third Sector, and Popular Economy.	34m

Source: Author

Annex B – The scripts of interviews

The relevance of the interviews to the work is based on the distinct and complementary perspectives of the participants: 1) the president of the Mumbuca bank; 2) the head of the Research and Extension Department at the Secretariat of Solidarity Economy; 3) a professor and researcher of solidarity economy and the Brazilian CDB network. Through the interviews, it was possible to get a wider scenario of the current activities of the bank, its dynamics with public policies, its innovative power, and its contributions to the CDB network.

Each interview was designed according to the main expertise and experience of the interviewee. For this reason, the interview with the representative of the bank was more concerned on the bank's activities and challenges. The second interview, with the staff of the Secretariat, aims to capture the nuances of the partnership between local public policy and the bank. The last interview was focused on perceiving the influences of the Mumbuca bank and its technologies to the future of the CDB network. Despite approaching different aspects, some questions were repeated in two or more interviews to observe the coherences and divergences between the participants.

Table 2. The script of the interview with the president of the Mumbuca bank

Category	**Questions**
The history of the bank and the social currency	1. Can you please tell me the history of Mumbuca bank? How did it start? 2. How important was the bank to the community in the beginning? And how is it today? 3. In your opinion, what is the main objective of Mumbuca social currency? 4. What is your perception of the E-Dinheiro platform? 5. How do you exchange reais for Mumbuca and vice versa? Is this process different for account holders and stores? 6. Is there any incentive or discount for the use of currency?
Microcredit lines and social actions	7. What were the different phases during the development of the bank? 8. What were the contributions of the change to the E-Dinheiro platform? 9. What are the fees charged by the bank? 10. Considering the 2% fee charged for transactions in Mumbuca, what is this amount allocated between microcredit and social actions? 11. What are the perceptions that users have had about the available microcredit lines? 12. How is the default rate being managed today?

	13. Who is responsible for creating and designing the social programs carried out by the bank? 14. What are the social actions that currently take place? 15. What are the partnerships that the bank has today?
Future Challenges	16. What is the current role of Palmas Bank? 17. Has the bank already supported any other CDB initiative in the network? Which one? 18. What can be the contributions of the bank to the future of the Brazilian CDB network? 19. Is the Mumbuca bank independent of external resources? Does the bank want to be? 20. What are the current challenges with E-Dinheiro? 21. What can you say about the opportunities for improvement/ innovations that the bank can offer? And in the E-Dinheiro? 22. What challenges does the bank perceive for its continuity?
General Questions	23. Numbers for 2019: a) beneficiaries of the social program; b) number of accredited stores; c) number of account holders; d) Loaned microcredit amount.

Source: Author

Table 3. The script of the interview with the Head of Research from the Secretariat of Solidarity Economy

Category	**Question**
The relationship between the Secretariat and the Mumbuca bank	1. How the beginning of the Mumbuca bank was influenced by local public policy? What was the participation of the City Hall? 2. Who were the main actors in this phase? 3. From the perspective of the secretariat, what is the importance of the bank today for the city of Maricá? 4. From the perspective of the secretariat, what is the importance of the Mumbuca social currency for the city? 5. What is the involvement of the Secretariat with the bank today? 6. Currently, how much is the investment of the municipality in the bank? 7. What are the contributions of the Secretariat to expand the use of the Mumbuca currency in the city?
Social benefit	8. Who was responsible for designing the social benefit programs? What was the goal of these benefits?

	9. Who currently manages the social program? That is, who is currently responsible for reviewing the number of beneficiaries and amounts? 10. The decision to pay the 2019 Christmas bonus via social currency was an interesting strategy to expand the use of social currency. Is there an intention today from the City Hall to pay more administrative expenses, such as the payroll expenses, in Mumbuca?
Public Policies	11. In which ways can the local public policies help to (re)organize the local economic circuit? 12. Are these public policies discussed with other municipalities? How does this debate take place? 13. Have these public policies already been 'transported' to other locations? Can you give some examples? 14. Is there any federal support for these initiatives or are the funds coming from the Maricá City Hall? 15. Who are the main partners of the Secretariat today? 16. What is the relation today of the Palmas Bank with the City Hall of Maricá?
Future Challenges	17. Are there any plans to make the RBC a long-term policy, such as Bolsa Família today in Brazil? If so, how? 18. Is there any review predicted for 2020 in the RBC's amount or the number of beneficiaries?
General Questions	19. What are the current projects developed by the secretariat? 20. What is the main focus of these initiatives? 21. How can these other projects contribute to the expansion of social currency in the municipality?

Source: Author

Table 4. The script of the interview with Prof. Dr. Genauto França Filho

Category	**Questions**
CDB Network	1. How did you see the situation of the Brazilian CDB network after the end of SENAE and the decrease in federal support? 2. In your opinion, what were the main difficulties perceived by the Brazilian CDBs at this time?
Mumbuca bank and the digital currency	3. In this context, what is the relevance of a digital currency and the E-Dinheiro platform? 4. What insights and influences the Mumbuca bank can bring to the network?

	5. How do you perceive the capacity of the Mumbuca bank to spread its knowledge and experience to new banks?
Public Policies	6. In your perspective, what would be the role of the public policy for the continuity and expansion of the movement? 7. What lessons did the Mumbuca bank bring with this partnership with the local public policy?
Future Challenges	8. Do you believe that the format today of charging a percentage of the transactions in social currency can support the banks to guarantee its financial sustainability? If no, what should be done? 9. What other innovations do you believe would be interesting or necessary for the movement nowadays? 10. What challenges can this new model also bring to the network? 11. How do you think community banks can contribute to the current Brazilian scenario?

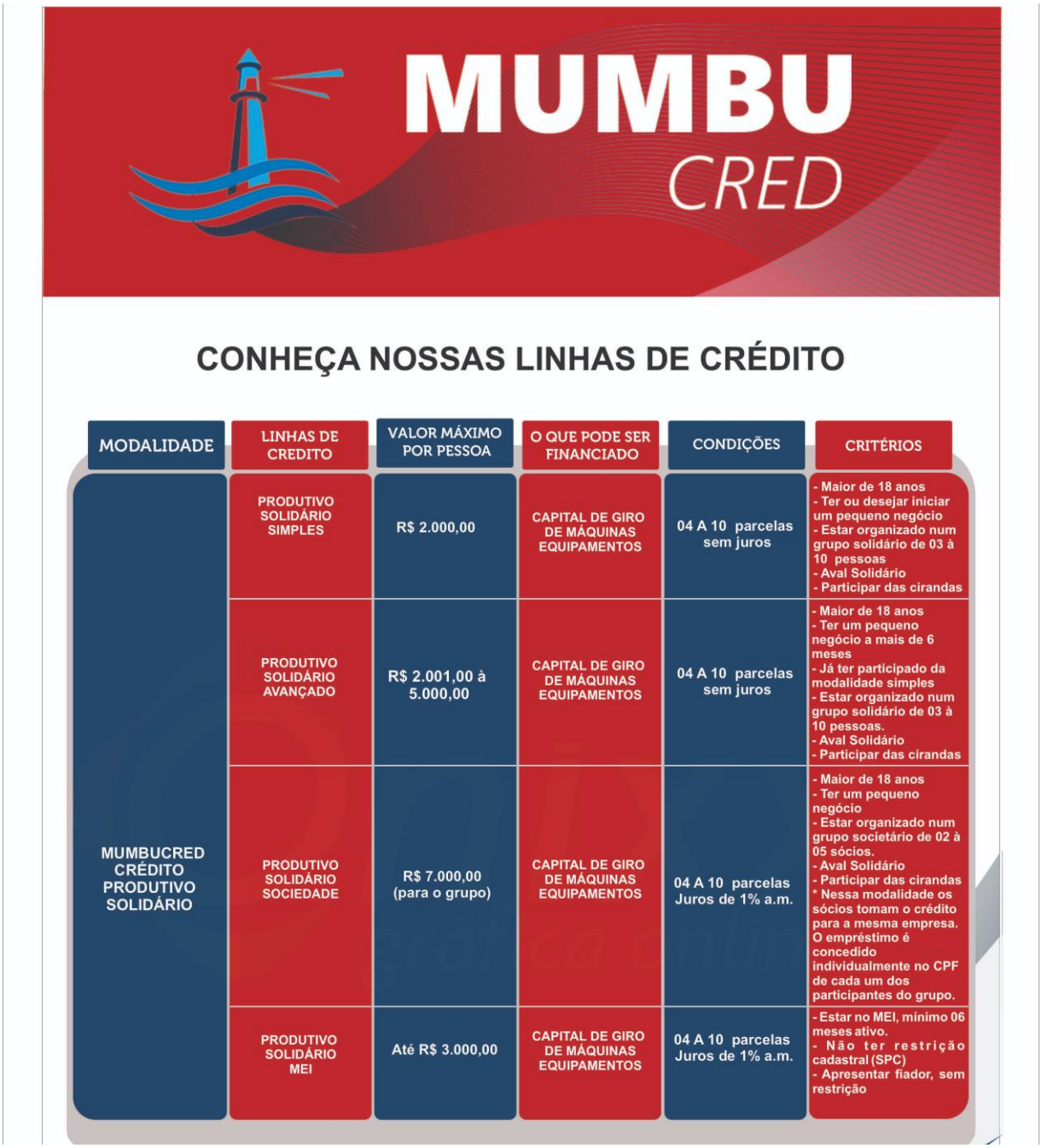
Source: Author

Annex C – Mumbuca *E-Dinheiro* app

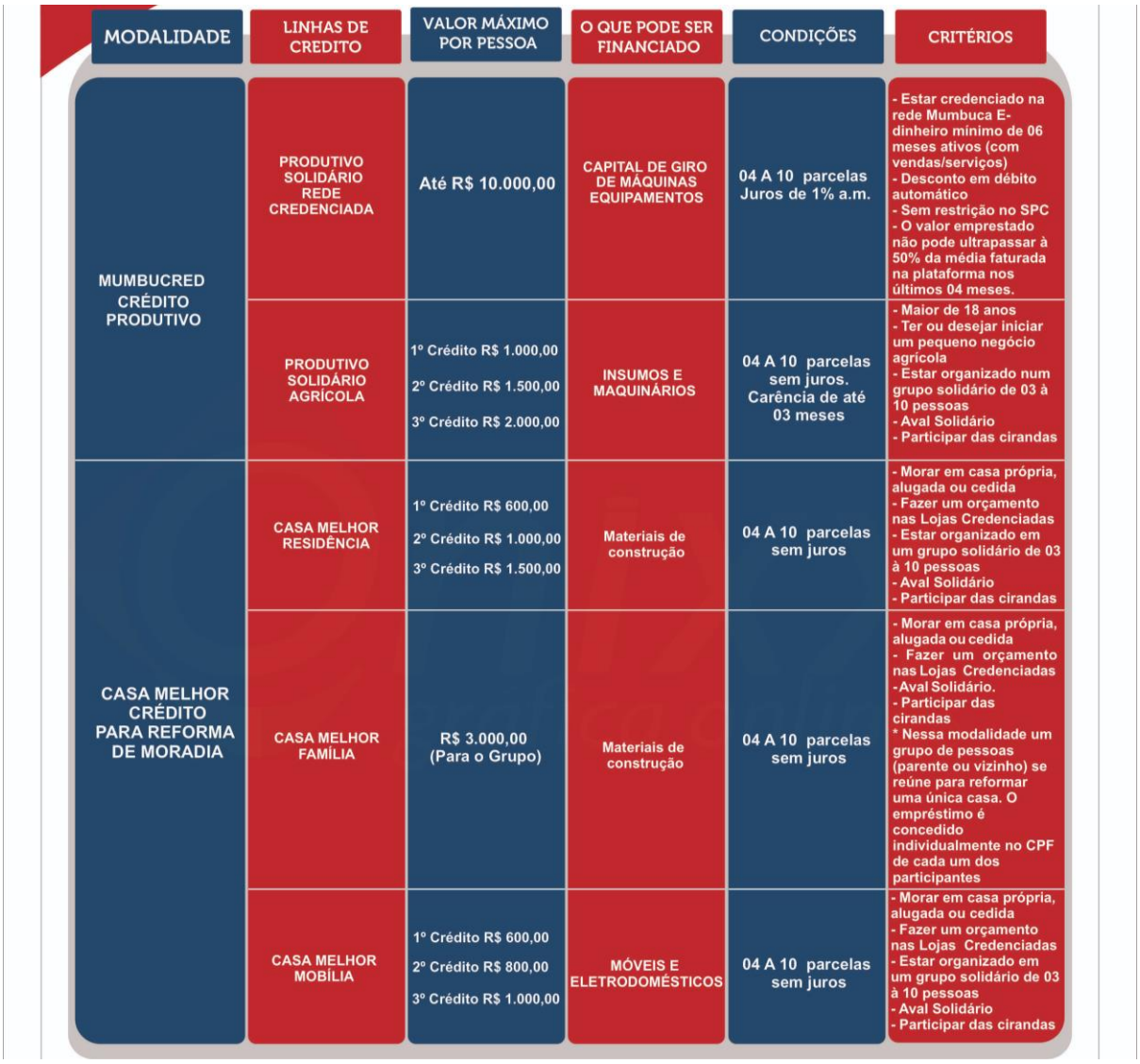
Fig. 1. The Mumbuca E-Dinheiro Application and its features

Source: Institute E-Dinheiro Maricá Website (2020)

Annex D – Mumbuca Microcredit Lines



MODALIDADE	LINHAS DE CREDITO	VALOR MÁXIMO POR PESSOA	O QUE PODE SER FINANCIADO	CONDIÇÕES	CRITÉRIOS
MUMBUCRED CRÉDITO PRODUTIVO SOLIDÁRIO	PRODUTIVO SOLIDÁRIO SIMPLES	R$ 2.000,00	CAPITAL DE GIRO DE MÁQUINAS EQUIPAMENTOS	04 A 10 parcelas sem juros	- Maior de 18 anos - Ter ou desejar iniciar um pequeno negócio - Estar organizado num grupo solidário de 03 à 10 pessoas - Aval Solidário - Participar das cirandas
	PRODUTIVO SOLIDÁRIO AVANÇADO	R$ 2.001,00 à 5.000,00	CAPITAL DE GIRO DE MÁQUINAS EQUIPAMENTOS	04 A 10 parcelas sem juros	- Maior de 18 anos - Ter um pequeno negócio a mais de 6 meses - Já ter participado da modalidade simples - Estar organizado num grupo solidário de 03 à 10 pessoas. - Aval Solidário - Participar das cirandas
	PRODUTIVO SOLIDÁRIO SOCIEDADE	R$ 7.000,00 (para o grupo)	CAPITAL DE GIRO DE MÁQUINAS EQUIPAMENTOS	04 A 10 parcelas Juros de 1% a.m.	- Maior de 18 anos - Ter um pequeno negócio - Estar organizado num grupo societário de 02 à 05 sócios. - Aval Solidário - Participar das cirandas * Nessa modalidade os sócios tomam o crédito para a mesma empresa. O empréstimo é concedido individualmente no CPF de cada um dos participantes do grupo.
	PRODUTIVO SOLIDÁRIO MEI	Até R$ 3.000,00	CAPITAL DE GIRO DE MÁQUINAS EQUIPAMENTOS	04 A 10 parcelas Juros de 1% a.m.	- Estar no MEI, mínimo 06 meses ativo. - Não ter restrição cadastral (SPC) - Apresentar fiador, sem restrição



MODALIDADE	LINHAS DE CREDITO	VALOR MÁXIMO POR PESSOA	O QUE PODE SER FINANCIADO	CONDIÇÕES	CRITÉRIOS
MUMBUCRED CRÉDITO PRODUTIVO	PRODUTIVO SOLIDÁRIO REDE CREDENCIADA	Até R$ 10.000,00	CAPITAL DE GIRO DE MÁQUINAS EQUIPAMENTOS	04 A 10 parcelas Juros de 1% a.m.	- Estar credenciado na rede Mumbuca E-dinheiro mínimo de 06 meses ativos (com vendas/serviços) - Desconto em débito automático - Sem restrição no SPC - O valor emprestado não pode ultrapassar à 50% da média faturada na plataforma nos últimos 04 meses.
	PRODUTIVO SOLIDÁRIO AGRÍCOLA	1º Crédito R$ 1.000,00 2º Crédito R$ 1.500,00 3º Crédito R$ 2.000,00	INSUMOS E MAQUINÁRIOS	04 A 10 parcelas sem juros. Carência de até 03 meses	- Maior de 18 anos - Ter ou desejar iniciar um pequeno negócio agrícola - Estar organizado num grupo solidário de 03 à 10 pessoas - Aval Solidário - Participar das cirandas
CASA MELHOR CRÉDITO PARA REFORMA DE MORADIA	CASA MELHOR RESIDÊNCIA	1º Crédito R$ 600,00 2º Crédito R$ 1.000,00 3º Crédito R$ 1.500,00	Materiais de construção	04 A 10 parcelas sem juros	- Morar em casa própria, alugada ou cedida - Fazer um orçamento nas Lojas Credenciadas - Estar organizado em um grupo solidário de 03 à 10 pessoas - Aval Solidário - Participar das cirandas
	CASA MELHOR FAMÍLIA	R$ 3.000,00 (Para o Grupo)	Materiais de construção	04 A 10 parcelas sem juros	- Morar em casa própria, alugada ou cedida - Fazer um orçamento nas Lojas Credenciadas -Aval Solidário. - Participar das cirandas * Nessa modalidade um grupo de pessoas (parente ou vizinho) se reúne para reformar uma única casa. O empréstimo é concedido individualmente no CPF de cada um dos participantes
	CASA MELHOR MOBÍLIA	1º Crédito R$ 600,00 2º Crédito R$ 800,00 3º Crédito R$ 1.000,00	MÓVEIS E ELETRODOMÉSTICOS	04 A 10 parcelas sem juros	- Morar em casa própria, alugada ou cedida - Fazer um orçamento nas Lojas Credenciadas - Estar organizado em um grupo solidário de 03 à 10 pessoas - Aval Solidário - Participar das cirandas

Fig 2. The nine microcredit lines in Mumbuca currency available in February 2020

Source: Document given to the author in the interview with the bank's representative

Annex E – Fieldwork Images

Fig. 3 - Mumbuca Bank Building

Fig. 4 - Mumbuca Bank – Agency of the center of Maricá

Fig. 5 – Banner at a local store "Aceitamos Cartão Mumbuca" (We accept Mumbuca Card)

Fig. 6 – Building of the Secretariat of Solidarity Economy

Fig. 7 – Banner at a local store "Aceitamos Cartão Mumbuca" (We accept Mumbuca Card)

Fig. 8 – Support area for the RBC beneficiaries at the Secretariat building

Source: Author