

Social Enterprise and Innovation: Opportunities for a New Development Model in Forest and Rural Areas

Climate and Forests 2030

AUTHORS

Luiza Maia de Castro (GITEC Brasil), Manuella Cunha Brito (Climatescape), Carolina Grottera (Fluminense Federal University)

EXPERT REVIEWERS

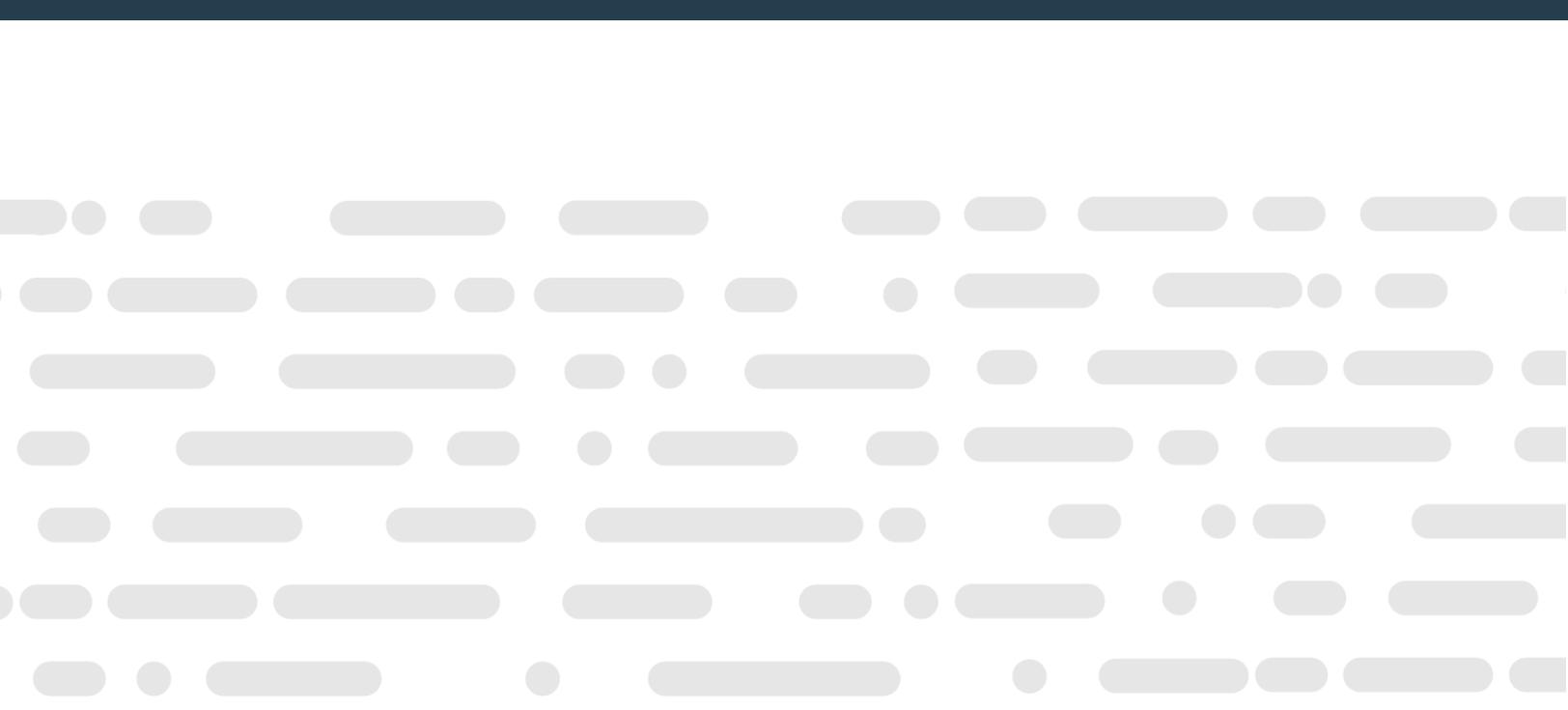
Felipe Brito, Carina Pimenta, Fitriani Ardiansyah, Raphael Medeiros, and Nnaemeka Ikegwonu

Background

The Climate and Land Use Alliance (CLUA), with the support of Meridian Institute, is exploring the integration of climate and land use with justice, equity, health, and economic recovery through the campaign Climate and Forests 2030: Resources for Funders. This focus is intended to inspire innovation and investment in integrated work with forests, rights, and sustainable land use over the next decade.

The views expressed herein are meant to stimulate discussion and debate and are not intended to reflect the views of the Climate and Land Use Alliance, its member foundations, or Meridian Institute. The views expressed in this paper are those of the author. They have been informed by commentary and input of a range of other experts. The authors would like to acknowledge Tomás de Lara (Cities Can B), Nana Orlandi (Minawi), Joana Alis, and Paulo Ferracioli (Fundação Getúlio Vargas) and thank this paper's reviewers: Felipe Brito (Instituto Universitário de Lisboa), Carina Pimenta (Conexus), Fitriani Ardiansyah (The Sustainable Trade Initiative - IDH), Raphael Medeiros (Centro de Empreendedorismo da Amazônia), Nnaemeka Ikegwuonu (The Smallholders Foundation).

This paper is not a comprehensive resource on social entrepreneurship, innovation, or climate solutions. Instead, it addresses an urgent need to orient grantmakers to the importance of funding at the intersection of these factors to enable a new development path in forest and rural areas. The authors opted for an informal and non-academic writing style. Most sections present their main argument in bold, followed by a brief contextualization and tangible examples. This unusual structure is combined with rigorous analysis of various papers, reports, and media sources.



Abstract

This paper presents the intertwined challenges of climate change and social inequalities, and explains how social entrepreneurship and innovation can open a new path where development is untangled from environmental degradation. It focuses, in particular, on forest and rural areas as the new impact frontier, where regenerative businesses and climate solutions can emerge. It defines six key conditions to enable a new development path in forest and rural areas: (i) access to market and sustainable value chains; (ii) access to infrastructure; (iii) access to capital and financial inclusion; (iv) access to knowledge, information, and training; (v) cultures, narratives, and community engagement; and, (vi) appropriate and transparent regulatory frameworks. In each of these sections, the paper illustrates how to meet these conditions with examples of social and technological innovations. Finally, it lists four risks which should be considered by grantmakers when supporting social enterprises and innovations. It concludes with a few recommendations for donors, especially foundations promoting a climate-positive future, and a path forward to a transformed, climate-just development model for the decade ahead.



A decade of action for a climate-just world

Climate change, biodiversity loss and social inequalities are wicked problems that demand a systemic response. Humanity has ten years to achieve the Sustainable Development Goals and limit global temperature rise to 2°C by halving greenhouse gas (GHG) emissions (United Nations 2020). Our capacity to meet the needs of current and future generations within planetary boundaries (Rockström *et al.* 2009) depends on a deep transformation of our economic system — including the way we produce, consume, and live (Raworth 2017).

Our limited global carbon budget is being deployed in the service of a minority, increasing the unsustainable consumption of the already affluent, instead of lifting people out of poverty and ensuring a decent standard of living to all humanity (Oxfam, 2020). Economic growth is not a path for sustainable development, unless it tackles inequality and creates the conditions for a climate-just world.

Social entrepreneurship and innovation have the potential to tackle these intertwined issues: bringing about innovative solutions that are socially fair, environmentally sustainable, economically viable, and adapted to local contexts. They should be an integral part of the much-needed change to our economic system, helping societies build an inclusive economy and a climate-just world.

Social entrepreneurship can be understood through different lenses, but it generally refers to the application of entrepreneurial means to solve social problems in an innovative way (Wirtz & Volkmann 2015). It often benefits specific marginalized or underprivileged communities, increasing their resilience and autonomy. Sometimes the benefit can also be extended to a larger group of stakeholders or the environment (Osberg 2015). Social enterprises are an institutional expression of the social entrepreneur drive. They are discussed in this paper regardless of their characterization as a non-profit, social business, cooperative, or for-profit entity. In

particular, these institutions tend to have a solid understanding of local communities, and when compared to more rigid corporate and governmental structures, they benefit from the flexibility to experiment and adapt to changing contexts (Moreno 2016).

One element that social enterprise can support is to highlight practical business models. These models can seek financial returns while ensuring positive social and environmental impacts in a relatively more sustainable way (longer term, on the ground, and not based on short-term grants). This can empower local residents by bringing ownership and leadership closer to them. They can also model the construction of a transformative narrative for development and climate action, which focuses on autonomy and empowerment of local agents of change. These results can be used as case studies or inputs for policy design.

Over the past decades, social entrepreneurship and innovation have flourished worldwide, especially in large metropolises and urban centers. However, many opportunities in rural and forest areas remain untapped. Smallholder farmers and forest-based communities could be responsible for the next generation of regenerative businesses and natural climate solutions¹ if enabling conditions are met. Increasing the pool of solutions led by rural and forest-based communities can help reverse global warming, protect natural ecosystems, and reduce poverty.

Empowering social entrepreneurs and bringing state-of-the-art technologies to the heart of forests and rural areas can enable a new and more sustainable development model for local communities (Nobre *et al.* 2016). This new model can unleash opportunities to draw on local knowledge and cultural heritage, help develop new services, and add value to biodiversity products. Innovations, both social and technological, can help to overcome challenges and establish new relationships with rural and forest areas and their populations, ultimately enabling a new economic model where development is untangled from environmental degradation.

¹ *Natural Climate Solutions as defined by Griscom et al. (2017) are conservation, restoration, and improved land management actions that increase carbon storage and/or avoid greenhouse gas emissions across global forests, wetlands, grasslands, and agricultural lands.*

This paper discusses key enabling conditions for a thriving entrepreneurial ecosystem² in forest and rural areas: (i) access to market and developed value chains; (ii) infrastructure; (iii) capital and financial inclusion; (iv) human capital; (v) culture, community engagement and communication; and, (vi) appropriate regulatory framework. A suite of these factors – many reinforcing – are needed to ensure the success of individual enterprises and the ability to scale. This paper also provides an overview of opportunities to overcome the challenges faced by these communities, many of them made possible by recent changes in consumption trends and market requirements, as well as social and technological innovations. Finally, we provide recommendations for stakeholders – namely donors – willing to bring social enterprise innovation in these areas to the core of our global agenda, and suggest a path forward to a transformed, climate-just development model for the decade ahead.

Rural and forest areas: the next frontier for social entrepreneurship and innovation

Changemakers worldwide are applying their skills to identify key societal problems and provide entrepreneurial solutions, combining sustainable business models (revenue-oriented objectives) with potentially transformative impacts (social-oriented objectives) through NGOs, cooperatives, start-ups, and other innovative ventures. This thriving ecosystem is supported by mentoring programs, incubators, accelerators, impact investors, venture philanthropists, and more. These ecosystems are particularly well-established in large urban centers, where there are many impact start-ups, social businesses, and other social enterprises.

Although talent may be evenly distributed between urban and rural areas, opportunities are not. The challenges faced by entrepreneurs and innovators in the latter are significantly greater, including limited

access to knowledge, credit, investment, and infrastructure. While nearly 56% of the world population lives in urban areas (World Bank 2021a), more than three-quarters of those living below the poverty line are concentrated in rural areas (International Labour Office 2017), often lacking access to basic services such as electricity (World Bank 2021b).

Global warming accentuates inequalities (Diffenbaugh & Burke 2019, Carleton et al. 2020), and “climate justice” is the term used to recognize that climate change is also a social and political issue. Those least responsible for climate change experience its greatest impacts (Davis, Roper & Miniszewski 2015), including poorer countries and poorer people within countries (Jafino et al. 2020). The richest 1% are responsible for about 15% of cumulative GHG emissions, or twice as much as the poorest half of the world's population (Oxfam 2020). Current emissions also place a burden on future generations, who will inherit a world on the verge of climate breakdown. Historically marginalized people, including women and gender-diverse people, people of color, rural populations, and Indigenous and other traditional communities, are already suffering the impacts of global warming, and they will disproportionately bear the consequences of the climate crisis.

The many dimensions of inequality must be taken into account in the development of any activity designed to curb climate change, reflecting the priorities and needs of marginalized groups. Smallholder farmers are vulnerable to food insecurity, droughts, and extreme weather events due to their dependence on natural resources and lower adaptive capacity (FAO 2017), and will severely suffer from climate change impacts (Intergovernmental Panel on Climate Change 2018). Indigenous groups often face challenges regarding land tenure and access to healthcare, which reduces their resiliency in the face of extreme weather events. Women often have less access to resources, including credit, extension services, information and technology, mobility, and carry heavy household responsibilities like searching for water and cooking (UN WomenWatch 2009). People of color and gender-diverse people have less

² *Entrepreneurial ecosystem is the holistic understanding of an environment in which entrepreneurs are operating and includes: the business environment and investment climate, actors that are interacting with one another, and an entrepreneurial culture and attitude towards entrepreneurial activity (Kreuzer et al. 2018).*

access to justice, and their voices are often silenced, which hinders their capacity to shape decisions and influence policies. Furthermore, these different groups intersect,³ which ultimately exposes people to even greater vulnerability.

To create conditions for a climate-just world, it is important to avoid climate colonialism⁴ and ensure climate reparation⁵ (Táiwò & Cibralic 2020). A climate-just transition looks not only at the outcomes in terms of GHG reduction but also at the process, including workers' rights, land use, how people are treated, and how climate solutions affect local communities (Yeampierre 2020). Human rights and equality create cascading benefits concerning climate change. For instance, ensuring land rights for Indigenous people contributes to the preservation of culture and forest ecosystems; and access to inclusive education and high-quality, voluntary reproductive healthcare also benefits the climate (Foley *et al.* 2020).

Engaging rural and forest-based populations in the climate fight is necessary and strategic to achieve a climate-just world. The agriculture, forestry, and other land use (AFOLU) sector contributes to nearly 18% of total anthropogenic greenhouse gas emissions (Climate Watch 2020), namely derived from large-scale agribusiness activities and deforestation induced by them. Meanwhile, smallholder farmers are the backbone of rural economies and supply 70% of total food production (FAO 2013). Likewise, Indigenous and other forest-based communities are the stewards of the forests (FAO & FILAC 2021). By conserving and sustainably managing forests and lands, they helped to retain the carbon equivalent of approximately 33 times the annual global energy emissions in 2017 (Frechette 2018) and kept deforestation rates lower than other territories, including government-protected areas. Therefore, an effective climate strategy must seek a new development path in rural and forest areas by improving well-being, income, and access to infrastructure in these areas while also

acknowledging traditional knowledge and combining it with technological know-how.

Social entrepreneurship and innovations offer relevant leverage points to unveil the potential for new development paths in rural and forest areas.

This is usually in the form of identifying issues and finding practical solutions on the ground while also providing economic returns. The increase in sustainable consumption and social-environmental awareness can accelerate opportunities for social enterprise innovations (Butler 2018). **True Moringa**,⁶ a black-owned social business in Ghana, created a new sustainable value chain by producing 100% vegan beauty products made of moringa oil. Moringa is a local tree variety, and its leaves offer numerous nutritional benefits to local farmers. Now, thanks to this new market, farmers can also earn an income with the previously unused seeds. Innovative processes, products, and services can add value to primary goods and thus generate income and increase the well-being of farmers and traditional peoples.

Technology and science are key enablers of sustainable development (Global Sustainable Development Report 2019). The fourth Industrial Revolution marked the emergence of exponential technologies such as artificial intelligence (AI), drones, robotics, blockchain, and biotechnology, among others (Schwab 2017). The power of innovation can be harnessed to promote better, cheaper, faster, scalable, and easy-to-use solutions to key global challenges like reversing climate change and achieving the UN Sustainable Development Goals (UNCTAD 2018). This is illustrated by over four hundred examples mapped by Tincq, Brito & Sinet (2019) across the 17 Global Goals, ranging from drones enabling large-scale reforestation (**Dendra**)⁷ to synthetic biology improving nitrogen fixation in soil (**Pivot Bio**)⁸, or satellites monitoring deforestation (**MapBiomass**)⁹.

Protecting ecosystems with science and technology

³ Intersectionality refers to the multiple social and political identities of individuals, as well as to the compounding effect of oppressive social structures which further discriminate people at the intersection of different marginalized groups.

⁴ Climate colonialism refers to initiatives meant to slow the pace of global warming but which actually reinforce domination from the wealthier towards the poorest.

⁵ Climate reparations are systemic approaches to redistributing resources and changing policies and institutions that have perpetuated harm to address entrenched inequalities (Táiwò & Cibralic 2020).

⁶ www.truemoringa.com

⁷ www.dendra.io

⁸ www.pivotbio.com

⁹ www.mapbiomas.org/en

can unveil the tangible value of biological and biomimetic assets of biodiversity (Nobre *et al.* 2016). Currently, the Brazilian Amazon is being exploited, generating little local added or social value with high destruction, as is the case with cattle, soybeans, and mining (Pinheiro *et al.* 2020). Additionally, the fauna and flora destroyed are responsible for the production of several active ingredients for allopathic and herbal medicines and high value-added cosmetics, such as rosewood oil – priced at 200 USD a liter – which is raw material for the perfume Chanel N°5, or the *Bothrops jararaca* venom that allows for the production of Captopril, a medicine used to control hypertension (Nobre & Nobre 2019; Meregali *et al.* 2013).

Therefore, technology and scientific innovation developed in forest and rural areas can create a positive transformative impact by increasing local capabilities, facilitating access to market and value chain development, ensuring transparency, and decentralizing power, among others. Moreover, for a social enterprise to fully utilize technology and science effectively, it must strengthen its agility. The **Sustainable Trade Initiative - IDH** and the Indonesian start-up **JALA**, for example, reuse a shrimp epidemiology application, developed to collect and analyze data to reduce the risk of shrimp diseases, to facilitate the sale of shrimp from small semi-intensive and traditional producers to local, retail, and online markets during the Covid-19 pandemic (IDH 2020a).

In the same vein, technology and the new media give us the chance to connect with the forest and its people through a new lens in which they are empowered to build their own narratives. In addition, traditional knowledge and values can help to create not only new products and services but also a path for a new economy. Good examples of these exchanges are the creation of a value chain for Yanomami mushroom production with the Brazilian chef Alex Atala or the sportfishing project in the village of Kendjam, a partnership between the *Kayapó* people association (**Associação Floresta Protegida**) and a sports company. The Brazilian movie selected for the 2021 Berlin Cinema Festival had an Indigenous author as one of its screenwriters. The feature portrays Yanomami Indians in the Amazon Rainforest who live in isolation and try to protect themselves from invading prospectors.

Meeting the right enabling conditions, smallholder

farmers and forest-based peoples could lead the next generation of regenerative businesses – and this is the new impact frontier where innovative climate solutions can emerge. There is abundant ethnoecological knowledge, and many talented individuals in these communities, whose different backgrounds could develop innovative solutions to forest degradation and other societal challenges if provided with the right means (Griscom *et al.* 2017). Through their active leadership in local NGOs and cooperatives, forest restoration start-ups, or social ventures for sustainable products, these social enterprises can promote autonomy, fair trade, inclusion, and long-term development of new business. This could not only promote a significant systemic change (World Economic Forum 2017) in rural and forest ecosystems but also increase the pool of solutions for achieving the Global Goals by 2030 while mitigating climate change.

Enabling conditions for a thriving entrepreneurial ecosystem in rural and forest areas

Successful entrepreneurial ecosystems require community engagement, well-established value chains and infrastructure, access to knowledge, funding, and the appropriate regulatory framework.

In spite of amazing innovations developed by enthusiastic and mission-driven social entrepreneurs around the world, several challenges remain, especially in forest and rural areas. We provide an overview of the challenges faced by social entrepreneurs to reach these key enabling conditions and present some solutions through social and technological innovation provided by ground-breaking social enterprises, innovators, and changemakers.

MARKET: Development of a sustainable value chain

Developing a fair and sustainable value chain is a challenge for every market in the 21st century. GIZ (2017) defines a value chain as a sequence of related business operations, from the provision of specific inputs for a particular product to primary production, transformation, marketing, up to the final sale to

consumers. It is composed of a set of enterprises performing such operations (for instance: producers, agents, processors, traders, and distributors), linked by a series of business transactions in which products are passed on from primary producers to end consumers.

The integration of rural and forest social enterprises into larger supply chains could create more robust and sustainable value chains worldwide while generating transformative impact in these communities. In the growing cosmetics sector, the Brazilian B corp **Natura**¹⁰ creates new ways of integrating traditional populations with the value chains through the development of local community businesses in the Amazon region. Nevertheless, the challenges faced by enterprises in rural and forest regions are particularly exacerbated. They include lack of familiarity with products and producers, ensuring product quality and stability of supply, providing legal contracts, certifications and impact verification, and guaranteeing a fair price. Building up stock constitutes a challenge for community businesses, primarily due to precarious infrastructure, financial management of the stock, and the high opportunity cost of keeping merchandise stocked without the certainty of commercialization. It is important to note that community enterprises usually organize themselves as cooperatives or production associations. They may also build intercooperation in networks to reach markets (Conexus 2020).

Strong and well-connected value chains can ensure the quality of products, guarantee constant supply, and thus provide a recurring income for smallholder farmers and forest-based communities. A relevant example is the *pirarucu* fish, traditionally only consumed in the Amazon region and now commercialized in large cities such as Rio and São Paulo. In the Brazilian Amazonas state, the **Território Médio Juruá** program sought to strengthen local community-based organizations by fostering youth leadership and providing support to project management. It involved 17 fishing communities. The coordinated, sustainable management of *pirarucu* stocks allowed the commercialization of 104 tons of fish in 2019, leading to a substantial increase in the communities' income. Furthermore, a 50% increase in the number of *pirarucus* in monitored aquatic

environments was observed (Sitawi 2020).

Online marketplaces can play an important role in facilitating the integration of smallholder farmers and forest-community produce into larger supply chains.

- A good example is the Brazilian start-up **Sumá**,¹¹ an online platform that connects smallholder farmers with regular buyers. It offers training for suppliers to meet buyers' requirements. It also provides direct information from the field for buyers to prepare their menus according to local production plans and in line with the seasonality of products.
- The global agroforestry hub **reNature**¹² also connects growers with buyers and increases regenerative agriculture practices around the globe. Additionally, they bridge farmers to research, knowledge, and funding sources.

Reducing exploitative intermediaries and engaging agents and hubs in a fairer and more sustainable value chain is an important aspect of sustainable value chains. These agents and hubs need to be involved and often aggregate value if they are part of sustainable value chains. Many middlemen and women have been successful because of their understanding of the cultural and social settings. Around 90% of the Indonesian coffee trade takes place through these agents. The **IDG Farmit** is an analytical tool that seeks to professionalize service delivery and suggests how to integrate intermediaries into efficient marketing models that add value for both buyers and farmers (IDH 2020b).

Furthermore, forest areas offer an immense opportunity to develop sustainable biodiversity-based product value chains capable of reaching global markets with unique differentiation (Nobre *et al.* 2016).

- A case study is the development of the *açaí* value chain, which was traditionally consumed in the Brazilian Amazon region and has reached a multibillion-dollar scale across the globe.
- The *ucuúba*, traditionally used for manufacturing broomsticks, gained new status after researchers identified that its butter offers enormous potential for the cosmetics industry.

¹⁰ www.naturaeco.com/en

¹¹ www.appsuma.com.br

¹² www.renature.co/projects

Currently, the annual income generated by a standing *ucuúba* tree is three times higher than the revenue earned from cutting it down (Nobre & Nobre 2019). Gauging the effective value of traditional biodiversity-based products can enable the development of multiple value chains, untapping an opportunity for many rural and forest-based communities to make a sustainable living without harming the environment.

→ In Indonesia, the **Javara**¹³ company promotes partnerships with farmers, foragers, fishers, and food artisans to promote Indonesian food biodiversity heritage in national and international markets.

→ The **Orang Utan Coffee** project, also in Indonesia, collaborates with small-scale farmers who have long owned their land to promote organic farming in the Sumatra island, where orangutans are losing their natural habitat due to the expansion of the palm oil industry. The province of Aceh issued a moratorium on deforestation for new plantations. Therefore, only farmers who owned their plantations before the year 2008 are targeted by the project. Profits are reinvested in organic certification, training (e.g., farming methods, coffee production and processing), marketing, infrastructure, and facilities such as processing, storage, and transport. This allows farmers to offer deforestation-free, good-quality produce with low-carbon intensity.

Labels and certificates (e.g., organic or fair trade) can add value to products. However, acquiring them can be very expensive for early-stage or small enterprises. Technology offers cheaper and easier tools to prove impact and offer transparency to the market. Innovative solutions like community-based certification models or blockchain-powered traceability can provide more transparency to this process and incentivize customers to afford a premium price for certified origins and quality.

→ As an example, **Amazonbai**¹⁴ facilitates the commercialization of their product with a community-based model and certifications.

→ **Sambazon** produces *açaí* with fair trade and

sustainable labels for the whole world.

→ The UK-based **Provenance**¹⁵ offers a blockchain-based solution to track the supply chain of fish, cotton, and other products.

There are many organizations experimenting with this type of technological innovation to ensure more sustainable and transparent supply chains. For instance, the **World Wildlife Fund (WWF)** is working on an initiative focused on tuna (Visser & Hanich 2018).

Going beyond certification and focusing on scale, verification, and narrative-building can also become a new path to building trust. Focusing on particular sourcing areas can be a good foundation. In this way, any product cultivated or produced from such sourcing areas can easily be connected to the market. One affordable tool is to create QR codes that offer a "real journey" into the social enterprises' value chain and impact strategies. A well-known example in Brazil is led by **Selo Origens**¹⁶, which uses QR codes to track supply chains from three different protected areas corridors, with traditional and Indigenous populations in the Brazilian Amazon.

Advancements in AI, satellite, and remote sensing technologies enable more transparency in forest management – allowing for more standardized and accessible data. The planet is losing about 10 million hectares of forest every year, or about 4.7 million hectares in net loss over the last decade (FAO 2020). Establishing a strong and trustworthy carbon market could not only protect forests but also ensure the right impact of emissions reducing projects. However, challenges remain in developing a trustworthy value chain as double-counting of carbon capture is quite common. New platforms are accessing and analyzing data to prevent this and facilitate the carbon market's overall organization. A very interesting example is the US-based start-up **Pachama**.¹⁷ The company, led by an Argentinean founder, verifies and monitors the capacity of a forest to capture and store carbon. They also offer a marketplace for carbon credits directly coming from projects around the globe with updated images. The potential impact of this innovation is immense, as it generates significant co-benefits for forest-based

¹³ www.javara.co.id

¹⁴ www.amazonbai.com.br

¹⁵ www.provenance.org

¹⁶ www.origensbrasil.org.br

communities.

INFRASTRUCTURE: Clean energy, accessible transportation, connectivity

Access to clean energy improves people's well-being and capabilities. For instance, lighting allows individuals to work and study at night, cold storage solutions allow food to last longer, irrigation can contribute to increased food production, improved cooking stoves reduce respiratory diseases, and so on. Thus, further innovation in providing clean energy to agricultural activities and forest areas is needed. Energy access has been increasing globally; in Latin America and the Caribbean, as well as Eastern and Southeastern Asia, electrification rates climbed to 98% in 2017 (Economic and Social Council 2020; Sustainable Energy for All 2014), though Africa remains significantly behind. Nevertheless, access to clean energy is not equally distributed between rural and urban areas (Ritchie & Roser 2019). According to the International Energy Agency (IEA), there are 770 million people without access to clean energy, who depend on firewood and expensive fossil fuels which travel long distances to be delivered at those remote locations (World Wide Fund for Nature 2020; Instituto de Energia e Meio Ambiente 2019).

- ➔ Initiatives like the **Xingu Indigenous Territory Clean Energy Project** helped Indigenous populations in the Amazon region access electricity. Over 70 photovoltaic systems were installed in 65 communities in the *Xingu* Indigenous Territory (TIX) (Instituto de Energia e Meio Ambiente 2020).
- ➔ In Guatemala, **Kingo**¹⁸ is a start-up that helps rural families improve well-being and education.

Future alternatives to diesel could include next generation biofuels made from agri-waste available on site, such as *açaí* seeds in Brazil (Ferreira *et al.* 2020) and paddy straw in India, as produced by **A2PEnergy**.¹⁹

Affordable cooling systems in all production stages are key for extending the shelf life of agricultural products, simultaneously reducing food waste, and

increasing farmers' income. Currently, a third of global food production is lost. In the developing world, this frequently occurs at the production level (FAO 2020), where food perishes due to the hot tropical weather and poor access to transport infrastructure. The Nigerian social enterprise **ColdHubs**²⁰ provides an innovative and sustainable solution to this challenge by offering a pay-as-you-go subscription model and a solar-powered refrigeration system, extending the shelf life of perishable food and improving the income of farmers.

Smart irrigation systems can increase resilience to drought, food production, and income for farmers (Mercy Corps 2020). Different from rainforests, certain rural areas have arid soils, which limits the production of smallholder farmers. Smart solar irrigation can help overcome the challenge of variable rainfall, as developed by the Kenyan company **SunCulture**,²¹ which claims to double the yields and increase revenue five-fold. Low-tech solutions like the "*Irriga Pote*" – a clay pot that collects rainwater for use in crops – have also been implemented in different rural areas in Brazil and Ethiopia to tackle water shortage in dry seasons (Siqueira *et al.* 2018).

The quality of transportation networks is critical to carry produce from the farm to markets at a reasonable cost (FAO 2020). Rural and forest areas are often isolated by poor transport infrastructure. Emerging innovations can help tackle this challenge in creative and efficient ways, avoiding deforestation and GHG emissions. Appropriate solutions might include electric boats, bikes, or cars, which, if powered by renewable energy, could significantly reduce costs, economic dependency, and emissions associated with current diesel alternatives. The **Kara-Solar**²² in Ecuador is uniting social and technical investigation, ancestral wisdom, and cooperative businesses to create a custom solar powerboat for river transportation in the Amazon basin. Other interesting transportation options include using drones (unmanned aerial vehicles), which could cover strategic routes to allow products to traverse forest stretches even in the absence of greenfield infrastructure, which is particularly beneficial

¹⁷ www.pachama.com

¹⁸ www.kingoenergy.com

¹⁹ www.a2penergy.com

²⁰ www.coldhubs.com

²¹ www.sunculture.com

²² www.karasolar.com

considering how deforestation is correlated to the construction of roads. The **Amazonia 4.0**²³ project is experimenting with drones to harvest forest products in isolated communities and transport them to consumer and distribution centers (Zanon 2020).

Internet connection is a fundamental pillar of the digital revolution and a key point to develop and connect social enterprises to other initiatives, companies, and customers. Connectivity must be increased to enable not only commercial communication or online marketing but also free access to education and other learning tools. Developing the necessary infrastructure in remote areas can be challenging, but innovations in telecommunication can be brought to bear by satellites or even rural antennas. Development will not happen without the possibility of being connected. The Covid-19 crisis highlighted this challenge as millions of students were in lockdown, many of whom could not attend online classes, thus increasing the global education gap.

FINANCE: Access to capital and financial inclusion

Innovative financial arrangements combined with financial and managerial education offer new approaches and capital access for rural and forest-based communities, allowing local social enterprises to build perennial and resilient commercial relations. The **Conexus Socio-Environmental Fund**²⁴ is a Brazilian initiative that provides direct financing for supported businesses to meet their working capital needs. Resources are guaranteed on time for the purchase of raw materials and products. Through financial advice, it also aims to prepare them to meet the requirements of financial markets so they can be recipients of important policies available to rural and forest economies, such as subsidized rural credit, public food procurement policies, subsidized interest rates, and other public financial resources.

A combination of grant, seed money provision, blended finance and patient capital, and the gradual inclusion of private finance is key to leveraging resources for social enterprises. Blended finance

can play a fundamental role, as it combines the strategic use of public or philanthropic development capital for the mobilization of additional external private commercial finance for SDG-related investments (Business & Sustainable Development Commission 2018). Connecting accelerators with philanthropists and private companies also helps by lowering acceleration costs and needs. Forest-based and small rural businesses rarely present risk-return profiles and scales that allow access to traditional funding or capital. The long payment terms adopted by buyers also limit the possibilities for commercial transactions with community businesses. A well-known example tackling these issues is **Root Capital**,²⁵ which provides credit for rural enterprises that are too big for microfinance and too small or risky for commercial banks in Latin America, sub-Saharan Africa, and Southeast Asia. Such enterprises provide farmers with better seed varieties, fertilizers, and training, while also connecting them to international markets where their crops receive a better price. Root Capital puts a special focus on women, youth, and post-conflict communities.

Information and Communication Technology (ICT) tools and emerging technologies can be instrumental for financial inclusion, access to banking and financial services, and transactions among different actors of the supply chain. An effective strategy is the digital peer-to-peer lending model.

→ **SITAWI**,²⁶ a Brazilian organization that offers social impact-driven financial solutions, launched its Collective Loan Platform, allowing people and organizations to invest in businesses with a positive socio-environmental impact.

→ The **AgUnity App**²⁷ uses low-cost smartphones to provide smallholder farmers with accessible tools to connect and work with each other. Farmers can plan, trade, and track everyday transactions, collaborate, store value, save money and easily buy products and services. It applies blockchain to secure record-keeping, increasing trust among farmers and harnessing cooperation (FAO & ITU 2019).

Access to credit as well as savings accounts can be

²³ www.amazoniaquatropontozero.org.br

²⁴ www.conexus.org

²⁵ www.rootcapital.org

²⁶ www.sitawi.net

²⁷ www.agunity.com

transformative for many smallholder farmers.

→ **MyAgro**²⁸ offers a simple mobile layaway platform that allows farmers to use their mobile phones to purchase seeds and fertilizer and receive them right in time for the planting season. In practice, it works like a savings account, allowing farmers to guarantee that their resources are well applied in the medium-term future when needed.

→ In West Kalimantan, Indonesia, a joint initiative between the **Sustainable Trade Initiative - IDH** and **SAMPAN**, a local NGO, provided financial literacy training and introduced smallholders to saving and investment habits. It helped the community create a collective savings fund to support village forest patrol management, preventing fire and training the community in sustainable production. The initiative also provided technical assistance for farmers to develop their non-forestry commodities production, such as beekeeping, crab farming, and producing charcoal from coconuts. As a result, they were able to increase their incomes without cutting down the surrounding forest. The example is being replicated in other Indonesian localities through a EUR 6 million loan provided by the country's Ministry of Environment and Forestry (IDH 2019).

HUMAN CAPITAL: Access to knowledge, information and training

We live in an era of knowledge-based capital; this "includes a range of intangible assets, like research, data, software, and design skills, which capture or express human ingenuity" (OECD 2013). Valuing traditional knowledge built upon by centuries of experimentation and interaction with ecosystems is a key point when thinking about innovation and development. Creating conditions to transfer and exchange knowledge can change the way we see rural and forest territories. They should not be seen as only a source of materials but also as a source of strategic knowledge able to create endogenous solutions.

In this exchange process, basic education and entrepreneurship training — through business classes, mentorship, incubation, acceleration, or other models — must reach rural and forest communities, namely youth, in a clear manner,

adapted to their reality, in order to reduce the education gap. **The Entrepreneurship Center of Amazonia** developed specific programs to educate, pre-accelerate, and accelerate rural and forest enterprises in the field using local language and observing the local value chains.

High-quality education and leading research centers located in rural and forest areas could attract talent, unleash local knowledge, and enable the development of the entrepreneurial ecosystem. An alternative model that proved successful in China involved connecting rural students with the best teachers in the country through the digitalization of content, mixing both virtual and in-person classes (Bianchi *et al.* 2020). However, access to digital infrastructure remains a barrier to virtual learning in most developing countries. Successful programs also provide capacity building for business management and administration in rural areas (Lopez & Pastor 2015).

Complementary to distance learning, virtual and augmented reality can be used to provide technical assistance. These technologies allow virtual interaction with machines with varying degrees of complexity and precision, as if they were physically within reach. The **Brazilian Agricultural Research Corporation (Embrapa)** uses both technologies to promote Integrated Crop-Livestock-Forest systems (ICLF). Using virtual reality glasses, they show smallholder farmers how ICLF works, allowing them to see the transformation of degraded areas into productive and sustainable ones.

Knowledge and information sharing can significantly improve the conditions for rural and forest communities, even with more basic resources like mobile phone applications. Peer learning can be very valuable for smallholder farmers to get access to valuable information and share best practices. Some of these apps are also capable of working offline and on simple phones.

→ A famous example is **WeFarm**,²⁹ which brings together millions of African farmers to share knowledge and learn from their peers' experiences with fertilizers, irrigation, and more.

→ **Digital Green**³⁰ promotes a platform for video

²⁸ www.myagro.org

²⁹ www.wefarm.co

production and sharing among a network of partners and communities, spreading relevant content about productive farming, health, and conservation practices.

→ Another interesting approach by the German company **Plantix**³¹ combines the community's knowledge with an AI tool that allows farmers to send pictures of their plants to identify and diagnose diseases, protecting the crops and livelihoods of many farmers in India.

→ **JALA** offers a shrimp epidemiology app that combines water monitoring through the internet-of-things (IoT) and a data-analytics system to achieve precision farming, improving shrimp production (IDH 2020a).

→ **Esoko**³² offers information services to farmers in Africa, including market price information, agronomic advice, and climate-smart weather updates. It also connects farmers with insurance and pension providers that offer affordable services to these communities.

Ethnobotany integrated with research can provide solutions and shorten the path to new discoveries,

oftentimes found within unique spaces. This is the context within which natural products for pharmaceutical discovery are emerging in the age of genomics (Harvey *et al.* 2015). However, for this development to occur, traditional knowledge needs to be respected, and the mechanisms for sharing the benefits generated from this knowledge must be improved. It is important to highlight that Indigenous knowledge builds on long-term understanding and practices of socio-ecological systems, and it traditionally embraces better uses of the surrounding environment, while contributing to well-being at the individual, communal, and societal levels (Global Sustainable Development Report 2019).

CULTURE: Cultures, Narratives, and Community Engagement

The creative economy is a relevant economic sector that provides both commercial and cultural value, generating income through trade and intellectual property rights and creating new opportunities, particularly for small and medium-sized businesses (United Nations Conference on Trade and

Development 2019). It also supports community engagement, navigates gender and racial issues, and sustains our ability to imagine a different world.

Narratives help create engagement and a sense of community by strengthening the connections between people and deepening their relationships. They transmit cultural values, share knowledge, increase awareness, and entertain.

Ostrom (1989) sets ten success factors for governing the commons, among them the importance of trust and reciprocity and a common understanding of the system and a sense of belonging. Social and traditional media are used to create self-defined narratives for rural and traditional populations (Bueno 2013). They allow for the exchange of information and traditions and open the possibility to communicate about common challenges. In doing so, these channels help to engage local and non-local populations, fight racism, and create a new world of possibilities of exchange, business, partnership, political, and economic pressure.

The importance of such channels was witnessed during the Movement at Standing Rock (Elbein 2017) against the Dakota Access Pipeline, and the Articulation of Indigenous Peoples of Brazil (APIB) (2021) open letter to BlackRock CEO – the largest asset management fund in the world – calling on the firm to adopt a comprehensive policy for forests and Indigenous rights. The *Kayapó* people in Brazil managed to negotiate their own endowment fund, **Fundo Kayapó**, allowing them to invest in infrastructure and capacity-building in the forest. One of their leaders, Cacique Raoni, became a symbol of the fight for Indigenous rights and Amazon protection traveling the world to meet with leaders and activists (Reuters 2019).

Information and Communication Technology (ICT) tools can significantly increase communications speed and reach, magnifying the impact of narratives and increasing community engagement.

In Brazil, **Yande Radio**³³ is an example of a community-driven initiative that allows Indigenous people to share their own traditional perspectives and knowledge, preserving their cultural heritage. Meanwhile, **Videos nas Aldeias**³⁴ offers film-making

³⁰ www.digitalgreen.org

³¹ www.plantix.net/en

³² www.esoko.com

³³ www.radioyande.com

classes and training for Indigenous peoples, helping them learn audio-visual techniques, providing them with a new way to communicate with the world, tell their stories, and preserve their memory.

Social networks and other media can contribute to connecting communities and generating impactful narratives while opening new market opportunities.

These new media play an important part in renewing these communities' perspectives and knowledge, which are not encapsulated or frozen in time. Instead, they are dynamic and contemporary, with a lot to contribute to a new economic system. Following the new trend of the digital world, influencers present a new understanding of beauty, politics, style, and culture (cf. Sehra 2020). During the Covid-19 pandemic, many of these channels became sources of information, support, and direct sales (Zuñiga *et al.* 2020). Therefore, it is important to guarantee infrastructure, improve digital literacy, and scale up such exchanges.

Art and culture play an important role in increasing the visibility of local traditions while providing sustainable revenue.

Social entrepreneurs are experimenting with different strategies to explore this market opportunity. Strategies include selling through online marketplaces, partnering with brands and social influencers, and fostering community-based tourism. An example is the online marketplace **Tucum Brasil**,³⁵ a platform through which more than 30 Brazilian Indigenous peoples can sell their craftwork, valuing their culture while generating income, namely for women. *Huni Kuin* artist Ibã Sales coordinates Mahku, the *Huni Kuin* Young Designer Artists Group, which translates ritual music into visual language. Ibã and his group exhibited in relevant art centers worldwide, including Brazil, France, Austria, and Mexico. With the revenue from their artwork sales, they purchased native forest lands, in which they are now building a cultural center to exchange with non-Indigenous artists from different languages and regions.

POLICY: Appropriate and transparent regulatory framework

Appropriate regulatory frameworks can ensure a thriving environment for social entrepreneurs and

innovation ecosystems. Economic incentives like taxes and subsidies must be designed to promote climate justice and support local development, with particular attention to forest and rural areas. Adequate policies can enable fair economic redistribution (e.g., conditional cash transfer programs), reduce GHG emissions (e.g., carbon taxes), and create incentives for positive social impact (e.g., tax incentives for organizations with official social enterprise legal status), and biodiversity conservation (e.g., payment for environmental services). Meanwhile, inadequate policies can hinder innovation, lead to the migration of talent, and accentuate inequalities. Hence, policymakers play a strategic role in driving better development models, as well as reducing the gap between urban metropolises and forest or rural areas. Through their unique capacity to take risks and prioritize value-creation and mission-driven research and innovation, states can help solve society's biggest challenges (Mazzucato 2019).

A key issue for smallholder farmers and forest-based communities is land ownership. Insecure land tenure motivates conflicts and reduces the incentives for long-term investment in lands

(FAO 2012). Indigenous populations are particularly exposed to such threats – while they protect more than 50% of the world's land surface, only 10% of their land ownership is formally recognized (Land Rights Now 2018). The importance of land tenure in sustainable development has been recently recognized by the establishment of Sustainable Development Goal (SDG) indicators 1.4.2 and 5.a.1. In Indonesia, the government of the Jambi province is collaborating with IDH to simplify the certification and cultivation license processes, making it more accessible to smallholder farmers by relocating it to sub-district instead of district level. These processes are free of charge and a mandatory step to help palm oil farmers meet sustainability standards (IDH 2018). There is also an undeniable opportunity to develop efficient, contextually-adapted and culturally-adapted solutions for the land tenure challenges.

→ Some of these solutions may benefit from technological innovations like **BenBen**,³⁶ in Ghana, which applies distributed ledger technologies to build smart land administration and real-asset

³⁴ www.videonasaldeias.org.br/loja

³⁵ www.tucumbrasil.com

³⁶ www.benben.com.gh

transaction systems.

→ Another example is **Tô no Mapa**,³⁷ an application recently developed in collaboration with traditional communities from the Cerrado (Brazilian savanna) to allow them to inform their location and sacred and important sites, as well as existing conflicts in the area. The process for submitting community data follows a controlled protocol that ensures data privacy and respects the communities' local governance structures (Sax 2021).

Harnessing, securing, and documenting existing Indigenous knowledge with ethics and respect, including acknowledging the Indigenous peoples' intellectual property ownership, can untap enormous potential in key sectors like biodiversity, climate change adaptation, and land conservation

(Global Sustainable Development Report 2019). Patents create incentives for discoveries, innovations, and technology transfer. However, in developing countries, the benefits and correlations between patents and innovation in the green technology field are not clear — and may even hinder innovation in certain cases (Hall & Hermes 2013; Lybecker & Lohse 2015). Open sharing of scientific knowledge could play a significant role in fast-tracking innovations for sustainable development in the Global South (Global Sustainable Development Report 2019). Combining digital, material, and biological technology breakthroughs with biological assets and biomimetic designs can enable innovative high-value products, services, and platforms for existing and entirely new markets (Nobre *et al.* 2016). Emergent technologies can help the creation of a regenerative economy that is driven by biodiversity conservation instead of destruction. Efforts in this direction are being made by initiatives like the **Earth Bank of Codes**,³⁸ which aims to build on the existing wisdom of local Indigenous and forest-based communities and give due credit and economic rewards for their knowledge of plant species, medicines, and more (Nobre *et al.* 2016). They plan to use machine learning systems to build a catalogue of all forms of life and biodiversity in the Amazon region and create a distributed ledger to track all economic transactions inspired by it.

Key obstacles to consider

Despite great opportunities and synergies — like all investments — social enterprises have financial, economic, environmental, social, and especially mission-related risks. Mixing the dual goal of profit and purpose is not trivial and demands knowledge on both sides. One key element is the definition of the business model, as well as the level of scale, technical autonomy, and financial autonomy aimed along with the investment to understand its financial viability. Social enterprises can tackle small problems or scale up. These expectations must be reflected in the business plan. As complexity grows, it becomes fundamental to involve specialized staff or community organizations to allow for more professionalism and accountability while remaining connected to the social setting and purpose.

The business's impact on local inequalities can be a sensitive topic and involves internal governance of the enterprise and the community. In that sense, success for a social enterprise depends on the overall positive impact generated and its alignment with the community. For example, in a community that depends on subsistence agriculture for food security, it is important to consider if new activities complement or compete with traditional ones.

Robust monitoring with metrics and indicators that can help keep track of mission-driven actions and guarantee mission and reputational compliance of the investments. To this end, it is necessary to bring together researchers and decision-makers to design and refine such solutions and their applications, ensuring that the evidence created is used to improve implementation and impact. The **Poverty Action Lab** presents a case study in which a biometric monitoring technology was implemented to increase doctors' attendance at primary health centers in India. The evaluation revealed that, despite the availability of real-time, accurate attendance data, the system did not help generate the right incentives and penalties, and did not increase attendance. The government decided not to scale up the program, saving millions of dollars in costs and countless staff time hours (J-PAL 2017).

³⁷ www.tonomapa.org.br

³⁸ www.earthbankofcodes.org

Monitoring and transparency can also help find co-benefits. For instance, a business model at the local level will not tackle climate change, but the overall results of aggregate initiatives can bring about such outcomes. Monitoring systems must be complemented with internal governance and transparency. Often, trust between members of communities can be easily established if no money is involved. However, when money or capital are involved, such trust is more challenging to establish.

Traditional funders must be brought into the effort, avoiding losing an important funding source. Such integrations can enhance impacts and reduce monitoring costs and reputational risks. In this sense, instruments such as blended finance structures, particularly social and development impact bonds, can assist in creating synergy and impact.

Ambitions for a climate-just world in 2030

Climate change and social inequalities are intertwined problems, and solutions can only be considered sustainable if they are primarily inclusive. Climate change has already increased inequalities (Difflenbaugh & Burke 2019), which is particularly unfair considering that the world's wealthiest countries and individuals account for the bulk of GHG emissions (Gore 2020). Many forest peoples and smallholder farmers lack the financial resources or technological capacity required for climate change adaptation. However, if provided with the right incentives, they can be powerful agents of change once included in the design of solutions since they are first-hand witnesses of climate change impacts (Global Sustainable Development Report 2019).

This paper sought to explore the enabling conditions required for social entrepreneurship to thrive in rural and forest-based communities. While challenges are particularly exacerbated, there is a range of opportunities to unleash their full potential, making them the next frontier for social entrepreneurship and innovation — a much-needed condition to transform the economy, preserve natural capital, and benefit local people.

Harnessing the social enterprise ecosystem refers not only to techno-economic perspectives but also

socio-cultural and ethical ones — issues that are beyond industry boundaries and that the market alone cannot solve. A successful strategy to promote climate justice and unleash the full potential of rural and forest-based communities must take into account the following recommendations:

- **Be visionary and anticipate future courses of action.** Social enterprises need to be less reactive, investing in solutions to current challenges while also strategically foreseeing and acting on future trends and technologies. Donors must be open to social, technological, and thematic innovations. This implies being tolerant to a higher risk than traditionally provided by tested and proven strategies, but being cautious not to fall into the trap of technological "solutionism."
- **Communicate to engage.** Listening to different narratives allows us to understand and connect to different cultures and values. This exchange creates innovation, empathy, income, and knowledge. Social enterprises can create business models derived from a specific culture and go beyond, using these enterprises to empower, preserve, and spread such knowledge. Donors must incorporate the power of grassroots communication and social networks into economic and social development. Investing in communication can have positive impacts in monitoring costs, engagement, and economic resilience.
- **Create impact at scale.** Solutions should focus on structural shifts. Considering the size and complexity of global challenges such as climate change, social inequality, and biodiversity loss, solutions must have an impact at scale. In that sense, it is important to support visionary leaders who can create a transformative narrative for their community, but it is fundamental to avoid the "hero-preneur" mindset, and ensure that solutions are replicable.
- **Create a robust, supportive, and enabling bottom-up ecosystem.** This includes service providers, technical assistance, and financial support, as well as a strong R&D community able to identify scientific and technological breakthroughs to promote the development of forest and rural-based economies. These networks should enable local communities to

store and exchange knowledge. Resources must systematically reach the final recipients, and new beneficiaries must constantly incorporate the review of criteria and selection standards, thus allowing a virtuous cycle of strength. Investing in local hubs and platforms can help this transition by reducing transaction costs.

- **Embrace diversity.** Social enterprises differ regarding their goals, stages of development, governance models, and profit-sharing agreements, among others. Understanding their differences is key to expanding opportunities and horizons. It is important to fund not only social businesses that benefit vulnerable populations, but also those that are led by them.
- **Integrate urban and rural social enterprises.** They can complement and strengthen each other. Knowledge and information sharing can significantly improve the conditions for rural and forest communities, especially through synergies and linkages between rural and urban social enterprises or models. Technology opens a new perspective to connect urban and rural action through engagement, exchange of knowledge, and integration of value chains, thus adding to the traditional practice of providing the resources needed to share best practices, including publications, events, and workshops.
- **Think globally, but act locally.** Only a combination of different levels of action can provide the right solutions at the scale we need. While every individual may contribute to addressing the issues at stake, approaches must be designed considering the specificities of different contexts, including the economic needs and cultural priorities of local resource-owning communities. This is an important part of ensuring climate justice for those most affected.
- **Establish valuable partnerships.** The 2030 Agenda cannot be achieved by a handful of organizations alone. Connecting the traditional wisdom of forest peoples, scientific knowledge, and political will is essential to unleash our desired breakthrough. Businesses, investors, and philanthropists oriented by Environmental, Social, and Governance (ESG) values will play an increasingly important role, whilst civil society and other non-governmental stakeholders will be key for advocacy and agenda-setting.

There is a clear opportunity for social enterprise innovations to promote the autonomy and well-being of forest and rural peoples, with special attention to women, youth, disadvantaged populations, and traditional peoples. This can contribute to reducing the gender gap, valuing the local culture so that young people are willing to remain in their territories while allowing the world to build on their knowledge to come up with solutions to our global challenges.

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AUGUST 2021

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