Inclusive Business Cases Linking Agriculture and Conservation

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Photo: Solidaridad

Introduction

Deforestation is one of the major current sustainability concerns around the world, with severe short- and long-term impacts on both a local and global scale. Global tree cover decreased by around 10 per cent between 2001 and 2020, contributing to rising CO2 emissions and biodiversity loss, and putting the livelihoods of local communities in and around forests at risk (Global Forest Watch, 2021). While the rate of forest loss has declined since its peak in the 1980s (Ritchie, 2021), 12 million hectares of tree cover in the tropics were lost in 2020 alone, including 4.2 million hectares – the size of the Netherlands – of previously undisturbed land (Weisse & Goldman, 2021).

Africa has the highest annual rates of net forest loss, followed by South America; whereas Asia reported a net gain of forest area in 2010-2020 due to afforestation efforts which compensated forest loss (FAO, 2020).

Causes of deforestation can be complex and context specific. Direct causes of deforestation, which are usually relatively easy to identify and quantify, include the conversion of forest land to other uses (such as mining, agriculture, infrastructure and urban expansion) as well as fires, disease and severe weather events. Indirect causes typically stem from the fact that current economic systems fail to reflect the true value of the environment. Many environmental costs of production and consumption are carried by society as a whole instead of by (individual) producers or consumers, which incentivises deforestation and other harmful practices. Indirect causes are more difficult to quantify, but cause the most harm (Chakravarty et al., 2012).

Agricultural expansion is the most significant direct cause of deforestation, accounting for 73 per cent of all deforestation (FAO, 2016). This is mainly fuelled by population growth and the need to sustain livelihoods with small-scale agriculture (FAO, 2020). In Latin America and Southeast Asia, commodity-driven deforestation is the leading cause of tree cover loss – specifically beef and soy production in Latin America and palm oil production in Southeast Asia, but also wood products (e.g. paper, pulp and timber) (Richtie, 2021). In Africa, by contrast, shifting agriculture is the prime cause of deforestation. Forests are cut and burned to make space for subsistence agriculture and to gain fuelwood and charcoal for energy (Ritchie, 2021). Yet, in Africa, commodity production can also be a key driver of deforestation, as the example of cocoa production in West Africa brings to the fore. Cocoa's deforestation footprint is relatively small compared to beef, soy or palm oil, and, therefore, received less attention in the past.

However, its importance cannot be overlooked in view of its significant local impact on biodiversity hotspots, such as the Upper Guinean Rainforest in West Africa, the Amazon in Latin America, and rainforests in Southeast Asia (Kroeger et al., 2017). For example, by 2017, Côte d'Ivoire had lost around 90 per cent of its protected forest areas to expanding cocoa land (Higonet et al., 2017).

The direct causes of deforestation are fuelled by a multitude of indirect causes. These include a continuously rising market demand for agriculture and livestock products, export dependencies, poor enforcement of law, unclear land tenure regimes, and widespread poverty in many emerging and developing economies. Farmers and communities at the forest frontier are often among the poorest segments of the population and cut forest to expand production as a way to sustain their livelihoods (Ordway et al., 2017; Kroeger et al., 2017; Chakravarty et al., 2012). Poverty was found to be the most important driver for deforestation in Indonesia and Malaysia (Miyamoto, 2020) and in cocoa producing countries in West Africa (Kroeger et al., 2017).

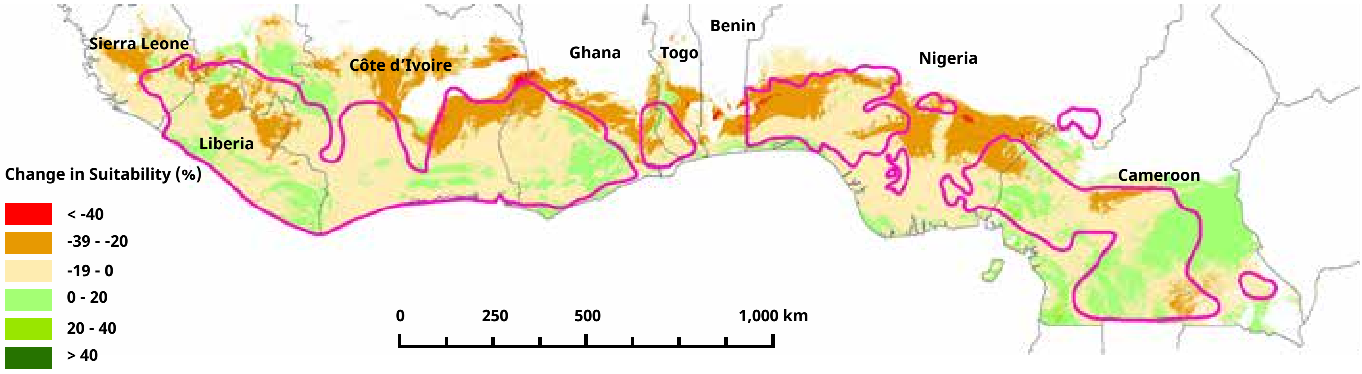
Forest loss can directly threaten the livelihoods of those living in or depending on forests and their resources. Impacts are also felt beyond forest boundaries. Deforestation can change the local microclimate and lead to lower local precipitation, reduced barriers to the spread of pests and diseases, and soil erosion, with serious consequences for the livelihoods of those relying on agriculture (Schroth et al., 2016).

For example, the land suitable for cocoa production in West Africa (see Figure 1), palm oil in Indonesia and Malaysia, and Arabica coffee in Southeast Asia, Central America, Latin America and East Africa, is projected to reduce gradually or even significantly in the future (Schroth et al., 2016; Ovalle-Rivera et al., 2015; Paterson et al., 2015). All these factors put further pressure on forest areas, resulting in a vicious cycle of poverty, land degradation and deforestation; all the while further threatening the livelihoods of millions of smallholder farmers (Schroth et al., 2016).

Addressing deforestation is difficult and there is no global consensus on the most suitable strategies – in part because deforestation causes, effects and stakeholders (and their interests) vary between local contexts (Miyamoto, 2020). As such, a plethora of national and international efforts – often in the context of multi-stakeholder initiatives – have been launched to conserve remaining forests and restore deforested and degraded lands, with varying degrees of effectiveness. One of the most prominent initiatives is the UN Programme on Reducing Emissions from Deforestation and Forest Degradation (REDD+), which incentivises developing countries to keep their forests standing by offering results-based payments for actions to reduce or remove forest carbon emissions. This feeds into the essence of deforestation reduction strategies, which must go hand-in-hand with improving the welfare of the people at the forest frontier (Chakravarty et al., 2012). For private actors, ongoing initiatives offer useful learning platforms and potential tools which can be leveraged for designing efficient, effective and sustainable business models for conservation.

This paper explores, through desk review and two case studies, emerging business models for conservation and agricultural production, with a specific focus on the livelihoods of smallholder farmers living at the forest frontier. Special attention will also be paid to the latest developments in technology used to monitor commodity-driven deforestation (e.g. GPS mapping of farms and forest areas, satellite measurements). The conclusions highlight the identified opportunities and pitfalls of strengthening the potential business models and approaches that support both forest conservation and livelihoods.

Figure 1: Projected changes in climatic suitability for cocoa in West Africa in 2050 (Schroth et al. 2016)



Business models combining agriculture and conservation

The agricultural sector has recently seen an increase in programmes focused on combining crop, livestock or timber production with agroforestry, reforestation, landscape management, and the inclusion of smallholder farmers and communities in or near forests. Business models centred on conservation and the economic benefits of forests and forest agriculture aim to reveal the true economic value of protecting the forest in a way that makes deforestation unattractive to all stakeholders, not just to those who stand to lose from deforestation. Such business models usually include long-term investments and sustained close coordination of multiple stakeholders. They can be powerful catalysts of rural transformation by creating jobs, raising incomes, reducing malnutrition, and kick-starting economies on a path to middle-income growth (Grow Asia, 2019).

The critical question of these business models is who benefits. Existing business models have not been sufficiently studied, and there is not enough evidence of what and for whom value is created. It seems evident that successful approaches take into account both the environmental and economic costs of different farming schemes, and compensate farmers for the costs they incur by implementing environmentally friendly (or conservation friendly) farming strategies (Banks, 2004). Based upon this key essence, a number of success factors of inclusive business models linking agriculture and conservation can be identified (see Box 1).

Payment for Environmental Services

Over the last 20 years, Payment for Environmental (or Ecosystem) Services (PES) has become one of the most promoted and popular instruments to provide incentives (financial and in-kind) to participants to engage in conservation practices (Perevochtchikova et al., 2021). They facilitate the direct exchange between those demanding environmental services, such as forest protection or rehabilitation, and those in a position to provide them locally (e.g. the local communities and farmers who might otherwise engage in deforestation activities). PES interventions are frequently implemented under the REDD+ umbrella, but there are also various nationally-funded initiatives and public-private partnerships between governments, companies and NGOs. Research on the effectiveness of PES on environmental and socioeconomic outcomes (e.g. reducing poverty of target communities) paints a mixed picture. Review studies find that PES may

Box 1. Key success factors for inclusive business models linking agriculture & conservation

- Coordinated action of multiple partners with clear roles and responsibilities, shared objectives, participation in decision-making, and clear accountability
- Proven demand in the market and established market linkages, including off-takers committed to purchasing set volumes of ‘conservation-friendly’ products, including food, forest and non-timber forest products
- Established and verifiable market requirements which support farmer groups to align their activities and ensure buyers clearly communicate their expectations
- Profitability for all players along the value chain, starting with farmers and communities at the forest frontier
- Sustained incentives for investments in conservation and solutions for producers to increase productivity and incomes
- Access to tailored finance for farmers and communities, in the pilot stages of an intervention and as the project scales up
- Conducive regulatory or policy environment that reduces risks for value chain actors
- Integration of projects into carbon trading markets or tree planting programmes, to attract funders from outside the value chains.

Source: Based on Grow Asia (2019)

increase household income, increase employment in ES provider communities, reduce deforestation, and improve forest cover and water availability (Snilsveit et al., 2019; Blundo-Canto et al., 2018). However, findings are based on low- and very low-quality evidence from a small number of programmes and should be treated with caution (Snilsveit et al., 2019).

Critical design factors determining the relative success of PES include (Grima et al., 2016; Snilsveit et al., 2019):

- Clear conditionality in implementation;
- Sustained financing (10-20 years commitments) necessary to achieve behaviour change with respect to the use of natural resources;
- In-kind forms of payment (rather than cash or cash and in-kind combination);
- Private (rather than public) entities as providers of PES;
- Inclusion of strong governance structures for PES implementation;
- Inclusion of ES providers in decision-making; and
- Effective targeting of both locations and participants.

In addition, many contextual factors are conducive to cost-effective PES, such as low levels of pre-programme compliance and opportunity costs, well established property rights, and limited mobility of production factors (Börner et al., 2017).

Based on the current evidence, strong conclusions about the short- and long-term impact of PES cannot yet be made (Snilsveit et al., 2019).

Critics argue that PES often benefits richer (and male-headed) households (Blundo-Canto et al., 2018); lack appropriate ecosystem service definitions specific to local contexts and thus output measurements (Börner et al., 2017); tend to treat environmental objectives secondary compared to pro-poor impacts; and do not consider trade-offs between impacts in different livelihood dimensions of ES providers (Blundo-Canto et al., 2018). Much of this can be explained with the poor design and implementation of PES programmes, which can even lead to adverse social or environmental impacts (Wunder et al., 2018).

Landscape Governance for Sustainable Sourcing

Integrated landscape approaches (sometimes also called jurisdictional landscape governance) are based on the idea of reconciling trade-offs between conservation and development objectives through multi-stakeholder, inter-sectoral governance in a specific region (Ros-Tonen et al., 2018). While there is great diversity in landscape governance, there is general recognition that it requires collaboration between value chain and non-chain actors to achieve positive impact on farmers, contribute to biodiversity conservation, and offer incentives for buyers to engage over a longer period of time (Arts et al., 2017; Ros-Tonen et al., 2018). This includes actors from local (or national) government, private sector, civil society, and farmer associations. Sayer et al. (2013) developed a set of design principles to guide landscape-level processes in an inclusive, democratic, and transparent way (see Box 2).

Box 2. Ten 'best practice' principles for a landscape approach reconciling agriculture, conservation, and other competing land uses

1. The dynamic nature of landscapes forms the basis for continual learning and adaptive management.
2. Intervention strategies are built on common concerns and shared negotiation.
3. Landscape processes are shaped by influences from multiple scales.
4. Landscapes are multifunctional by nature, which requires choices and trade-offs.
5. Multiple stakeholders frame objectives differently, hence all stakeholders need to be engaged.
6. Trust among stakeholders is crucial to build up a negotiated and transparent change logic.
7. Clarification of rights and responsibilities, especially regarding land and resource use, is a necessity.
8. Monitoring of progress has to be done in a participatory and user-friendly manner.
9. System-wide resilience is to be achieved through recognising threats and vulnerabilities, and the capacity to resist and respond.
10. The complexity of landscape processes requires strong capabilities of all stakeholders involved.

Source: Sayer et al. (2013)

Photo: Divine Chocolate

One of the application areas is the tropical landscapes where soy, palm oil, timber and cocoa are produced for international export markets (Ingram et al., 2018). Here, a ‘landscape’ overlaps with a sourcing area of specific crops. As such, landscape approaches are increasingly embraced by companies, who recognise landscapes are a source of resources and income that need to be managed to: secure supply; combine economic returns with sustainable land use; respond to consumer demand (or public pressure); and optimise stakeholder collaboration within their sourcing areas (Arts et al., 2017).

The most popular strategies of landscape governance approaches include: certification; partnering; and promoting an enabling environment for ecosystem services, by raising awareness of ecosystem services as a means to develop new business practices (Ingram et al., 2018). More recently, the use of technology, such as GIS mapping, has become more widespread as a means to monitor progress against set targets. This illustrates the opportunity for innovation in landscape governance. Furthermore, innovative approaches could help share the value created by landscape governance with grassroots farmers who need to benefit in order to achieve sustained improvements.

By means of the diversity in strategies used, landscape governance has the potential to go ‘beyond certification’ and ‘beyond the chain’ as critical steps to create incentives for actors to address conservation and ecosystem services in international supply chains (Ros-Tonen et al., 2018). Where it can be linked to different private sector actors, there is also potential to create a level playing field which rewards agro-ecological diversity within sourcing areas, instead of continued mono-cropping regimes (Ingram et al., 2018).

However, the evidence base of ecological and socio-economic impact of landscape governance approaches is still poorly developed. Moreover, a number of challenges have been identified by scientific studies, including unclear definition and/or integration of ecosystem services, persisting limited inclusiveness of private sector-led arrangements, questions about the equitability of risk and benefit sharing, a narrow commodity focus, and heavy reliance on public sources of funding (Ingram et al., 2018; Ros-Tonen et al., 2018).

The role of technology in agriculture and conservation

Technology, such as satellite imagery, farm management software and GPS mapping, has become much more widespread in recent years to monitor progress, stagnation or failure to reduce deforestation. These are important, for example, to establish reference levels (e.g. for emission reduction) in PES programmes or to model landscape-scale impacts of different agricultural management systems (Middendorp et al., 2018).

Technology used in tackling deforestation and supporting conservation, reforestation, regeneration or agroforestry activities, can be defined and categorised according to main users (e.g. supply chain managers, smallholder farmers and financial institutions) and purposes (e.g. digital farmer advisory, access to markets, access to finance, meeting certification standards, yield predictions, weather, and pests information provision). The hardware infrastructure which supports these solutions includes mobile tools (e.g. smartphones), agronomic diagnostics equipment (e.g. crop testing tools and soil), surveillance systems (e.g. satellite networks, drones, soil and crop sensors), weather stations and 'in situ' sensors (e.g. farm field sensors, agricultural machinery sensors and logistics sensors for transport). The software infrastructure comprises a wide range of field data collection and management tools, data analytics tools, and software building blocks, such as blockchain, artificial intelligence, machine learning algorithms, and enterprise resource planning (Tsan et al., 2019).

Accessibility of technology-based solutions varies greatly. Whereas at farmer level, the main answer to digital solutions seems to be to expand the use of mobile phone technologies, large agribusinesses and international platforms are surging ahead with more sophisticated technologies. The solutions offer benefits to value chains and to those paying for their implementation; for instance, by offering visibility in quantities, qualities, locations, and exchanges of ownership and finances, or by helping companies manage potential food recalls in case of any food safety risks. Examples are ChainPoint, Farmforce, CropIn, Sourcetrace, Sourcemap, and SAP.

Agribusinesses in particular have started adopting such solutions to comply with mandatory and voluntary standards and certification schemes, often integrating their output data with forest monitoring data for improved supply chain traceability. The starting point of a traceability system is almost always data collection on the geo-locations of farmers' plots. These can then be overlapped and compared against maps (satellite images) of protected areas, often primary tropical forests with a history of illegal deforestation. One of the leading digital solutions is Global Forest Watch Pro (GFW Pro), an online app supporting businesses in reducing deforestation in commodity supply chains. The app delivers critical decision-making analysis at property, supply shed and portfolio levels, on managing and monitoring changes in deforestation risks. It is built upon timely data from the Global Forest Watch Partnership and World Resources Institute, and monitors locations in over 90 countries, including more than 60 million hectares of farms and concessions and one billion hectares of supply areas surrounding agricultural processing facilities.

Examples of GFW Pro users include (GFW Pro, 2021):

- Louis Dreyfus Company audits farmers in Paraguay on sustainability schemes for soy production. The company constantly watches for deforestation alerts and reviews high-risk locations every six months.
- Mondelēz International mapped over 90,000 cocoa farms in Ghana and Côte d'Ivoire to analyse forest cover, improve on-the-ground programme decisions, and help farmers grow more cocoa on less land.
- Procter and Gamble has mapped 1,200 suppliers of palm oil millers around the world and identified that 7 per cent of mills in its supply chain are located within high-risk areas. The company now prioritises engagement with these mills to tackle deforestation.

There are also individual company initiatives. For example, in 2020, Cargill launched CocoaWise—a digital portal which provides fast and easy access to sustainability data of its cocoa supply chain. The company already tracked 151,190 metric tons of cocoa beans using barcoded cocoa bags and digital cooperative management systems in 2018-2019 and made public the names and locations of farmer cooperatives, buying centres and sustainability projects running at each location in Côte d’Ivoire, Ghana and Cameroon (Cargill, 2020).

The increase in mapping of areas where agricultural commodities are grown has led to the identification of farming risks, driven by both large and small-scale farmers, and the development of mitigation approaches. Companies have begun acknowledging that a proportion of their suppliers are situated in areas that were previously primary forests cut illegally. Other farmers are in buffer areas, placed under a ‘high deforestation risk’ status. Companies with traceability systems in place indicate that suppliers are immediately suspended in case they are linked to (illegal) deforestation. Action plans are developed to lead farmers towards more sustainable practices. However, farmers may continue to sell their products to other less-demanding buyers and circumvent sanctions, especially when market demand for their product is high, regardless of the production methods used.

Monitoring projects, such as the ones exemplified above, face the challenge of needing to track growing trees, carbon storage and other benefits (e.g. food, economic, biodiversity) provided by forests. This is also important to show whether initiatives combating deforestation, e.g. by planting trees, succeed. When this is done in a standard way, global platforms can link conservation projects with new funders. For example, this is being done by Mastercard Foundation’s initiative (together with the World Resources Institute and Conservation International), planting 100 million trees by 2025, or by TerraMatch (by the World Resources Institute), a global platform which matches tree-growing projects with people and organisations who want to fund this work.

Moreover, monitoring methods and the type and quality of data vary greatly and are expensive for small-scale projects. The World Resources Institute is therefore developing a “consistent, scientifically sound, cost-effective protocol that practitioners across the world can use, and investors can trust” (World Resources Institute, 2020). This protocol will measure key indicators such as tree count, cover and species, and will combine field data collection with remote monitoring approaches like satellite imagery interpretation and artificial intelligence. The advantage would be that, when projects use the same protocol, the aggregated data will offer insights into the success rate of tree-planting initiatives.

Photo: Divine Chocolate

Divine Chocolate - Conserving the Gola rainforest in Sierra Leone using high quality cocoa

Local context

The Gola Rainforest National Park (GRNP) in South-East Sierra Leone and its adjacent forests are the country's largest remaining areas of the Upper Guinea Tropical Forest, a biodiversity hotspot of global importance. The area is home to over 330 bird species and 49 species of large mammal, including the Critically Endangered Western Chimpanzee and the Endangered Pygmy hippopotamus (Klop et al., 2008). Around 40,000 people live around Gola, with 90 per cent of their livelihoods depending on natural resources and subsistence agriculture. The forests are therefore under significant pressure from clearance and degradation, especially due to the farm fallow agricultural system practiced by local communities. In addition, other unsustainable activities, such as mining and timber extraction and the 1990s' civil war, have also been, or continue to be, serious threats to Gola's biodiversity (Tubbs et al., 2015). Initial conservation work in the area commenced in the 1990s and was funded by the Global Conservation Fund and the European Union. However, donor funding was deemed not to be a viable option for long-term conservation, driving stakeholders involved to start investigating other financing mechanisms, including private sector involvement.

Business models for conservation and economic development through agriculture

A major multi-stakeholder effort in the Gola area is a REDD+ project initiated in 2012 by the Royal Society for the Protection of Birds (RSPB) to conserve a tropical forest area of 68,515 hectares, protect species, and provide livelihood support to 114 surrounding impoverished communities (Global Citizen, n.d.). The project is implemented by the Gola Rainforest Conservation LG, a non-profit organisation formed by three partners: the Government of Sierra Leone, the Conservation Society for Sierra Leone, and RSPB.

The REDD+ project essentially aims to create a new business model based on selling carbon credits: carbon captured by the rainforest is measured, and carbon credits are validated by the Verified Carbon Standards and the Climate, Community and Biodiversity Standards. In order to sell carbon credits under the Verified Carbon Standard, a forest-carbon project must be validated and verified (audited); and the Rainforest Alliance was the partner of choice for these efforts. According to REDD+ project documents, the income stream (e.g. PES to village leaders or chiefdoms) will lead to less deforestation activities, as financial resources will support the implementation of a conservation strategy in the buffer zone (4-7 km around the GRNP) and sustainable resource management focused on cocoa and other food crops (e.g. rice, maize, cassava, sorghum, and millet) (RSPB, 2015).

A second effort consists of a cocoa-focused partnership formed in 2015 between local communities, the Government of Sierra Leone, the Conservation Society of Sierra Leone and, later on in 2018, with Divine Chocolate—a UK-based 100 per cent Fairtrade-certified chocolate company co-owned by cocoa farmers and chocolate manufacturer Weinrich. The aim of this partnership is to combine conservation goals with sustainable cocoa farming and project financing. The large majority of farmers in the Gola region grow staple crops (e.g. rice) and cash crops, such as cocoa, which assures around 40-60 per cent of their income (the average family has 8.5 members) (Innes, 2019). Historically, they have been unable to benefit from agricultural initiatives aimed at developing cocoa farming, due to geographical isolation, illiteracy, gender inequities, and low social cohesion.

Reported average cocoa yields are 146 kg per hectare per year, and the majority of farms need renovation and rehabilitation, as the cocoa trees are old (>50 years) and produce suboptimal harvests. These numbers indicate a failure of previous projects which aimed to increase the incomes of farmers selling cocoa. The REDD+ initiative has a PES-based component for improving cocoa yields and, before Divine Chocolate, other private cocoa traders and chocolate companies used their own investments and public grants to support cocoa farming. The latest reported average income for a family at the edge of the GRNP is US$ 1,009, with most families living far under international poverty lines and the living income benchmark estimated at US$ 4,658 (Innes, 2019).

The Divine Chocolate project builds on the work of RSPB and the Gola Rainforest Conservation LG, which organised farmers into associations and provided technical assistance on growing, processing, and selling cocoa. Since 2016, farmers have been organised into a third-tier cooperative union called Ngoleagorbu (formally registered in 2019), meaning 'we who live at the forest edge', with a membership of 2,362 farmers in 2021. Ngoleagorbu aims to practice 'forest-friendly farming' and export cocoa at premium prices, under Fairtrade and organic standards, to international buyers such as Divine Chocolate. In 2020, Ngoleagorbu became the first farmer-led organisation to obtain an official export license and managed to directly export its first container to Rotterdam harbour through UK-based importer Ético.

The key variables driving the conservation business case in the Gola area are the market access through Divine Chocolate and the income streams that farmers receive: the Fairtrade and organic premiums, and the REDD+ cash transfers to village leaders. In addition, 2 percent of Divine Chocolate's annual turnover is invested in a 'Producer Support and Development' fund, part of which goes towards supporting Ngoleagorbu farmers to professionalise their cooperative management and improve cocoa quality.

The Gola Rainforest Conservation LG, as the local partner for Divine Chocolate, was tasked with continuing technical assistance for cocoa farming, with the Divine project adding extra resources and a focus on quality. The partners aim to use the Smallholdr software to capture the GPS locations of farms and ensure these are not located in the GRNP, and to measure cocoa plots and track cocoa; with all activities partly funded by a grant. Another feature of the Smallholdr application is the management of fieldwork by extension teams and field agents. The use of the software and resulting data should lead to proof that the cocoa is 'forest-friendly', as well as to improvements in the cost-efficiency of extension work. It would therefore strengthen the cocoa business case.

However, implementation has been delayed in 2020 and 2021, partly due to the COVID-19 pandemic and partly due to negative developments involving Gola Rainforest Conservation LG, a key partner in the Divine Chocolate project. Both impact the effective and sustainable implementation of conservation and agriculture activities. Gola Rainforest Conservation LG cited COVID-19-related difficulties, among others, and stopped providing technical assistance to the cocoa farmers before its contract with Divine Chocolate ended. Divine Chocolate mentioned a potential conflict of interests, as Gola Rainforest Conservation LG started pursuing its own cocoa trading activities, building a business relationship with Ngoleagorbu and selling the cocoa to other buyers without quality criteria. Such challenges negatively affect both the farmers and the efficacy of the whole business model in preventing deforestation.

Impact and discussion

The Divine Chocolate intervention has been well designed and adapted to the difficult socio-economic context. One intermediate outcome is the successful development of 'forest-friendly' criteria by project partners and Ngoleagorbu, based on five principles for 'forest-friendly' cocoa: beneficial for consumers; beneficial for forest-based farmers; protective of the environment; grown in agroforests supportive of forest dependent wildlife; and supporting the integrity of the forest habitat in the landscape. This outcome is important for the continued market access for Ngoleagorbu—a key factor in the agri-conservation business model. The 'forest-friendly' protocol has already attracted another large chocolate maker in the UK, as well as the UK Fairtrade Foundation, which is promoting the case in view of its importance to conservation.

The Fairtrade premium and 'forest-friendly' premium also have the potential to raise farmers' cocoa-related income. There are indications that pre-intervention prices fluctuated from between 5,000 to 12,000 SLL (Sierra Leone leones) per/kg, and post-intervention prices increased to 10,000 SLL with a peak reported of 25,000 SLL per/kg in 2020 (Tetra Tech, 2020); but solid data over time is still missing.

Different interventions have also contributed to building the capacity of Ngoleagorbu and its member associations and helped train farmers. For example, in addition to Divine Chocolate (which has invested EUR 303,000 since 2018), there is the IDH Cocoa Origins Program (which invested EUR 300,000 to strengthen Ngoleagorbu and its farmers) and the Lorna Youth Foundation (which received a £50,000 from the UK's Small Charities Challenge Fund to broadcast participatory radio to train farmers).

Yet, given the context, achievements are fragile and need to be sustained and expanded on. Working with reliable partners to train and monitor farmers is an important component. After the loss of a critical local partner in Gola Rainforest Conservation LG, a newly-hired agronomic consultancy company resumed farmer training on good agriculture practices. As of May 2021, Divine is still awaiting the loosening of COVID-19 related restrictions, so that implementers of the Smallholdr software can reach the farmers. With data on the size of cocoa plots and tree counts becoming available, Divine Chocolate can then use the premiums paid as incentives for farmers to replace old trees and perform proper farm maintenance. Finances are made available through a grant for the construction of a nursery and provision of cocoa seedlings.

While investments have been made, it is important not to develop a 'project-based mentality' and further work on the business case for farmers, raising quality and productivity. Ongoing public grants to Ngoleagorbu, Gola Rainforest Conservation LG and RSPB are already building upon the results achieved by the local actors with past grants, partly with the same cocoa-related targets—from Rainforest Alliance, International Fund for Agricultural Development and Comic Relief, among others. If not well managed and coordinated projects with competing or un-aligned conservation strategies, can have detrimental consequences without leading to benefits for farmers. Despite the history of public and private initiatives in the Gola area, including the REDD+ project, clear evidence of impact is scarce. The PES scheme seems to be a case in point: there are allegations that the REDD+ benefits from carbon storage do not reach and benefit farmer households. Transparent data and information can help to verify (or reject) related assertions and claims, and offer a clear evidence base for outcomes and impacts achieved—something which needs to be improved in the future.

Solidaridad – PES for coffee farmers in Colombia

Local context

Colombia is an important biodiversity hotspot in Latin America. The country hosts a wide variety of natural areas, including the Amazon Basin, the Andes mountains, and extensive river landscapes. Ten percent of global plant and animal species can be found in Colombia, which makes it the second most biodiverse country in the world (Selibas, 2020).

To understand conservation in Colombia, one needs to appreciate the socio-political context of the country. Colombia was the scene of a long civil war that ended in 2016 following a peace agreement between the Colombian government and the FARC rebels. Although the peace agreement can generally be seen as a positive development, it is one of the causes for increasing deforestation (Clerici et al., 2020). During the civil war, Colombia's forests remained well-preserved because the FARC strictly controlled deforestation so as to conceal their movements, along with the illegal mines and coca plantations that financed most of their operations. The FARC's demobilisation left a power vacuum for other illegal criminal groups (Clerici et al., 2020), who currently cause up to 70 per cent of deforestation occurring in the Amazon area of Colombia through illegal logging, mining, coca cultivation, and clearing of forest for pasture (Selibas, 2020). Deforestation is further driven by poverty and the lack of economic options in remote rural areas. Communities living in regions without infrastructural development and established stable markets often rely on clearing forests to claim land for subsistence agriculture (Clerici et al., 2020). This is what the Solidaridad project in Colombia attempts to address.

Business models for conservation and economic development through PES

In 2013, the NGO Solidaridad started working with nearly 6,000 coffee farmers in the regions of Risaralda and Cauca, with the aim of supporting them in adapting to climate change as well as protecting biodiversity on and around their farms. While Solidaridad was happy with the results of the projects, including the adoption of climate-smart agriculture by farmers, they encountered challenges in turning these conservation practices into financial benefits (Solidaridad, 2021). Subsequently, Solidaridad partnered with an existing voluntary scheme for PES, called BancO2, created by the Colombian Government in cooperation with the Colombian NGO, Masbosques. This voluntary scheme allows private companies and public entities in the Colombian market to compensate for their ecological footprint by making payments to farmer families and indigenous communities in exchange for conserving the environment both on their farm and in surrounding areas. In this project, Solidaridad supports farmers in receiving access to BancO2, in addition to providing training and access to inputs, promoting agroforestry production systems and collecting data on socio-economic indicators. Around 1,000 coffee farmers from Solidaridad are currently part of BancO2.

Families living in prioritised ecosystem areas can join the scheme provided they implement the activities as outlined in the PES contracts. These farmers are then monitored through GIS tracking and receive the necessary training for conservation. Monitoring of compliance with the PES agreements is done through visits by officials from the public Environmental Authorities (Masbosques, personal communication, 28/4/2021). When everything is in order, payments are made through a banking app from Bancolombia called 'Ahorro a la Mano' (Savings in your Hand). This leads to some challenges, as participating farmers can be illiterate or are located in areas with poor connectivity. Illiteracy in general is an important challenge, as it makes it difficult for farmers to understand the agreements on which the PES is based.

The payments to the farmers come directly from local authorities, who pay using income from environmental taxes or companies. Having both public and private customers creates a broad and stable market for carbon credits. Companies have the benefit of being able to directly choose the areas where they want to invest in carbon credits. For example, hydro-electrical companies can directly invest in conservation of the watersheds on which their projects rely. The transparency of the scheme is also a selling point due to corruption of local authorities, which can easily be bypassed through BancO2. Moreover, companies can deduct one-quarter of their investment in the scheme from their income taxes.

Another interesting feature of the project is how it deals with farmers who are already in protected natural areas. This is a complex issue, because forcible relocation by local authorities is unthinkable in a post-civil war recovery. To advance conservation of protected areas, authorities first attempt to offer farmers land and money elsewhere to move them outside protected zones. If this does not work, cooperation is the only option, and farmers in protected areas are allowed to join the PES scheme to conserve surrounding areas and use more environmentally-friendly production systems, such as agroforestry.

Impact and discussion

At this stage, Solidaridad is still measuring the impact of its initiative and to what extent farmers involved have improved their income and whether it has been effective in countering deforestation. However, the overarching BancO2 is one of the largest national PES schemes in Colombia and they appear to be successful in conserving biodiversity hotspots, with over 141,000 hectares conserved and around 20,000 farmer families and indigenous communities reached. BancO2 is currently the PES with the highest impact at household level in Colombia, as monthly payments to farmer families can amount to up to US$ 250 per month (Moros et al., 2020). In the Amazon region of Colombia, BancO2 works mostly with indigenous communities. Incentive payments in these contexts are communal and made in accordance with a communal investment plan which, in turn, builds on community 'Planes de Vida' (Life Plans).

One of the key success factors of BancO2 is the fact that costs are kept low through the use of an online platform for transactions. This has increased transparency and participation, particularly for potential funders. BancO2 is also very attractive to private companies that seek to offset their impacts, generate a good corporate image, and receive tax write-offs. The programme establishes legitimacy in this space by positioning itself as a transparent means to simultaneously contribute to conservation and social goals. Key elements of the approach include the aforementioned highly transparent online transaction mechanism and, more recently, certification which allows polluting firms to avoid paying a carbon tax if they offset emissions. Finally, BancO2 is attractive to farmers because they receive monthly payments, which contributes to household income. However, a downside is that this makes it challenging to impose conditionality and sanctions in a consistent manner. Furthermore, Masbosques argues that, for the PES to really generate a positive impact on families, a process of five years is needed (Masbosques, personal communication, 28/4/2021). This can be problematic, because a lot can change in this time frame, such as changes in land use (e.g. mining) or the involvement of local authorities or companies.

The success of BancO2 shows that providing farmers with access to carbon markets and related PES can be a viable method of fostering conservation while simultaneously giving farmers and communities an additional source of income. It also generates benefits to participating companies. The cooperation between BancO2 and Solidaridad is therefore a promising way to connect coffee farming with conservation objectives. In the future, impact can be increased by expanding beyond the local Colombian carbon market. Solidaridad is currently looking into offering Colombian coffee carbon credits on the international market, which has more stringent criteria, especially on scale (e.g. smallholder farmers do not qualify because of their small landholdings). This can be interesting for large coffee multinationals sourcing from Colombia, as they can provide extra support to the coffee farmers in their respective chains whilst compensating for their ecological footprint, and market a product that contributes to biodiversity conservation.

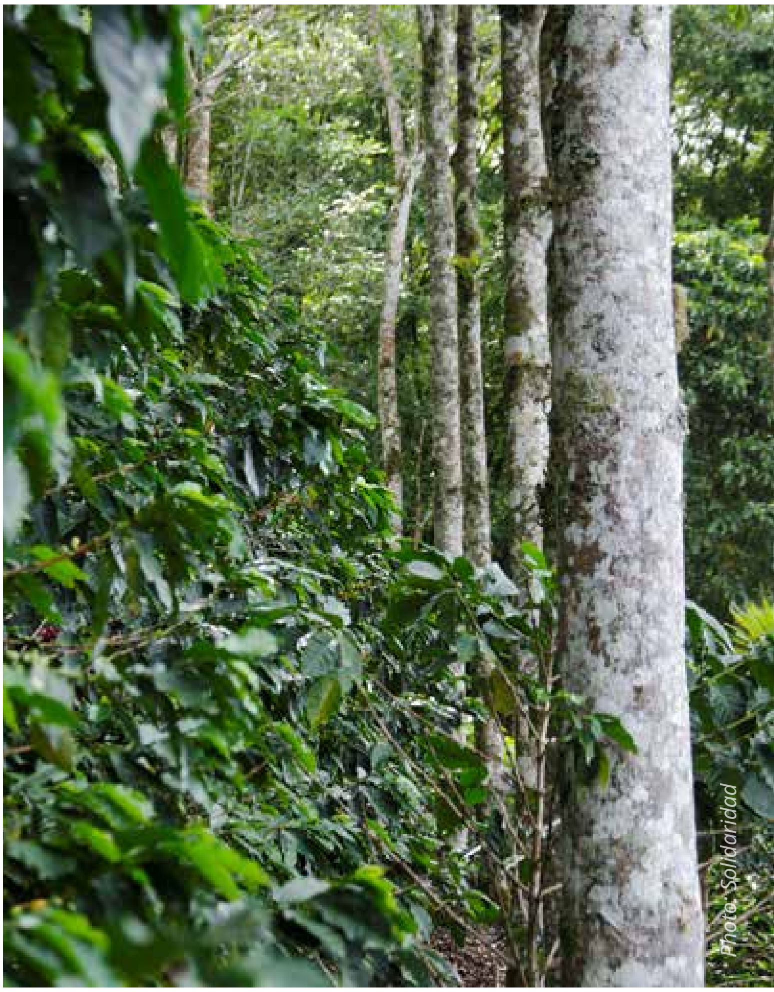
Conclusion

The two cases of this paper illustrate some of the opportunities and challenges of business models linking agriculture and conservation through specific projects.

The Gola case in Sierra Leone entails all the right ingredients of a successful inclusive business model (as defined in section 2)—clear partner roles; market demand; potential of profitability from trading cocoa; sustained incentives for investments in conservation; and solutions for producers to increase productivity and incomes, support farmer groups, and provide farmers with access to tailored finance upfront. The private and public support targeting the cocoa farms, culminating with the Divine Chocolate project in the last three years, showed that joint aims of increasing cocoa yields, incomes and conservation, are possible. However, creating a sustainable business model also depends on other factors. For example, there are doubts that the local producer association Ngoleagorbu can function independently and follow a business plan once the Divine Chocolate project activities are finished. Also, the task of implementing the Smallholdr software, which would accelerate the process and lower the costs, cannot be delegated to Ngoleagorbu. Without long-term partnerships, allowing for cost-efficiencies (using technology), cocoa farms remain in need of renovation, with farmers having little ability and knowledge to invest in creating a cocoa-based livelihood.

The case of Solidaridad in Colombia, but more notably BancO2, shows that PES can be a viable method of conserving natural areas by providing clear incentives for conservation, rather than disincentives (e.g. sanctions). At the same time, the importance of an enabling environment comes to the fore, as the existing national Colombian carbon market, the environmental taxing system, and the conditions offered to private companies (e.g. tax write-offs), make the success of BancO2 highly context specific. This leads to the question whether a similar programme can be successful elsewhere. For example, local cocoa companies in West Africa have little incentive (or pressure) to offset their ecological footprint. This can be rather different for multinational companies with clear consumer demand or public pressure. Ensuring a mix of private sector involvement is therefore critical to create incentives along the supply chain. Moreover, linking smallholder farmers to global carbon credit markets seems imperative, but this is currently not the case as they do not meet the stringent criteria of global PES schemes. It is therefore interesting to see to what extent Solidaridad will be successful in selling Colombian carbon credit on the international market, as this might pave the way for PES reaching smallholder farmers.

A business approach to agriculture and conservation is not a panacea—but it moves away from *'business as usual'* and can offer important insights about identifying revenue streams which combine economic and environmental benefits. Finding successful approaches requires experimentation, longer-term commitments and tailoring business plans to local circumstances, including social processes, legal frameworks and economic opportunities. As the global destruction of forests and natural habitats continues at unprecedented rates, the next step will be to move from individual experiences and exemplary cases to collective learning and cross-commodity action.



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