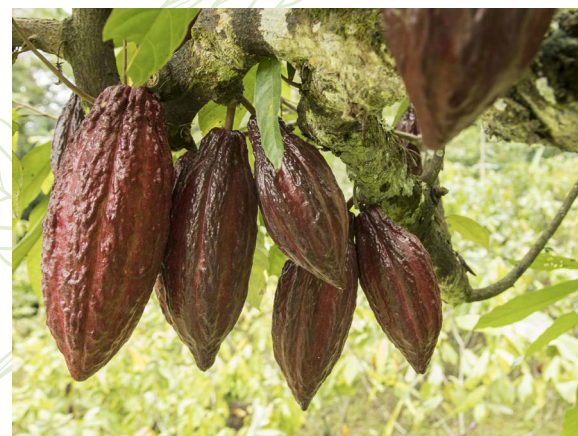
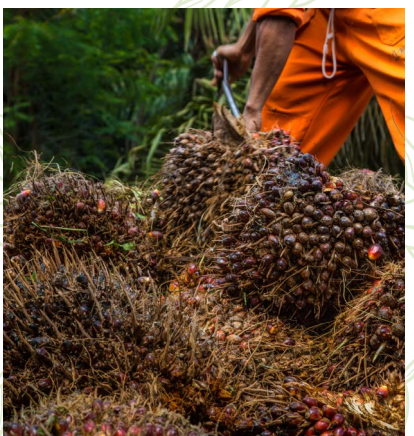




Incentives for deforestation-free value chains in the Peruvian Amazon



Supported by:



Federal Ministry
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INCENTIVES FOR DEFORESTATION-FREE VALUE CHAINS IN THE PERUVIAN AMAZON

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The relation

Natural forests provide goods and services necessary for the sustainability of society and the planet, such as carbon capture, biodiversity, water regulation, forest products, food, and medicines, among others (FAO, 2010). In a climate change scenario, forests are essential to combat the increase in global temperature. However, deforestation is one of the main causes of the increase in greenhouse gases (GHG) in the atmosphere, which is causing global warming and is increasingly related to the loss of biodiversity, which is substantially affecting the services and goods provided by ecosystems. Furthermore, deforestation contributes to the growth of poverty as forests provide 90% of the livelihoods (timber, medicines, food, fibers and building materials) of those living in poverty (FAO & UNEP, 2020). Once trees are cut down, it takes years to replace them, driving people deeper into poverty. At the same time, poverty is also a contributor to deforestation. This is one of the major obstacles to sustainable rural development in tropical countries, and one of the major challenges to achieving the Sustainable Development Goals (SDGs) for the world (Wan Mahari et al., 2020). Despite efforts to reduce deforestation rates, over the last three decades since 1990 some 420 million hectares of forest have been lost globally through conversion to other land uses (FAO & UNEP, 2020). The Intergovernmental Panel on Climate Change (IPCC) estimates that emissions within agricultural activity and from agricultural land expansion, which contribute to the global food system, represent between 16% and 27% of total anthropogenic emissions (IPCC, 2019).

The direct and underlying causes of deforestation are multiple and the processes are complex; however, the expansion of agriculture continues to be a direct cause of deforestation and forest fragmentation (FAO & UNEP, 2020).

According to the Governors' Climate & Forest Task Force (GCF Task Force), between 2001 and 2015, more than 71.76 million hectares of land were deforested globally primarily for agricultural production (Pritchard & Cupp, 2019). Cattle, coffee, cocoa, soybean, and oil palm rubber and plantation wood fiber production are associated with deforestation processes (Goldman et al., 2020). At the same time, the production, processing, and distribution of these products also contribute to employment and income. Therefore, working with the value chains of these products should be part of the solution to curb deforestation¹.

The challenge is to find a novel and innovative model to maintain or increase agricultural production, without involving its expansion into areas of natural ecosystems, by reducing negative environmental consequences, and by maintaining or improving the competitiveness of these value chains and their respective business models. This is a complex approach, but one with great potential for the sustainable development of agricultural frontier areas. It requires the involvement of

the different links in the value chains and the improvement of the capacities of the relevant actors. This value chain approach, which involves different links, is novel but still incipient since most of the current efforts on deforestation-free² value chains focus only on the production link or the final consumer link. Little emphasis has been placed on the intermediate links that could generate incentives to align decisions along the chain to promote deforestation-free behavior.

Although deforestation processes affect the entire world, there is greater concern about tropical forests, particularly the Amazon basin because of its high biodiversity value (FAO & UNEP, 2020). In Peru, in 2020, the Ministry of Environment (MINAM) reported 68,274,160 hectares of Amazon rainforest, which occupies 53.1 % of the total area of the country, after the loss of 148,426 hectares of forest in 2019 (MINAM & PNCBMCC, 2020). The information available on the causes of deforestation in Peru, the actors driving this process and their motivations, is still limited and in some cases, inaccurate (Ravikumar et al., 2017). However, there is a spatial relationship between the production of some of the main commodities (cocoa, coffee, oil palm, and beef) to varying degrees throughout the Peruvian Amazon. Although no causality is attributed, they show a coexistence between deforestation processes and agricultural production (e.g., cocoa, coffee, oil palm) in the same territory (Castro-Núñez et al., 2020a). This coexistence justifies the need to work with the value chains of these products to explore opportunities to reduce or avoid deforestation in these areas.

-
1. International trade in commodities, such as palm oil, soybeans, and cattle, generates more than US\$80 billion annually in export revenues for producing countries. 1.5 billion people, many of them in developing countries, depend on this activity for their livelihoods. For more information see: <https://bit.ly/3R4dWqL>
 2. This document uses the concepts of zero and deforestation-free in the contexts that correspond to the discourse used in the country.

This article has the following objectives: 1) to identify the bottlenecks in the cocoa and palm oil value chains in the Ucayali region (Peru), so that their different actors and links can contribute to avoid deforestation, and 2) based on these bottlenecks, to identify the enabling conditions and incentives (from the perspective of the actors in the different links of these value chains), necessary to reduce or avoid deforestation in this Amazon region.

This document is developed in the following sections: first, it describes the conceptual and action framework for deforestation-free value chains; second, it describes the bottlenecks and/or constraints for value chains to achieve the objective of reducing or avoiding deforestation; third, it identifies the enabling conditions necessary to generate incentives for non-deforestation at different levels of the value chain; and the fourth section presents (as a case study the proposals of the project “*Business models to address the drivers of deforestation in Peru – Sustainable Amazon Businesses (SAB)*”, in which deforestation-free value chain strategies for cocoa and palm oil were built using multi-stakeholder platforms, and deforestation-free business models were designed and implemented for the prioritized chains. It is important to highlight the perspectives of the actors in the chains, as they are the ones

who can bring about significant change in driving agricultural production towards an activity that contributes to rural and sustainable development in the Peruvian Amazon.

The identification of bottlenecks, enabling conditions, and incentives to contribute to the reduction of deforestation was carried out through a literature review on value chains, sustainable value chains, and deforestation-free value chains. Additionally, semi-structured interviews were conducted with national and international experts between March and April 2021: Ministry of the Environment (MINAM), Ministry of Agriculture and Irrigation (MIDAGRI), National Forest and Wildlife Service (SERFOR) of Peru, Earth Innovation Institute (EII), Tropical Forest Alliance (TFA), Peruvian Society of Eco-development (SPDE), and NGO Solidaridad, among others. Information collected in 2019 through semi-structured interviews with representatives of the cocoa and palm oil chains in the Ucayali region was also used.

The interviews provided information on the role of value chains in reducing and eliminating deforestation, the opportunities for developing deforestation-free value chains in the Amazon, their bottlenecks and the incentives and conditions needed to promote and implement value chains that do not affect forests. Two specific case studies of the cocoa and palm oil chains in the Ucayali region were also analyzed. These were prepared under the SAB Project led by CIAT, as part of the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), in coordination with MINAM and MIDAGRI in Peru. The project is part of the International Climate Initiative (IKI), which is supported by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany (BMU).



Conceptual and action framework for deforestation-free value chains

Land use and land-use change (LULUC) is a major source of GHG emissions globally (Taylor & Streck, 2018). Twenty-seven percent (27%) of global forest loss can be attributed to deforestation due to permanent land-use change for agricultural production (Curtis et al., 2018). Between 2001 and 2015, more than 71.76 million hectares of land were deforested for agricultural production (Pritchard & Cupp, 2019). The adverse effects of deforestation are not only increased GHG emissions, but also loss of biodiversity and ecosystem services and soil degradation. Similarly, deforestation has negative social effects, associated with increased poverty including food insecurity (along with the loss of local dietary diversity) (Blundo-Canto et al., 2020) and the displacement of populations, including indigenous communities (Taylor & Streck, 2018).

Deforestation, associated with agricultural production, is a global problem that is part of the main agenda of several international environmental initiatives and strategies. Many of these initiatives recognize the opportunity working with value chains to contribute to forest conservation and climate change mitigation.

The following table summarizes some of the main international and national initiatives that focus on agricultural value chains in their approach to reduce deforestation.

These initiatives are grouped into four types: (1) multi-stakeholder initiatives, such as Public-Private Partnerships (PPPs); (2) government initiatives; (3) private sector initiatives; and (4) other sectoral initiatives.

Table 1. Main initiatives and commitments related to zero-deforestation value chains.

	NAME OF THE INITIATIVE	BRIEF DESCRIPTION
Public-private partnerships representing multiple governments and different commodity companies	New York Declaration on Forests (NYDF)³	Driven by the UN and signed in 2014 by governments, companies, and civil society, it includes indigenous peoples' organizations, with the goal of halving annual natural forest loss by 2020 and eradicating it by 2030.
	Tropical Forest Alliance (TFA)⁴	Global public-private partnership where parties take voluntary actions to reduce deforestation in the tropics associated with the provision of commodities, such as palm oil, soybean, beef, among others.
	Forest Positive Coalition of Action⁵ – Consumer Goods Forum (CGF)	Global initiative composed of CGF member companies committed to driving collective action and accelerating efforts to eliminate deforestation, forest degradation and the conversion of key commodity supply chains.
	Coalition for Sustainable Production⁶	National initiative that integrates representatives of the public sector, private sector, organized civil society and academia to promote deforestation-free chains and sustainable jurisdictions in the Amazon and forests of northern Peru.
Government initiatives	European Parliament and the Council of Europe Regulation Concerning the sale in the EU market and the export from the EU of certain raw materials and derived products associated with deforestation and forest degradation and repealing Regulation (EU) No. 995/2010⁷	Initiative comprising the member countries of the European Union that aims to protect and improve the health of existing forests, especially primary forests, and significantly increase forest cover and biodiversity globally. Included as part of the proposal is a regulation to minimize deforestation and forest degradation caused by the EU. Six commodities (beef, timber, palm oil, soybeans, coffee, and cocoa) and some of their derivatives are included in the scope of the regulation. The aim is to ensure that only legal, deforestation-free products enter the EU market.

3. New York Declaration on Forests and Action Agenda and New York Declaration on Forest Progress Assessment.

4. Tropical Forest Alliance.

5. Forest Positive Coalition of Action and Consumer Goods Forum.

6. Roadmap: Towards the consolidation of a Coalition for Sustainable Production.

7. Proposal for regulation by the European Parliament and the Council of Europe on the sale in the European Union market and the export from the Union of certain raw materials and derived products associated with deforestation and forest degradation.

	NAME OF THE INITIATIVE	BRIEF DESCRIPTION
Government initiatives	Joint Declaration of Intent	The governments of Peru, Norway, and Germany signed a Joint Statement of Intent on REDD+ cooperation and sustainable development to support Peru in achieving its NDC (Nationally Determined Contributions) mitigation targets linked to reduced deforestation and zero net emissions from LULUC.
	Declaration of Amsterdam⁸	Coalition of 9 European countries committed to the preservation of primary forests and areas of high conservation value through responsible supply chain management. They focus on cocoa, palm oil, soybean and, to a lesser extent, rubber supply chains.
	National Strategy to Combat Imported Deforestation – France	In 2018, France adopted a National Strategy against Imported Deforestation (SNID) which aims to “put an end to the import of unsustainable forest or agricultural products that contribute to deforestation by 2030”, to “reduce deforestation, forest degradation, ecosystem conversion and indirect land use change abroad”. The SNID covers the following agricultural products: soy, palm oil, beef and its associated products, cocoa, rubber, timber, and its derivatives.
Private sector initiatives	Cargill⁹	One of the goals of their corporate sustainability policy is deforestation-free supply chains by 2030.
	Unilever¹⁰	Corporate commitment to eliminate deforestation from its palm oil, paper, tea, soy, and cocoa supply chains. Its commitment is to a system of traceability and transparency through digital technologies, empowerment of small producers and joint work between industry, NGOs, and governments.
	McDonald's¹¹	Corporate commitment to eliminate deforestation from its global supply chains. McDonald's is also a signatory to the NYDF.
Sectoral initiatives	Agreement to achieve zero deforestation in the palm oil value chain in Colombia¹²	The Government of Colombia, the National Federation of Palm Oil Growers (Fedepalma), FEDEBIOCOMBUSTIBLES, companies in the sector, palm oil refiners and wholesalers, biofuel production plants, food, cosmetics and oleochemical industries in general, and civil society organizations linked to the palm oil chain, signed a voluntary agreement to ensure that palm oil is produced free of deforestation and to eliminate the deforestation footprint of the palm oil sector in Colombia.
	Cocoa & Forests Initiative¹³	The governments of Côte d'Ivoire and Ghana along with 35 leading cocoa and chocolate companies have joined forces since 2017 to end deforestation associated with cocoa production.

8. Amsterdam Declarations Partnership

9. Cargill Sustainability policy

10. Deforestation-free supply chain policy – Unilever

11. McDonald's Corporate Commitment to Forests

12. Agreement to achieve zero deforestation in the palm oil value chain in Colombia

13. Cocoa & Forests Initiative

	NAME OF THE INITIATIVE	BRIEF DESCRIPTION
Sectoral initiatives	Cocoa, Forests and Peace Initiative in Colombia¹⁴	In July 2018, the Government of Colombia, together with the National Federation of Cocoa Growers, The Casa Luker Company, The World Resource Institute and The Sustainable Trade Initiative signed the Framework Agreement for Joint Action to Promote Zero Deforestation Production Models for the Protection and Restoration of Forests in the Colombian Cocoa Supply Chain.
	Zero deforestation agreement for livestock in Colombia¹⁵	A voluntary agreement in Colombia's cattle and milk sector was established in 2019. The agreement was signed by 34 public and private institutions seeking to reduce deforestation in the sector by 2030. The main companies in the meat and dairy sector have committed to deliver information to verify non-deforestation in their supply chains and generate mitigation strategies in areas at high risk of deforestation. Companies must ensure that their suppliers do not deforest. Reference date: January 1, 2010.
	Zero deforestation agreement for cattle ranching in Brazil¹⁶	Brazil's 4 largest beef production companies signed a sectoral agreement in 2009 to monitor their supply chains and set clear targets for the registration of the farms they supply with cattle, both directly and indirectly.

Source: SAB Project.

14. Cocoa, Forests and Peace Initiative in Colombia

15. Agreement for zero deforestation in the beef value chain and Agreement for zero deforestation and non-transformation of moorlands in the dairy value chain in Colombia.

16. Zero deforestation agreement for cattle ranching in Brazil

As can be seen in Table 1, several countries and companies show support and interest in developing value chain-based strategies to make agricultural production and marketing more sustainable and deforestation-free. All these initiatives are related to the most important commitments and frameworks related to climate change and sustainable development, such as the Paris Agreement on Climate Change and the 2030 Agenda. The Peruvian state has also subscribed to these international commitments and has reflected them in public policy instruments, such as the National Environmental Policy (PNA), the Framework Law on Climate Change, the National Climate Change Strategy [*Estrategia Nacional de Cambio Climático* (ENCC)] and the National Strategy for Forests and Climate Change (ENBCC).

Agricultural supply chains are the basis for the production and marketing of agricultural products, but they are not always developed under a value chain approach. The latter constitutes a comprehensive framework of analysis, which includes all the activities carried out to produce a certain product or service (from the provision of inputs to the final consumer), aimed at improving competitiveness and equity in the value chains (Springer-Heinze, 2018). Its concept encompasses organization and coordination, and strategies and power relations of the different actors in the chain (M4P, 2008). From a functional approach, this can be represented in a map (value chain map) in which the different actors and interactions are identified at its three levels: (1) the micro level comprises the direct actors or operators that perform functions related to the production, transformation, distribution and marketing of the product and derivatives; (2) the meso level comprises public and private actors, that provide support services for the execution of the functions of the actors at the micro level, and that represent the interests of one or several

groups of actors; and, (3) the macro level is made up of government institutions that design and implement productive, territorial, environmental and other policies and regulation (Springer-Heinze, 2018). In this context, analyzing the value chain provides the chance to explore opportunities from the various actors involved in the functioning of the value chain, which could have a role in contributing to avoid, reduce, or eliminate deforestation.

Therefore, using a value chain approach to address the problem of deforestation associated with agricultural activity makes it possible to design and implement actions aimed at segments of the value chain, or the whole chain, in order to achieve certain environmental, social and economic objectives (Castro-Nuñez, et al., 2020a).

This approach involves all sectoral actors in a concerted commitment. In this way, responsibilities are shared and do not fall solely on the producer (traditional approach). On the contrary, responsibility is shared throughout the value chain since value is built jointly. However, it is necessary to find a balance, so as not to dilute responsibilities between the links in the value chain, for example, with consumers (Lambin et al., 2018).

The new challenge is to create a value chain concept that specifically aims to add additional value through activities that contribute to reducing or eliminating deforestation. These activities will be identified by the actors and links in the value chain, assuming that they have the potential to influence (directly or indirectly) forest conservation and contribute to GHG reduction in the land use sector. These so-called deforestation-free and low GHG emission value chains involve various innovations and interventions that actors along the value chain (at the micro, meso and macro levels), must make in order to be much more effective in terms of generating environmental benefits, without being detrimental to economic benefits.

Generally, these interventions include practices and policies that affect actors, from primary production to the final consumer. They involve sustainable production management practices, provision of services (technical, financial) to actors committed to conservation and non-deforestation, mechanisms to articulate responsible consumption with products that do not deforest, and policy instruments to safeguard commitments for non-deforestation, among others.

In a deforestation-free value chain, it is therefore necessary to address the following assumptions:

- ✔ Addressing the problem of deforestation, linked to agricultural value chains, is also contributing towards sustainable rural development in the Amazon.
- ✔ It is possible to have a value chain that improves competitiveness and equality and, at the same time, avoids deforestation.

- ✔ The pre-established notion that the contribution to avoiding deforestation can only be made within the producer-buyer relationship is expanded by considering other actors and links in the value chains, as well as enabling conditions.
- ✔ The value that forests conservation adds to the chain should not only be measured through a business cost-benefit analysis, but also through a valuation of the goods and ecosystem services that come from forests.

While recognizing the potential that a deforestation-free agricultural value chain approach can have to slow forest loss, there is currently insufficient evidence to determine the impact of value chain interventions on halting deforestation rates (Castro-Nuñez et al., 2020a; Lambin et al., 2018; Taylor & Streck, 2018). One of the reasons why it is still not possible to account for the impact of value chain interventions on deforestation, is their complexity, multilevel nature, dynamism and the context in which they are developed (Castro-Nuñez et al., 2020b). Evidence on the effectiveness of actions that are quantifiable and verifiable is still limited (Lambin et al., 2018). Therefore, it is necessary to develop reports on the progress of actions carried out in different links of the value chain, in order to have scientific evidence on their impact on halting deforestation (Taylor & Streck, 2018).



Main bottlenecks in agricultural value chains to achieve the goal of reducing or avoiding deforestation

Limitations in the implementation of actions, within the framework of corporate commitments and multi-governmental and national policies to halt deforestation, are related to the challenges and bottlenecks faced by value chains. For the purpose of this document, a bottleneck is defined as aspects that limit and halt the development and progress of agricultural value chains towards the goal of reducing and eliminating deforestation. Bottlenecks are presented below at the multiple levels of the value chain and for the different actors involved.

The first identified bottleneck is **inconsistency in the definitions that frame zero deforestation initiatives and commitments** (Taylor & Streck, 2018). These definitions can change or be interpreted differently by a company, producers, or governments. Given the diversity of commitments and strategies related to zero deforestation in agricultural commodity value chains different definitions are used on key concepts such as forests, deforestation (net zero, gross zero and deforestation-free) as well as dates for the start of zero deforestation commitment monitoring.

For example, in the case of Peru, deforestation-

free sustainable family agriculture and livestock production has been defined only in terms of REDD+. And it only applies if they are agricultural and/or livestock activities implemented in some form of associativity before 2011, such as by avoiding the loss of forest cover through the application of good practices in a specific geographical area and complying with the typology of family agriculture¹⁷. In the case of deforestation, Peru has defined it as “the conversion of forest or forest land caused by a decrease of more than 30% in its size and in 0.5 ha permanently during an observed period of time which is transformed to agricultural land, grassland or human settlement” (MINAM, 2021). However, locally, producers refer to forest only as primary forest, therefore, loss of cover in secondary forests is not interpreted as deforestation.

Another bottleneck is **weak governance** in agricultural production areas (Taylor & Streck, 2018). The dynamics of value chains are affected by enabling conditions, i.e. the legal and regulatory framework of the country where they are developed (Springer-Heinze, 2018). A weak regulatory and fiscal framework that does not reinforce and promote the conservation of forest areas and generates problems for initiatives committed to forest conservation. This highlights the essential role of government policies and the need for public sector support for private sector initiatives in value chains to halt deforestation (Seymour & Harris, 2019). Several of the experts interviewed recognize that the role of the Peruvian state, at its different levels, is a bottleneck, as it does not generate the enabling conditions for the development of deforestation-free value chains. Two of the experts interviewed agree that there are no clear territorial planning and management instruments.

In terms of planning, it was noted that the Concerted Regional Development Plans [*Planes*

de Desarrollo Regional Concertado (PDRC)] do not integrate the environmental dimension in a cross-cutting manner. Regarding land management, there are no clear land-use planning instruments that are essential for identifying areas suitable for developing agricultural crops and contributing to a favorable scenario for investment, as well as those areas that should be for conservation. According to the expert, another important issue linked to the role of the state, is the infrastructure to support production. In a family economy characteristic of small producers, the costs of education, health and accessibility have a strong impact on the resources needed to invest in their agricultural production. This generates disadvantages to capitalize and reinvest in improving their productivity.

In this context, far fewer have sufficient resources to undertake deforestation-free production, which would imply improving their capacity to produce in less area, and in turn, to engage in a business model that recognizes the value generated by their productive activities in environmental terms. In this regard, the expert calls attention to the need to elevate the discussion on deforestation-free value chains to a broader discussion on rural development, in which value chains play a fundamental role. The experts interviewed agree that another bottleneck is centered on the production link, where **low productivity, given the lack of good practices for crop management**, generates low profitability and therefore, reduced economic income for small farmers. Low profitability per hectare could be pushing producers to increase their production area, which affects residual forests. In this sense, it would be necessary to generate greater productive and business management capacities in small producers, so that it would be viable to produce more in less area and in a sustainable manner. Experts recognize that small producers

often do not have access to quality technical assistance services that are essential to ensure the best production practices in a timely manner. One expert noted that producers may be very knowledgeable about crop management, but they need to develop business management skills so that they can negotiate better terms with buyers.

A third bottleneck, related to low productivity, is the **absence of technical support for producers** interested in the processes of changing practices that are more sustainable (Taylor & Streck, 2018). Given that the agreements and strategies to achieve deforestation-free production are not only theoretical commitments, their operationalization in concrete actions is needed, which requires investments at different levels and where various actors are involved. In the field of production, recommendations are provided for production that complies with deforestation-free environmental standards, voluntary commercial certifications are also promoted, and a premium price is offered with access to differentiated markets. However, few companies offer quality training and technical assistance programs for their producers, while others seek support from public services that are generally deficient (Taylor & Streck, 2018). A fourth bottleneck is the lack of clarity **about the roles for confirming, verifying, and certifying that a product is deforestation-free**. Although the productive link in the value chain is interested in being recognized as deforestation-free and buyers are interested in this type of product, it is not clear who is responsible for monitoring and verifying that a product is deforestation-free. This is a fundamental aspect in order to give confidence to the buyer and other actors in the value chain, who are linked to and invest in a deforestation-free effort. Despite the lack of clarity, some projects have made progress in developing methods and tools for producers and their organizations to

monitor deforestation events in the areas under their control. In other cases, they have opted to adhere to a certification mechanism that incorporates elements of ecosystem conservation, such as the Roundtable on Sustainable Palm Oil (RSPO) in the case of palm oil production. However, this standard certifies many aspects other than those related to ecosystem conservation, which complicates the path towards the establishment of deforestation-free palm oil.

The role of governments in determining whether a product is deforestation-free is also unclear. As mentioned above, some countries, such as Peru, are making progress in their definitions, but it is still unclear who monitors, verifies, and certifies the deforestation-free status of an agricultural product. Colombia and Peru are making progress in establishing spaces for dialogue with the private sector, technical and scientific organizations, and the government to make progress with conversations on this subject. Such is the case of the dialogue platforms created in Colombia for the voluntary agreements between public and private actors to prevent the deforestation of natural forests in the palm oil, cocoa, milk and meat value chains, and the Coalition for Sustainable Production in Peru.



Existing or necessary enabling conditions and incentives for deforestation-free value chains

Existing or necessary enabling conditions

The experts consulted recognized that the international political commitments adopted by countries to reduce deforestation is one of the enabling conditions, where there are already quantifiable commitments. Such is the case of the Nationally Determined Contributions (NDCs), within the framework of the Paris Agreement, in which mitigation measures have been defined in the Land Use, Land-Use Change and Forestry (LULUCF) sector. Likewise, the commitment to carbon neutrality by 2050, within the framework of the National Strategy for Climate Change 2050 and compliance with the Sustainable Development Goals, among others. All this has had a direct effect on the public policy agenda, where the reduction of deforestation is a key element to achieve international commitments related to forest conservation and GHG reduction. Today, commitments are not restricted to the national level; regional governments (sub-national level of government) in the Peruvian Amazon also assume commitments to reduce GHG emissions from deforestation¹⁸. In addition, one expert recognizes

that the international funds available not only allow the country to be supported with funding to meet its goals, but also play an important role in funding specific projects to advance the concrete development of deforestation-free agricultural value chains.

A second group of necessary conditions is aimed at the **regulation and legal security of land tenure**. This is particularly important for small producers. One expert points out that, in Peru there are disputes over the major land-use capacity, which in some cases is a barrier to sustainable land use¹⁹. The resolution of disputes over major land use capacity could be an incentive to develop new plantation facilities in non-forested areas that meet sustainability criteria and promote economically and environmentally viable land use. In relation to this issue, there is no legal security for a large number of small farmers. Addressing the problem of land ownership could motivate small producers to regularize their production to make it more sustainable. At the same time, clarifying land tenure would make it easier to define the mechanisms through which deforestation-free agreements can be reached in these areas, by recognizing who is responsible for land management and what their rights and duties are.

The experts interviewed agreed that one of the greatest current opportunities for the development of deforestation-free value chains is the **effect of global markets and consumer preferences** for environmentally sustainable products. This implies more demanding procurement and purchasing requirements. Two of these experts indicated that the global market factor, which demands

deforestation-free products, has an effect on the dynamics of national value chains. A concrete example is the case of oil palm, where the national sustainability agenda is increasingly reaching larger companies at various scales. Another expert points out that commodity value chains, which are seeking to consolidate their deforestation-free status, could help attract other value chains and actors to develop deforestation-free agriculture. To this end, it is necessary to demonstrate that the path towards sustainability of agricultural value chains can be achieved through productive intensification, with low GHG emissions, reflected in increased productivity and better access to differentiated markets. As a result, this will generate higher income for small producers.

In turn, the role of the consumer is key, as it has been a relevant driving force behind corporate commitments to zero deforestation, which in recent years have been signed by the world's largest retail product companies. One of the experts pointed out that in Peru, little work has been done to study national consumers who are responsible and committed to accessing products that do not affect forests. Therefore, it is the right time to explore alternatives in this link. This is particularly important if one considers that the value chains in deforested areas are not necessarily linked to the international market, they mainly only supply the domestic market. For example, the palm oil value chain in Peru supplies the domestic food and biofuels industry, or the cocoa chain in Colombia, that's product is destined for the domestic market. Another expert interviewed said that consumers are becoming more informed and that gradual changes in their consumption

18. The governments of Amazonas, Huanuco, Loreto, Madre de Dios, Ucayali and San Martin signed the Rio Branco Declaration in 2014, formalizing the commitment of the Governors' Climate and Forests Task Force (GCF) - of which they are part - to reduce deforestation and foster partnerships to achieve sustainable jurisdictions. Likewise, since 2020 the governments of the Amazon regions have had their Regional Strategy for Low Emission Rural Development, a territorial management instrument that seeks to reduce deforestation and forest degradation and facilitate sustainable rural development with low GHG emissions.

19. In Peru, the major land use capacity is understood as the natural aptitude of a geographical area to generate goods and services on a constant basis, under continuous treatments and specific uses (land classification regulation by major land use capacity, MIDAGRI).



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habits are to be expected. They will consider the origin of the product, whether any ecosystem has been affected, among other criteria. From this perspective, agricultural value chains that are committed to deforestation-free production would have a leveraging effect, not only on their own sector, but also on other value chains and actors.

In this context, incentives such as premium prices for deforestation-free products have been increasingly diluted and transformed into legal market requirements, including trade regulations for exports in international markets. For example, the countries of the European Union (EU) are becoming increasingly demanding in terms of

compliance with environmental criteria, generating the mandate to transform the traditional mode of production (business as usual) to a sustainable one (See Table 1). The European Environment Commission has been designing regulations to prohibit the entry into European markets of products related to deforestation and forest degradation. The same *modus operandi* is also found in Free Trade Agreements (FTAs), which for some years now have included environmental aspects in their conceptual framework, objectives, and actions, and recently have also made specific mention of provisions that guarantee deforestation-free production and forest conservation²⁰.

20. See for example: the preliminary document of the proposed Trade Agreement between the EU and Mercosur, Agriculture chapter https://trade.ec.europa.eu/doclib/docs/2017/april/tradoc_155480.pdf

Possible incentive alternatives that can be generated from different segments of the value chains

Incentives are instruments that motivate decisions of economic actors. In a conservation context, they seek to motivate actors' decisions towards conservation (Abed, 2012). Taking the value chain approach as a starting point, this study has proposed that incentives can involve actors beyond buyers (who through their willingness to buy deforestation-free products generate incentives for production that avoids deforestation). Based on the value chain map, possible incentives have been identified that can originate from the three different levels of the value chain: (1) the micro level, which comprises the direct actors in the value chain (production, processing, distribution, marketing and consumption); (2) the meso level, public or private actors that provide support services for the execution of the functions of the micro level actors; and, (3) the macro level, where government institutions responsible for the design and implementation of policies and productive, territorial and environmental regulation, etc. are located (Springer-Heinze, 2018). The experts interviewed suggest various incentives at the different levels of the value chains and which respond to the issues of production and market (level 1), funding (level 2), and enabling policies (level 3).

At the micro level, experts point to the **provision of technical and technological assistance** to small producers committed to being deforestation-free as an incentive. Improving the technical capacities of producers should be timely and easy to access, in addition to contributing not only to production and plant health issues, but also to developing

the producer's business management skills. This will require technicians who are specialized in the crop and the climatic conditions of the area. One expert adds that the technician should not only focus on improving productivity but should also have the capacity and tools necessary to manage the environmental sustainability of the farms (which should include aspects of conservation and sustainable management of their forests). The transfer and adoption of technologies by small producers will provide them with tools to deal with scenarios marked by climate variability, and the need for efficient use of natural resources. In addition, the use of information and communication technologies will enable producers to make better production and marketing decisions by having a direct link with marketing companies.

At the meso level, experts point out that the **adaptation of funding instruments** to the specific characteristics of small producers, **access to public and private funding mechanisms**, and the **implementation of market intelligence systems**



are key incentives for small producers committed to being deforestation-free. The adaptation of financial instruments suggests, for example, considering grace periods according to the agricultural calendar. For this to be an incentive to be deforestation-free, priority access should be given to producers committed to this objective. One expert suggested an example of access to financial mechanisms through the collateralization of existing forest. This mechanism means placing a value on the existing forest, without necessarily exploiting its resources, so that it functions as a guarantee in the financial market. The mechanism is complex and requires a design according to the specific case. According to the expert, it is a way to ensure the conservation of forest areas and at the same time guarantee better access to the financial market for small producers.

In general, the financial sector could exert pressure on companies by including environmental variables in its risk analysis, as there have been cases where funding schemes have been withdrawn from companies with environmental infractions. The implementation of market intelligence systems (specifically sustainable

markets with sustainability seals and standards) will enable better sales decisions to be made by small producers and agricultural companies. Small producers are often at a disadvantage in competitive markets, that require up-to-date information for negotiations under fair conditions. The adoption of market intelligence systems that prioritize opportunities for business models with environmental co-benefits would favor small agricultural producers committed to zero deforestation. This should incorporate market opportunities where benefits are prioritized.

At the macro level, that is, in the area of government policies and regulations, the experts interviewed suggested improving conditions that favor the development of zero deforestation agricultural value chains. In this regard, the **incorporation of cross-cutting environmental components in public planning, management and funding instruments** would create better conditions to ensure the promotion and development of value chains that contribute to forest conservation. One expert points out that territorial management instruments and productive sectoral plans should incorporate



the environmental component in a cross-cutting manner at local and regional government levels. The Concerted Regional Development Plans (PDRC) are the instruments that result from the strategic planning process in the territory. They guide the comprehensive development of the territories and govern the management of the regional government in the medium and long term, for the welfare of the population and the harmonious and sustainable development of the territory (CEPLAN, 2020).

The PDRC contain the vision for the territory, i.e., the desired image of the territory in the future.

In this sense, it will be extremely important to include strategic actions on deforestation-free agricultural production with goals linked to national commitments to reduce deforestation and emissions from land-use change. Regarding the **design of public financial instruments**, one of the experts interviewed pointed out that environmental variables can be included in their selection criteria. In this way, public credits, and non-reimbursable funds, such as Agroldeas, ProCompite, or the Agroperú Fund, could prioritize funding for associations, companies or businesses that guarantee that their production processes do not involve deforestation.

 **Table 2.** Bottlenecks, existing or necessary enabling conditions, and incentive alternatives that can be aligned toward the creation of deforestation-free value chains.

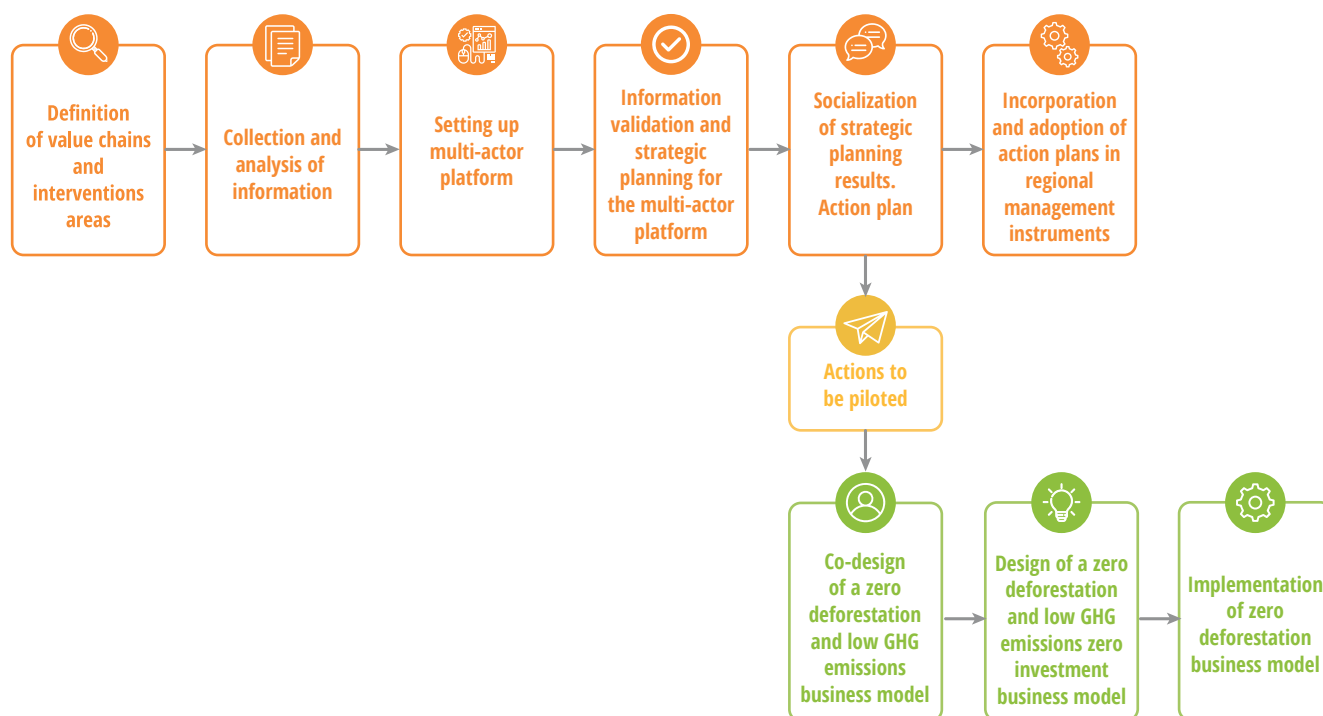
VALUE CHAIN LEVEL	BOTTLENECKS	EXISTING OR NECESSARY ENABLING CONDITIONS	INCENTIVE ALTERNATIVES
Micro	Low productivity of agricultural crops in agricultural frontier areas and soil degradation, which encourages agricultural expansion into forest areas; and lack of technical and technological support for producers in the process of changing to sustainable practices.	National programs to promote sustainable production aligned with international political commitments to reduce deforestation.	Facilitation of technical and technological assistance to small producers committed to non-deforestation.
Meso	Inconsistency in the definitions that frame the different initiatives and zero deforestation commitments.	Global markets and consumer preferences for environmentally sustainable products.	Adaptation of funding instruments; access to public and private funding mechanisms; and implementation of market intelligence systems.
Macro	Weak governance in agricultural frontier areas.	Clarity in land tenure and legal security for small farmers.	Incorporation of environmental components (including the reduction of deforestation and forest conservation) in a cross-cutting manner in public planning, management, and funding instruments.



A business model that contribute to the strengthening of deforestation-free cacao and palm oil value chains in the Ucayali region (Peru)

The SAB Project developed activities (Figure 1) to achieve two goals: (i) the formulation of deforestation-free and low GHG emission value chain strategies for the cocoa and palm oil value chains in the Ucayali region of Peru; and (ii) the design and implementation of pilot zero deforestation business models.

 **Figure 1.** Summary of SAB Project activities.



Source: SAB Project.

To achieve the first goal, the SAB Project established multi-stakeholder platforms for the cocoa and palm oil value chains in the Ucayali region. The platforms brought together various representatives of the links in the chains, such as organized producers, actors providing various services (technical assistance, financial services, etc.) and representatives of the public sector at local, regional, and national levels. The multi-stakeholder platforms were a means of constructing (in a participatory and consensual manner) a roadmap for achieving deforestation-

free value chains with low GHG emissions in the palm oil and cocoa sectors. Thus, a strategy for deforestation-free and low-emission **cocoa and chocolate**²¹ was formulated, and another for **palm oil**²². The strategies include action plans for each of the value chains, whose actions were subsequently incorporated into the regional management instruments.

For the palm oil value chain, three strategic objectives were defined: i. adapt the palm oil agroindustry to new market demands, particularly

21. Moving towards a deforestation-free cacao and chocolate value chain with low greenhouse gas emissions: <https://hdl.handle.net/10568/109751>

22. Moving towards a palm oil value chain that contributes to the conservation of forests and a reduction in greenhouse gas emissions: <https://hdl.handle.net/10568/109750>

in terms of environmental sustainability; ii. improve production and increase productivity (with a focus on forest conservation and reduction of GHG emissions); iii. strengthen the value chain and its actors towards commitments to forest conservation and reduction of GHG emissions.

The stakeholders in the cocoa and chocolate value chain defined three strategic objectives: i. strengthen organizations and institutions for the production and promotion of deforestation-free cocoa; ii. improve cocoa production through best practices, with a focus on forest conservation and reduction of GHG emissions; iii. improve the environment for deforestation-free and low GHG emission business models. In addition to these objectives, a series of activities were proposed in order to achieve them, and the stakeholders identified the public and private institutions that could lead the activities. The roadmap was delivered and distributed among the members of the Regional Government of Ucayali so that it can channel the activities through its regional plans and technical committees.

As a next step, the two strategies were implemented through the design of zero deforestation business models in the palm oil and cocoa value chains. The development of a zero deforestation business model aims to add value to the agricultural product, which is associated with forest conservation and the reduction of GHG emissions by avoiding the deforestation of remaining forests and implementing sustainable land-use practices. To achieve this objective, all the actors in the value chain must be aligned. Thus, the business model offers an opportunity to connect them to the value chain.

For the development of the zero deforestation business models, producer organizations were identified, which bring together producers in an area with deforestation processes, they have active commercial relationships, and are proactive in providing technical assistance services and facilitating access to funding for their members. Figure 2 shows the ecosystem of the zero-deforestation business model, its actors, and relationships. In the framework of a zero deforestation business model, the actors



assume new functions. For example, producer organizations have the role of promoting and demanding agricultural production that does not generate deforestation, promoting the adoption of standards or systems to verify compliance with producers' forest conservation commitments. Producer organizations may also facilitate access to markets that provide added value to deforestation-free products. Likewise, through the organizations, technical assistance services can be strengthened in order to improve crop yields through a sustainable land management approach and discourage expansion to the detriment of natural forest areas. In a zero deforestation business model, the producer has the role of guaranteeing that his agricultural production areas are not located in forest areas (in addition to identifying nutritional needs), so that he can make efficient use of agricultural inputs and contribute to the reduction of GHG emissions. The actors in the marketing link have the role of promoting and demanding that the product is traceable, guaranteeing deforestation-free production, and informing the end consumer about the origin of their products. Funders and investors could facilitate preferential funding conditions for producer organizations and companies that guarantee sustainable production. Finally, consumers have the role of informing themselves about the origin of the products they demand and recognizing the value of a deforestation-free product.

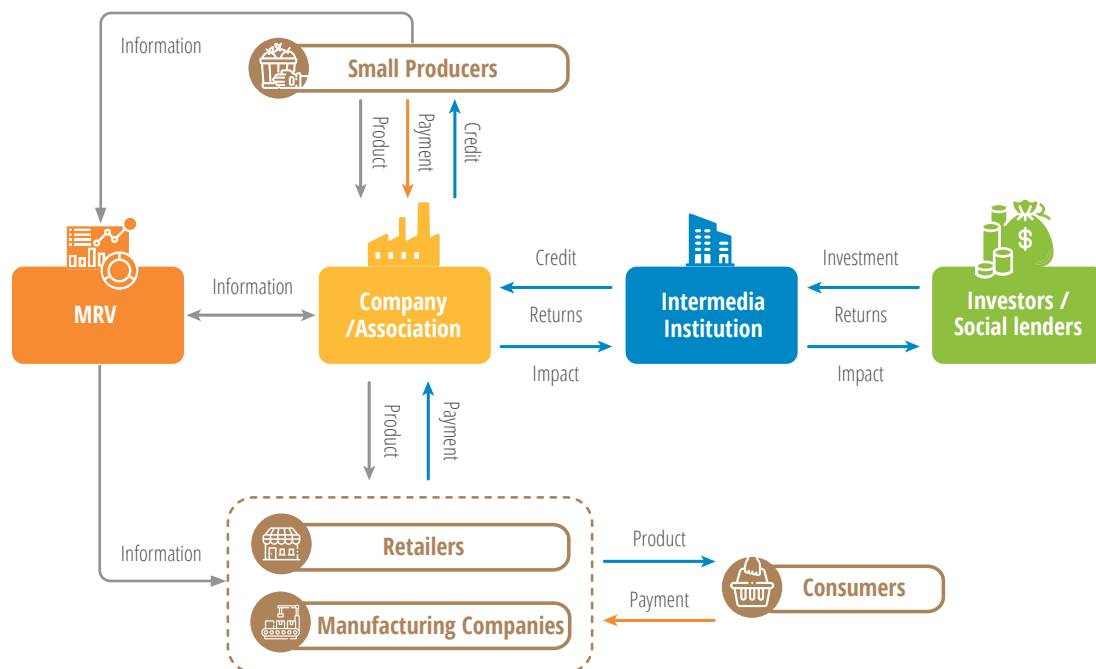
In order to add value, not only from a business cost-benefit analysis, but also with a valuation of the ecosystem services that come from the forests, a roadmap on carbon credits in oil palm plantations and areas where deforestation is avoided was included in the business model. The economic valuation of ecosystem services could go beyond carbon capture and GHG reduction by opening up other opportunities for small producers.

The business model also includes a monitoring, reporting and verification (MRV) system to measure



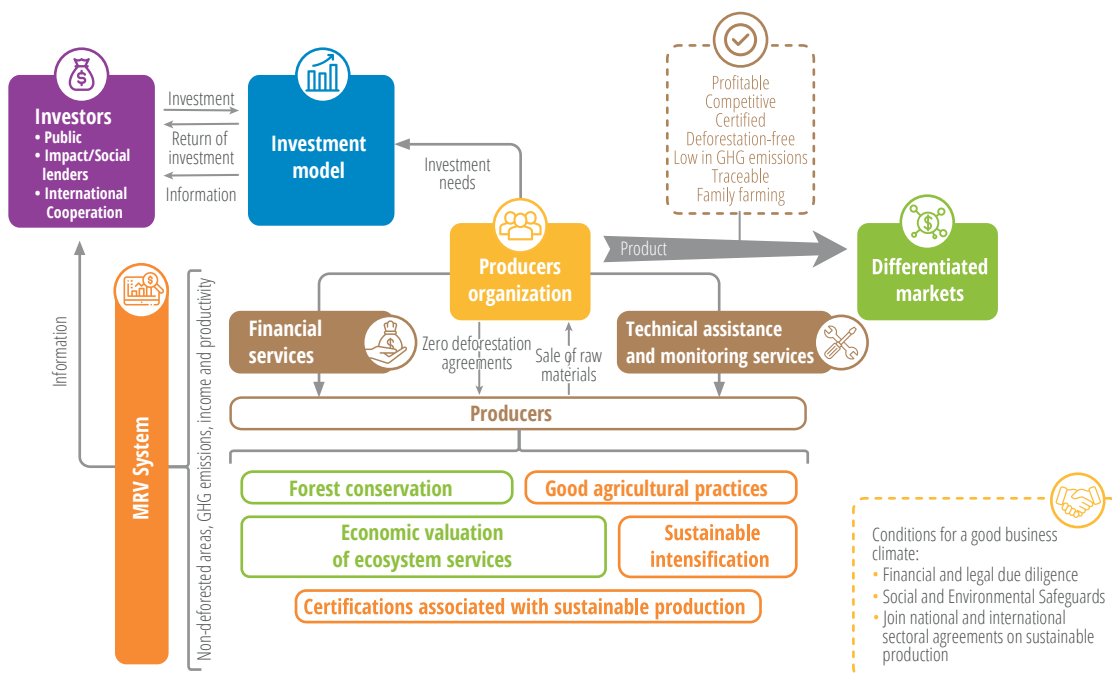
the impact of the business model in socio-environmental dimensions. The system will verify that the agricultural plantations have not generated deforestation, in addition to evaluating the productivity of the crop and its contribution to the economic well-being of the producer families. The MRV system includes indicators on non-deforested areas, indicators of GHG emissions from good production practices and land-use change, as well as annual income per hectare and crop productivity per hectare. This system will make it possible to provide verifiable and updated information to value chain actors, particularly buyers and investors interested in the product. Figures 3 show the zero deforestation cocoa business model being developed under the SAB Project in Ucayali.

Figure 2. Zero-deforestation business model ecosystem.



Source: SAB Project (CIAT and Climate Focus).

Figure 3. Zero-deforestation business model ecosystem for cocoa.



Source: SAB Project (CIAT and Climate Focus).



One of the main challenges for the transition from a traditional business model (business as usual) to a zero deforestation model is funding for the implementation of planned activities. This will require an investment model that considers the investment needs of the company and/or producer organization and the identification of investors interested in funding sustainable production businesses. In an ideal scenario, loan conditions, such as interest rates, grace periods or terms, should be in line with the production conditions and the socioeconomic reality of the agricultural producers.

A zero deforestation business model requires compliance with conditions that will enable a good climate for business development. First, compliance with legal and financial due diligence. In legal terms, it was verified that the companies must not have any tax issues, and that the properties of the producer associations do not violate any environmental or property regulations. In this way, it was determined that the areas must not include Permanent Production Forests (PPF), overlap with Protected Natural Areas (PNA), Indigenous Reserves, Regional Conservation Areas (RCA) or Private Conservation Areas (PCA) that could generate any conflict.

Second, compliance with social and environmental safeguards of the International Climate Initiative (IKI), based on the International Finance Corporation (IFC) Performance Standards for Social and Environmental Responsibility. The IFC Performance Standards cover aspects that include labor conditions; resource efficiency and pollution prevention; human health, safety and security; biodiversity and natural resource management; indigenous communities; and cultural heritage. In this way, the potential impacts, in the form of risks, that may arise from project activities are assessed.

Finally, the business models for palm oil and cocoa, developed under the SAB Project, seek to form part of the national zero deforestation sectoral agreements promoted by the Coalition for Sustainable Production²³. Significant progress has been made in the design of the Cocoa, Forests and Diversity agreement, which seeks to catalyze resources and collaboration among its members for the implementation of concrete actions for sustainable value chains.

²³ <https://produccion sostenible.org.pe/>



Conclusion

Agricultural value chains have the potential to contribute to reduce deforestation, considering that all their components and levels (micro, meso and macro) are committed and aligned towards this objective. To implement this approach, the following bottlenecks must be resolved: inconsistency in the definitions that frame zero deforestation initiatives and commitments; weak governance over resources in agricultural production areas; low productivity in agricultural crops; the absence of technical support for sustainable intensification; and the lack of clarity on the roles to confirm, verify and certify that a product is deforestation-free. Work must also be done to create incentives that motivate actors in agricultural value chains to make decisions towards deforestation-free value chains: facilitating technical and technological assistance; adapting funding instruments, access to public and private funding mechanisms, and implementing market intelligence systems; and, finally, incorporating environmental components in a cross-cutting manner in public planning, management, and funding instruments. Finally, the experience in creating zero deforestation business models in Ucayali has shown that agricultural companies with a productive base of small producers can subscribe to conservation and zero deforestation production commitments through the implementation of activities that favor their



competitiveness. In turn, they integrate the social and environmental co-benefits of the businesses into funding alternatives, donations and access to differentiated markets.

The transition towards deforestation-free value chains requires the participation of all actors in the value chain. Therefore, it is necessary to attract actors that are traditionally absent, such as service providers, final consumers, and investors. In addition, a better understanding of the relationship between deforestation processes and agricultural production is required, so that intervention strategies are geared towards addressing the local dynamics that govern this relationship between agricultural production and deforestation.

Given that there is no single path to achieving deforestation-free value chains, it is of the utmost importance to seek the perspectives of the actors in the value chains, since they are the ones who can bring about a change in the way agriculture can contribute to mitigating the negative impacts of climate change. For this reason, the establishment of spaces for dialogue and consensus (which bring together multiple stakeholders) is important for defining a road map with common objectives. From the value chain actors, various monetary and non-monetary incentives can be identified to motivate decisions by economic actors to conserve forests in the Amazon. Incentives should be presented in

packages since on their own, they will not be able to address a problem as complex as deforestation. In addition, conditions are needed to enable the development of deforestation-free value chains and business models.

The value chain approach has some limitations, as it is a sectoral approach. Therefore, it will also be important to consider a territorial approach to identify other actors outside the value chain that play an important role in avoiding deforestation or participate in deforestation processes. The challenge will be to articulate and make the sectoral and territorial approach operational in order to contribute to the sustainable development of the Peruvian Amazon.



References

- Abed S. 2012. Incentivos : una introducción a mecanismos que nos ayudan a conservar. En Parera A; Paullier I; Bosso A. (eds.). Incentivos para conservar los pastizales naturales del Cono Sur: una oportunidad para gobiernos y los productores rurales. Aves Uruguay- Grupo Uruguayo para el Estudio y Conservación de las Aves. Montevideo, Uruguay. pp 33–64.
- Blundo-Canto G; Cruz-Garcia GS; Talsma EF; Francesconi W; Labarta R; Sanchez-Choy J; Quintero M. 2020. Changes in food access by mestizo communities associated with deforestation and agrobiodiversity loss in Ucayali, Peruvian Amazon. *Food Security* 12(3):637–658.
<https://doi.org/10.1007/s12571-020-01022-1>
- Castro-Nuñez A; Charry A; Castro-Ilanos F; Sylvester J; Bax V. 2020a. Reducing deforestation through value chain interventions in countries emerging from conflict: The case of the Colombian cocoa sector. *Applied Geography* 123:102280.
<https://doi.org/10.1016/j.pgeog.2020.102280>
- Castro-Nuñez A; Ganzenmüller R; Francesconi W. 2020b. Emerging scenarios on the role of supply chain initiatives in reducing deforestation: evidence from Peru, 1–8.
- CEPLAN. 2020. Guía para el Plan de Desarrollo Regional Concertado. Lima.
- Curtis PG; Slay CM; Harris NL; Tyukavina A; Hansen MC. 2018. Classifying drivers of global forest loss. *Science* 111:1108–1111.
<https://doi.org/10.1126/science.aau3445>
- FAO. 2010. Global Forest Resources Assessment 2010. Rome, Italy.

- FAO & UNEP. 2020. The State of the World's Forest 2020. Forest, biodiversity and people. Rome, Italy. <https://bit.ly/3KILXAO>
- Goldman E; Weisse M; Harris N; Schneider M. 2020. Estimating the Role of Seven Commodities in Agriculture-Linked Deforestation: Oil Palm, Soy, Cattle, Wood Fiber, Cocoa, Coffee, and Rubber. Technical Note. World Resources Institute. Washington, DC. <http://bit.ly/3tT3LM8>
- IPCC. 2019. Resumen para responsables de políticas. En: Shukla PR; Skea J; Calvo E; Masson-Delmotte V; Pörtner HO; Roberts DC; Zhai P; Slade R; Connors S; van Diemen R; Ferrat M; Haughey E; Luz S; Neogi S; Pathak M; Petzold J; Portugal Pereira J; Vyas P; Huntley E; Kissick K; Belkacemi M; Malley J. (eds.) El cambio climático y la tierra: Informe especial de la IPCC sobre el cambio climático, la desertificación, la degradación de las tierras, la gestión sostenible de las tierras, la seguridad alimentaria y los flujos de gases de efecto invernadero en los ecosistemas terrestres. En prensa. <https://bit.ly/3ArlJbi>
- Lambin EF; Gibbs HK; Heilmayr R; Carlson KM; Fleck LC; Garrett RD; Streck C. 2018. The role of supply-chain initiatives in reducing deforestation. *Nature Climate Change* 8:109–116. <https://doi.org/10.1038/s41558-017-0061-1>
- M4P. 2008. Making Value Chains Work Better for the Poor: A Toolbook for Practitioners of Value Chain Analysis. Making Markets Work Better for the Poor (M4P) Project, UK Department for International Development (Version 3). Cambodia. <https://bit.ly/3TpfQUG>
- MINAM. 2021. Resolución Ministerial No. 143–2021–MINAM: Lineamiento para la identificación y clasificación de las acciones REDD+. <http://bit.ly/3U4JMo9>
- MINAM & PNCBMCC. 2020. *Monitoreo de la pérdida de bosques húmedos amazónicos en el año 2019*. Lima.
- Pritchard L; Cupp D. 2019. Atacando la deforestación por commodities: es hora de ponerse aburridos. Governors' Climate & Forest Task Force. Recuperado en julio de 2021.
- Ravikumar A; Sears RR; Cronkleton P; Menton M; Sills E. 2017. Is small-scale agriculture really the main driver of deforestation in the Peruvian Amazon? Moving beyond the prevailing narrative. *Conservation Letters* 10:170–177. <https://doi.org/10.1111/conl.12264>
- Seymour F; Harris NL. 2019. Reducing tropical deforestation: The interventions required to reduce deforestation differ widely across the tropic. *Science* 365(6455):756–758.
- Springer-Heinze A. 2018. ValueLinks 2.0: Manual on Sustainable Value Chain Development. GLZ. <https://bit.ly/3AXUwid>
- Taylor R; Streck C. 2018. The Elusive Impact of the Deforestation-Free Supply Chain Movement (Working paper). World Resources Institute. <https://bit.ly/3AoxkYT>
- Wan Mahari WA; Azwar E; Li Y; Wang Y; Peng W; Ma NL; Sonne C. 2020. Deforestation of rainforests requires active use of UN's Sustainable Development Goals. *Science of the Total Environment* 742: 140681. <https://doi.org/10.1016/j.scitotenv.2020.140681>





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