

# How can Côte d'Ivoire reconcile agricultural and forest development and at what price?



## Key messages

- At the current rate of deforestation, Côte d'Ivoire may well lose its entire forest cover by 2034. To reverse course, the government aims to increase forest cover to 20% of its land area, compared to the current forest cover of 10–13%.
- Although forests are becoming increasingly scarce, deforestation is still very high due to increasing demand for fertile farmland. The remaining 3–4 million hectares of forest, including highly degraded massifs, are mainly threatened by the allocation of more land for crop production: cocoa, rubber, oil palm, yam and rice.
- The current deforestation trend would expose the cocoa commodity chain to greater loss of productivity in a transformed landscape made more vulnerable to drought and climate change.
- Côte d'Ivoire is the world's leading cocoa producer. To continue to lead over the long term requires integrating commodity chain development with the national strategy on climate change mitigation and adaptation in general and efforts to reduce emissions from deforestation (REDD+) in particular.
- Considerable gains in productivity for commodity chains are possible in Côte d'Ivoire, and these would largely compensate for the need for more land for crops. However, significant investment and ambitious land reforms are needed to achieve these gains in productivity. The costs and benefits vary for each sector. The transition could be partly financed through innovative incentive mechanisms, such as payments for environmental services within the framework of the REDD+ process.
- In this 'green' scenario, national forest cover would stabilise at about 3 million hectares by 2020, making it possible to reconcile agricultural and forest development.
- This strategy would allow Côte d'Ivoire to position itself as a supplier of 'deforestation-free' agricultural products to international markets. From 2015 to 2030, the cumulative added value of four agricultural sectors — cocoa, rice, rubber tree, oil palm — could rise from about XOF12 500 billion to 17 700 billion, changing the scenario from the current trend to one of green development.



Photo: oneVillage Initiative

## Agricultural development that consumes forests

‘People will understand that it will not be possible to overturn the primacy of agriculture, the foundations of Côte d’Ivoire’s wealth.’  
Konan Bédié, 1995

These words of the former president of the Republic of Côte d’Ivoire are still fully in line with the reality of the country nearly twenty years later. The priority given to agricultural development is undeniable. Agriculture provides employment to two-thirds of the working population. The world’s leading producer of cocoa, Côte d’Ivoire has nearly 800 000 farms. The diversification and modernisation of agriculture constitute one of four parts of the National Development Plan (PND, Plan national de développement), aimed at making Côte d’Ivoire a newly industrialised country between 2015 and 2025.

The pursuit of these ambitions is nowadays, however, not as easy as it used to be. Of the 16 million hectares of forest the country had when it gained independence, fewer than 4 million hectares remain today, most of which are degraded. Forest cover accounts for less than 13% of the country’s land area, well below the government’s 20% target. This deforestation has disrupted the rainfall pattern, limited agricultural productivity, and created an alarming vicious cycle for the future of the sector, which climate change will only make worse. In contrast, the new cocoa belt in the south-west of the country, for example, benefits from the conservation of the large Taï National Park, which helps maintain a climate favourable for cocoa farming.

Agricultural development in Côte d’Ivoire is destroying increasingly large expanses of forest. Forests in national parks are not safe either. For example, 80% of Marahoué National Park has been turned over to crop production. The Ministry of the Environment estimates that approximately 200 000 hectares of forest are disappearing each year, mainly to increase the land available for agriculture. At this rate, the country will have lost all its remaining forests within 20 years. Between 40 000 and 50 000 jobs in the timber supply chain are now under threat — the last straw for a country that was for a long time Africa’s leading timber exporter.

## Is another path for agricultural development still possible in Côte d'Ivoire?

This cost-benefit analysis looks at development scenarios for the five agricultural commodity chains responsible for most of the deforestation in Côte d'Ivoire (almost 150 000 hectares per year): cocoa, rice, yam, rubber tree and oil palm.

Field studies reveal that considerable gains in productivity on land already under cultivation are possible in all commodity chains through improved management of soil fertility and the dissemination of effective agricultural practices. Projections for 2010 to 2030 indicate that a progressive decoupling of agricultural production and deforestation in Côte d'Ivoire can be achieved by following green scenarios that assume a sustainable agricultural intensification in already cultivated areas (see Figure 1).

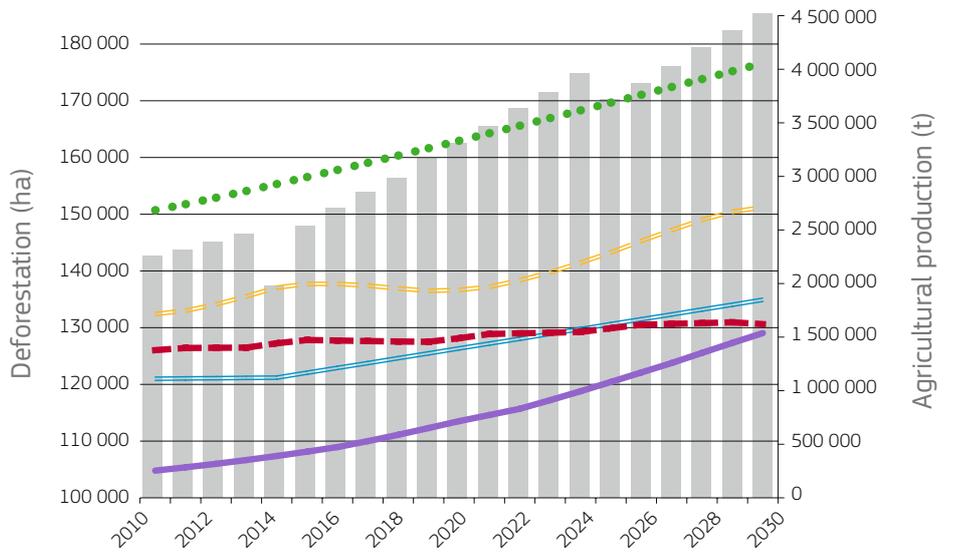
The green scenario assumes the identification of improved practices specific to each commodity: the use of improved plant material, the addition of green manure, various types of crop maintenance and an insurance mechanism for producers allowing them to replant more quickly in the event of crop loss. Achieving these gains in productivity without increasing land area requires significant accompanying measures. With variations specific to each commodity, the implementation of the green scenario generally involves at least doubling farmer training for the dissemination of improved production methods, supporting the regeneration of old plantations, increasing the amount of effort to improve land tenure clarification and security, participatory forest zoning and the development of a forest cover monitoring system (already in preparation within the framework of the REDD+ process).

Photo: World Agroforestry Centre



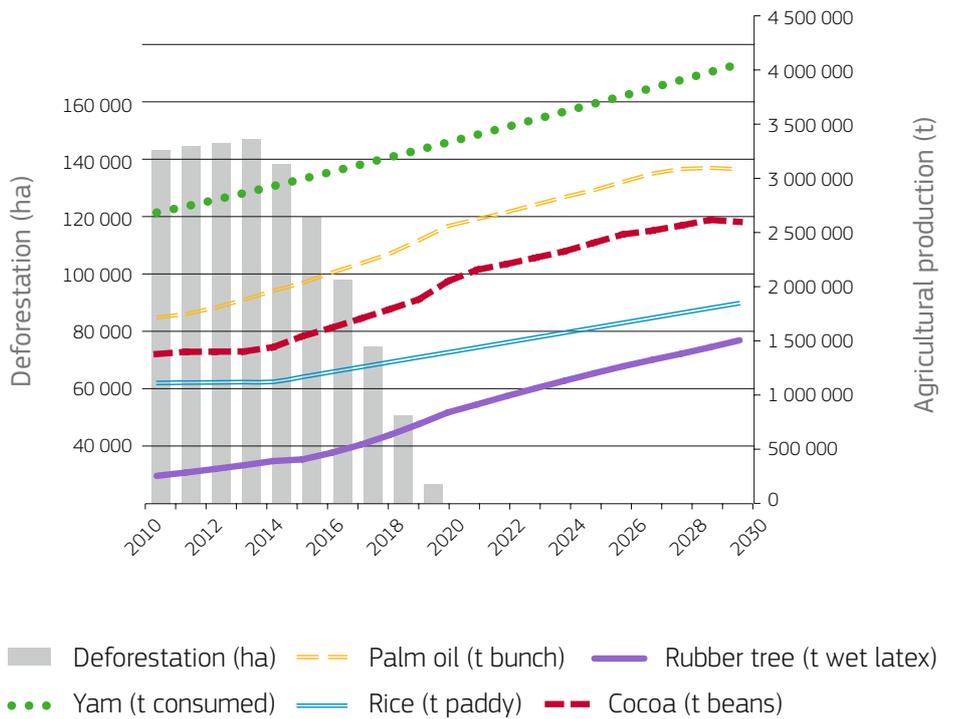
### Current trend

#### Continuation of the current agricultural model



### Green scenario

#### Agriculture-deforestation decoupling



**Figure 1** Production and deforestation trends of five commodity chains under two scenarios in Côte d'Ivoire. The calculations for each commodity are described in the study 'Coûts-bénéfices de la REDD+ en Côte d'Ivoire'.

# What would be the cost of moving to the green scenario in Côte d'Ivoire?

The balance between costs and benefits varies depending on the commodity (see Box 1).

In the case of oil palm, for example, the implementation of the green scenario remains profitable, but would reduce the profits generated through the entire commodity chain for the period 2015–2030 by around XOF 12 billion compared to the existing trend (see Figure 2). In other words, the green scenario reduces profits by approximately 2% of the total profits estimated for this period. For cocoa on the other hand, the implementation of the green scenario, despite being more costly over the first five years, would make it possible to increase economic growth by 32% for the supply chain as a whole compared to the current trend over the same period 2015–2030.

## Box 1 The cost-benefit analysis

In order to reply to the question of the business case from an agricultural perspective, a cost-benefit analysis was carried out for each commodity chain. The method involves several stages:

- documenting current practices that generate deforestation and improved practices for the green scenario on already cultivated land, for each commodity,
- estimating the distribution of plantations by age, their development and yield classes for the period 2015-2030,
- estimating the associated costs for the green scenario, including additional technical management and support for land tenure security,
- estimating the future development of productive areas, total production and deforestation by commodity,
- estimating the economic benefits including sale of agricultural commodities and economic value of forests saved.

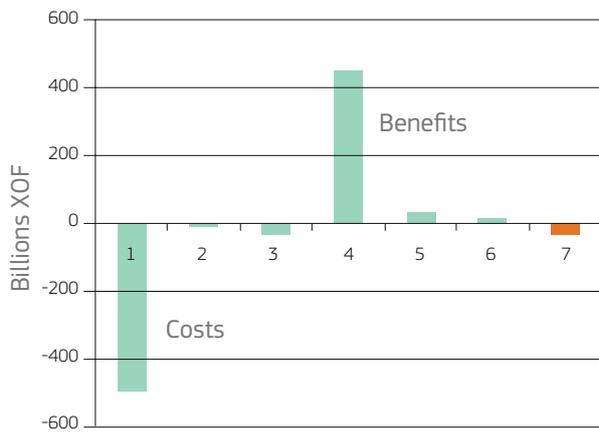
In addition to document analysis and field studies, consultations bringing together representatives of all stakeholders involved in each commodity chain (producers, cooperatives, public authorities, managers, NGOs, industries and certification bodies) were essential in order to refine the data and hypotheses of the prospective analysis. For example, the trend in the expansion of the oil palm plantations was estimated with stakeholders as the estimate depends on numerous factors including competition with rubber trees and effectiveness of the Third Oil Palm Plan.

The results vary in accordance with the hypotheses retained and the data used, hence the importance of the stakeholder dialogue; the cost-benefit analysis does not supply a 'scientific' set of data, but reflects the arbitration expressed by the stakeholders involved. An interactive estimate simulator of the costs and benefits by commodity chain is being developed to facilitate this type of dialogue.

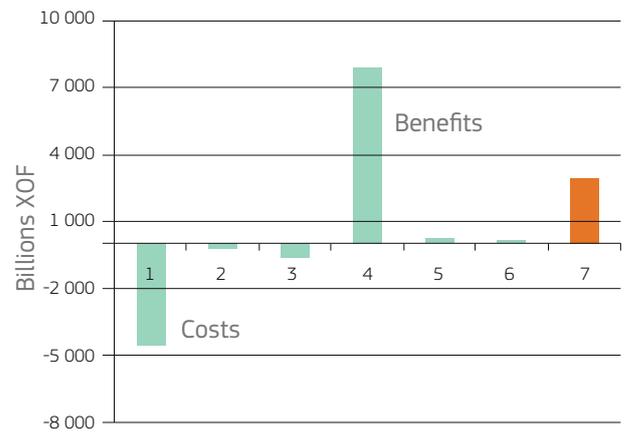
For more information, see 'Coûts-bénéfices de la REDD+ en Côte d'Ivoire'.

The direct costs for producers to implement improved practices (including more labour, seed production and purchase, and insurance) carry the greatest weight in the analysis. Similarly, with regard to the benefits, income linked to the sale of agricultural products is the most important (production surplus and possible price effect of the shift to deforestation-free products from 2020 onwards, for sensitive commodities such as cocoa and oil palm) (see Figure 2).

### Oil palm supply chain



### Cocoa supply chain



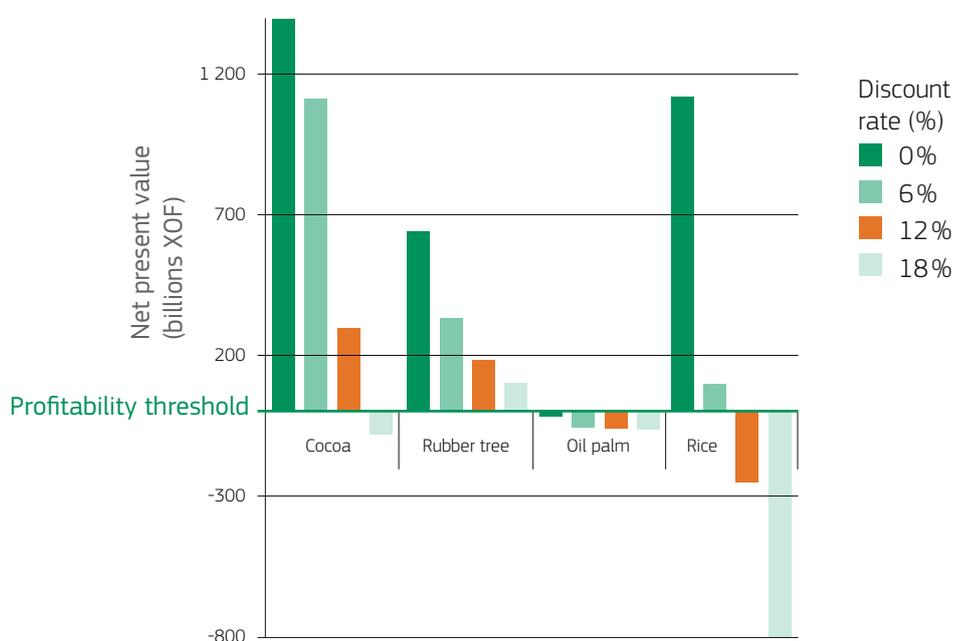
- Costs**
  - 1 Improved agricultural practices (labour, seeds)
  - 2 Strengthened extension services
  - 3 Land tenure and zoning
- Benefits**
  - 4 Proceeds from the sale of the commodity (quantity and price effect)
  - 5 Carbon (avoided emissions)
  - 6 Environmental goods and services maintained
- 7 Balance

**Figure 2** Costs and benefits of the alternative scenario compared with the current trend (aggregation 2015–2030) in billions of XOF

Other benefits derived from the value of forest carbon that is not released into the atmosphere, and from the value of conserved environmental goods and services such as the collection of non-timber forest products and firewood, carry relatively little weight in the analysis, according to this simulation. This is partly due to the conservative values attributed to these environmental benefits. For carbon, the economic benefit resulting from the reduction in deforestation are estimated to be XOF 2 500 per tonne of CO<sub>2</sub> in 2030 (approximately USD 5). These saved resources could be sufficient to cover most of the farmer training costs estimated here. Moreover the estimated emissions reductions for food commodities such as rice and yams are much more significant.

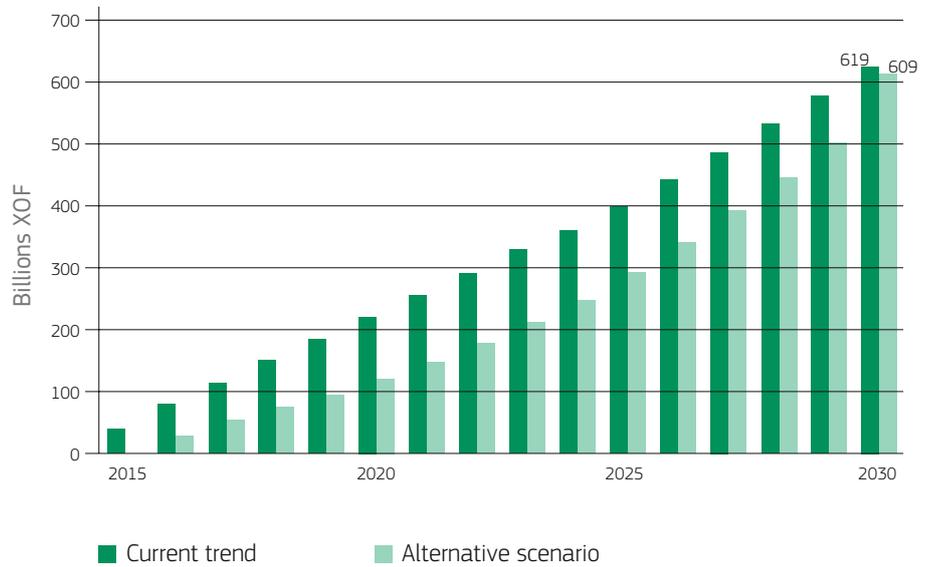
The phasing of costs and benefits over time is a crucially important element for evaluating the profitability of various scenarios. Investments related to land tenure security must be carried out as soon as possible to allow for the effective implementation of improved agricultural practices. In Côte d'Ivoire as elsewhere, people tend to care less about the distant future than they do for the short term. Thus the costs and benefits in 2030 matter less than they do in 2015. The stakeholders in the cocoa and oil palm commodity chains consulted in 2013 opted for a high discount rate of 12%, which indicates a strong preference for rapid returns on investment. A zero discount rate, which was used in the 2006 Stern Review for the costs of climate change, would express intergenerational equity, in other words no preference for the present over the future.

Figure 3 depicts the results of the cost-benefit analysis for four commodities adjusted in accordance with four different discount rates ('net present value' [NPV] for 2013). For the rice sector for example, a discount rate of 6% instead of 12% makes the green scenario economically attractive. This indicates that there should be a clear business case for the rice sector to implement the green scenario, provided it can secure financing at a reduced interest rate of 6% rather than 12%.



**Figure 3** Cost-benefit analysis adjusted in accordance with the discount rate

For the oil palm sector, the green scenario, which is constrained to stabilise land use from 2015 onwards, would be less profitable than the current trend no matter what the discount rate (Figure 4). The slightly less profitable green scenario would nevertheless remain clearly profitable over time. In fact, the cumulative profit for the two scenarios is almost the same by 2030: slightly more than XOF 600 billion. The main difference is that the scenario based on the current trend becomes profitable more quickly than the green scenario.



**Figure 4** Cumulative profit of the oil palm sector by scenario

When the costs and benefits of the five main agricultural commodities in these scenarios are pooled, the global green scenario becomes more profitable than the current trend five years after implementation.

Photo: Jean-Baptiste Dodane



# The challenges of forest-friendly agricultural development in Côte d'Ivoire

## Challenge 1 Lack of information and resistance to change

Conditions in recent decades have enabled the development of the current agricultural model at the expense of forests:

- large land areas allocated to crop production,
- renewal of soil fertility through prolonged fallow periods,
- lower climate stress,
- the agricultural markets' total indifference towards zero deforestation products, and
- non-existent resources such as REDD+ to support efforts to maintain forests.



Photo: World Agroforestry Centre

However, all these factors, which ultimately have an impact on agricultural profits, are evolving. Effective alternative agronomic practices which make it possible to adapt to these changes, do exist, but either remain unknown to most farmers or are not adapted to suit their requirements. Efforts to adapt to, demonstrate and disseminate these improved practices are required to overcome the resistance to change.

Furthermore, as experienced during the consultations held for the cost-benefit analysis, it is important to engage in dialogue with stakeholders in their terms. In this way stakeholders in these commodity chains can engage using economic and food security arguments adapted to the value chain that concerns them, rather than through environmental discourse that does not speak to their needs.



Photo: Zenman

## Challenge 2 Financing the cost of the transition

The inability to shoulder the high initial costs may act to deter individuals or groups from making an excellent investment. In particular, this concerns small-scale producers in Côte d'Ivoire who predominate in the supply chains studied. The implementation of the green scenario in each sector would thus require some technical and financial support for some stakeholders, notably where there are significant costs involved at the start of the transition linked for example to land tenure security, or the production or purchasing of quality seedlings.

The organised supply chains already have mechanisms in place to support producers. Complementary support in line with the green scenarios could be considered in the future through the redirecting of certain existing or planned funding mechanisms (for example, the public debt reverse transfer mechanism), or through other channels, such as the REDD+ mechanism (see Box 2).

### Box 2 The REDD+ mechanism

The REDD+ mechanism, which forms part of the international climate change negotiations, aims to support countries that reduce greenhouse gas emissions from deforestation and forest degradation and increase their carbon stocks through reforestation and the conservation and sustainable management of forests.

At the end of 2013, Côte d'Ivoire developed a REDD+ national roadmap (the R-PP document), which focuses on the decoupling of agricultural production and deforestation. The national REDD+ strategy, expected by 2017, should be articulated with plans for this decoupling for each of the main agricultural supply chains. The national discussion will establish to what extent the national REDD+ funds, planned to support actions that help reduce deforestation, can cover certain costs of the agricultural transition, in which the future of the country's forests is effectively at stake. The REDD+ roadmap envisages the introduction of a national system of payments for environmental services or advantageous loans with reduced rates and long maturities to support producers during the transition years, based on respect for a forest zoning plan.

Not everything has to involve financial incentives, however. Introducing incentives in areas where the stakeholders could simply respect the law could have the perverse effect of supplanting civic motivations. The green scenario in the rubber sector, for example, is highly profitable with an internal rate of return (IRR) of 43%. Regulatory or legal tools rather than incentives could play an important role through, for instance, the clarification or definition of production minimum standards.

### Challenge 3 Uncertainty related to unforeseen costs

The complete study includes ancillary costs and generally adopts a conservative approach for all green scenario assumptions. Ancillary costs are linked to land tenure, extension services to farmers, and preparing the REDD+ mechanism, which includes systems to monitor forest cover and manage complaints, etc. For example, the current very high costs for securing land tenure are maintained in the calculations up to 2030, even though reforms aimed at lowering these costs are underway. On the other hand, the study overlooks to some extent other costs that are difficult to anticipate related to research, strengthening institutions, building capacity and sharing information.

Photo: World Agroforestry Centre





Photo: EC DG ECHO Anouk Delafortrie

## Challenge 4 Existence of considerable non-economic costs

Important non-economic factors complicate the transition to the green scenario. The impact on employment is mixed (see Box 3). Political and social challenges linked to large-scale land tenure security are inevitable. Campaigns about land tenure security risk are reopening the sensitive debate on 'Ivoirité'. The problem of infiltrations into classified forests, parks and reserves appears particularly hard to solve. Indeed, decision-makers have yet to find an easy solution as they are caught between refusing to declassify occupied forests to avoid promoting settlements and failing to evict people occupying forest areas. In addition, lack of transparency, corruption and weak law enforcement constitute barriers to the development of sound public policies. Within this context, Côte d'Ivoire has nevertheless engaged in an ambitious effort to improve forest governance, notably within the framework of the FLEGT Voluntary Partnership Agreement process, in partnership with the European Union. This participatory process, with the prospect of privileged access to the EU market for timber from Côte d'Ivoire, is expected to lead to a clearer legal framework regarding the forest sector. This will only affect the agricultural sector indirectly. Complementary work to clarify the specific legal framework for agricultural commodities contributing to deforestation is set out in the REDD+ roadmap.

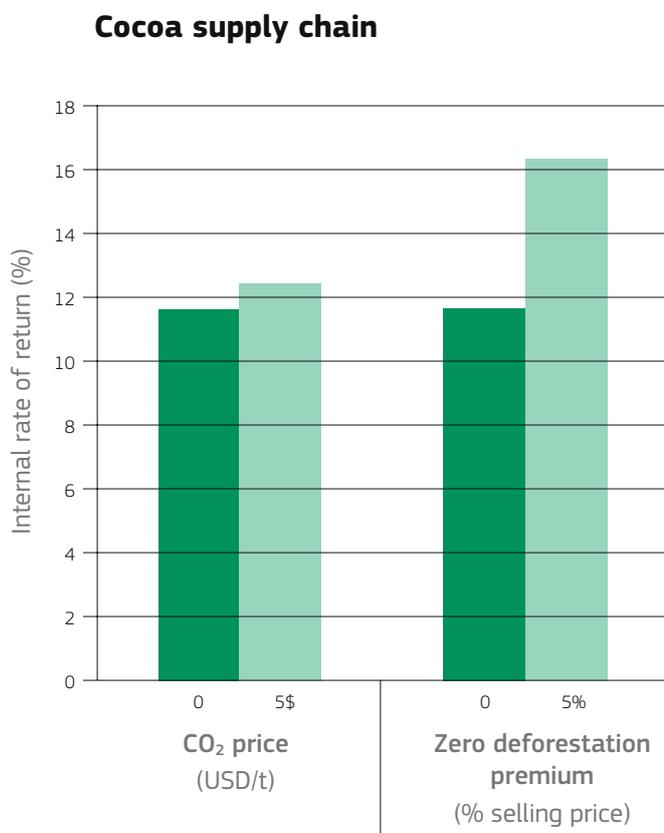
### Box 3 The impact on employment

- In general, green scenarios limit the number of producers as cultivated land is stabilised by 2020, but they increase the need for labour and qualified trainers.
- In the green scenario for the cocoa sector, 223 000 additional fieldworker jobs and 3 000 additional trainer positions would be created.
- In the current scenario with deforestation, assuming that the average land area per producer for perennial crops remains stable at 6.5 hectares, would allow for 239 000 new producers to cultivate a plot of land between 2015 and 2020, but wouldn't allow any further expansion after 2030 — the country would have virtually no forests left.
- Thus for the cocoa sector, the comparative effect on employment is qualitative (producers versus employees/trainers) rather than quantitative. Both scenarios provide about 230 000 jobs but one employs field workers and managers while the other employs small-scale producers.
- For food crops such as rice and yam, job creation is clearly higher in the current trend than in the green scenarios, as long as the land area under cultivation can increase, unless the rise in productivity in green scenarios accompanies a reduction in the average plot size cultivated by each producer.

## Challenge 5 Unpredictable signals from consumers

The study reveals that return on investment is quite sensitive to agricultural commodity price variations, even when the variations are small (5% or under). The study applied a price differential of 5% to two sectors (cocoa and oil palm) between production considered to involve a low risk of deforestation (green scenario) and production associated with deforestation (trend scenario) starting in 2020. In other words, the cocoa and oil palm sectors earn a 'zero deforestation' reputation (or low risk of deforestation) and would have a competitive edge, which would lead here to a 5% rise in price in products after 2020, in comparison with the deforestation scenario.

According to the results of the study, without a price differential, the move to the green scenario would entail no significant economic attraction for the cocoa supply chain: profitability would be 11.6% (IRR), which does not reach the 12% discount rate used by stakeholders in the sector. With a differential of 5%, on the other hand, the IRR rises to 16.3%. The extent of this variation largely exceeds the price effect of the tonne of carbon dioxide on the results (see Figure 5), for example. The price signals coming from Côte d'Ivoire's trade partners thus play a crucial role. This hypothesis of a price differential is based on few objective elements including the oil palm sector's current international exposure with regard to deforestation issues and the current price differential between certified and non-certified products. The hypothesis emerged from a compromise of opinions expressed during consultations for the study. In certain markets such as Europe and Brazil, buyers are differentiating more and more between commodities linked to deforestation and those free from it. Buyers are also looking for assessments of commodities' carbon footprints. However, the intensity and speed of these developments remain uncertain (see Box 4).



**Figure 5** Variations in the profitability for cocoa, based on the price of carbon dioxide and a premium for deforestation-free commodities

## Box 4 Who can strengthen the demand for deforestation-free commodities?

### The agricultural private sector

With regard to the private sector, an interesting strategy is the support from large agribusinesses that want to reduce the risk of deforestation in their supply chains, or be recognised as companies that sell zero deforestation commodities. This trend is already affecting the international market, notably through the Consumer Goods Forum, which brings together the main food industry multinationals committed to achieving zero net deforestation for their main supply channels by 2020. Some companies restructure their supply chains, favouring suppliers or zones at low risk of deforestation. The use of deforestation monitoring tools in real time is starting to guide agricultural commodity purchasing decisions (see for example [www.globalforestwatch.org](http://www.globalforestwatch.org)), as well as important independent monitoring work carried out by NGOs.

However, without support from producer countries, this restructuring often means that the manufacturer simplifies its supply chain leading to a decrease in the number of suppliers, which harms small-scale producers. In a country like Côte d'Ivoire, where small-scale producers play a major role in the commodity chains, engaging the private sector appears particularly strategic. A territorial approach, as in the context of the REDD+ process, with forest-friendly commitments coordinated in each supply chain, offers an alternative strategy to reducing the number of suppliers.

### The Government of Côte d'Ivoire

The Government of Côte d'Ivoire can of course play a decisive role. Even for export products such as cocoa, measures can be planned to favour the sector's transition to new production methods, such as a lower export tax or simplified procedures for producers adopting an approach to reduce the risk of deforestation.

### Côte d'Ivoire's trade partners

A growing number of consumer countries are becoming aware of their responsibility in the trade that leads to the destruction of tropical forests. A recent study of the European Union (2013) estimated that 9 million hectares of tropical forests were thus cleared for agricultural and livestock commodities, which were exported to and consumed in the EU between 1990 and 2008, corresponding to 10% of the global 'embodied' tropical deforestation during this period. The EU is considering measures to take to limit its ecological footprint and some EU member country governments are already promoting the consumption of sustainable or zero deforestation commodities, notably through their public procurement policies. In parallel, current negotiations between Côte d'Ivoire and the European Union aimed at achieving a Voluntary Partnership Agreement on legal trade in timber and timber products constitute an interesting precedent for collaboration between the two trade partners on similar issues in the forest sector.

## Challenge 6 Importance of collective action

The green scenarios are only worthwhile if they are implemented collectively. Otherwise, the decoupling of agriculture and deforestation will not take place. In the absence of coordinated collective action, producers who seek a zero deforestation reputation, will have to rely on private certification, a costly option for small producers, and one that, on its own, often has a limited impact on deforestation because non-certified operators are free to clear any land that remains. Certification, on the other hand, can play an essential early role in promoting stronger and clearer legal standards and in the broader

implementation of new production methods. The Côte d'Ivoire oil palm sector is currently interested in a national interpretation of the international sustainability standard of the Roundtable on Sustainable Palm Oil (RSPO). In this context stakeholders will need to define through consensus a definition of forests that cannot be cleared for the production of certified palm oil, a definition adapted to the context in Côte d'Ivoire.



Photo: Jean-Baptiste Dodane

Inter-professional associations and national platforms for dialogue exist for each of the main commodities. The Coffee-Cocoa Board (Conseil Café-Cacao) is an example. The timber sector committed to the VPA process relies on a national multistakeholder platform for dialogue representing the interests of stakeholders from the private sector, civil society and the government. These organisations and platforms for dialogue play an important role in coordinating beneficial actions including campaigns to combat disease, training to producers and policy dialogue. They could also play a pivotal role in implementing green scenarios and in defining action plans for each supply chain, including:

- establishing links between buyers of deforestation-free commodities and supply chains,
- introducing measures such as a voluntary moratorium on deforestation,
- launching innovative communication campaigns,
- clarifying or defining minimum legal or legal and sustainable production standards,
- coordinating financial and technical support, allowing for the funding of certain requirements,
- using political advocacy for the introduction of specific incentives, etc.

# Given the scale of these challenges, is the decoupling of agricultural production and deforestation in Côte d'Ivoire possible?

The next step required to study these results in greater depth and define the conditions for a feasible green scenario in Côte d'Ivoire, is testing the decoupling of agriculture and deforestation under real conditions at a suitable scale.

Between the national level, which is too ambitious, and the project approach, which is too limited, administrative districts experiencing deforestation and agricultural production, seem to offer the most suitable scale for piloting. Indeed, the subnational jurisdictional scale may serve as a small-scale model for national questions, notably issues that require significant intervention by the administration: land tenure, land use planning, support mechanisms for producers and deforestation monitoring.

The visibility of an administrative district also makes it possible to test an essential element of the green scenarios: the competitive advantage of deforestation-free supply chains through a territorial approach — 'jurisdictional certification' rather than certification of a specific supplier or shipment. Nevertheless, such an approach requires a minimum degree of organisation in the sector, and in the most remote or unstable parts of the country other approaches are more appropriate, such as focusing efforts on the protection of parks and reserves that are under pressure. The Ministry of the Environment is currently evaluating, within the framework of the REDD+ process, the possibility of a pilot programme at district level in partnership with commodity buyers who are ready to support the transformation of local supply chains and to help introduce deforestation-free production.



MINISTÈRE DE L'ENVIRONNEMENT DE  
LA SALUBRITÉ URBAINE DU  
DÉVELOPPEMENT DURABLE

**CN-REDD+**  
**CÔTE D'IVOIRE**



This note is based on the study 'Coûts-bénéfices de la REDD+ en Côte d'Ivoire' (costs and benefits of REDD+ in Côte d'Ivoire), carried out by SalvaTerra in the context of the collaboration among the EU REDD Facility, the European Union and the Ministry of the Environment of Côte d'Ivoire. The study also benefited from collaboration with the NGO Solidaridad in order to involve stakeholders in agricultural sectors. As part of the REDD+ process, the Government of Côte d'Ivoire was given three years to work out a national strategy to combat deforestation developed in consultation with stakeholders in the major commodity supply chains. The results presented here aim to illustrate an approach that helps support this consultation. The apparent precision of the figures should not mask the great uncertainties discussed in the study.

This briefing is a translation of the original document in French, 'Comment concilier développement agricole et forestier en Côte d'Ivoire, et à quel coût?'