ADDRESSING AGRICULTURAL DRIVERS OF DEFORESTATION IN COLOMBIA:

Increasing Land-Based Production While Reducing Deforestation, Forest Degradation, Greenhouse Gas Emissions and Rural Poverty

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OVERVIEW

In a world facing the triple challenges of land scarcity, climate change, and the loss of tropical forests, there is an urgent need to increase agricultural production while reducing greenhouse gas emissions and slowing tropical deforestation. Colombia is well positioned to become a global leader in meeting these challenges. Its palm oil and sugarcane sectors have begun the transition to sustainability as they expand biofuel production and exports, supported by free-trade agreements and effective finance programs. The beef and dairy sector, which occupies most of Colombia's cleared land, has a goal of reducing the area of pasture from 38 to 28 million hectares by 2019 as it increases production. If successful, this reduction of pastureland area could open up land for crop expansion, sparing forests on a national scale. A peace agreement under negotiation between FARC[1] guerrillas and the national government could soon end the half-century war that has paralyzed much of Colombia's rural zone and strengthened the illicit drug economies. An ambitious restitution program is beginning to compensate or resettle some of the five to six million smallholder farmers and villagers who have moved to urban centres, displaced from their land by guerrilla activity or land grabs. Tree plantations are expanding onto degraded lands. These trends and programs are reinforced by the national government's commitment to end deforestation by 2020, by the law n. 2 of 1959 prohibiting deforestation in the Amazon and six other main forest regions[2], by the national REDD+[3] framework, and by the "Heart of the Amazon" programme designed to consolidate protected areas and indigenous territories in the Amazon region while arresting further frontier expansion into the region.

A Colombian strategy for addressing the agricultural drivers of deforestation is best framed at the national level. There is an opportunity to link the increasingly export-oriented, "legal" agricultural regions (outside of the Amazon biome) with the unconsolidated agricultural and livestock regions of the Amazon and Piedmont regions, where illicit crops and low governance capacity impede the transition to a low-emission, low-deforestation, productive economy. Palm oil and sugarcane sectors are poised to build upon their informal "zero-deforestation" supply chain commitments to endorse a zero-deforestation, low-emission national agenda. The cattle sector has made important advances towards more sustainable production systems, and is poised to extend this progress into the Amazon region, where forest clearing for livestock is an important driver of deforestation.

A second overarching theme of a national land-use strategy is the urgent need for robust economic opportunities for small-scale producers. Colombia is moving beyond its legacy of land concentration—which has been an important motive of the guerrilla war—into a new chapter of its rural economic history, in which a diversity of small-scale producers are expecting improved livelihoods. To meet the critical demand for better economic opportunities in rural Colombia, effective models of farm settlements with innovative land tenure arrangements, technical support, marketing/commercialization systems, and financial instruments are needed. Many options for achieving this goal are on the table.

A national land-use strategy for increasing agricultural production and improving rural livelihoods while slowing and eventually ending deforestation, could potentially reduce greenhouse gas emissions associated with deforestation while enhancing CO_2 removals from the atmosphere by regrowing forests at a scale of approximately 0.7 billion tons CO_2 equivalent by 2020. These emissions reductions would be accompanied by substantial co-benefits in the form of improved smallholder farmer livelihoods, better air quality, biodiversity conservation and regulation of water flow (i.e., less flooding) in watersheds. To realize this potential, we recommend a "theory of change" that seeks to support and strategically link five opportunities: (a) the nation's progress in developing a jurisdictional REDD+ programme; (b) the progress of palm oil and sugarcane sectors towards sustainability; (c) the cattle sector's 2019 goal of reducing pasture area while increasing production; (d) restitution and farm settlement programs; and (e) the planted forest program.

1 FARC is the acronym for the "Fuerzas Armadas Revolucionarias de Colombia", (Revolutionary Armed Forces of Colombia), the principal guerrilla group operating in rural Colombia since 1964.

2 Six additional forest areas: Pacific, Central, Magdalena River, Sierra Nevada de Santa Marta, Serranía de los Motilones, and Cocuy.

3 REDD+ is the acronym for "Reduced Emissions from Deforestation and forest Degradation", which is a mechanism for compensating nations that lower their emissions from deforestation and forest degradation under development within the United Nations Framework Convention on Climate Change and through other bilateral and voluntary market processes.

SUMMARY OF RECOMMENDATIONS

Colombia has an excellent opportunity to develop a national land-use strategy over the next two or three years that is supported by government, the private sector, and civil society. The likelihood of success of this strategy will be enhanced through a sustained, orchestrated commitment from donor nations that helps to maintain momentum across political election cycles and that provides a long-term prospect for funding at scale that is tied to realistic performance milestones. The recommendations presented in this report are focused on this opportunity. They are presented assuming an initial design and early implementation phase (2013 through 2015) of a programme that will take ten years (or more) to bring to full fruition. They are intended to provide a broad conceptual framework for linking together the many opportunities and initiatives underway in Colombia into an integrated synergistic programme, with some detail on potential examples of specific interventions. (A full description of the recommendations is found in the main text of the report.) These recommendations should be developed more fully with the benefit of deeper analyses that provide more detail on the scale of finance that will be necessary to achieve stated goals and to investigate more thoroughly the business case for each proposed intervention. We recommend a six- to eight-month period of further analysis and investigation to provide this deeper level of analysis.

This strategy must be "owned" by several rural sectors with little track record of collaboration and it must be sufficiently flexible to respond to changing circumstances, including the possible failure of the Havana peace talks (which should by no means be viewed as a game-stopper).

The recommendations fall into three categories of intervention: sector-specific, systemic, and multi-stakeholder processes. They are integrated within a Theory of Change that focuses, initially, on achieving broad support for a national land-use strategy by the end of 2015, as illustrated in Figure ES-1.

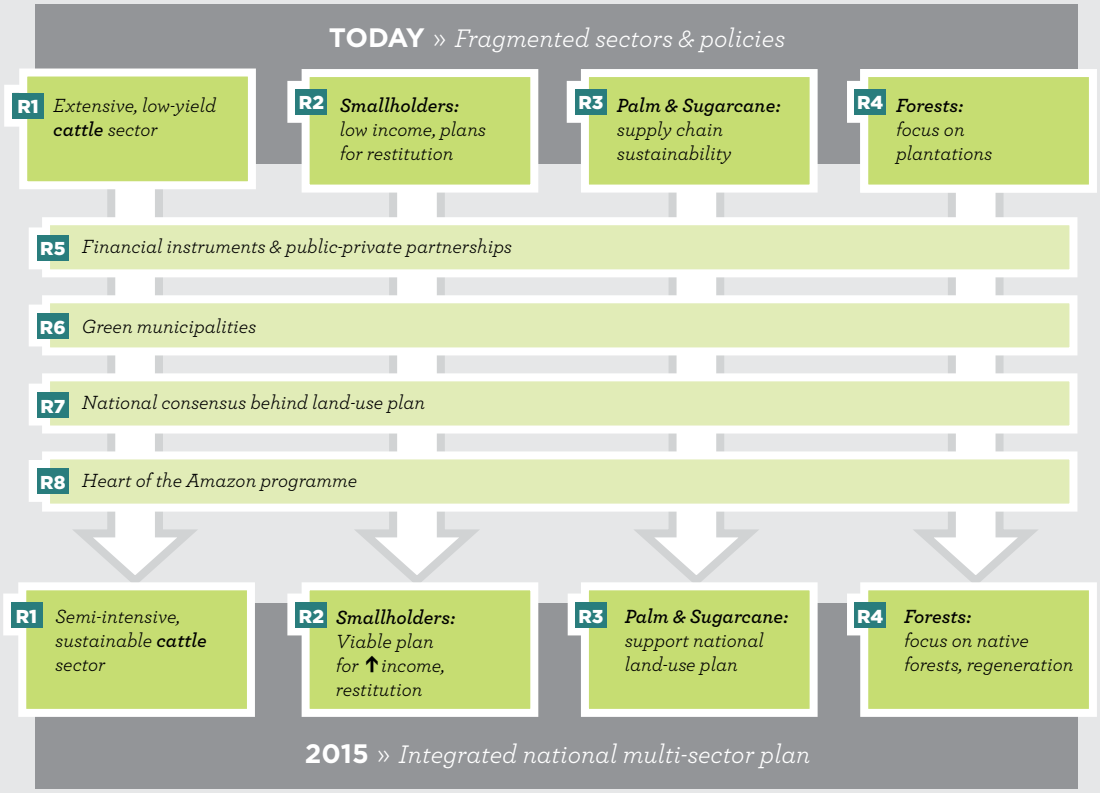

Figure ES-1 | *Theory of Change for interventions through which the UK and other donors could support the national transition to a "low-emission" rural development model in which deforestation declines and eventually ends as agricultural and livestock production and rural incomes increase, with a special focus on the Amazon region. This diagram features the initial 2.5-year intervention, ending in 2015, that would develop the integrated national multi-sector land-use plan and enabling conditions. Subsequent funding over an additional period would support completion of the transition to the "low-emission" rural development model.*

Sector-Specific Recommendations

RECOMMENDATION 1. *Support the transition to a zero-deforestation, more productive cattle sector.*

Overview | Cattle grazing lands (both planted and natural grasslands) occupy 38 million hectares in Colombia (40% of total land cover)[4]. These largely inefficient livestock systems are the necessary centrepiece of any strategy for expanding agricultural production while slowing and eventually ending deforestation in Colombia. Through a programme of intensification, grazing land can be made available for crop expansion while beef and milk production increase on a smaller fraction of the current area. This intensification can be achieved sustainably through improved cattle breeds, pasture management, technical support, finance and commercialization systems, and is supported by Colombia's beef sector. The transition to higher yields is proceeding successfully in many Latin American nations.

DESIRED OUTCOMES BY 2015

- Enabling conditions for national cattle sector transition established and integrated within the national land-use plan *(Rec. 7).*
- National zero deforestation cattle plan expanded to include deforestation hotspots in the Amazon region.
- Finance and technical support approaches for small- and medium-scale beef and milk producers in deforestation hotspots designed and beginning implementation.

STRATEGY

Goal 1 | FEDEGAN and other cattle producer organizations participate in and support both national and Amazon land-use strategies *(see Recs. 7 and 8).*

Goal 2 | System of technical and financial support for cattle sectors in deforestation hotspots to shift to low-deforestation, high-yield production, building on silvo-pastoral systems designed and tested.

Goal 3 | Public-private partnership developed with FINAGRO, beginning to deliver loans to cattle producers in deforestation hotspots.

Goal 4 | Cattle production system developed and beginning implementation within 3 to 5 restitution settlements.

RECOMMENDATION 2. *Support for a nation-wide program of sustainable farm settlements.*

Overview | The concentration of land in the hands of a small minority is at the core of Colombia's rural conflict. With the prospect of peace on the horizon, it is crucial that an effective programme for resettling a significant fraction of the five to six million farmers displaced by rural conflict be designed and implemented. Those small-scale producers who are still on the land are also in need of economic alternatives, clear land titles, and basic services. Both groups of farmers are vulnerable to the illicit crop trade, to the

4 Ministerio de Agricultura y Desarrollo Rural. Min. Juan Camilo Restrepo Salaza, Bogotá, 2010. Available at http://www.minagricultura.gov.co/archivos/ministro_jc_restrepo_tierras_2.pdf

flooding of the market with cheap farm products from the US and other nations (through free trade agreements), and to the expansion of agribusiness. Both groups of smallholders could also turn to forests for their livelihoods, clearing forests for the production of subsistence crops and for the establishment of cattle pastures. Alternatively, smallholders could be supported to develop agricultural and forest-based enterprises, increasing food security both regionally and nationally while reducing pressure on remaining forests. If sustainable settlements are achieved at scale, they could provide a powerful alternative to illicit crop production systems. Colombia is developing programmes to address these challenges through its restitution programme and through programmes in support of existing smallholder settlements.

Colombia's incipient programme of land restitution, its silvo-pastoral livestock production pilot project, and its community forest management initiatives represent important opportunities to foster integrated smallholder production systems that increase the production and incomes of smallholders and groups of farmers. One important innovation in this regard could be the establishment of regional smallholder production "clusters", each supported by a centre for technical and business outreach to build the capacity of smallholders to engage in commercial enterprise. This intervention links directly to the public-private partnership and finance components *(Rec. 5).*

DESIRED OUTCOMES BY THE END OF 2015

- Incorporate smallholders settlements into national spatial plan for land use *(Rec. 7).*
- Design effective strategies for (a) resettling farmers displaced by guerrillas (supporting the government's restitution program) and (b) increasing productivity and incomes of existing settlements.
- Support development of sustainable, community enterprises based on forest products, tree crops, and agricultural products.
- Design and begin implementation of ten pilot restitution settlements.
- Design and begin implementation of interventions in ten existing smallholder settlements.

STRATEGY

Goal 1 | Ministry of Agriculture restitution programme leaders and representatives of displaced farmers participate in national land-use planning process to secure favorable locations and to design supporting policies for new smallholder settlements.

Goal 2 | Effective approaches for the design and implementation of successful smallholder settlements representing a range of modalities developed and vetted by relevant stakeholders.

Goal 3 | Ten pilot restitution settlements designed with effective technical/business support and finance mechanism *(see Rec. 5).*

Goal 4 | Ten existing smallholder settlements (with half in Amazon deforestation hotspots) beginning transition to sustainable, productive, economically viable systems.

RECOMMENDATION 3. *Consolidate the transition to sustainable palm and sugarcane sectors.*

Overview | Palm oil and sugarcane sectors figure prominently in Colombia's ambitious renewable fuel agenda. Both sectors have also initiated a transition towards sustainability. Production centres currently are located largely outside of forest frontier regions; palm oil could become a direct driver of deforestation in the near future[5] however, and industries from both commodities are exploring greater investment near the forest frontier. These sectors could become important elements in the strategy to slow deforestation while increasing agricultural production if they throw their

political and economic weight behind both the design and implementation of a national land-use plan *(see Rec. 7)*. They can also provide a large number of jobs within their supply chains, potentially providing economically viable alternatives to slash-and-burn agriculture and illicit crops. Such alternatives will be extremely important in rural Colombia with or without a peace agreement. Both sectors run the risk, however, of excluding large numbers of small-scale growers from their supply chain transitions to sustainability, since mills that depend on large numbers of small-scale producers are more costly to certify under Bonsucro or RSPO standards. The exclusion of smallholders from palm oil and sugar supply chains could potentially undermine the peace process, which is focused on peasant access to land and economic opportunities.

For palm oil and sugarcane sectors to realize their potential as proponents of a national land-use strategy, a few interventions could help consolidate and expand their commitment to sustainability while providing direct support for increasing the participation of smallholder growers as suppliers. They are already positioned to formally take on zero deforestation commitments that could be reinforced through both roundtable certification and through the requirements of the European Union's Renewable Energy Directive. Palm oil and sugarcane sectors currently view deforestation as a supply chain issue however, instead of a regional or national issue that could affect their ability to sell into some markets.

DESIRED OUTCOMES BY THE END OF 2015

- Palm oil and sugarcane sectors support and participate in the national land-use planning process, moving beyond supply chain focus to embrace national sustainability goal.
- Palm oil and sugarcane sectors achieve high level (25% of production) of certification under RSPO and Bonsucro that includes smallholder growers.
- Substantial number of smallholder growers of palm oil and sugarcane receiving higher incomes.

STRATEGY

Goal 1 | Colombian producers' associations engaged in a national land use dialogue that finalizes maps for go/no-go zones for each commodity and that supports national zero deforestation goal.

Goal 2 | Autonomous smallholder groups and mills with large numbers of smallholder growers receive financial assistance to cover the costs of certification for a 2-3 year period.

5 Inter-American Development Bank (IDB), and Colombian Ministry of Mining and Energy. 2012. Assessment of biofuels chain production life cycle in Colombia - Executive Summary. Prepared by Consortium CUE. Bogota, Colombia. Available at http://www.fedebiocombustibles.com/files/Executive%20Summary.pdf

Goal 3 | Processors and commercial buyers (both local & international) agree to purchase a percentage of sustainable palm and sugar from Colombian producers (including a commitment to buy from small- and medium-scale producers) by 2015.

Goal 4 | Credit union providing loans with differentiated interest rate structures tailored to promote sustainable palm, sugar, and biofuel production.

RECOMMENDATION 4. *Expand sustainable forest management, forest regeneration, and tree plantations.*

Overview | One half of the Colombian territory is covered by forests, making it one of the world's great tropical forest nations. As is the case with palm oil, sugarcane and biofuels, the nation is seeking to organize and modernize its forest sector. This is no small task. The Colombian economy consumes four million cubic meters of wood each year. Three fourths of this demand is supplied by logging natural forests and nearly half of this logging is illegal. A major piece of the plan to gain greater control over the forest sector is the establishment of tree plantations. By the end of 2014, Colombia hopes to establish one million hectares of planted forests (60% commercial plantations with exotic species; 40% with native species) to reduce exploitation pressure on natural forests and to restore degraded lands. To support this ambitious goal, USD 184 million will be made available to cover some of the costs of plantation establishment (up to 50% of costs for commercial exotics and 75% of the costs of native species plantations) through the CIF ("Forest Incentive Certificate") of MADR (Ministry of Agriculture and Rural Development). So far, this programme has supported the establishment of approximately 200,000 ha of forests. CIF funds can also be used to cover the costs of natural forest management.

Colombia has an excellent opportunity to build upon its impressive planted forest agenda to develop a more comprehensive approach to forests, weaving them more deliberately into the zero deforestation cattle agenda *(Rec. 1)*, the farm settlement/restitution agenda *(Rec. 2)*, the national land-use strategy process *(Rec. 7)* and the Heart of Amazon proposal *(Rec. 8)*. Three opportunities are particularly ripe in this context. First, if the *area* of cattle pasture declines at the pace that is envisioned by the cattle sector (i.e. from 38 million hectares today to 28 million hectares in 2019), large areas of marginal land will become available for natural forest regeneration, which can be surprisingly cheap[6,7]. Even if only 20% of the 10 million ha of pastures that are taken out of grazing are allowed to naturally regenerate, 10 to 15 million tons of CO_2 could be pulled out of the atmosphere each year by regenerating forests.

Second, Colombia's "competitive regional consortium" initiative, designed to support tree planting and tree-based enterprise among clusters of smallholders, could be expanded/adapted as an important element of restitution settlements. The role of UK finance could be similar to that described under Recommendation 5, in collaboration with FINAGRO.

Third, National and Amazon land-use planning processes *(Recs. 7 and 8)* could develop regional analyses and seek multiple-sector consensus on a spatial and economic/business plan for fostering sustainable forest management and associated enterprises (for timber and non-timber products), forest regeneration, and tree plantations. The spatial land-use plans of the national and Amazon forest strategies could recognize and, where appropriate, address the major constraints to forest-based enterprise, while seizing the major opportunities. The finance and technical outreach mechanisms for implementing the strategy on the ground could be similar to those described under *Recommendation 5*.

DESIRED OUTCOMES BY THE END OF 2015

- A national forest sector plan that is supported by the major rural sectors, with viable, spatially-differentiated business models for unlocking the potential of natural forest management,

6 Nepstad, D. C., G. O. Carvalho, A. C. Barros, A. Alencar, J. P. Capobianco, J. Bishop, P. Moutinho, P. A. Lefebvre, U. L. Silva, and E. Prins. 2001. Road paving, fire regime feedbacks, and the future of Amazon forests. Forest Ecology and Management 154:395-407.

7 Bowman, M. S., G. S. Amacher, and F. D. Merry. 2008. Fire use and prevention by traditional households in the Brazilian Amazon. Ecological Economics 67:117-130.

forest regeneration on marginal lands, and tree plantations, successfully incorporating tree-based enterprise into restitution settlements, smallholder settlements, and small-scale cattle producers.

STRATEGY

Goal 1 | Forest sector representatives and experts participate in national land-use strategy process *(Rec. 7),* advocating larger role for forest- and tree-based enterprise and mechanisms for compensating the maintenance or restoration of forest-based ecosystem services.

Goal 2 | Forest management/tree plantation pilots (12 to 20) designed and beginning implementation for three modalities, documenting costs and multiple benefits and testing finance/ compensation models.

Goal 3 | CIF expanded to support broader range of forest- and tree-based enterprise.

Systemic Interventions

RECOMMENDATION 5. *Public-private partnerships for innovative finance.*

Overview | The transition to low-emission rural development in Colombia is technically viable and could become financially self-sustaining. Investments in better cattle breeds, fertilizer, improved land management, tree crops, silvopastoral systems, higher yielding palm oil, sugar and other plantations, and other interventions can provide higher yields and higher profits per hectares—a key component of the transition to low-emission rural development. However, the capital necessary to make these investments is not available to most micro-, small-, and medium-sized producers. The problem cannot be simply described as a lack of public finance. Colombia directs USD 8.6 billion per year to its agricultural sectors through public loans, grants, and investments. Rather, the problem is often that the people and regions that are most in need of finance can't access it. Many landholders in the Amazon and smallholders nationally do not have clear title to their land and therefore have difficulty guaranteeing their loans. Infrastructure, technical support and commercialization systems are also lacking in the Amazon region, elevating risks for loan-makers. In this recommendation, we also present possible financial instruments that could incentivize municipal-level declines in deforestation, drawing lessons from Brazil's "green municipalities" program.

This recommendation is for a "cross-cutting" intervention in the Colombian public finance systems to improve their effectiveness in stimulating the transition to higher yields, lower deforestation, better soil and water management, and better labour practices on private farms. We have identified several potential interventions to mobilize finance where it is most needed, and FINAGRO (with the supervision of MADR) has expressed interest in working with the UK in developing these instruments.

DESIRED OUTCOMES BY THE END OF 2015

- Finance mechanisms designed and beginning implementation through public-private partnerships in support of sustainable cattle production, responsible beef and milk processing *(see Rec. 1)*, smallholder settlements *(see Rec. 2)*, certification of mills and their smallholder growers *(see Rec. 3)*, and to reward "green", low-deforestation municipalities *(see Rec. 6)*.

STRATEGY

Goal 1 | Matching Fund Agreement with Colombia. New "LED-R" financial products with better terms (lower interest rates) and conditions (longer repayment periods) than ordinary loans, are developed together with FINAGRO.

Goal 2 | Public-Private Partnerships designed and beginning implementation. The matching fund agreement would be implemented through public-private partnerships (PPPs) with a commercial bank, microcredit institution, and/or credit union to offer LED-R finance products.

Goal 3 | Performance-based allocation of royalties to municipalities in support of a "Green Municipalities" initiative (Rec. 6). Negotiate agreement with National Royalty Program for a pilot system for allocation of funds to municipalities that are lowering their deforestation rates (and possibly other criteria). UK or other donors provide a part of the finance and fund the design process.

RECOMMENDATION 6. *Design and implement a "green municipalities" program.*

Overview | One of the most effective governmental interventions in deforestation in the Brazilian Amazon was the municipal black list, created in 2008[8]. The farms located in the region's 36 top-deforesting (i.e., "black") municipalities were cut off from government agricultural loan programmes and markets until deforestation declined. Several municipalities responded rapidly, with farmers, ranchers, and local governments organizing themselves to lower deforestation. By defining performance at the scale of the entire jurisdiction (the municipality) with a simple metric (annual deforestation compared to the historical average) and direct consequences (access to credit), the programme fostered collaboration, dialogue, and innovation that achieved declines in deforestation at a very large scale. This programme has since been adopted and modified by the state government of Pará, which has begun to allocate state-to-municipal governmental transfers to favour declines in deforestation through a programme it calls "Municipios Verdes" (Green Municipalities)[9]. Many stakeholders in Colombia believe that such an approach holds potential to slow deforestation in the Amazon region of Colombia and perhaps elsewhere in the country; work has already begun on the development of a programme of this type.

Colombia has an opportunity to design, test and implement its own version of a Green Municipalities programme that leapfrogs some of the weaknesses of the Brazilian system. The main problem in Brazil has been the lack of positive incentives at the farm level in successful municipalities and the dependence upon the support of elected mayors that can disappear through election cycles. (Brazil's 76% decline in deforestation is vulnerable to a reversal precisely because it has been achieved with virtually no positive incentives to farmers and settlements that are opting for sustainable, zero-deforestation production systems.) Colombia could consider designing a programme that punishes high deforestation municipalities

8 Decree n. 6.321/2007, Brazil. More information available at http://www.mma.gov.br/florestas/controle-e-prevenção-do-desmatamento/plano-de-ação-para-amazônia-ppcdam/lista-de-munic%C3%ADpios-prioritários-da-amazônia

9 Decree n. 31.884/2011, Pará, Brazil (officially created the program). More information available at http://municipiosverdes.com.br/arquivos/decreto_de_criacao_do_pmv.pdf

and rewards farmers, settlements, and governments in municipalities that are lowering deforestation. This programme could initially focus on the Amazon region as part of the "Heart of Amazon" initiative *(Rec. 8)* as it expands to the Llanos/ Orinoco and other regions.

DESIRED OUTCOMES BY THE END OF 2015

- Pilot Municipalities (4 to 8) in each of two target regions (Amazon deforestation hotspots; Llanos) reducing deforestation through performance-based positive and negative incentives.
- Political support across several sectors for expanding the programme to the entire Amazon and, perhaps, nationally.

STRATEGY

Goal 1 | Amazon and Llanos target municipalities selected on the basis of: (a) capacity and engagement of the municipal government; (b) location; (c) agricultural sectors and their level of organization; (d) remaining forests and savannas; and (e) historical rate of deforestation.

Goal 2 | "Green Municipalities" programme designed.

Goal 3 | IDEAM's forest monitoring programme operationalized as authoritative source of deforestation information across all levels of government in support of green municipalities and to increase awareness of deforestation nationally.

Goal 4 | Request for proposals from municipalities within target departments to support their efforts to organize their stakeholders and plan for the reduction of deforestation.

Multi-Sector Consensus, Governance, and Spatial Planning

RECOMMENDATION 7. *A national land-use strategy with deep cross-sector support.*

Overview | Colombia's rural sector policies and dialogues are highly fragmented. Strategies for increasing the production of crops, livestock, and biofuel are operating outside of strategies for ending deforestation or resettling hundreds of thousands of displaced farmers onto the land. The national strategy for mining is even further removed from the forests and farms agenda. As a result of this fragmentation, many programmes and policies have the potential to undermine each other. For example, even if a multi-sector agreement is reached to make the Amazon region off limits to further agricultural expansion, mining and hydrocarbon policies that open up remote regions of the Amazon to mineral exploitation could usher in waves of colonization and forest clearing. To achieve better harmonization across divergent objectives, multi-sector dialogues at different scales that develop evidence-based, spatial land-use zoning plans, infrastructure plans, and strategies for increasing frontier governance capacity are needed. This agenda is consistent with Colombia's decentralized spatial planning policy and holds great potential for diminishing conflict among rural development agendas.

Important precedents exist for achieving integrated regional development plans through multi-stakeholder processes. The "MAP" (Madre de Dios, Acre and Pando) planning process along the interoceanic highway from Brazil through Peru to the Pacific has fostered integration of policies and programmes across sectors in Acre (Brazil), Madre de Dios (Peru) and Pando (Bolivia).[10] The BR163 "soy highway" regional planning process, in the eastern Amazon of Brazil, culminating in 2005, resulted in one of history's greatest pulses of tropical forest protected area and extractive reserve creation, with 24 million hectares set aside between 2004 and 2006[11,12]. This process was driven by civil society and assimilated by the federal government. Comments from a broad range of Colombian stakeholders suggest that an agreement is within reach to fully implement Law 2 of 1959 that prohibits forest clearing in the Amazon and to identify viable pathways for increasing agricultural and mineral production with a minimum of negative impact.

DESIRED OUTCOMES BY THE END OF 2015

- National land strategy designed, with support across several sectors, to reconcile Colombia's goals of ending deforestation, increasing agricultural and mineral production, and resettling displaced farmers.

STRATEGY

Goal 1 | Design and implement a regionalized, multi-sector, participatory process that would culminate in a national land strategy.

Goal 2 | Develop plausible 2020 scenarios for reconciling Colombia's forest, agriculture, resettlement, mining, and hydrocarbon goals that highlight the potential of current and proposed public policies and governance instruments to achieve each scenario.

Goal 3 | Develop a single, broadly shared land-use map for Colombia that reinforces the legal status of the Amazon and other regions as forest reserves that are off-limits to agricultural expansion.

RECOMMENDATION 8. *Complete and implement an Amazon land strategy (Heart of the Amazon proposal).*

Overview | Colombia's greatest challenge in reconciling its deforestation, mining, and hydrocarbon goals is the Amazon region. Governance capacity is low in the Amazon, and even with a successful peace process, the illicit crop economy will continue to undermine efforts to govern this vast region. Mining and hydrocarbon interests are anxious to achieve permits to do prospecting and exploit resources in areas that are legally off limits to such activities. And, yet, there is a great deal of convergence across many national rural sectors around the notion that the Amazon region should be off-limits to further agricultural and livestock expansion. The cattle, palm oil, sugarcane and biofuel sectors all support the removal of deforestation from their supply chains. There is strong support for the indigenous peoples' formally recognized territories within the Amazon Biome, for management of protected areas, and for the HA programme to inter-connect these territories and reserves across an eleven million hectare area.

Colombia's HA proposal/programme is an appropriate centrepiece of the

10 Mendoza, E. R. H., S. G. Perz, S. Souza da Silva, I. F. Brown, and P. S. Pinheiro. 2013. Revisiting the knowledge exchange train: scaling up dialogue and partnering for participatory regional planning. Journal of Environmental Planning and Management:1-19.

11 Campos, M. T. and D. C. Nepstad. 2006. Smallholders, the Amazon's new conservationists. Conservation Biology 20:1553-1556

12 Nepstad, D. C., D. McGrath, A. Alencar, C. Barros, G. O. Carvalho, M. Santilli, and M. d. C. Vera Diaz. 2002. Frontier governance in Amazonia. Science 295:629-631.

UK investment strategy in Colombia. It lays out an agenda of spatial planning, investments in governance capacity within subnational governments, the development of economic alternatives to forest conversion to livestock and crops, the development of programmes for improving the livelihoods of the indigenous groups whose territories lie within the Amazon biome, protected area management, among other elements. We recommend the expansion of this proposal to encompass the entire Amazon biome, given the large potential for an orchestrated set of investments from the UK, Germany and Norway. Most of the elements of the HA programme are addressed in *Recommendations 1-5*. The "Green Municipality" recommendation could further strengthen the HA programme, as could the National Land-Use Strategy *(Rec. 7)*. In this recommendation, we highlight those elements of the HA proposal that are not already addressed in other recommendations.

DESIRED OUTCOMES BY THE END OF 2015

- Heart of the Amazon programme expanded to the entire Amazon Biome, with robust business models developed to address agricultural drivers of deforestation (increasing the value of timber- and non-timber-based enterprises), effective participatory planning achieving consensus on a spatial plan and land-use strategy, a programme of support and economic alternatives for indigenous communities developed with meaningful engagement of these groups.

STRATEGY

Goal 1 | Indigenous groups of the Amazon region, together with relevant government agencies and with adequate support from partner organizations, develop programmes for improving livelihoods and managing territories, supported by analysis of current circumstances, needs assessment, and current systems for supplying basic services (health, education, water).

Goal 2 | Governance deficiencies in the Amazon region understood and strategy for overcoming these deficiencies developed with cross-sector support.

Goal 3 | Heart of the Amazon programme expanded to the Amazon Biome, developed and ready for implementation, with deep support from key sectors and developed on a foundation of economic, governance, and sociological analyses.

1 | GLOBAL AND NATIONAL CONTEXT

Climate change, the growing global shortage of agricultural commodities and the loss of tropical forests are some of the biggest challenges facing humanity. Anthropogenic climate change is increasing temperatures, weather extremes, and sea level, with impacts already being felt and more predicted[13,14,15,16]. Growth in the demand for land-based production of food, feed, fuel and fiber is outpacing the growth in supply, leading to a rise in commodity prices that contributes to hunger, malnutrition, and civil unrest[17,18,19,20]. This second challenge can be viewed as a global land crisis since the declining amount of land available for agricultural expansion[21,22] is contributing to the imbalance in supply and demand[17,20]. The land crisis is, in turn, driving agricultural and livestock expansion into tropical forests, where much of the world's remaining arable land is found[20]. These global challenges are the broader context for other major global environmental issues that we are facing, including freshwater scarcity, nitrogen loading, the loss of natural ecosystems and biodiversity, and the release of toxins into the environment[23,24].

In light of these global challenges, an important question is **"how can land-based production increase to meet growing demands while reducing GHG emissions and sparing tropical forests?"** Answers to this question must also address the related issues of freshwater supply, the loss of native ecosystems and biodiversity, toxic agrochemicals and nitrogen loading. These questions are particularly daunting in light of the *declining* trends in agricultural yields in many places in the world[25].

A comprehensive global set of policies for addressing the competing demands for land and land-based production and the links between land scarcity and climate change does not currently exist and is unlikely anytime soon under the international framework. Policy approaches can be reinforced through market transformation *(see Figure 1.1 below)* to favor sustainable practices, and these market-based initiatives can be strengthened through linkages to policy. Possibilities include: (a) emerging policy frameworks that create incentives and compensation for jurisdictional efforts to Reduce Emissions from Deforestation and forest Degradation while enhancing

13 Hansen, J., M. Sato, and R. Ruedy. 2012. Perception of climate change. Proceedings of the National Academy of Sciences.

14 IPCC. 2007. 4th assessment report of the intergovernmental panel on climate change. Intergovernmental Panel on Climate Change, Geneva, Switzerland.

15 IPCC. 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge, UK, and New York, NY, USA.

16 Lobell, D. B., W. Schlenker, and J. Costa-Roberts. 2011. Climate Trends and Global Crop Production Since 1980. Science 333:616-620.

17 OECD/FAO. 2010. OECD-FAO Agricultural Outlook 2010-2019. OECD/FAO.

18 Grantham, J. 2011. Time to Wake Up: Days of Abundant Resources and Falling Prices Are Over Forever. GMO LLC.

19 Werrell, C. E. and F. Femia. 2013. The Arab Spring and Climate Change. Center for American Progress | Stimson | The Center for Climate and Security, http://www.americanprogress.org/wp-content/uploads/2013/02/ClimateChangeArabSpring.pdf.

20 Nepstad, D. C., W. Boyd, C. M. Stickler, T. Bezerra, and A. Azevedo. 2013. Responding to climate change and the global land crisis: REDD+, market transformation, and low emissions rural development. Philosophical Transactions of the Royal Society.

21 Lambin, E. F. and P. Meyfroidt. 2011. Global land use change, economic globalization, and the looming land scarcity. Proceedings of the National Academy of Sciences of the United States of America 108:3465-3472.

22 Tilman, D., C. Balzer, J. Hill, and B. L. Befort. 2011. Global food demand and the sustainable intensification of agriculture. Proceedings of the National Academy of Sciences 108:20260-20264.

23 Foley, J. A. et al. 2011. Solutions for a cultivated planet. Nature 478:337-342.

24 Brown, L. 2011. The Great Food Crisis of 2011:. Foreign Policy. Slate Group, Washington DC.

25 Ray, D. K., N. Ramankutty, N. D. Mueller, P. C. West, and J. A. Foley. 2012. Recent patterns of crop yield growth and stagnation. Nat Commun 3:1293.

carbon storage in natural and managed ecosystems, known as jurisdictional "REDD+"[26]; (b) market exclusion of agricultural commodities produced in a way that is associated with the conversion of forests and other natural ecosystems to cropland and other unsustainable practices, and (c) domestic policies and markets that promote a shift to low-deforestation, high-yield land-use systems. Although these three possibilities have proceeded largely in isolation, there are emerging opportunities for combining them into a new rural development model, referred to here as "low-emission rural development" (LED-R). The figure below illustrates these synergies and potential linkages.

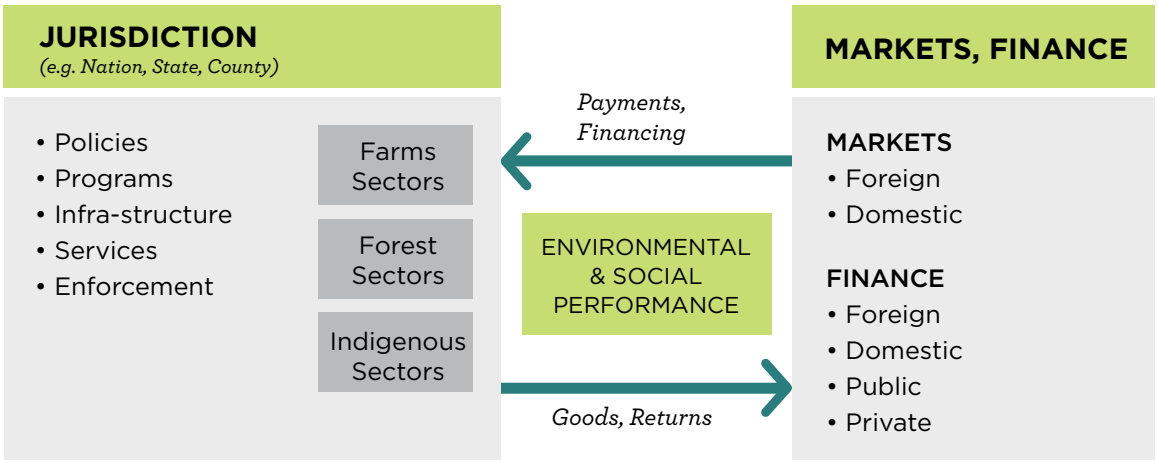

Figure 1.1 | *Conceptual framework for linking jurisdiction-wide performance in lowering deforestation, GHG emissions, and rural poverty with markets (foreign, domestic) and finance (foreign, domestic, public private) to achieve "low-emission" rural development.*
Fragmentation in the definition of performance at the scale of entire jurisdictions has emerged as an important obstacle to the transition to low-emission rural development. (From: Nepstad et al. 2013[20]). Colombia has strong potential for developing and implementing this framework.

With abundant water, land, and favorable climatic conditions, Colombia is poised to either exacerbate the problems of climate change and tropical forest loss or become part of the solution. Colombia will soon become one of the top nations supplying the growing global demand for food, feed, fuel, and fiber—particularly beef, palm oil, sugar, and ethanol. This role is reinforced by Colombia's free trade agreements, by the prospects of a peace agreement between the central government and rural guerrillas and by the rising prices for agricultural commodities. Under the business-as-usual high-emission pathway of horizontal frontier expansion into the forests of the Amazon and the savanna woodlands of the Orinoco emissions are projected to greatly increase from forest conversion, approaching one billion tons of CO_2 by 2020 *(see Table 9-1)*. Alternatively, this expansion in production could take place primarily onto lands that are already cleared and being used for low-productivity cattle grazing. This alternative, low-emission pathway can be achieved through a series of orchestrated interventions that are strategically linked within a LED-R model.

The pathway that Colombia follows—"business-as-usual" versus "low-emission" rural development—will depend, in large part, upon the degree to which the governance capacity and private sector innovation that characterize the "legal" agricultural frontiers in the Llanos and Valle del Cauca can permeate the frontiers currently dominated by illegal activities (illicit crops and mining of gold and other minerals), including those in the Amazon biome. In this context, the palm and sugarcane sectors, which have grown more powerful through Colombia's renewable fuel policies, could play a pivotal role. These industries have made important steps towards the development of sustainable supply chains, and are making incursions into the western fringe

26 Nepstad, D. C., W. Boyd, A. Azevedo, T. Bezerra, B. Smid, R. M. Vidal, and K. Schwalbe. 2012a. Overview of State-based Programs to Reduce Emissions from Deforestation and Degradation (REDD) as part of the Governors' Climate and Forest Task Force EPRI, Palo Alto, CA.

of the Amazon region (in the case of oil palm) that could become a positive force for greater legality and governance capacity. The cattle sector has embraced an ambitious 2019 national goal of greatly reducing the area of cattle pasture (from 38 to 28 million hectares)[27] while increasing production, and has launched a successful pilot for increasing yields and sustainability. Forest-based economies, including rotational timber production from natural forests in the Amazon and tree plantations in the Andes, are poised to help secure or increase carbon stocks on the land while providing new revenue streams.

Colombia is committed to rural development that increases production while slowing deforestation. However, most governance capacity lies outside of the Amazon forest regions and most of the main private sector innovation and transition to sustainability is taking place in the Piedmont and Llanos regions, far from the forest frontier. In one plausible scenario, current finance mechanisms and policies will favour expansion of vertically integrated, high-yield production of palm oil, sugarcane, biofuel and other crops while existing and resettled smallholder communities are trapped in rural poverty. This scenario could undermine the peace negotiations, which are focused on access to land.

Political commitment to slowing deforestation and curbing GHG emissions is manifested in many policies and programmes. Colombia is committed to end deforestation by 2020[28]. It is currently developing: (a) a national REDD+ Strategy; (b) a Multi- Sectoral Low Carbon Development Strategy (SLCD); (c) a National Plan for Climate Change Adaptation; (d) a National Disaster Prevention Financial Strategy. The National Development Plan; and (e) for years 2010-2014 aims to avoid deforestation of 200,000 ha. Colombia has designed an ambitious "Heart of the Amazon" initiative as part of its REDD+ strategy that could interconnect many of the Amazon's protected areas and indigenous lands and aspires to drive the transition of smallholders and ranchers to low-deforestation, sustainable production systems. Forest clearing in the Amazon and six other forest reserves was prohibited in 1959[29], reinforcing a perception among many sectors that the Amazon region is off-limits for agricultural expansion.

If these policies are to align with, and influence, other policies related to land-use (e.g., programmes for restitution of land and spatial land planning), commerce (e.g., free-trade agreements), and conflict resolutions (i.e., peace talks), significant obstacles must be overcome. These include: (a) lack of coordination of land-use policies and planning across national ministries, across sectors, and across different levels of government (i.e. regional authorities (e.g. national agencies and Regional Autonomous Corporations "CAR"s, responsible for environmental regulations and enforcement) and territorial institutions (departmental and municipal governments)); (b) insufficient governance capacity to implement policies in remote forest regions; and (c) the lack of a finance model for favouring low-deforestation activities.

Colombia has a high level of financial support for agriculture and rural development provided through the Fund

27 Plan Estratégico de la Ganadería Colombiana 2019. FEDEGAN. Bogotá, Nov. 2006.

28 UNFCCC Secretariat. 2011. Nationally Appropriate Mitigation Actions (NAMA), . Pages March, 2011. Colombia. 2046, a, p. 2011 FCCC/A WGLCA/2011/INF .1., UNFCCC, http://unfccc.int/resource/docs/2011/awglca14/eng/inf01.pdf.

29 Ley 2/1959. This law established 7 forest reserves: Amazon, Central, the Cocuy, the Pacific, and Magdalena River, Serrania de los Motilones, Sierra Nevada de Santa Marta. The total area was approximately 65 million hectares.

for Financing the Agricultural Sector (FINAGRO), agribusiness producers and traders, royalties from the mining and extraction industries, and Overseas Development Assistance (ODA). Total funding is USD8.6 billion per year. While the overall amount of funding seems sufficient to support the transition to low-emission, low-deforestation, high-production rural development, a number of factors restrict access for small- and medium-sized producers leaving them with little to no funding or incentives to make this transition. This funding is also not yet designed to favour low-deforestation, low-emission practices.

The recommendations presented in this report are focused on the initial design and early implementation phase (2013 through 2015) of a process that will probably take eight to ten years to bring to full fruition. They are intended to provide a broad conceptual framework for linking together the many opportunities and initiatives in Colombia into a synergistic integrated programme, with some detail on potential examples of specific interventions. Further analysis will be needed to examine the recommended interventions more closely, and to develop the "business case" for those interventions, before implementation.

2 | DESCRIPTION OF THIS STUDY

This report summarizes research and fact-finding conducted from March through June 2013 to assess the potential for a United Kingdom investment to re-direct the drivers of deforestation in Colombia, reducing deforestation and greenhouse gas emissions. The research covered the main sectors, policies, and actors who influence Colombian land use, with a particular focus on the potential for weaving together current initiatives, commitments, and trends into a comprehensive national strategy that could shift the rural economy towards a pathway that could slow and eventually end deforestation while increasing economic growth and raising the rural poor out of poverty.

The study was conducted through literature review and through interviews of key stakeholders to understand the political economy of major agricultural sectors, the potential for increasing production while lowering deforestation and GHG emissions, and the institutional barriers and opportunities for realizing this potential in Colombia. Those interviewed included Colombian and donor Government officials and representatives from private sector industries, agricultural associations, civil society organization, research institutes, and consultants. Local organizations led parts of the data collection and research according to their areas of expertise, including analysis of official and non-official reports.

Our analysis is also informed by lessons drawn from the first six years of efforts to develop REDD+ programs in tropical nations, by the first seven years of efforts to achieve "market transformation" to establish international social and environmental standards for agricultural commodities, and by more recent efforts to drive large-scale transitions to "low-emission rural development" at the jurisdictional level in key regions including Brazil, Colombia, and Indonesia. For further information, definitions, comments on jurisdictional REDD+, market transformation, and more, please see *Appendix A*.

3 | LAND USE IN COLOMBIA

3.1 Overview of agricultural production today: amounts and geographical distribution

Colombia has a land area of 1.14 million km^2 and can be divided into five major biogeographic regions with contrasting biophysical and land use characteristics: Andes (322,100 km^2), Caribbean (115,400 km^2), Pacific Coast (74,600 km^2), the Amazon (455,000 km^2), and the Orinoco plains (169,200 km^2)[30]. The Colombian economy is based largely on mining, agriculture, and industrial exports. It is the fourth largest economy in Latin America, and its economic credibility remains high; Colombia remained relatively unaffected during the global economic crisis of the last five years. Stronger macroeconomic policy, the China-driven commodity boom and increased rule of law in areas previously controlled by guerillas have favored strong economic growth since the early 2000s.

Agriculture and livestock contribute 10-14% of annual GDP and employ and/or support the livelihoods of approximately 3.7 million people (8%) in Colombia[31]. Agricultural products account for approximately 40% of annual exports. In 2007, crops were cultivated on 3.8 million ha, whereas livestock was produced on 38 million ha, or 3 and 33 % of Colombia's land area[32], respectively. Principal agricultural activities vary by region. Pasturelands are the dominant land cover in the Andes region (24%) compared with croplands (19%). The arid lands in the Caribbean are mainly used for cattle ranching (48%) and agriculture (14%). The Pacific region contains a dense coastal lowland rain forest, where croplands cover a greater area (10%) than pasturelands (2%). In the Orinoco region (usually referred to as the Llanos) pasturelands (86%) and croplands (3%) have increased rapidly since the 1980s[33]. Finally, the Amazon is mostly covered by tropical rainforests. It is estimated that deforestation has converted about 6% of Amazon forests into pasturelands, and less than 1% into legal and illegal croplands[34].

The principal export crops are coffee (7346 km^2), maize (5235 km^2), sugar cane (4251 km^2), palm oil (3128 km^2), and cocoa (935 km^2). The main crops for domestic use are plantain (3763 km^2), maize, and rice (4608 km^2)32,[35]. Cacao, sugarcane, coconut, banana, plantain, rice, cotton, tobacco, cassava, and most of Colombia's beef cattle are produced in low-lying, warm regions. Coffee, maize, fruit and vegetables are grown in temperate regions between 1000 and 2000 m elevation[32].

Crops such as oil palm are mostly grown on large farms (average 525 ha), although over the last decade the proportion of oil palm plantations on smallholdings has increased considerably, with a total area of 70,000 ha (16%) in smallholder farms as of 2011. Crops such as cacao, coffee, and rice are produced on smallholdings of 3 to 11 ha[36,37,38]. Among export crops, only sugarcane is grown largely on large farms[38].

30 Etter, A., C. McAlpine, K. Wilson, S. Phinn, and H. Possingham. 2006. Regional patterns of agricultural land use and deforestation in Colombia. Agriculture Ecosystems & Environment 114:369-386.

31 DANE - Departamento Nacional de Estadistica de Colombia. 2011. Series de Población 1985–2020. http://www.dane.gov.co/index.php?option=com_content&view=article&id=238&Itemid=121.

32 Ramirez-Villegas, J., M. Salazar, A. Jarvis, and C. E. Navarro-Racines. 2012. A way forward on adaptation to climate change in Colombian agriculture: perspectives towards 2050. Climatic Change 115:611-628.

33 Sánchez-Cuervo, A. M., T. M. Aide, M. L. Clark, and A. Etter. 2012. Land Cover Change in Colombia: Surprising Forest Recovery Trends between 2001 and 2010. PLoS ONE 7:e43943.

34 IDEAM, IGAC, IAvH Invemar, Sinchi, and et al. 2007. Mapa de ecosistemas continentales, costeros y marinos de Colombia (escala 1: 500.000). Bogotá, D.C, Colombia. Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM), Instituto Geográfico Agustín Codazzi (IGAC), Instituto de Investigacion de Recursos Biológicos Alexander von Humboldt (IAvH), Instituto de Investigaciones Ambientales del Pacífico Jhon von Neumann (IIAP), Instituto de Investigaciones Marinas y Costeras José Benito Vives De Andréis (Invemar), Instituto Amazónico de Investigaciones Científicas Sinchi (Sinchi), Bogotá, Colombia.

35 MADR 2007. Sistema de Información de la Oferta Agropecuaria. Encuesta Nacional Agropecuaria 2007. ENA - Cifras 2007. Online at: http://www.agronet.gov.co/www/htm3b/public/ENA/ENA_2007.pdf

36 Espinal, C. F.; Martínez C., H.; Acevedo G., X. 2005. La cadena de arroz en Colombia: una mirada global desde su estructura y dinámica 1991-2005. Ministerio de Agricultura y Desarrollo Rural; Instituto Interamericano de Cooperación para la Agricultura (IICA)

37 Espinal, C. F.; Martínez C., H.; Acevedo G., X. 2005. La cadena de Café en Colombia: una mirada global desde su estructura y dinámica 1991-2005. Ministerio de Agricultura y Desarrollo Rural; Instituto Interamericano de Cooperación para la Agricultura (IICA).

38 Espinal, C. F.; Martínez C., H.; Ortiz H., L.; Beltrán L., L. S. 2005. La cadena de Azúcar en Colombia: una mirada global desde su estructura y dinámica 1991-2005. Ministerio de Agricultura y Desarrollo Rural; Instituto Interamericano de Cooperación para la Agricultura (IICA).

BIOFUELS

Government targets for the next 15 years call for an additional 30,000 km^2 of new biomass crops. This is 14% of the 215,000 km^2 of the total Colombian land area that is judged by the Ministry of Agriculture to be suitable for the production of biofuel but un- or underutilized[39]. The Ministry of Agriculture indicates that none of the potential area includes rainforests.

- **Sugar Cane |** Traditionally, the sugarcane industry has been concentrated in the Cauca Valley region, centred around the city of Cali *(Figure 3.2)*. In response to government encouragement for expanded ethanol production, sugar cane plantations are spreading to the Cauca and Risaralda departments. The Ministry of Agriculture estimates that the potential land area that could sustainably produce sugarcane in Colombia is about 38,000 km^2; currently, sugarcane is cultivated on just over a tenth of that area (4780 km^2).

- **Palm Oil |** The Ministry of Agriculture estimates that the area suitable for palm oil cultivation totals approximately 35,000 km^2, but only 12% (4290 km^2) of that area is currently planted with palm oil *(Figure 3.2)*, and there is some overlap of suitability with the sugar cane.

CATTLE

Livestock accounts for the majority of agricultural area in Colombia—approximately 38,000 km^2. The cattle herd is estimated at about 23 million head[40]. The majority of cattle are produced for beef (52% beef only, 44% beef and dairy), with a minor part (4%) for dairy production only *(Figure 3.2)*.

3.2 LULUCF GHG emissions: overview

Colombia's most recently published national GHG inventory, for 2004 emissions, found that most emissions come from the energy (37%) and agriculture (38%) sectors *(Table 3.1)*.

Another 14% of total national emissions come from LULUCF. Although overall emissions increased by approximately 2.4 $MtCO_2e$ from 2000 to 2004, the LULUCF sector experienced a reduction of 4.4 $MtCO_2e$, mostly due to decreases in emissions from changes in forest cover and other woody vegetation *(Table 3.1, 3.2, Table B.1)*. Fossil fuel combustion accounts for nearly one-third of total national emissions and 85% of all energy-related emissions. Emissions associated with agriculture are primarily due to enteric fermentation (mostly from non-dairy cattle) and agricultural soil management (including fertilizers) *(Table 3.1, 3.3, Table B.2)*. Between 2000 and 2004, emissions from agriculture increased by 3.4 $MtCO_2e$. Enteric fermentation by non-dairy cattle accounted for two-thirds of the increase, and agricultural soil management accounted for one quarter of the increase *(Table 3.1, 3.3 Table B.2)*.

39 Salazar, Juan Camilo Restrepo Salazar. MInistro de Agricultura y Desarollo Rural. Una Política Integral de Tierras para Colombia. Bogotá. Agosto de 2010. Bogotá.

40 FEDEGAN 2012. Inventário Bovino Nacional. Censo final: predios y población bovina por sexo y categorías de edad. Todos Departamentos, 2011. April 14, 2012. http://portal.fedegan.org.co/pls/portal/docs/PAGE/PORTAL/ESTADISTICAS1/INVENTARIO_BOVINO_2/INVENTARIO%20DEPTOS%202011%20-1.PDF

Table 3.1 | *GHG Emissions inventory (2000-2004) by sector (Ideam, 2008, 2009)*[41].

	2000		2004		Change (2000-2004)	
Sector	CO_2e (Mt)	% of total contribution	CO_2e (Mt)	% of total contribution	CO_2e (Mt)	% of total contribution
Energy	66.5	37	66	37	-0.5	No change
Industrial processes	7	4	9	5	+2	+1
Agriculture	65.2	37	68.6	38	+3.4	+1
Land Use, Land-Use Change and Forestry	30.2	17	26	14	-4.2	-3
Waste	9.3	5	10.3	6	+1	+1
TOTAL	**177.6**	**100**	**180**	**100**	**+2.4**	**(N/A)**

Emissions due to conversion of forests and woodlands accounted for the majority of all LULUCF-related emissions, increasing from 54 to 64% of all LULUCF emissions from 2000 to 2004 *(Table 3.2, Table B.1)*.

A more detailed assessment of emissions due to deforestation, using satellite image analysis, was carried out for the period from 2000 to 2010[42]. These results are not directly comparable to those reported in the national GHG emissions inventories for 2000 and 2004, since the latter use forest inventories (through permanent plot sampling) to obtain values for different forest types and activities. For the period from 2000 to 2005, Yepes et al estimated total emissions due to deforestation of 238 $MtCO_2e$, or an average of 48 $MtCO_2e$ per year (compared with 17 $MtCO_2e$ for the year 2004 estimated by the national GHG emissions inventory, *Table 3.2*). From 2005 to 2010, emissions from deforestation were estimated to be 64 tCO_2e, or 13 tCO_2e per year. This represents a reduction of nearly 35 tCO_2e per year or 73% between the two periods[42].

41 IDEAM. 2009. Inventario Nacional de Fuentes y Sumideros de Gases de Efecto Invernadero 2000-2004. IDEAM, Bogotá D.C., Colombia.

42 Yepes, A., N. D.A., P. J.F., A. J. Duque, E. Cabrera, G. Galindo, D. Vargas, M. C. García, and M. F. Ordoñez. 2011. Estimación de las emisiones de dióxido de carbono generadas por deforestación durante el periodo 2005-2010. Instituto de Hidrología, Meteorología, y Estudios Ambientales IDEAM, Bogotá D.C., Colombia.

Table 3.2 | *GHG Emissions from land use, land-use change and forestry (LULUCF) activities (2000-2004) by source*[41].

	2000		2004		Change (2000-2004)	
Source	CO_2e (Mt)	% of total contribution	CO_2e (Mt)	% of total contribution	CO_2e (Mt)	Change % of total contribution
TOTAL LULUCF	**30.2**		**26**		**-4.2**	
Changes in forest and other woody biomass	6.4	21	2.1	8	-4.3	-13
Conversion of forests & woodlands	16.3	54	16.6	64	+0.3	+10
Abandonment of cultivated lands	-0.2	-0.5	-0.1	-0.4	+0.1	+0.1
Emissions and absorption of soil CO_2	7.3	24	7.3	28	0	+4

Table 3.3 | *GHG Emissions from agricultural activities (2000 2004) by source*[41].

	2000		2004		Change (2000-2004)	
Source	CO_2e (Mt)	% of total contribution	CO_2e (Mt)	% of total contribution	CO_2e (Mt)	Change % of total contribution
Enteric fermentation	30.9	48	33.3	48.5	+2.4	+1
Manure management	1.1	2	1.2	1.7	+0.1	-0.3
Rice cultivation	1.3	2	1.4	2	+0.1	No change
Agricultural soil management	31.7	49	32.6	48	+0.9	-1
Prescribed burning (grasslands)	0.1	0.1	0.1	0.1	0	No change
Burning agricultural wastes	0.1	0.1	0.1	0.1	0	No change
TOTAL AGRICULTURE	**65.2**		**68.6**		**+3.4**	

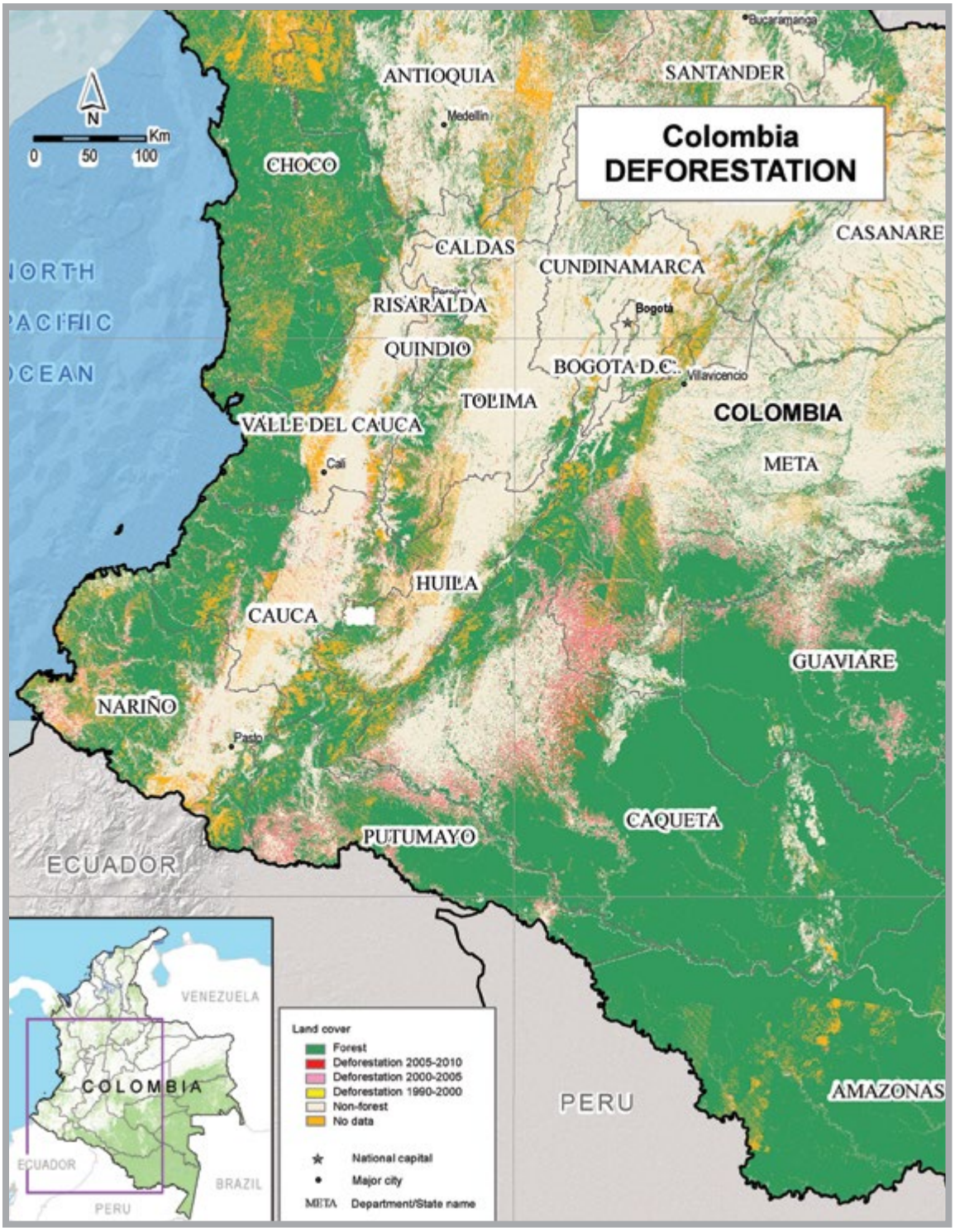

Figure 3.1 | *Distribution of deforestation in 3 periods: 1990-2000; 2000-2005; and 2005-2010 (Source IDEAM 2011 - deforestation 1990-2000 / 2005-2010). The deforestation maps are derived from satellite images selected by their low cloud coverage, data quality and availability. The boundary years for the analysis periods (1990, 2000, 2005 and 2010) are actually reference points to select the images. The search for imagery starts with the reference year, looking both in the dry and rain season, and may extend to neighbor years (1 to 3 years before and after) in places with persistent clouds. The challenge of picking useful images usually makes the maps to diverge from the beginning/end of the year. Hence, the amount of deforestation should not be assumed to cover the whole calendar year.*

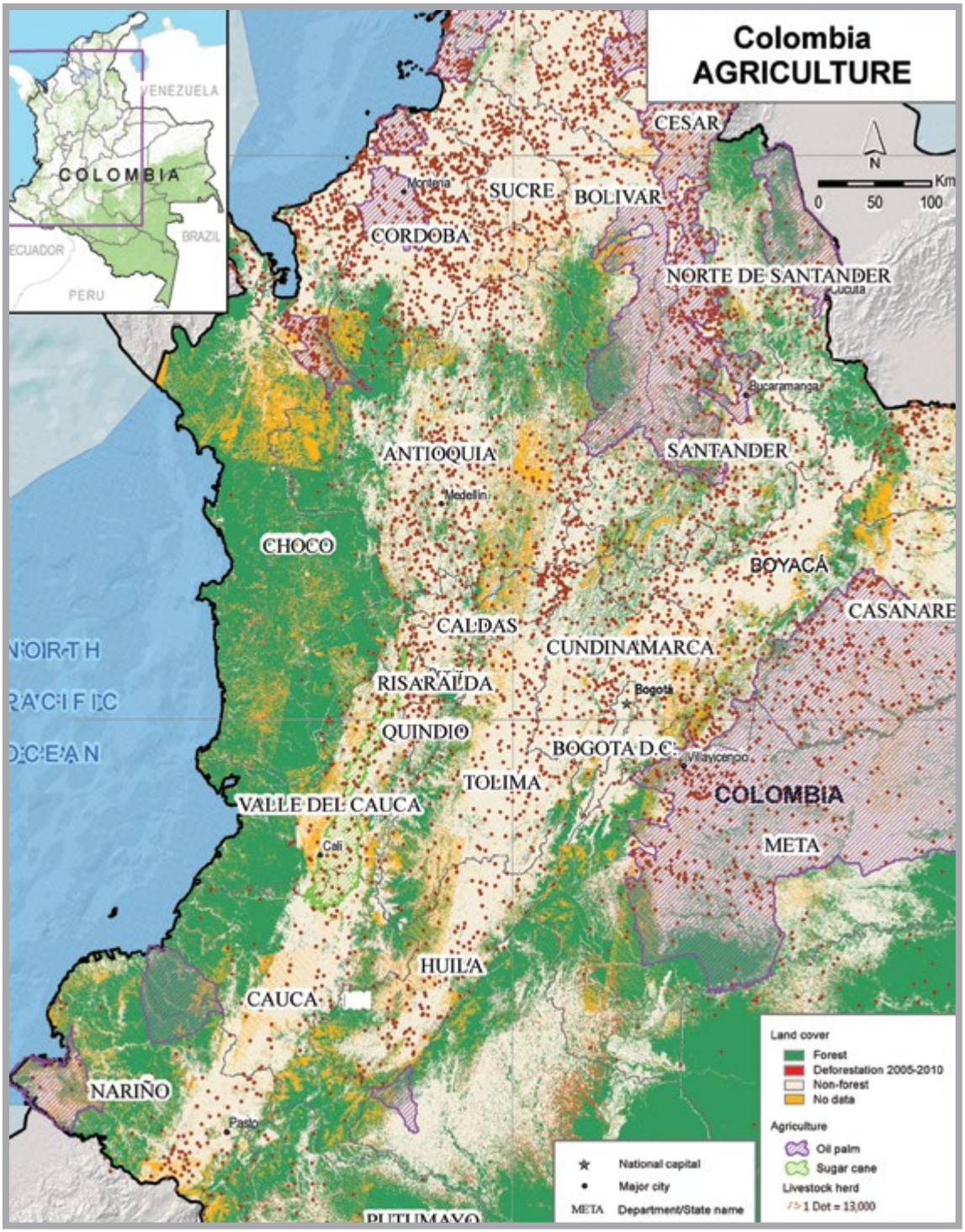

Figure 3.2 | *Current distribution of oil palm plantations, sugar cane plantations and the cattle herd.*
Sources: FEDEPALMA, 2011 (oil palm), Ministry of Agriculture and Rural Development, 2006 (cattle herd size), IDEAM 2011 (land cover 2010)

3.3 Patterns and drivers of land use/land-cover change (especially deforestation, direct and indirect)

FOREST CONVERSION

Deforestation in Colombia declined from an average of 322,757 ha per year between 1990-2000 to an average of 273,334 ha per year between 2000-2005[43] and to an average of 239,198 ha per year between 2005 and 2010[42,43] *(Figure 3.1, Table 3.4)*. By 1998, approximately 35% of the total land area of Colombia had been cleared; some 180,600 km^2 (69%) of the Andean forests and 203,400 km^2 (30%) of the lowland forests were cleared[44]. As of 2009, Colombia maintained approximately 550,000 km^2 of natural forest. In the period from 2000 to 2005, forest conversion to other land cover types totaled nearly 16,000 km^2 [43] *(Table 3.4)*. Approximately one third of deforestation took place in the Amazon basin region, while another third occurred in the Andes region[43] *(Table 3.4)*. From 2005 to 2010, total clearing declined 25% from the previous period, to 12,000 km^2 [43] *(Table 3.4)*. Although absolute clearing declined in both the Amazon and Andes regions, one third of clearing took place in the Amazon region, while clearing in the Andes increased to 38% of the total.

The principal drivers of deforestation are agricultural expansion, illegal crop cultivation, internal migration, mining, and infrastructure development. Logging and forest fires are the principal forms of forest degradation. In general, deforestation has been found to be greater in non-protected areas with fertile soils, gentle slopes, and near to settlements, roads and rivers[43,45].

AGRICULTURAL EXPANSION

Forest conversion for agriculture has been concentrated in the Andean and Caribbean regions. The process typically begins with clearing of small areas for subsistence crop[44]. Many such areas have later been abandoned due to loss of soil productivity[44], rural-urban migration, technology improvement, and globalization of markets[46]. These processes may promote forest recovery[33], but in some cases abandoned lands continue in a degraded state[47] (see Forest Regrowth below).

43 Cabrera, E., D. M. Vargas, G. Galindo, M. C. García, and M. F. Ordóñez. 2011. Memoria técnica: Cuantificación de la tasa deforestación para Colombia, periodo 1990-2000, 2000-2005. Instituto de Hidrología, Meteorología y Estudios Ambientales –IDEAM-. Bogotá D.C: Colombia.

44 Etter, A., C. McAlpine, S. Phinn, D. Pullar, and H. Possingham. 2006. Unplanned land clearing of Colombian rainforests: Spreading like disease? Landscape and Urban Planning 77:240-254.

45 Etter, A., C. McAlpine, D. Pullar, and H. Possingham. 2006. Modelling the conversion of Colombian lowland ecosystems since 1940: Drivers, patterns and rates. Journal of Environmental Management 79:74-87.

46 Etter, A., C. McAlpine, and H. Possingham. 2008. Historical patterns and drivers of landscape change in Colombia since 1500: A regionalized spatial approach. Annals of the Association of American Geographers 98:2-23.

47 Guenter, S., P. González, G. Alvarez, N. Aguirre, X. Palomeque, F. Haubrich, and M. Weber. 2009. Determinants for successful reforestation of abandoned pastures in the Andes: Soil conditions and vegetation cover. Forest Ecology and Management 258:81-91.

	REGION										TOTAL NATIONAL	
	AMAZON		ORIINOCO		CARIBBEAN		PACIFIC		ANDES			
	00-05	05-10	00-05	05-10	00-05	05-10	00-05	05-10	00-05	05-10	00-05	05-10
Agriculture	**3943**	**3115**	**708**	**403**	**1022**	**1486**	**268**	**194**	**2366**	**2486**	**8307**	**7722**
Croplands (annual)	-	2	4	5	0.1	8	-	7	66	0.3	70	22
Croplands (permanent)	23	0.4	15	1	0.02	0.5	-	0.1	0.1	6	38	9
Pastures	2781	2725	621	376	737	1400	266	160	1853	1980	6258	6642
Mixed Agricultural Lands	1139	423	68	21	285	78	2	27	447	500	1941	1049
Degraded & Secondary Vegetation	**1503**	**993**	**619**	**89**	**1272**	**644**	**1021**	**555**	**2144**	**1795**	**6559**	**4059**
Burnt Areas	0.01	16	43	10	-	16	-	-	10	9	53	35
Other Secondary Vegetation	1503	977	576	79	1272	628	1021	555	2134	1786	6506	4024
Other	**84**	**30**	**65**	**24**	**11**	**20**	**33**	**85**	**90**	**29**	**283**	**187**
Total Regional	**5626**	**4186**	**1434**	**531**	**2365**	**2176**	**1462**	**991**	**4862**	**4592**	**15,749**	**11,968**

Table 3.4 | *Conversion of forest to other land cover and land-use types, for the periods from 2000-2005 (00-05) and 2005-2010 (05-10), in km² [43].*

Until 1998, crop cultivation accounted for 126,500 km² or 32% of the cleared area, while extensive grazing of beef cattle accounted for the remaining 264,500 km² 30. To date, the beef cattle industry has been the largest contributor to conversion of native ecosystems[30,43,48]. Commercial agriculture and intensive peasant agriculture occur on more fertile soils, and grazing and colonist agriculture occupies less fertile areas[30].

Between 2000 and 2005, more than half of all clearing resulted in the creation of new crop- or pasturelands[43] *(Table B.1)*. At least 6200 km² (40%) of forests converted during this period were transformed into pasture. The majority of new pastures were created in the Amazon (45%) and the Andes (30%) *(Table 3.4)*. A further 20% of clearing in the Amazon was for mixed agricultural lands—such as those used for shifting cultivation and/or by smallholders or indigenous or traditional populations, or perhaps for illegal crop cultivation.

In the period from 2005 to 2010, nearly 90% of clearing of forest in the Amazon was to create new pasturelands, mirroring the national trend. In the Andes, new pastures accounted for 80% of forest conversion *(Table 3.4)*. This represents a doubling of the proportion of pasture creation in the Amazon, and nearly a tripling of pasture creation in the Andes. Conversion to mixed agricultural lands, by contrast, fell to 14% in the Amazon *(Table 3.4)*.

Illicit coca and opium cultivation is constrained to remote areas or those areas with low government control *(Figure 3.3)*. Illegal coca plantations have contributed to deforestation in the Andes and in the western Amazon[44]. In the Amazon, the departments of Putumayo, Guaviare and Caquetá have shown the greatest expansion of illicit croplands[49]. Drug eradication efforts centred on spraying non-selective herbicides (which affect subsistence crops and native plants, as well) may be causing coca cultivation to shift from the Andean highlands to the Choco of the Pacific coast. The amount of land under coca cultivation in 2011 was 64,000 ha[49]. Where illicit crop cultivation ceases, they are often replaced by legal crops and other land-use alternatives; however, lands that were deforested often do not return rapidly to forest.

48 Etter, A. and W. van Wyngaarden. 2000. Patterns of landscape transformation in Colombia, with emphasis in the Andean region. Ambio 29:432-439.

49 UNODC 2012. Colombia. Censo de Cultivos de Coca 2011. UNODC (Oficina de las Naciones Unidas contra la Droga y el Delito) y Gobierno de Colombia. June 2012.

MIGRATION/COLONIZATION

Internal migration and colonization of frontier areas is an important driver of deforestation, but figures to assess the magnitude of this effect are scarce. Population movements within Colombia are driven by a variety of interacting factors including social and political unrest caused by conflict between guerrilla movements and government forces, economic destabilization (brought on in part by trade liberalization and increased foreign imports), illegal crop production[45], and land tenure inequality and insecurity[50]. Colonist-driven forest clearing is primarily for subsistence agriculture, as well as for illegal crop production (depending on the region).

50 The Economist. 2012. More personal security, less inequality [On-line interview with Fernando Henrique Cardoso]. Page http://www.economist.com/node/21543084 The Economist. The Economist Group, London, UK.

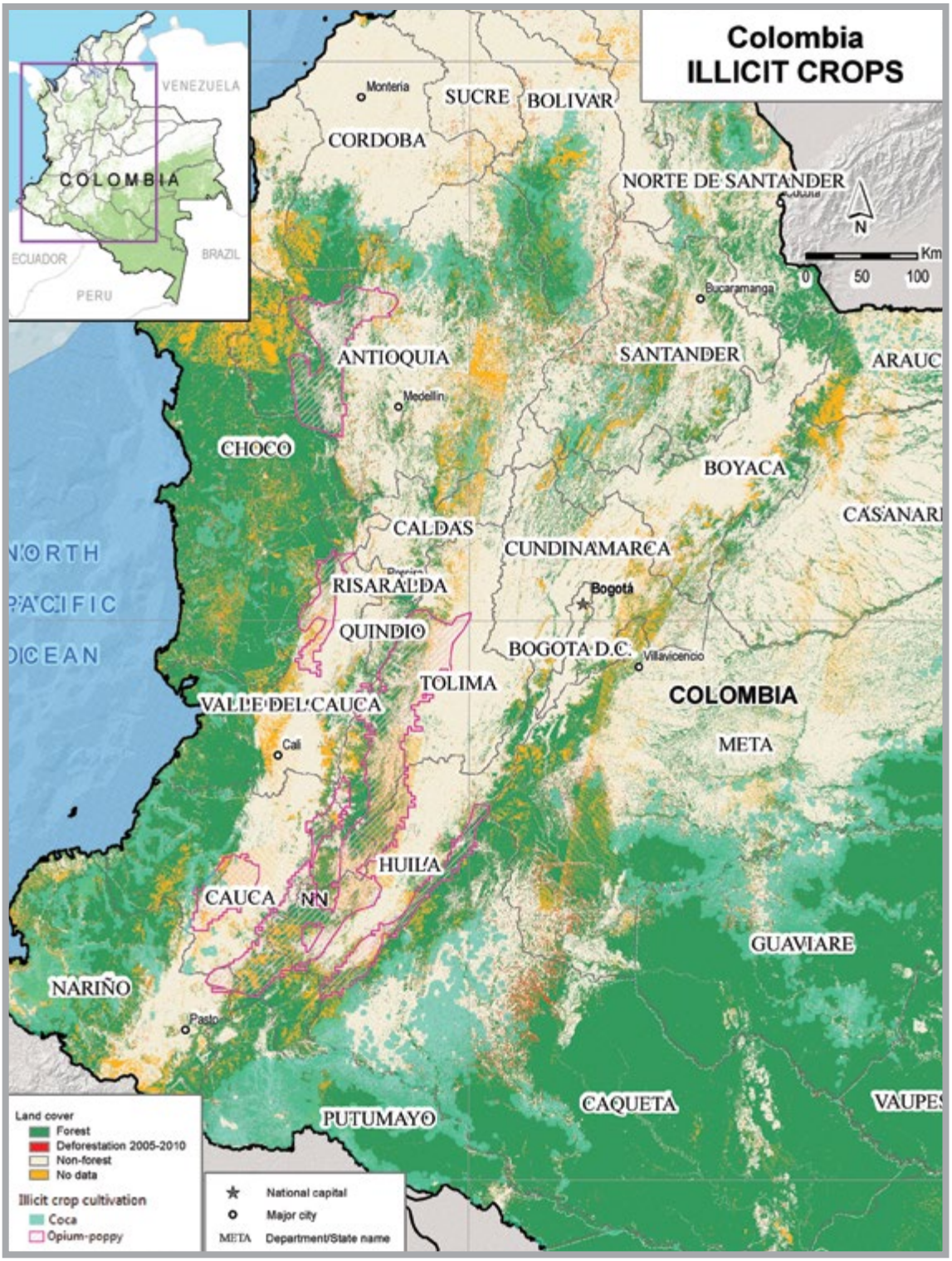

Figure 3.3 | *Distribution of illicit crops (coca, opium) in Colombia*
Sources: UNODC and Government of Colombia, 2012. Colombia - Coca crop cultivation census 2011. UNODC (United Nations Office on Drugs and Crime). Report in Spanish and DEA, 2002. The drug trade in Colombia: a threat assessment. DEA (U.S. Drug Enforcement Agency), Intelligence Division.

INFRASTRUCTURE

A large proportion of agricultural and grazing lands throughout the country are located within 10 km of roads, indicating a strong positive relationship between the presence of road infrastructure and forest clearing for agricultural purposes[30]. Colonist agriculture, on the other hand, is more dispersed, occurring in the Amazon and Pacific regions at distances greater than 50 km from roads[30]. Rivers are an important means of access in these regions *(Figure C.2)*. Remaining forested areas are predominantly located

on less fertile soils and are distant from roads. Roads and railways are currently concentrated in the Andes, Orinoco, and Caribbean coastal regions. Hydroelectric projects are also concentrated in the centre of the country.

MINING

Gold and other mineral mining and oil drilling contribute to forest clearing and contamination of soils and water sources in Colombia[51]. However, it is unclear what the magnitude of the impact of mining and drilling on forests are. It is likely, nonetheless, that this impact will increase, as the Colombian government grants new mining licenses on 176,000 km^2 declared as strategic mining zones in 2012.

SELECTIVE LOGGING

Annual timber production in Colombia is estimated at 3.4 million m^3; approximately 40% of this harvest is illegal[52]. Illegal logging contributes to 480 km^2 of forest degradation per year and the overexploitation of 21 tree species.

FOREST FIRE

Between 1986 and 2002, 4000 km^2 of natural ecosystems were affected by fire[53], primarily in the Orinoco basin grasslands and the Andes, but fire affected only 7 km^2 of forests in the Amazon basin[53]. Burned forests in the Amazon increased from 0.01 km^2 during the period from 2000 to 2005 to 16 km^2 in the period from 2005 to 2010, but still represented a minute portion of forest conversion in both time periods[43] *(Table 3.4)*. In the Caribbean coastal zones, burning of forests also increased[43]. In the Orinoco and Andes region, burning decreased, as it did overall nationally *(Table 3.4)*. Fire is used by farmers to establish and manage agricultural areas throughout the country.

FOREST REGROWTH

Between 2001 and 2010, woody vegetation increased by 3% from 580,420 km^2 to 597,383 km^2 [33]. This regrowth appears to result from secondary forest recovery in abandoned agricultural areas. This may be the effect of land abandonment resulting from armed conflicts and economic development experienced during the last 10 to 20 years. Land abandonment of rural areas began in the early 1990s when the Colombian government implemented an economic liberalization model, and continued in the late 1990s as a result of the intensification of internal conflicts[33].

3.4 Likely future trends in land use

The Colombian government is focusing simultaneously on increasing biofuel production and demand, livestock yield and efficiency, mining and oil exploration, and resettlement of erstwhile militia zones stimulated by an incipient peace agreement.

- **Biofuels |** In an effort to increase energy independence, Colombia has begun to develop a biofuel industry, primarily based on ethanol from sugar cane and biodiesel from palm oil (although other crops contribute to the production of both fuels). Through government regulations and incentives for both supply and demand, the aim is to bring production to 29,907 barrels a day by 2019[54]. The government goal is to bring a total of 30,000 km^2 under biofuel cultivation. Currently, oil palm and sugar cane are cultivated on approximately 9000 km^2.

- **Cattle |** FEDEGAN, the national cattle association, aims for Colombia to become one of the world's leading cattle producers, projecting an increase in the size of the national herd from 22 million in 2005 to approximately 56 million head by 2019[55]. This very ambitious expansion of the herd is planned through a continuation of the largely grass-fed production system, although with steep increases in yields that would enable the growth in the herd to take place while shrinking by 100,000 km^2 of the total area of pasture, to approximately 280,000 km^2. To

51 Perez, C. T. 2012. Minería, Território y Conflicto en Colombia. Universidad Nacional de Colombia, Bogota, Colombia.

52 World Bank. 2006. Strengthening Governance and Forest Law Enforcement. Addressing a Systemic Constraint to Sustainable Development. World Bank, Washington, DC.

53 Ministerio de Ambiente y Desarrollo Sostenible (MADS). 2012. Nota sobre esta versión de la remisión formal de la propuesta de preparación para REDD+ (R-PP). Ministerio de Ambiente y Desarrollo Sostenible (MADS), Bogota, Colombia http://www.minambiente.gov.co/documentos/DocumentosBiodiversidad/bosques/redd/documentos_interes/080612_colombia_rpp_version_06.pdf.

54 CONPES, 3150 Lineamentos de Política para Promover la Producción Sostenible de Biocombustibles en Colombia. Bogotá, Colombia March 31, 2008

55 FEDEGAN 2006. Plan Estratégico de la Ganadería Colombiana 2019. 296 pp. Bogotá, D. C.

achieve both goals, FEDEGAN plans to increase productivity and breeding, but it is not clear how and whether these measures will increase yields and avoid pasture expansion.

- **Mining |** Traditionally, mining has been concentrated in the Andes region, with about 48,000 km^2 of mining licenses granted. However, new government policies call for expanding mining and oil exploration to other regions. In 2012, the government began to grant new mining concessions over an area of 176,000 km^2. The recent decline in violence in FARC and other militia strongholds has led to a surge in unlicensed and unregulated mining, leading to forest clearing and other environmental damage. The effect of this new mining will depend on the government's ability to control the expansion of both licensed and unlicensed mines.

- **Resettlement |** Land reform is a central issue in the peace agreement with the FARC, and a focus of the current government, with specific proposals for peasant settlement zones. The government has already initiated a process for resettling families who abandoned or were forced off their land as a result of insecurity and conflict. Solicited land restitutions thus far total 32,688 in an area of 23,689 km^2 [39]. It is not clear what impact resettlement will have on land use and forest clearing—this will depend to some extent on where resettlement takes place, whether and to what extent those lands had already been cleared, and what investments are planned for the region.

4 | STATUS OF POLICIES THAT INFLUENCE LAND USE

Colombia has made several commitments to reduce deforestation, although there are still significant challenges to be overcome if these commitments are to be realized. The country is currently developing: (a) a national REDD+ Strategy; (b) a Multi- Sectoral Low Carbon Development (SLCD) Strategy; (c) a National Plan for Climate Change Adaptation; and (d) a National Disaster Prevention Financial Strategy. Additionally, (e) the National Development Plan for years 2010-2014 aims to avoid deforestation of 200,000 ha.

For these land-use policies to be effective on the ground they must overcome challenges such as: (a) lack of coordination of land-use policies among national ministries, at different levels of government, and among subnational governmental entities such as CARs, departments and municipalities; (b) ineffective engagement, especially of the agriculture sector; and (c) the lack of positive incentives for the changes in land-use (i.e. lower deforestation, higher productivity) that these policies are designed to promote.

Below we discuss the main laws and policies likely to influence land-use change in Colombia. Additional information for these policies and a summary table can be found in *Appendix D*.

4.1 Land Rights, Land Distribution, and "Clearing to Own"

The **Constitution of 1991** endows access to land for agricultural purposes to improve the income and livelihoods of farmers (art. 64). Following the constitutional mandates to promote access to land for agricultural development, the national government created a mechanism for land distribution. Under the existing mechanism, to receive land from the State the possessor of the land has to prove that he/she is utilizing at least two thirds of it for economic purposes (Law 160, 1994, art. 8). This directive has inspired peasants and land speculators to convert large tracks of forests into cattle pastures, which contributed to the formation of a cattle ranching sector that is inefficient, where only 19.3 Mha out of the 38.6 Mha being used for pasture is deemed suitable for this purpose[4,56]. A **"Law for Rural Development and Land-Tenure"** was recently proposed and is now open for public consultation among indigenous groups and other affected communities[57]. If approved, the law would limit access to public land to those that possess one UAF (Family Agricultural Unit[58] or less, and facilitate local producer organizations' *(organizaciones campesinas)* access to land.

Also, in 2011 the government passed a law establishing a **programme for land restitution for displaced communities** (Law 1448/2011). The aim is to return land to people illegally displaced by guerillas since January 1991 across an area of approximately 6 Mha[59]. However, the transfer of land has not been easy, as some areas where the programme is being implemented still do not have government institutional presence, and are unsafe[60]. *Figure 4. 2* below shows the density of abandoned or divested properties that will be considered as targets of resettlement

56 REDD R-PP Version n.5, June 4th, 2012. Available at http://www.minambiente.gov.co/documentos/DocumentosBiodiversidad/bosques/redd/documentos_interes/080612_colombia_rpp_version_06.pdf

57 Daniel Valero, Consultas con minorías éticas 'paralizan' la agenda estatal. Feb. 9, 2013. El Tiempo. Available at of http://www.eltiempo.com/politica/ARTICULO-WEB-NEW_NOTA_INTERIOR-12587449.html

58 According to the Law 160 of 1994, art. 38: "The Family Agricultural Unit (UAF), is the basic enterprise of agricultural production, livestock, aquaculture and forestry whose extension, according to agro-ecological conditions of the area and with appropriate technology, allows the family to reward their work and have a compounded over that contributes to the formation of their heritage." The UAF's size can vary from less than 1 hectare to hundreds of hectares, depending on ecologic, social, cultural, and economic aspects, and the sizes can be revised periodically

59 Giraldo, J. C. M. and A. F. Velásquez. 2011. Ley reparará a cuatro millones de víctimas. http://www.elcolombiano.com/BancoConocimiento/L/ley_reparara_a_cuatro_millones_de_victimas/ley_reparara_a_cuatro_millones_de_victimas.asp El Colombiano. Periódicos Asociados Latinoamericanos, Bogota, Colombia.

60 Caracol. 2013. Piden garantizar la seguridad de lideres de restitución de tierras en Antioquia (Leaders ask to ensure the safety of land restitution in Antioquia). May 6, 2013 Caracol. Caracol Radio, Bogotá, Colombia - www.caracol.com.co/noticias/regional/piden-garantizar-la-seguridad-de-lideres-de-restitucion-de-tierras-en-antioquia/20130506/nota/1893265.aspx.

by the programme[61].

4.2 Territorial Planning

As part of the decentralization process that occurred in Colombia in the 1990s, all **municipalities in the country became responsible for developing territorial plans** (Ley n. 388/1997). Municipalities with less than 30,000 people, which represent the majority of the municipalities within the Amazon Biome,[62] are not required to prepare detailed plans, but only simplified "schemes". The Regional Autonomous Corporations (CARs) must approve the environmental component of the land-use zoning plans. In practice this can be challenging because CARs are not directly involved in the preparation of plans, and municipalities often do not have enough resources to prepare elaborate plans. To adopt a more holistic approach, the national government approved a law (Law 1454/2011) conferring to departments the authority to enact guidance for municipal land-use planning processes that should

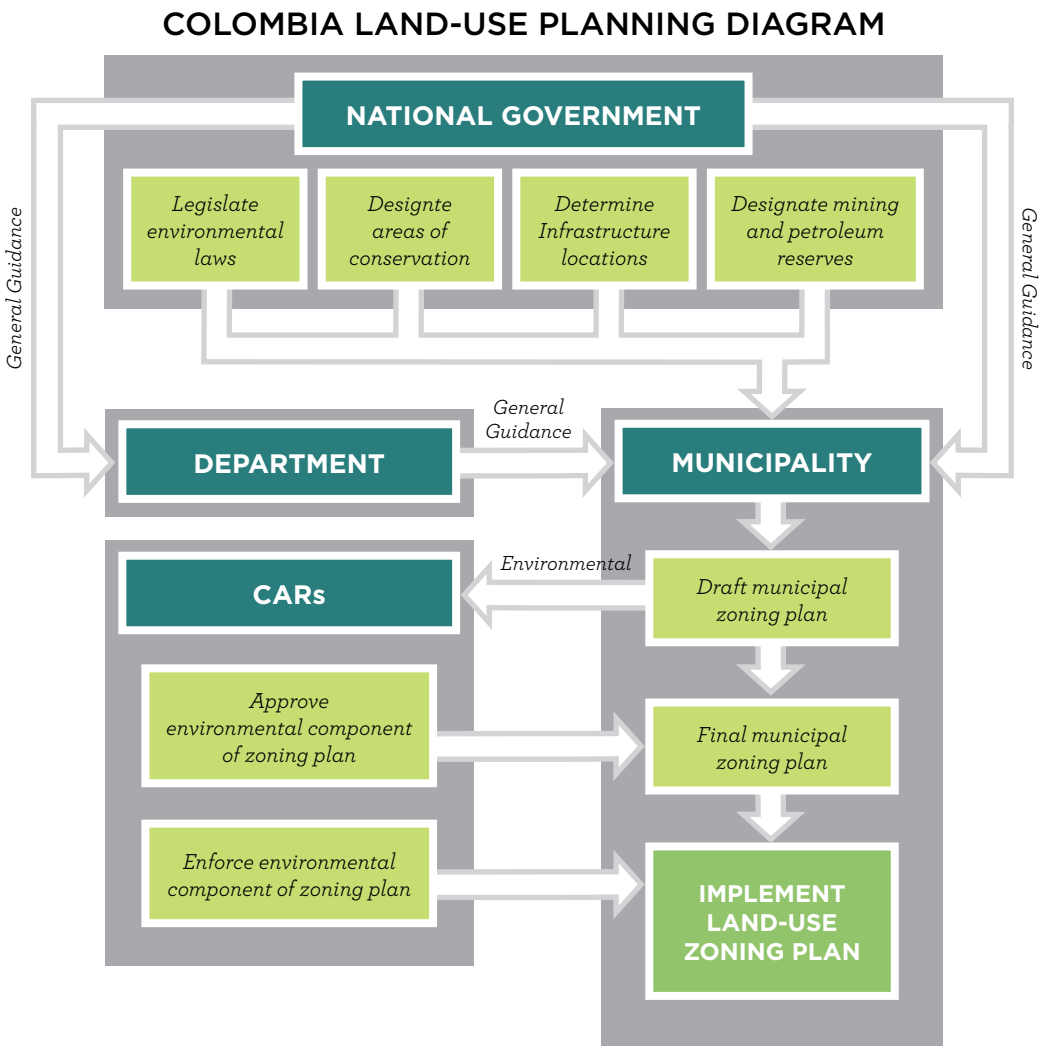

Figure 4.1 | *Land-Use Planning in Colombia: The national government enacts general land-use laws, environmental laws, designates National Parks, and sets aside areas for mining and petroleum concession as well as infrastructure projects.*

The Departments were recently authorized to enact general guidance on land-use planning, and the municipalities are responsible for preparing the land-use plan, and submitting them to CARs for approval of the environmental component of the plans. Once approved, the municipalities implement the plan and CARs enforce the environmental component of the plan.

61 Unidad de Restitución de Tierras - URT. 2013. Desidad de Predios Abandonados y/o Despojados. http://restituciondetierras.gov.co/media/descargas/mapas/actualizacion_2013/Densidad_de_Abandono.pdf.

62 DANE - Departamento Nacional de Estadistica de Colombia – Census 2005. http://www.dane.gov.co/

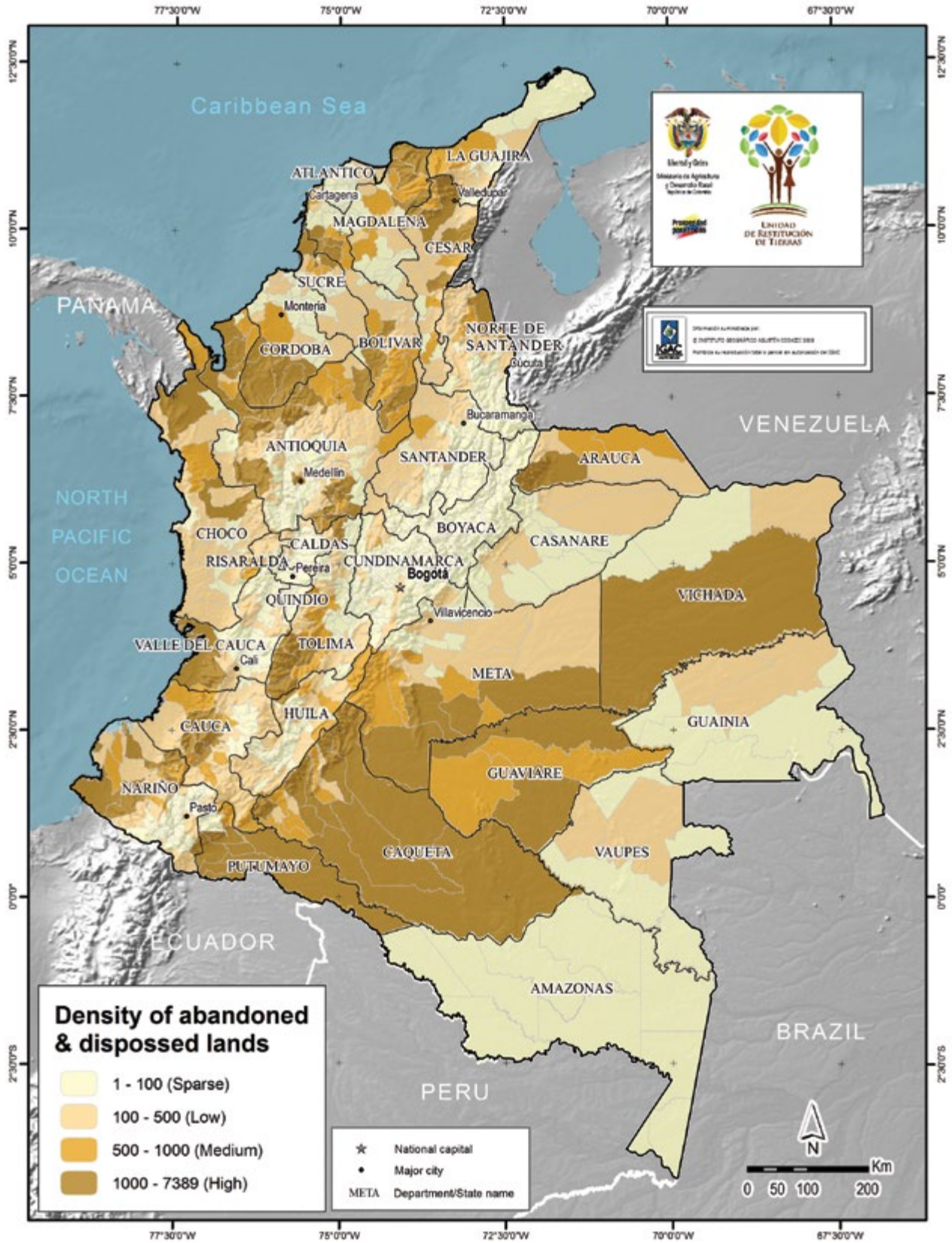

Figure 4.2 | *Average number of lands (i.e. properties) abandoned or divested throughout Colombia.*
Source: URT 2013 http://restituciondetierras.gov.co/media/descargas/mapas/actualizacion_2013/Densidad_de_Abandono.pdf

be observed by municipalities and also created a national board to review and advise (art. 6) land-use planning. However, it is still unclear if this law is being effectively implemented on the ground. Below is a diagram illustrating the land-use planning process in Colombia.

4.3 Enforcement

Environmental law enforcement is often deficient in Colombia. Contributing factors are lack of political will and inadequate access to police assistance, low levels of human and technical capacity, weak information systems, guerilla activity and inadequate regulations[63]. The Regional Autonomous Corporations (CARs) are often identified as the main enforcer, but environmental violations may also be enforced by MADS, National Parks Agency, and regional governments where appropriate (Laws 99/1993 and 1333/2009). Enforcement to prevent deforestation is especially difficult because deforestation often occurs in areas with a large presence of armed militias and low enforcement capacity.

4.4 Mining

There are clear conflicts between mining and environmental interests in Colombia[51]. This situation was further aggravated in June 2012 when President Santos declared 176,000 km^2 as strategic areas for mining, including places with high levels of biodiversity in the Amazon, Orinoco, and Chocó regions (Presidential Communication, Rio+ 20)[64]. This declaration caused a great deal of unrest within civil society, indigenous and environmental groups in Colombia. The situation was partially remedied after the Minister of Environment at the time, Mr. Frank Pearl passed Resolution no. 1518, 2012, which requires the development of environmental zoning, planning and management throughout the forest reserves and sets aside areas for strict protection and sustainable use prior to the operation of any mining concession. Mining policies and legislation in Colombia also must be aligned with environmental directives and land-use zoning to avoid indirect deforestation (by attracting people to mining areas) and damage to sensitive ecosystems.

4.5 Biofuels

Colombia has ambitious directives for the reductions of its GHG emissions by increasing the production and consumption of biofuel and renewable energy. Its international commitments include generating at least 77% of total energy by 2020 from renewable sources and using its own resources to attain this goal[65]. Another commitment is that 20% of the total national fuel consumption by 2020 should come from biofuel[65]. Ethanol from sugar cane and biodiesel from palm oil are a large part of the plan to achieve these bold commitments *(see more under Section 6)*.

There is general informal agreement among FEDEPALMA, PROCAÑA/ ASOCAÑA, and FEDEBIOCOMBUSTIBLES, the national palm oil, sugar cane, and biofuel organizations, respectively, to expand sugar and palm oil production without causing deforestation and to attain supply chain certification through RSPO and Bonsucro, respectively, in the near future. However, at this time there is no formal public document where these entities expressly commit to pursue only "deforestation-free" palm and sugar production. Additionally, according to interviews with key stakeholders, producers and mills are having difficulties attaining certification in their respective supply chains. This is mainly due to the cost of certification, as well as absence of price premiums and assured demand for certified production *(see more under Section 6)*. With additional support, it appears that these sectors are ready to embrace certification at a large scale and make the transitions to supply chains that are free of deforestation.

63 Blackman, A., R. Morgenstern, and E. Topping. 2006. Institutional Analysis of Colombia's Autonomous Regional Corporations (CARs). RFF, http://www.rff.org/rff/documents/rff-rpt-colombiacars.pdf.

64 Presidencia de la Republica, Juan Manuel Santos en la Conferencia de Rio+20. Rio de Janeiro, June 21, 2012. http://wsp.presidencia.gov.co/Prensa/2012/Junio/Paginas/20120621_04.aspx . At the time of this declaration, the National Agency of Mining enacted Resolution n. 45, 2012, declaring 22 million ha as strategic areas for mining, gas, and oil exploitation, many of which are in sensitive or unknown ecosystems. until it develops the necessary environmental zoning, planning and management throughout the forest reserves and sets aside areas for strict protection and sustainable use.

65 Nationally Appropriate Mitigation Actions (NAMA) submitted to the UNFCC Secretariat, in 2011, FCCC/A WGLCA/2011/INF .1. March, 2011. Colombia. 46, a, p. 11.

4.6 Forest Reserves

In 1959 the Colombian government delimited forest reserves in seven[66] main regions (Pacific, Central, Magdalena River, Sierra Nevada de Santa Marta, Serranía de los Motilones, Cocuy, and Amazon) with a total of 650,000 km^2 (i.e. more than half of Colombia's land surface) to support the national forest economy and to promote the conservation of natural resources. Some forest reserves include urban areas, areas affected by anthropogenic use, and about 50,000 km^2 of non-forests[67]. Since the original delimitation, forest reserves have been greatly reduced[68]. Despite their importance for biodiversity, ecosystem services, and cultural values, there is still little legal clarity regarding the geographical delineation of these forest reserves[51]. Consequently, from a legal standpoint many have ignored this law over the years, and the institutional capacity to oversee these areas has been disproportionally small[51]. Currently there are 22,000 km^2 of authorized mining titles located in forest reserve areas[51], including areas in the Amazon region.

4.7 Forestry Activities

Illegal logging accounts for approximately 42% of the wood produced in Colombia[52]. The wood consumption in Colombia is approximately 4 million cubic meters, with 25% supplied by commercial plantations and imports, and 75% from natural forests[69]. An effective instrument in the promotion of commercial plantations and reforestation in Colombia is the Forest Incentive Certificate – the "CIF". CIF covers: (a) 75% of the costs to plant native species and 50% for non-native species; (b) from the second to the fifth year it covers 50% of the costs of maintenance, and (c) 75% of the maintenance of natural forest inside of the management plan during the first five years (Law 139, 1994)[70]. From 1996 until 2011, 173,950 hectares of forest were established with economic incentives provided by the CIF (CONPES 3724). The Ministry of Agriculture plans to achieve 1.5 million ha reforested by 2025[71]. (For more details on forestry policies, see Appendix E.)

In 2009 a multi-sectoral group (government, private industry, and civil society) took an important step towards the reduction of illegal timber by signing the voluntary "Pact for Legal Timber in Colombia" (PLTC)[72]. The goal of PLTC is to ensure that the wood harvested, transported, processed, marketed, and used in Colombia comes exclusively from legal sources. Further policy reform to make the marketing of illegal wood economically unattractive could improve the success of the agreement. The value of illegal timber in the market is about USD 194 per cubic meter, while legal timber is nearly double the cost at USD 333 per cubic meter[73]. MADR also plans to promote the implementation of PLTC[74], but there are no clear directives yet.

Congress, in considering a draft law for forest plantations, suggests that Finagro should offer credit lines to cover up to 50% of the costs of forest plantations[71]. MADS is also considering the proposal of a law to address forest management (this information is not yet official, source: WWF-CO, 2013). It is important that these proposed laws take into account climate change mitigation and adaptation factors, transparency, and effectiveness. This would allow greater participation of

66 There are approximately 30 reserves in total, including the Bogotá East Forest (Pérez, 2012)

67 MADR, Proposed Law of Rural Development. March 9th, 2011.

68 The initial area was 43,959,737 ha and the actual area is 37,844,524 ha. Source: MADS and IDEAM. Atlas Temático y Cartográfico Base de Reservas Forestales. Bogotá, 2005. Not all areas located within the Amazon biome are declared forest reserves; there are areas with unclear definition

69 Ministry of Agriculture and Rural Development (MADR). Plan de Acción para la Reforestación Comercial. Juan Camilo Restrepo Salazar, Minister. August, 11, 2011.

70 There is however a requirement of more than 1,000 trees per ha, and for plantations with lower density, but not inferior 50 trees per ha, the amount will be calculated proportionally.

71 Ministry of Agriculture, Press Release n. 324, Nov, 15th, 2011. Bogotá, Colombia. Available at: http://www.minagricultura.gov.co/archivos/_bol_324_2011_minagricultura_radica_proyecto_de_ley__para_reglamentar_la_actividad_reforestadora_en_el_pais.pdf (last accessed in May 11, 2013)

72 The pact was signed by the representatives of the following groups: European Union Delegation to Colombia and Ecuador, Minister of Environment, Housing and Territorial Development, National Federation of Wood Industry, (FEDEMADERAS), World Wildlife Fund WWF, Colombia, CARDER (CAR from Risaralda), CRC (CAR from Quindio) Cortolima (CAR of Tolima), Corponor (CAR of the Northeast Frontier), FEDEGAN, Federation of Municipalities, Federation of Coal Producers (FEDECARBON), Federation of Transport Industry (COLFECAR) and others. – Source: Forests Project Publication FLEGT / Colombia (CARDER-EU) – Available at http://elijamaderalegal.blogspot.com/p/pacto-intersectorial-por-la-madera.html

73 Presidential Communication, Aug. 31st, 2011. Available at: http://wsp.presidencia.gov.co/Prensa/2011/Agosto/Paginas/20110831_05.aspx

74 Ministry of Agriculture and Rural Development (MADR). 2011a. Plan de Acción para la Reforestación Comercial.

community forestry enterprises[75].

4.8 National Development

The primary goal of the **National Development Plan (NDP) for 2010-2014** is to foster prosperity and economic growth in Colombia. The NDP includes the following goals:

- Avoid deforestation of 200,000 hectares, and restore 90,000 ha (NDP, Chapter VI);
- Expand and develop mining activities by increasing coal production from 73 million tons in 2010 to 124 million tons in 2014, and petroleum and gas production from 990,600 to 1,420,000 Barrels of Oil Equivalents Per Day (BOEPD), representing increases of 70% and 43% respectively;
- Increase total agricultural output by 19% (from 30,600 tons to 36,300 tons);
- Promote infrastructure and integration with Brazil and Peru by improving river way connections across remote frontier areas in the Amazon region, and linking the Departments of Nariño and Putumayo.

The NDP could potentially be at odds with Colombia's more conservation-oriented policies, and climate change policies.

4.9 Climate Change

To address climate change, Colombia has coordinated its actions through a **National Climate Change System** (CONPES 3700/2011)[76] including: (a) Climate Change Adaptation, (b) a REDD+ National Strategy, (c) a Multi-Sectoral Low Carbon Development Strategy (SLCDS), and (d) Financial Protection against National Disasters. The Adaptation Plan was adopted at the national level and defines responses to different climate change impacts such as those on high mountain regions, sea level rise, and health related issues (e.g. increased cases of dengue and malaria). Now, the government is engaging local authorities to develop regional plans for climate change adaptation called Regional Climate Nodes.

In 2011, Colombia publicly committed to end deforestation by 2020 with international support[28]. **The National REDD+ Strategy** is an important part of its plan to achieve this ambitious goal, and Colombia's position on REDD+ is to support a permanent sub-national approach that allows for flexibility in addressing land-use patterns in different regions in the country.

The National REDD+ Strategy began through Colombia's "REDD readiness" proposal to the Forest Carbon Partnership Facility (FCPF), administered by the World Bank, which is now in its 7th version. Colombia expects to develop a national forest carbon accounting system, and is considering the creation of a national fund to channel REDD+ funds to activities on the ground (mentioned in the Heart of the Amazon proposal). The development of regional emissions reference scenarios is just beginning within the Amazon Region as the first exercise (expected to be completed by the end of 2013). In

75 According to information provided by WWF Colombia (as part of the collaboration for this report), as of now, the overall costs associated with the legal and technical requirements are too high for the local communities).

76 Documento de Estrategia Insitutcional para la Articulación de Políticas y Acciones en Materia de Cambio Climático en Colombia, CONPES 3700, Bogotá D.C., Jul, 14, 2011.

addition, there are ongoing dialogues with interested parties, mainly indigenous people and afro-Colombian communities to promote their understanding and awareness of REDD+.

FCPF and UNREDD are committed to support the development of the REDD+ National Strategy, but they are still conducting due diligence prior to disbursing promised funds necessary to develop and implement the Colombian REDD+ strategy[77].

A **multi-sectoral low carbon development strategy** (SLCDS) is currently under review by the Ministry of the Environment. The preliminary results (not public yet) predict significant increases in emissions under the current BAU. For instance, the agriculture and mining sector are projected to increase their emissions in 2040 by 30% and 70% compared to 2004. A second phase of the SLCDS strategy development process is planned to begin in 2013 and will focus on designing sectoral action plans for emissions reductions that can be included in the National Development Plans for 2014-2018. However, to gain full support from different ministries (i.e., Agriculture, Mining and Transportation) it is necessary that the SLCDS demonstrates how these sectors will benefit from the strategy, and provide clear incentives for them to incorporate the recommendations listed in the SLCDS into their agendas. Moreover, the national government must coordinate its efforts with existing subnational governments.

The government is also working on the **Financial Protection Strategy Against Disasters**, as extreme events associated with climate change (e.g., the monsoon of 2010/2011) can have large economic impacts in Colombia. This strategy involves different instruments for risk retention and transfer so that the State can get the best coverage at the lowest cost. The financial instruments that have been used to cover losses from most natural disasters in Colombia have been implemented after the occurrence of the events. However, a comprehensive risk strategy should incorporate ex ante instruments such as contingent loans and insurance, which not only mitigate the lack of international financing in a given moment of time, but also enable transfer of some of this risk[78]. The instruments suggested by the Ministry of Finance are: reserve funds, contingent credits, insurances, equity securities, and captive companies. However, it is not clear how the government plans to protect the agricultural sector against natural disasters. One option would be to offer special security policies for producers adopting climate smart and zero-deforestation practices.

4.10 Key Policies under development affecting land-use dynamics and deforestation

Currently, Colombia has **Free Trade Agreements** (FTAs) with Mexico, Chile, Canada and the United States. Additional FTAs with the European Union and South Korea are signed but are not finally approved. There are also FTAs under negotiation with Panama, Turkey, Japan, Costa Rica and Israel (Ministry of Commerce, Industry and Tourism)[79]. Each FTA has a different effect on the productive structure of the country. The current FTA with the United States and the soon to be approved FTA with the European Union[80] are likely to have the most impact on the agricultural sector. Possible positive impacts include (a) lower prices of agricultural machinery and feedstock; (b) increased foreign investment; (c) increased opportunities for exporting of agricultural and processed commodities; and (d) the removal of tariffs for the export of sugar, sugarcane ethanol, and palm oil into USA and EU markets. The FTA with the US would make permanent several free-trade provisions

77 As part of the due diligence processes required by FCPF, MADS has to fulfill a number of requirements and activities. However, MADS has limited number of personal and budget to fulfill all these requirements (e.g. host a number of workshops in remote areas, or to bring representatives from these areas to workshops in Bogotá), and the whole process appears overwhelming to MADS existing capacity.

78 Strategy Against Disasters, 2012. Estrategia Financiera para Disminuir la Vulnerabilidad Fiscal del Estado Ante la Occurencia de Un Desastre Natural. MInisterio de Hacienda y Crédito Público. Dirección General de Crédito Público y Tesoro Nacional. Subdirección de Riesgo. 2012.

79 Ministerio de Comercio, Industria y Turismo, , 2013, Tratados de Libre Comércio. Available at http://www.tlc.gov.co/publicaciones.php?id=5398 (last accessed on May 8th, 2013)

80 Although the FTA with the European Union was not yet finalized, it is already affecting decisions by private parties regarding investments in biofuel and biodiesel production and RSPO and Bonsucro certification. These impressions where observed through conversations with Fedebiocombustibles representatives and Consultants.

currently in effect within the context of the US drug eradication programme. If not well managed, these agreements may lead to further deforestation and degradation of important habitats in Colombia because they are likely to increase foreign investments in the country, specifically in the agricultural and mining sectors.

In August 2012, after nearly 60 years of conflicts, the Colombia government entered into a **Peace Dialogue** with the FARC, the main armed guerilla group. Inequitable land distribution in Colombia was one of the main factors that motivated the emergence of the FARC movement, and it is an important part of the peace dialogue process.

Colombian armed militias influence the forest through their support and control of illegal crop production and illegal gold mining, which drive deforestation both directly and indirectly[81,82]. On the other hand, some argue that the presence of FARC may also inhibit deforestation in the Amazon and Andes regions by displacing *campesinos* and other landowners and by discouraging private investments[33].

If the conflict is settled, many of the displaced people will want to return to their rural homeland. As mentioned above, 32,000 families have already registered land claims totaling two million hectares through the land restitution programme. As security and the rule of law is re-established in these regions, it is also likely that domestic and foreign investors will be more inclined to invest in agricultural, forestry and mining enterprises within previously unsafe regions.

In May 25th, 2013, the negotiators from the Colombian government and FARC reached an agreement regarding agrarian reform in Colombia. The agreement aims to ensure access to lands, to promote land regularization, access to health, education and infrastructure in rural areas (El Tiempo)[83]. It is now plausible to imagine a scenario in which a peace agreement is achieved, illicit activities decline precipitously, and well-aligned policies and finance can foster a low-deforestation, poverty-alleviating development pathway. In this sense, it is a critical moment in time to support Colombia's efforts to end deforestation and to develop equitable economic alternatives for Colombian peasants.

81 Echandía Castilla, C. 1999. El conflict armado en los años noventa: Cambio en las estrat´gias y efectos económicos. Departamento de Ciencia Política – Facultad de Ciencias sociales Universidad de los Andes, Bogotá, Colombia.

82 Rettberg, A. (Compiladora). 2012. Construción de paz en Colombia. Universidad de los Andes, Facultad de Ciencias Sociales, Departamento de Ciencia Política, Ediciones Uniandes, Bogotá, Colombia.

83 El Tiempo, May 26th, 2013. Full communication of agreement between the Colombian Government and FARC. Available at http://www.eltiempo.com/politica/comunicado-conjunto-16_12825022-4 (last accessed at July 1st, 2013)

5 | DOMESTIC AND INTERNATIONAL PROGRAMMES ADDRESSING FORESTS, LAND-USE, AND REDD+ IN COLOMBIA

5.1 Domestic - Ministry of Environment – The Heart of the Amazon programme

for Conservation and Sustainability at the Heart of the Colombian Amazon" programme (referred to here as the "Heart of the Amazon Programme" or simply "HA") is an integral part of this

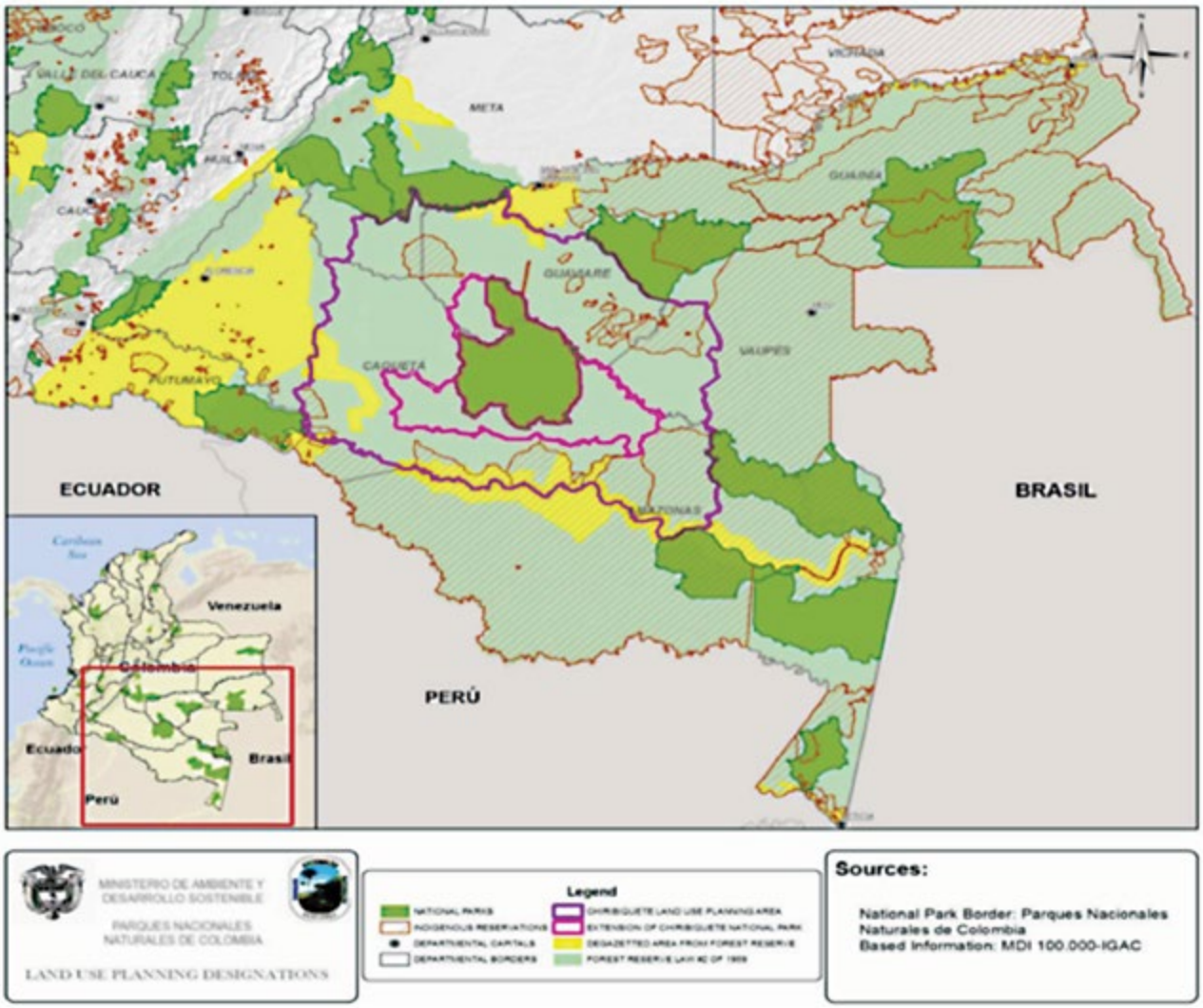

Figure 5.1 | *Map Highlighting the area covered by the "Heart of the Amazon" proposal.*

For several decades Colombia has been constructing an extensive system of protected areas and indigenous lands in the Amazon, which, according to the national government, have proven effective in preventing deforestation. The development of the "Governance

commitment. The initiative is designed to conserve and sustainably manage more than 11 million hectares with the Chiribiquete National Park at the core *(Figure 5.1)*. If successful, the project will significantly lower CO_2 emissions, preserve a biological corridor between the Andes

and the Amazon, promote sustainable development, and improve the livelihoods of local communities and indigenous peoples in the region[84].

The Colombian government is seeking donor contributions of USD 133.8 million: USD 33.8 million for a sinking fund and USD 100 million for the endowment fund. Additionally, they propose a 1:1 cost-sharing ratio for the sinking funds and an annual match of the returns from the endowment fund. This proposal is the result of an interagency effort led by MADS with the participation of National Parks of Colombia, IDEAM, the Amazon Institute of Scientific Research (SINCHI), Patrimonio Natural Fund, and The Nature Conservancy.

The idea is to fully protect Chiribiquete's Park through the creation of buffer zones surrounding the park and through landscape-level land-use planning that would inter-connect indigenous lands and other protected areas that encompass a large portion of the Colombian Amazon forest region. More specifically, the goals are to: (a) improve governance through land-use planning, zoning and institutional strengthening, (b) achieve sectoral accords for sustainability through interagency public policy agreements and public-private sectoral agreements; and (c) create incentives for conservation, restoration, and sustainable use, including forest conservation, restoration of degraded lands, reduced cattle ranching conversion, and improved commercialization systems for sustainable Amazonian production systems.

Some critics of this initiative raise the point that most of the areas covered by the initiative are indigenous peoples land, and they were not ensured free prior and informed consent regarding this project. *(For more details on the Heart of the Amazon Proposal, see Appendix F, F.1.)*

The Colombian Ministry of Environment has been actively seeking international support for the Chiribiquete "Heart of the Amazon" project, which focuses on three intervention strategies as well as a component of environmental and social monitoring and evaluation. The Chiribiquete National Part (at the core) is surrounded by a buffer zone and a larger land-use planning zone that would inter-connect indigenous lands and other protected areas that encompass a large part of the Colombian Amazon forest region.

5.2 Ministry of Agriculture: Strategy for International Cooperation 2013 to 2015

In December 2012, the Colombian Ministry of Agriculture defined six strategic areas with a number of priority issues possibly requiring international support (Estrategia de Cooperación Internacional del Sector Agropecuario 2013-2015)[85].

The main goals of the strategy are: (a) to develop a comprehensive land-use policy that ends further expansion of the agricultural frontier, secures the rights of land ownership and restoration of degraded lands; (b) to promote economic, social and environmental development of the rural zone through public-private partnerships that contribute to rural poverty alleviation; (c) to increase productivity while promoting and strengthening certification processes for small and medium producers; (d) to support research and development activities including second and third generation biomass utilization and biofuel production; (e) to identify and manage risks through better information management in support of timely and appropriate decision-making; and (f) institutional strengthening by Improving communication, coordination and planning to integrate and complement the resources and institutional efforts between different sectors involved in policies development. *(For more details on the Strategy from the Ministry of Agriculture, see Appendix F, F.2)*.

5.3 International Cooperation in the Amazon Region

The Departments of Amazonas, Caquetá, Guainía, Guaviare, Putumayo and Vaupés hosted 310 projects involving funds

84 Ministerio de Ambiente y Desarollo Sostenible, Republica de Colombia, - Governance for Conservation and Sustainability of the Heart of the Colombian Amazon – Proposal for Funding, May 2012

85 Estrategia de Cooperación Internacional del Sector Agropecuario 2013-2015. Bogotá, December 2012. Prepared by MADR et al)

totaling USD 91 million in international support during the period of 2008 – 2012 (as of September 5, 2012)[86]. Projects related to peace and regional development were the most widely funded (USD 25 million) followed by human rights (USD 18 million), social development (USD 17 million), infrastructure (USD 12 million), environment (USD 11 million) and alternative development (USD 8 million). Caquetá and Putumayo were the focus of most of the international cooperation, each hosting 33% of the total project funding. The project locations and themes are summarized in the table below. For more information *see Appendix F*.

Table 5.1 | *Total amount of funds tracked by the Presidential Agency for International Cooperation (APC) to the Amazon Region from the period of 2008 to 08/2012. Departments located within the Amazon Region. Source: APC, March 2013.*

Department	Cooperation (USD)	No. Projects
Caquetá	29,705,172	57
Putumayo	29,661,476	159
Guaviare	15,766,626	40
Amazonas	13,487,651	33
Vaupes	1,895,516	11
Guiana	491,083	10
Total	**91,007,524**	**310**

The EU was the largest contributor to the Amazon region giving USD 31 million to projects in peace and development, environment, and human rights. The United States gave the second largest amount at USD 25 million contributing to projects in infrastructure, alternative development, and social development. The major sources of funding are summarized in *Appendix F, Table F.3*.

Many of the funded projects in the areas of peace and regional development, human rights, social development, infrastructure, environment, and alternative development have strong synergies with the UK goals, and some funded projects that directly relate to UK goals are highlighted in *Appendix F, Table F.4*. It should be noted that while all of these projects had international support, many also had funding from the Colombian government.

86 Fuente Sistema de Información de Ayuda Oficial al Desarrollo – SIAOD de la Agencia Presidencial de Cooperación Internacional de Colombia APC-Colombia.

Finally, our research findings highlighted that the number of projects currently being funded and implemented and the volume of funding are not large enough to change the agricultural sector at scale.

5.4 Sustainable Cattle Ranching Project

Efforts to change the cattle sector have been underway for a few years in Colombia. In 2006, FEDEGAN established the goal to reduce the area of cattle pasture from 38.6 to 28 million ha by 2019 while increasing production[55]. As part of the plan, in 2007 the association decided to pursue the "sustainable cattle ranching initiative" with technical support from the Research Centre for Sustainable Systems of Agricultural Production (CIPAV), in partnership with Fondo Acción Ambiental y Niñez, The Nature Conservancy, and with financial support from the Global Environmental Facility, GEF[87].

The "GEF" project (as it is known) aims to promote the adoption of Silvopastoral Production Systems (SPS) among cattle producers located in 85 municipalities in Colombia. The goal is to improve natural resource management, increase the provision of environmental services (biodiversity, water, carbon, and soil fertility) and to increase productivity on the farms participating in the programme. For the period of 2010-2015, the target is to achieve 50,500 ha of environmentally friendly cattle production systems implemented in five strategic ecosystems (including dry forest, Andean forest and rainforest). Of this, 12,000 ha will be implemented as intensive SPS. The remaining 38,500 ha will involve payment for environmental services for: (a) the implementation of land corridors or connectivity corridors; (b) meadows with trees; (c) live fences; (d) restored areas; and (e) conservation of patches of forest in pasture areas[88]. The areas addressed in the project are not in the Amazon biome.

Now, with an additional £ 15 million in support from the UK government, the

87 GEF proposal document submitted by CIPAV and FEDEGAN in December, 2007.

88 Power point Presentation on Sustainable Cattle Ranching prepared by Andres Zuluaga. FEDEGAN, 2013. (shared with IPAM IP) – GEF and UK Overview

initiative expects to establish trees in 27,000 ha of pastures, support poverty alleviation of 1,500 small producers and achieve the reduction of approximately 2 tCO_2e. In addition, the project will focus its efforts in two deforestation hotspots identified by IDEAM. First, in La Guajira in the Pacific region, and second in Meta, close to the Serra de La Macarena and the Amazon Biome[88].

Table 5.2 | *Total area covered by the Colombian Sustainable Cattle Ranching Project Source divided by the areas covered with additional funding from GEF and the UK*[88].

	GEF (ha)	UK (ha)
Intensive SPS	12,000	3,780
Forests preserved	5,000	945
Pastures with trees	31,500	22,305
Restoration of degraded pastures	2,000	945
Total	**50,500**	**27,975**

FEDEGAN strongly believes that this project has the potential to become a widely adopted model in Colombia that could improve the livelihood of cattle producers and increase productivity within the sector.

5.5 REDD Projects in Colombia

There are 51 recorded REDD projects in Colombia totaling nearly 18 million ha. However, 46 of the projects are in the preliminary planning phase with four projects in the design phase, and only one project in the implementation phase. The one project being implemented is called the *Corredor de Conservacion Choco – Darien* and is being implemented by Consejo Comunitario COCOMASUR Athrotect on 13,465 ha in the department of Choco[89].

Four larger projects are in the design phase in the Amazon Region:

1 | **Implementacion Temprana REDD+ en la Amazonia Colombiana** – Covering 418,000 ha in Guaviare in the municipality of San Jose del Guaviare, this project is led by MADS, with participation of the National Parks, IDEAM, Patrimonio Natural, and the Netherlands. Other participants include DTAM, Alianza, ONF Andina, Ecoversa, SINCHI, CDA, INCODER, Guaviare departmental government, San Jose municipal government, and ASCATRAGUA (smallholder association). Others who have participated in the process include AGROCAFRE, AGROGUEJAR, ASCAL-G, and COAGROGUAVIARE.

2 | **REDD Corredor Biologico – Huila** – Covering 71,000 ha in Huila in the municipalities of Acevedo, Palestina, Pitalito, and San Agustin, this project is led by ONF Andina.

3 | **Gobernanza Ambiental para Evitar la Deforestacion y Promover la Conservacion de los Bosques de la Amazonia Colombiana** – Covering 210,000 ha in Meta in the municipality of La Macarena, this project is led by Patrimonio Natural and supported by the National Parks, ASCAL-G (Campesina association), IDEAM, SINCHI, MADS, and CORMACERANE.

4 | **Incentivos a la Conseravcion para el Manejo del territorio y la Mitigacion del conflitos Socio-ambientales** – Covering 51,278 ha in Meta in the municipality of Puerto Rico, this project is led by Patrimonio Natural and supported by the National Parks, AGROGUEJAR (Campesina association), IDEAM, SINCHI, and MADS. AGROCAFRE is a possible participant.

89 Internal data from the Ministry of Environment. Lead of the REDD+ National Strategy. Information updated until December 2012.

6 | SECTOR TRENDS AND INSTITUTIONS: CATTLE, SUGARCANE, PALM OIL, AND BIOFUELS

Colombia's reputation as an investor-friendly country has been improving. A key indicator of acceptance into the global investment community took place in 2010 when the country was given "investment grade" status by Fitch Ratings, Standard & Poor's and Moody's. Today, Colombia promotes itself as one of the most investor-friendly countries in Latin America. Foreign Direct Investment (FDI) has been on the rise since 2000 and is primarily focused on the oil and mining sectors.

Banks are the most important financial intermediaries in Colombia. The banking system was consolidated after the 1999 economic crisis. Business confidence, growing purchasing power, a deepening of new financial instruments (e.g., microfinance), and the implementation of international recommendations has driven the banks toward modernization and stabilization. According to the World Bank's *Ease of Doing Business 2012* report, Colombia is ranked in third place in Latin America, behind Mexico and Peru.

While the banking system is strong and private investment is on the rise, investment growth in the agricultural sector has been imbalanced, favoring big industry over Micro, Small and Medium Sized Enterprise (MSMEs). MSMEs in Colombia have limited access to finance. They constitute 99% of firms in the country, account for almost 80% of private employment and 35% of GDP but receive only 14% of total loans[90]. High profits in traditional business lines and poor contract enforcement among MSMEs reduce banks' incentives to explore these markets[91]. The lack of coordination between the national and the local level government has hindered the growth of small and medium-sized agricultural companies. Additionally, further investment is required to upgrade infrastructure networks. Moreover, commodity markets continue to suffer from extensive inefficiencies, rigidities and weak contract enforcement.

Due to insufficient access to capital, farmers and the agricultural industry in Colombia have had less than optimal innovation, suffer from low investment in R&D[90], and have yet to efficiently link with local universities. As a result, governments and development agencies have supplemented private innovation by providing funds and establishing R&D in public research organizations. It is currently most effective to spur innovation in specific sectors via public-private partnerships[92].

6.1 Industry trends for cattle, sugarcane, palm and biofuels

CATTLE

Around 38% of Colombia's total land surface is used for cattle ranching. The current model of cattle ranching in Colombia is extensive rather than intensive. Strong cultural traditions favoring informal, low-input, low-yield livestock production systems presents an obstacle to improved economic models. The cattle industry also faces structural barriers that are common to rural development in Colombia, such as: lack of trained personnel, inefficient use of natural resources, inadequate access to financial resources and technologies. The combination of these factors contributes to the sector's low productivity and high production costs.

Large landowners comprise a small percentage of production. Most landholdings are small and run by rural families; 82% of cattle ranchers have less than 50 animals per farm (phone interview

90 OECD. 2013. OECD Economic Surveys: Colombia 2013: Economic Assessment. OECD Publishing, http://dx.doi.org/10.1787/eco_surveys-col-2013-en.

91 Meléndez, M. and G. Perry. 2009. Industrial Policies in Colombia. Inter-American Development Bank, www.iadb.org.

92 McKinsey, 2010. (Andrade, L. and A. Cadena authors) Colombia's lesson in economic development. McKinsey & Company, Bogota, DF, Colombia.

with FEDEGAN, March 2013). Average stocking rates on these pastures are estimated at 1 animal per hectare[93].

Producers of beef and milk are mainly supplying the domestic market. Grupo Éxito, a leading Colombian grocer, is one of the largest meat buyers. Other important buyers include Tecnicarnes, Olímpica, and Colanta. The largest dairy buyers are Colanta, Colombia's major supermarket chain, Alpina Productos Alimenticios, and Nestle. Distribution for the sector is carried out by many small buyers.

Though production is vast it remains inefficient. To address such inefficiencies, the government has implemented policies to promote small producer access to markets and more efficient production methods. The clean production policy, part of Law 99/93, mandates concerted public-private efforts to ensure sustainable sector management. Under this mandate FEDEGAN developed the *Strategic Plan for Colombian Cattle Ranching 2019*, seeking to increase market access **by introducing international environmental standards into the beef and dairy supply chains**. To this end it has established the goals of withdrawing 10 million ha of unsuitable grazing land from production by 2019 through cattle intensification, improving breeding (genetics), and implementing silvopastoral practices that advance reforestation and soil restoration. To aid in this transition, FEDEGAN working with CIPAV and the Fund for Agricultural and Livestock Sector Financing (FINAGRO) have entered into agreements to better integrate credit lines with technical assistance for cattle ranching. In 2007, the Ministry of Agriculture and Rural Development established the *Rural Capitalization Incentive* (ICR) for ranchers interested in implementing sustainable silvopastoral production systems.

93 Vergara, W. 2010. La ganadería extensiva y el problema agrario. El reto de un modelo de desarrollo rural sustentable para Colombia. Revista de Ciencia Animal 3:45-53.

The National Slaughter System (Sistema Nacional de Sacrificio) represents an investment opportunity as it opens the window to the construction and implementation of modern plants. Investment in this area is needed and should absorb the informal slaughter operations that represent 55% of the national total. Camaguey-Galapa-Barranquilla, Ceagrodex-Neiva, Central Ganadera-Medellín, Cofema-Florencia (Caquetá), Coo- lesar-Cesar and EFEGE-Bogotá are among the largest slaughterhouses in Colombia[94]. Smallholders producing under contracts with larger buyers located in the central cattle regions have access to processors, but smallholders on the Amazon frontier have to overcome poor transportation infrastructure to process their animals. Only one precarious slaughterhouse exists in the Amazon region, so many producers are known to drive many hours with their live cattle to access the larger meat processing facilities of Vale de Cauca, close to Cali. Dairy processing is, similarly, underdeveloped in the Amazon.

SUGAR

The sugarcane industry is one of Colombia's leading sectors and is reported as the most efficient sugarcane producer in Latin America, with yields of 120 tonnes of sugarcane per hectare, followed by

94 DANE - Departamento Nacional de Estadistica de Colombia. 2012.

Guatemala and Brazil. The industry is a cluster that has developed around the production of sugarcane (white sugar), panela (brown sugar), and more recently ethanol. Colombia is the world's second largest producer of both ethanol and panela. The sugarcane industry is currently experiencing a period of rapid growth due to the lucrative expansion of ethanol through incentives provided by the government *(see biofuel section)* and has plans to triple the area of land under production by 2019. Most production takes place in Valle del Cauca and is comprised of 2,700 family farms and 13 sugar mills. Panela production is much less sophisticated and is located throughout the country distributed among 70,000 farms, employing approximately 120,000 subsistence farmers.

Many governmental policies and incentives have created a favorable environment for sugarcane expansion (see biofuel section). The influx of investment has allowed the industry to begin the process of integrating the supply chain, building facilities for ethanol and sugar production in close proximity. The sugar industry, through its research arm, the Colombian Sugar Cane Research Centre (CENICAÑA) has focused on developing land-management programmes to **increase productivity by expanding the area under cultivation, reducing costs, and orienting its business model towards international markets, which includes adopting international sustainability standards**. In 2010, the roundtable certification body, Bonsucro, began working in Colombia and there is currently one mill certified.

Some of the largest sugar mills and manufacturers include: Ingenio Pichichi S.A in Valle del Cauca, Grupo Manuelita, Mayagüez SA, and Incauca SA (run by Ardila Luelle - Postbon Beverage the chief beverage company in Colombia). Ardila Luelle is one of the largest producers and buyers of sugarcane in the country. The most promising companies to work with on LED-R production in the sugar sector are Grupo Manuelita and Postbon run by Ardila Luelle. AMAYA, a Colombian research and consulting organization, is developing new sugar cane varieties that can do well in the drier east. One promising variety has the ability to grow in poor-quality soil while consuming 50 percent less water.

PALM

Colombia is the 4th largest producer of palm oil in the world, and the government, in partnership with FEDEPALMA (the Palm Industry Association), **has targeted a six-fold increase in this sector by 2020** through the policy mandate for expansion of biofuels. Palm oil expansion is promoted by government incentives, including tax holidays (Law No. 788/2002 and Law No. 939/2004), tax-free zones (DS. No. 383/2007), tax reductions from investments in productive assets (Law 111/2006) and credit incentives for plantation establishment and maintenance (Programa *Agro Ingreso Seguro*). The latter include special credit lines and the ICR. These incentives have supported palm processors, with few incentives reaching smallholder producers.

Roughly 40 percent of Colombia's palm oil production is used to meet the demands of domestic food manufacturers with an equal proportion supplying the growing local biodiesel market; the remaining 20 percent is exported. Smallholders, accounting for 30-50% of the palm oil production, suffer from low yield plantations reflecting inefficient farming and land management practices. About one-third of plantations are on landholdings with areas greater than 1000 ha, while another third are between 200 and 1000 ha. The contribution of smallholders – with properties less than 20 ha – along with 'alliances' among several smallholders, was 19% of total production in 2010[95].

Most palm oil plantations are in the hands of vertically integrated private companies. The two largest are Casanare (owned by Palmar del Oriente SA) and Extractora del Sur de Casanare. Other important domestic and international companies include: Mondelez, Unilever and Cargill. The United Kingdom is one of the largest buyers of Colombian crude palm oil[96]. There are a total of 60 palm oil processing mills in Colombia with a trend towards expansion to include biodiesel processing.

95 Sistema de Información Estadística del Sector Palmero (SISPA). 2011. FEDEPALMA, http://sispa.fedepalma.org/sispaweb/default.aspx (30 December 2011).

96 Proforest 2011

Colombia developed its National Interpretation of Principles & Criteria for RSPO in 2010. As of today there is only one Company that has attained RSPO certification, but there is indication that additional mills are interested in RSPO certification because of European market prospects (and acceptance, by Europe's Renewable Energy Directive, of RSPO certification), but organizing the certification has been challenging due to the decentralized government design. All certification bodies have to work at the subnational level and develop 5 different strategies with 5 different governmental processes, one for each region: Pacific, Caribbean, Andean, Orinoco and Amazon. **Additional constraints are lack of financing for RSPO implementation.**

BIOFUELS

Colombia has emerged as the largest producer of palm biodiesel in Latin America and the second largest producer of ethanol. The Colombian government, with international cooperation and funding, has played a central role in modernizing the biofuels sector. Government support for biofuels began with the Uribe administration (2002-10) identifying it as one of the **major strategies for rural development and as an alternative to illicit crop production**. Additionally, the EU and US are interested in supporting this expansion to assist in meeting their renewable energy mandates with biofuel imported from Colombia. The FTA with the US should facilitate this linkage.

In 2012 a national government decree (Decree 4892) mandated a 10% biofuel blend level for vehicles, with a range of 8% to 13% for ethanol and 10% for biodiesel. Since the blend rule passed, five sugar mills in the Cauca Valley have established their own ethanol distilleries. Biofuel investment in Colombia is eligible for special tax treatment in free trade zones, which pay just 15% tax (compared to 33% outside the zones). In addition to tax exemptions for biodiesel and ethanol, other incentives include a provision stating that 40% of the investment in productive assets may be offset against income and 10% of new investment in reforestation, the planting of palm trees or irrigation and drainage works, is eligible for a 10% tax deduction.

Domestic demand for biodiesel is underpinned by a Government strategy to promote flex-fuel vehicles. Bogotá's Transmilenio mass transport system is run on mixed fuels. Since 2012, a minimum of 14% of all cars either manufactured in Colombia or imported into the country must be flex-fuel vehicles. That percentage will rise to 80% by 2016. Stimulated by governmental incentives, approximately 41,000 hectares of sugarcane were dedicated to bioethanol production and 168,000 hectares of palm oil for biodiesel[97], as of 2012. The national association of biofuels, projects (perhaps optimistically) that the country's ethanol output will double between 2012 and 2014[98].

Domestic production of ethanol is concentrated among five of the 13 sugar mill companies in the country[99]. Ardila Luelle, which is one of the largest conglomerates in Colombia, owns the sugar mill Incauca, and holds 52% of Ingenio Providencia mill and at least 35% of El Ingenio Risaralda mill. Together, these three mills account for 65% of ethanol production in Colombia. The two other mills account for the remaining production: Manuelita (20%) and Mayaguez (15%)[100]. Together, all the producers make roughly 300,000 gallons of ethanol a day.

Ecopetrol, Colombia's government owned oil and gas company launched a bioenergy refinery in the eastern part of the country (Llanos) adding an additional 6,000 ha of palm oil. Ecopetrol is also constructing a facility with capacity to process 400 thousand liters of ethanol per day, which will require about 80,000 ha of cultivated cane to maintain the plant at full operation[101]. Also, in 2012 the agribusiness company, Rio Paila-Castilla (based in Valle del Cauca), planted 2,000 ha of palm oil in the municipality of Santa Rosalia in the eastern part of the country (Vichada, Los Llanos). To date the major private investors are domestic, but interest

97 Fedebiocombustibles, Banco Interamericano de Desarrollo (BID), and Ministerio de Minas y Energía. 2012. Evaluación del ciclo de vida de la cadena de producción de biocombustibles en Colombia - Resumen Ejecutivo. www.fedebiocombustibles.com, Bogota Colombia.

98 Business Recorder. 2012. Colombia sees ethanol output doubling by 2014.in http://www.brecorder.com/business-a-economy/189/1170475/, editor. Business Recorder Group, Pakistan.

99 Land Deals Politics Initiative (LDPI) 2012 – unpublished work.

100 Pérez and Álvarez, 2009

101 Interview with members from FEDEBIOCOMBUSTIBLES, March, 2013.

from other Latin American countries is on the rise, particularly Brazil[102]. Foreign investors include the UK commodity merchant ED&F Man (which has invested with Latin American partners USD 240 million in an ethanol project in the Boyaca region) and Israeli speculators.

A study commissioned by Inter-American Development Bank (IDB) shows that there is potential for expansion of oil palm up to 4.0 million ha and sugar cane up to 4.9 million ha[103]. There is some overlap in the areas suitable for oil palm and sugar cane. However, highly suitable areas overlap very little, with suitability for oil palm higher in Caquetá and Meta and suitability for sugar cane higher in Magdalena, Cesár, and Cordoba. Also, areas in Vichada could be moderately suitable for growing biofuel feedstocks, if the transport infrastructure was significantly improved[103]. The IDB study also recognizes that establishing palm and sugar plantations in parts of Meta and Caquetá can increase pressure on rainforest areas, and for this reason, prior to establishing crops in these areas, evaluations and additional research on the potential impact of indirect land use must be performed[103]. Policies favoring the expansion of biofuels could also reinforce historical inequitable land distribution[104]. The legal instruments supporting the development of the industry are reinforcing the concentration of sugar mill ownership among a few large companies. *(For more information on key stakeholders in Colombia, see Appendix G)*

102 Borras, S. M., Jr., D. Fig, and S. M. Suarez. 2011. The politics of agrofuels and mega-land and water deals: insights from the PROCAÑA case, Mozambique. Review of African Political Economy 38:215-234.

103 IDB and Ministry of Mining and Energy - Medellin. January 2012. Biofuel Sustainability in Colombia. UniversidaPB – EMPA, prepared by CUE Consortium – Centro Nacional de Producción Más Limpia, CNPML.

104 Marin, V., J. C. Lovett, and J. Clancy. 2011. Bio-fuels and Land Appropriation in Colombia: Do bio-fuels national policies fuel land grabs'.in International Conference on Global Land Grabbing. IDS, University of Sussex, UK.

7 | DOMESTIC FINANCE PROGRAMMES AND THE TRANSITION TO LOW-EMISSION RURAL DEVELOPMENT

The shift from low-cost "horizontal" pasture expansion toward intensified systems in which greater production is achieved through higher yields requires upfront capital investment. While improved production systems are likely to be financially profitable in the long run, farmers (especially micro-, small- and medium-scale producers) currently face capital constraints and cannot readily access the funds necessary to cover the cost of the near term shift. Here we assess the capacity of the existing financial system for the agricultural sector, outline barriers for private sector investment in LED-R, and explore several mechanisms and delivery channels that could be supported to aid in the national transition to greater production with less deforestation.

Agriculture and livestock producers interested in transitioning from extensive, lower-yielding systems to intensive, higher-yield LED-R systems face various challenges:

- Lack of technical capacity, knowledge and training in higher-yielding techniques and/or silviculture methods;
- Limited access to inputs such as fertilizers or improved genetic varieties of crops or cattle;
- Unclear market signals and/or uncertain market incentives for sustainable or certified products; and
- Limited access to credit and appropriate finance for the transition to LED-R

7.1 Existing financial mechanisms and delivery channels for agriculture in Colombia

Colombia has a high level of financial support for agriculture and rural development, which is provided through FINAGRO, agribusiness producers and traders, royalties from the mining and extraction industries, and Overseas Development Assistance (ODA). Public financing through FINAGRO is Colombia's main source of agricultural loans, grants and subsidies. While it is a government programme, FINAGRO resources come from mandatory investments of private credit institutions. FINAGRO issued agricultural loans worth USD 3.6 billion[105] in 2012 and is projected to issue a similar amount in 2013 (USD 3.67 billion)[106]. Loans for working capital and investment are available to small, medium and large producers (with assets ranging from USD 33,000 to 1.6 million)[107] at interest rates of 10 to 15%[108]. FINAGRO loans are issued through the public Banco Agrario and the following commercial banks: Davivienda, Bancolombia, Banco de Bogota, and BBVA[109].

105 Currency expressed in US dollars uses COP to USD exchange rate of 1800:1.

106 FINAGRO statistics on its website, accessed March 20, 2013: https://www.finagro.com.co/sites/default/files/field-collection/estadisticas/files/otorgados_por_linea_.pdf

107 FINAGRO's *Manual de Servicios* obtained on the FINAGRO website, accessed March 19, 2013: https://www.finagro.com.co/normas/manual-de-servicios.

108 These interest rates are estimated using the stated rates in the Manual de Servicios: DTF+5, DTF+7, and DTF+10, assuming DTF of 5%. DTF (Depósito a Término Fijo) is the average deposit rate for 90-day time deposits. In 2012, the DTF remained over 5% (Grupo Aval, Tasas de Interés – https://www.grupoaval.com/portal/page?_pageid=33,115460184&_dad=portal&_schema=PORTAL)

109 Information obtained with Agrobiz. Interview, March of 2013.

"No longer will the royalties be for construction of small local public works of low impact, much less for whims of the municipal and provincial administrations of the moment … from today on they will have a very clear focus on regional competitiveness and development," Colombian President Juan Manuel Santos said. ("Colombians to share more widely in oil, mining royalties", Latino Fox News, May 22, 2012.)

Private finance for agriculture in addition to the public-private funds provided to FINAGRO exists, although it favors large and medium-scale producers. Commercial suppliers and trade finance, for instance, offer substantial finance to agricultural producers, with total portfolios estimated at about one third of bank credit to agriculture (excluding small and medium producers)[110]. Trade finance includes input suppliers (seeds, fertilizers, pesticides etc.), sellers of machinery and equipment, and purchasers of large-scale agricultural commodities. Also, associations such as FEDEPALMA, FEDEGAN and ASOCAÑA manage funds (*Parafiscales* Funds) from contributions of producers (usually a small percentage of their sales). These funds are used for research, marketing support and for strengthening their respective sector[111].

Financing from mining and oil royalties has been expanding substantially in recent years. From 2006-2011, royalties increased 70 percent[112], and in 2012, royalties totaled almost USD 4.8 billion[113]. The government expects to continue receiving about USD 5 billion per year in royalties going forward[114]. In 2011, Colombia passed a reform of the royalty system from one that directly allocated 80% of revenues to regions where the extractive industries were operating to allocating only 10% of royalties to these regions in 2014 *(see Figure 7.1)*. Royalties are channeled through the National Royalties System and are coordinated by Colombia's National Planning Department (NDP) in several ways[115]:

- Direct allocation (10%): allocated to producing regions
- Regional Development Fund (16%): finances projects that capitalize on "returns at scale"; also targets the needs of a specific region, allocated based on poverty, unemployment and population criteria. Mayors, governors, and the national government jointly approve/ reject particular projects
- Regional Compensation Fund (24%): targeted at improving the living conditions in the poorest regions, including the coasts and border regions where most Afro-Colombians and indigenous peoples live. After 30 years, this fund will terminate and the resources transferred to the Regional Development Fund
- Science, Technology and Innovation fund (10%): designed to foster economic growth through investments in these areas
- Territorial Pension Fund (10%): will decrease pension liability of territorial entities
- Saving and stabilization fund (≤30%): designed to reduce royalty revenue variability and favor macroeconomic stability.

110 In the time frame of this assessment, we have been unable to uncover the current terms and scope of commercial trade finance, but based on historic data (*Colombia Rural Finance: Access Issues, Challenges and Opportunities.* World Bank, November 2003 (Report No. 27269-CO), such finance is approximately one third of the FINAGRO lending portfolio (USD 3.67 billion in 2013).

111 Information obtained with Agrobiz. Interview, March of 2013.

112 "Colombia's Royalties Reform: Fueling Fairness, Saving and Equitable Growth." Colombia Embassy website, accessed April 30, 2013: http://www.colombiaemb.org/sites/default/files/factsheets/Colombia's%20Royalties%20Reform%20-%20July%202011%20(2).pdf

113 Distribución SGR 2013-2014 - resumen departamental on Sistema General de Regalias' website, accessed March 20, 2013: https://sgr.dnp.gov.co/LinkClick.aspx?fileticket=ybG3SPotZP4=&tabid=76.

114 "Colombia's Royalties Reform: Fueling Fairness, Saving and Equitable Growth."

115 Percentages for these channels are included in OECD Economic Surveys: Colombia 2013 Economic Assessment, and the descriptions are found in "Colombia's Royalties Reform".

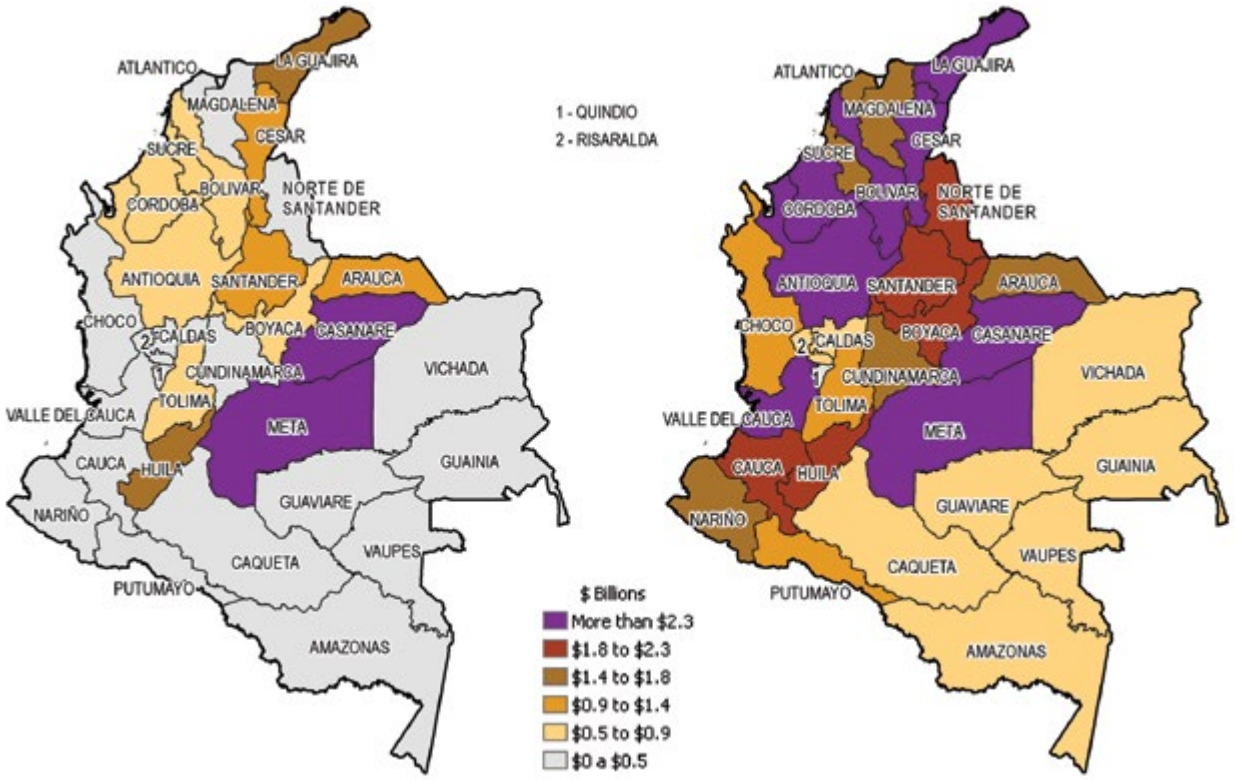

Figure 7.1 | *Total Royalties per department, 2002-2010 vs. 2012-2020*
Source: "Colombia's Royalties Reform: Fueling Fairness, Saving and Equitable Growth." Colombia Embassy website: http://www.colombiaemb.org/sites/default/files/factsheets/Colombia's %20Royalties%20Reform%20-%20July%202011%20(2).pdf (accessed April 30, 2013)

Overseas Development Assistance (ODA) to Colombia has fluctuated over the last several years and was estimated to be almost USD 750 million in 2011, of which 110 million was specifically directed to agriculture, forestry and fisheries[116]. See appendix H, Table H.1 for the types of finance available to the agricultural sector.

7.2 Barriers for private sector investment in LED-R

Investing in LED-R for entities within agricultural supply chain requires capital, knowledge of sustainable production/processing practices, and demand for zero-deforestation and certified products by buyers. For credit institutions and equity investors to invest in LED-R through debt or equity (respectively), the risks of doing so must be rewarded with comparable returns.

Producers

Barriers for farmers and ranchers to invest in LED-R, zero deforestation, certified commodities include:

- Lack of finance targeted at LED-R, and especially for long-term investing (e.g., there are no specific lines of finance for climate smart, zero-deforestation agriculture)
- High interest rates (public interest rates appear to be comparable to the interest rates of private loans)
- FINAGRO finance limited to those with legal land title (only 50% of land is legally recognized in Colombia)[117] and credit history (many farmers do not have it)
- Smallholders often have limited technical and financial capacity (in Colombia, 82% of cattle ranchers have less than 50 animals per farm[118], and 33% of the palm oil is produced by smallholders)[119], and many processors

116 Based on OECD data (see below). Other datasets such as the World Bank report somewhat different ODA figures but we chose to use the OECD source because of its sectoral breakdown. ODA by sector – bilateral commitments by donor and recipient (Geo Book), OECD statistics on its website, accessed March 20, 2013: http://stats.oecd.org/Index.aspx?DataSetCode=DACSECTOR.

117 Interview with SAC, March 2013.

118 Project Appraisal Document on a Proposed Grant from the Global Environment Facility Trust Fund for Mainstreaming Sustainable Cattle Ranching Project. September 2009.

119 Solidaridad presentation to RTREDD consortium. San Francisco: October 5, 2012.

interested in certification (e.g., RSPO) are often focused on changing their own practices, instead of assisting smallholders that supply them with fruit (oil palm) or beef

- Financial sector agencies concentrated in cities, with few or no credit institutions in rural zones and/or bankers often are not very familiar with the agriculture sector and thus less likely to assess and/or grant agricultural loans
- There are marketing and transportation issues related to poor infrastructure (distance to market). Limited marketing translates to lower sales and a lower level of approval of requests for credit
- Insufficient access to information regarding agricultural loans. Most farmers do not have access to the Internet, and information that reaches them is insufficient
- Farmers and ranchers often lack sufficient capacity to build business plans and financial projections that banks require as a part of credit analysis and due diligence

PROCESSORS *(slaughterhouses, palm oil mills, milk processing plants)* **AND BUYERS** *(if non-vertically integrated with processors)*

These actors likewise face various barriers and/or lack of incentives for investing in climate-smart practices themselves and/or through their suppliers. First, there is lack of available financing for LED-R, certified production (similar to above). Also, risks for investing in suppliers may be perceived as greater than potential returns. Another important barrier is lack of demand for LED-R, certified production because: (a) a large proportion of commodities are sold to the domestic market, which does not appear to demand climate smart or certified products (e.g., 40% of the palm oil produced in Colombia goes to the local biodiesel market, 40% for consumption/food, and 20% is exported); and (b) export markets that most likely will demand certified products in the medium term, e.g., the EU or companies member of the CGF (Consumer Goods Forum) are not currently demanding such products in a way that restricts access to these markets or rewards early adopters (such as price premiums).

CREDIT INSTITUTIONS

Entities that provide debt financing for agriculture could include commercial banks, microfinance institutions, credit unions, and informal credit cooperatives or moneylenders, as well as traders and or input suppliers. Commercial banks are required to "invest" into FINAGRO and also issue almost 50% of FINAGRO loans[120]; however, these institutions face various barriers to otherwise investing in climate-smart, certified agriculture and livestock production (i.e., developing their own lines of credit for LED-R):

- Agriculture loans are seen as risky, especially for smallholder producers that do not present the potential for high returns; thus, banks are not inclined to commit more than the mandated FINAGRO funds into agricultural loans
- Many bankers are not familiar with agribusiness, which makes it more difficult for them to assess the risks and returns for agricultural loans
- Microcredit institutions are spread out in Colombia, perhaps due to the historical insecurity in the countryside where demand for such credit is often highest
- Informal cooperatives or money lending systems are common in rural areas but are rarely used for agriculture, which is seen as more risky than other businesses

Equity Investors

These range from individuals to institutional funds (like pension funds) to funds more focused on a particular type of asset such as TIMOs (Timber Investment Management Organizations), to private equity or venture capital funds[121]. Such equity investors face various constraints to investing in climate smart, zero-deforestation production systems such as fragmented, smallholder production that does not offer the economies of scale in either the size of the investment or the potential returns from sustainable production that is more attractive for these types of investors. Also, the low levels of security in the Colombian countryside makes investments

120 "Conclusions del Diagnóstico en Financiamiento". Brochure provided from SAC (Sociedad de Agricultores de Colombia) in March, 2013.

121 Producers and/or others in commodity supply chains themselves are also equity investors of course, but we highlight external equity investors above as well, as they have different constraints and criteria to investing.

particularly risky, especially if they are long-term investments or not very liquid (timber, oil palm).

7.3 Preliminary recommendations to address these barriers

These challenges and barriers to private sector investment in LED-R production systems offer the opportunity to design solutions. Harnessing and leveraging the available funds to cover the costs incurred in the transition to LED-R will require improving access to credit, incentivizing long-term investment (and appropriate financial products), integrating financing sources, and building the capacity of producers, banks and related farming institutions. Below are some suggestions, summarized in *Figure 7.2*.

In Colombia credit institutions currently contribute a portion of their resources to FINAGRO, and extraction companies likewise must provide a portion of their resources to the national royalties system. The banking and extraction industries will continue to grow—as will their contributions to these funds—and it will be key to harness these funds for LED-R financing to best support *producers', processors/buyers'*, and LED-R investments in productivity improvements alongside positive environmental benefits.

There is need for designing credit and financial support to incentivize LED-R investments in the supply chain. Investments in LED-R, zero deforestation production are likely to be longer-term. For instance, the costs of planting trees for silvopastoral systems (SPS) can result in increases in soil fertility and higher stocking densities and productivity. This increase in productivity requires a few years to be achieved. Thus, lines of credit and other financial support/incentives

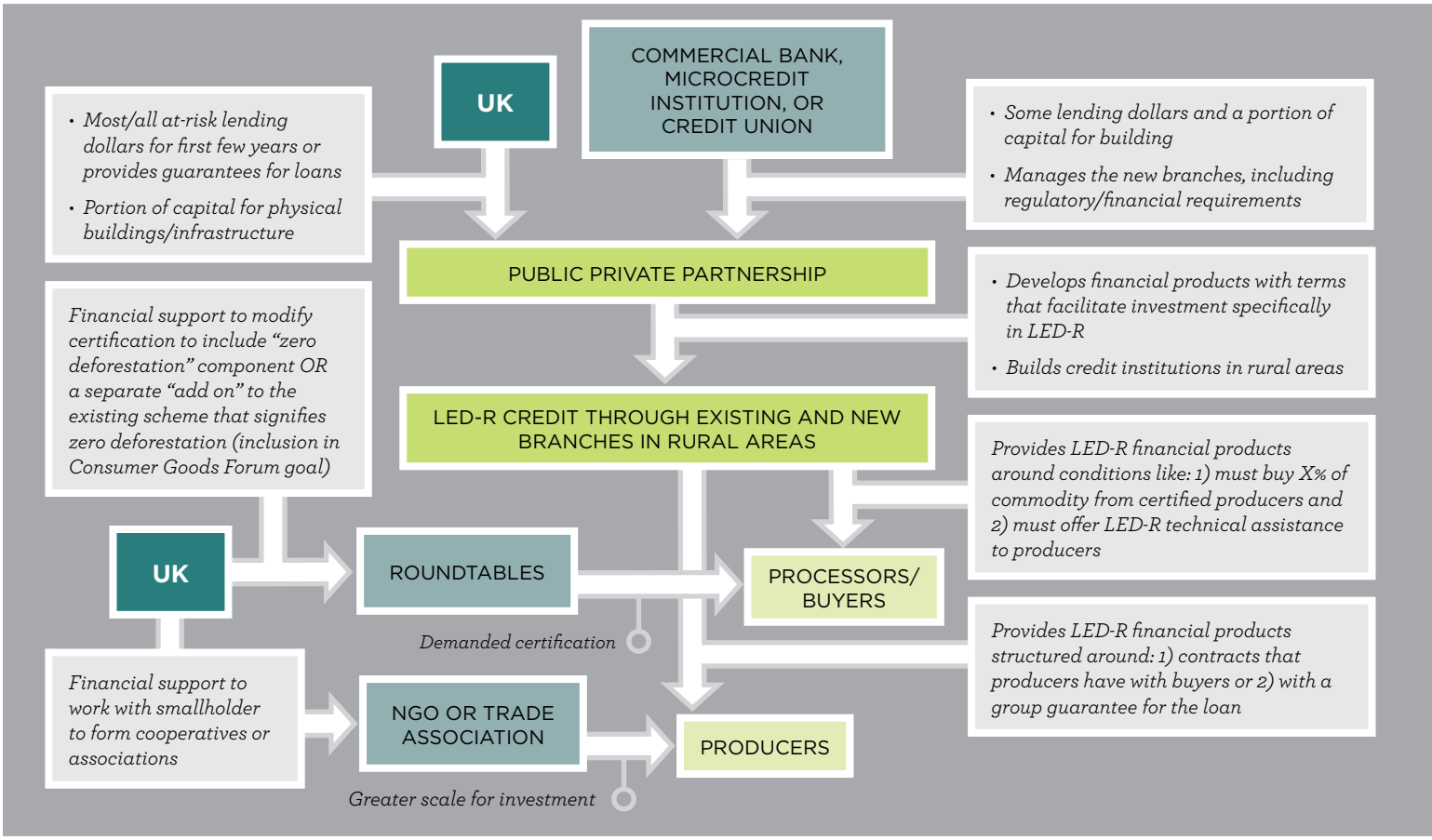

Figure 7.2 | *Diagram summarizing possible interventions that the UK could make in Colombia to address agricultural drivers of deforestation.*

for *producers* must be structured to best support such longer-term investing, including appropriate (probably lower) interest rates and longer time frames for loan repayment. In addition, LED-R financing lines for *processors/buyers* should include incentives for them to make investments in or buy from certified producers. For instance, LED-R financing lines tailored to processors and/or traders could include conditions such as the requirement that they buy X% of certified beef or palm oil from smallholders and that they must offer technical assistance to smallholders/outgrowers to implement LED-R sustainable practices that will enable them to achieve certification.

Create financial products to sidestep land tenure, credit history issues. Investments by producers in LED-R is constrained by lack of tenure and credit history, so new LED-R financial products should be designed around 1) contracts that producers have with buyers, 2) assets such as cattle, and/or other vehicles to deliver credit. For example, LED-R financial products can be structured for associations with a group guarantee on the loan, so if one producer does not pay, the other producers are responsible for repaying the loan (encouraging producers to monitor each other and collectively help manage production in order to be able to pay back the loan). Or financial products could be designed for cooperatives or associations but without tenure/credit history requirements (similar to Brazil's family agricultural programme (PRONAF), which waives land tenure requirements for farmers without official title to their land if they are organized into an association).

Support credit institutions to take risks on agricultural financial products. A key role for the public sector can be to encourage *credit institutions* to develop financial products for LED-R by mitigating some or all of the risk for such investments, since the risks of offering financial products for agriculture overall are currently perceived as prohibitively high in Colombia. This can range from providing most or all of the at-risk capital being offered by such credit institutions to providing guarantees for such loans/financial products and/or building capacity at these institutions to assess agricultural, LED-R loan applications. Additionally, loans can be structured to reduce risk; for instance, alternatives can be developed to the current practice of relying on producers to make payments after they sell their products. Loans can be structured such that once the buyer receives the product, payment is channeled through the credit institution, which takes the principal loan payment and interest, depositing the rest in each producer's account.

Improve the efficiency and distribution of financing through jurisdictional performance. Actors in the supply chains such as *producers* and *processors/buyers, credit institutions*, the Roundtables and/

or other certification schemes all bear substantial transaction costs to not only comply with but also demonstrate that supply chains are in compliance with LED-R, zero-deforestation practices. To decrease these costs and increase the efficiency of the system overall, a jurisdictional approach to financing and certification should be explored (this should also be appealing to the CGF members, as they struggle to find efficient ways to transform massive supply chains into "no net deforestation" supply chains and measuring/ensuring that the chains are in compliance).

Mitigate risks for *equity investors.* To attract more individuals and institutional investors, or long-term land equity investors such as TIMOs, their risks for such investment can be mitigated through the public sector, including FINAGRO, new LED-R lines of credit, CIF or other programmes that provide financial support for agriculture or timber investment. Also, potential solutions to the security and/or political risks associated with longer-term, LED-R investment could include political risk insurance and currency risk support through hedges.

Colombia could also strengthen the overall institutional capacity and knowledge regarding LED-R and associated sustainable production systems. This includes: building capacity for assessment, monitoring and technical assistance to producers alongside financial institutions and at the jurisdictional level; clarifying and strengthening land tenure; bolstering technical assistance to support LED-R; amplifying enforcement capacity to dissuade deforestation; strengthening private banks' knowledge of agribusiness and ability to assess agricultural/FINAGRO loan applications.

Working with these overall concepts to increase private sector investment in LED-R by mitigating such barriers, we have also developed **specific ideas related to various interventions for UK consideration to support the transition to LED-R development.** Each of these ideas is just one of various permutations that could be used to address the specific issues and challenges, so they should be viewed as starting points for a discussion around the best combined financial interventions to stimulate private investment in LED-R in Colombia.

One option for international investors (and donor countries) would be to offer an amount of funding to Colombia to put into FINAGRO under the condition that Colombia contributes an additional amount into new FINAGRO financial products designed to facilitate and incentivize investment into LED-R agricultural, livestock and forestry systems and geared towards producers becoming Roundtable-certified. Colombia's contribution could come completely or partially from the existing FINAGRO USD3.7 billion (note, our analysis suggests that with some restructuring, current FINAGRO programmes can be synergistic with UK objectives). In addition, UK support could be contingent on requirements such as: Banco Agrario open bank branches in a negotiated percentage of departments/municipalities without credit institutions; and a determined percentage of the finances are spent to develop and implement a training programme for FINAGRO bankers to enable them to better assess agricultural loans and also assist applicants (smallholders in particular) complete loan applications, including developing the financial models for their climate-smart/zero deforestation investments (this last component could also be undertaken through a technical assistance programme).

This approach is attractive because it could leverage UK funds with Colombian funds; utilizes the existing agricultural financing programme (FINAGRO) and creates an efficient way to offer new LED-R financial products; reduces marketing costs for new financial products because supply chain actors are already familiar with FINAGRO; supports Banco Agrario in offering more agricultural credit in rural areas and also increases access to credit in rural areas; increases technical capacity of loan officers (which may be needed for FINAGRO lines of credit in general); and increases abilities of smallholders to complete loan applications and access credit.

Develop public-private partnership (PPP) with commercial bank, microcredit institution, or credit union to offer LED-R

financial products through existing and new branches. UK could provide most or all of at-risk lending dollars into the partnership for the first few years, after which the partner institution would take on a greater percentage of the lending risk with its own finances (if products are financially successful); or UK and/or Colombian government provides guarantees for loans with the institution's own finances to minimize risk for commercial bank (similar to or through FAG, for example). UK provides a portion of the capital for new physical buildings/infrastructure and possibly salaries for the first year at new branch(es) in rural areas; credit institution manages the new branch(es), including the regulatory and financial system requirements of financial institutions. Also, training programme for loan officers is implemented.

This approach is appealing because it encourages private sector credit institutions to take more risks, over time, on agricultural LED-R lending/financial products, and their financial and risk expertise can also be used to create better, innovative financial products to support the LED-R transition. Currently, private sector lending to agricultural is crowded out through FINAGRO, so this would introduce greater private sector participation in lending to agriculture and LED-R in particular. It would also increase technical capacity of loan officers and smallholders (similar to n.1).

Develop PPP with processor/buyer to provide credit to its producers/suppliers. Through PPP, develop credit options geared towards LED-R that take into account the special needs of smallholders with little savings/cash on hand. In exchange, processor/buyer commits to buy, over time, an increasing amount of its supplies/commodities from certified producers (recipients of its loans) and establishes long-term contracts with such suppliers. In addition, the UK could provide financial support to buyers/processors to offer a price premium for climate-smart agriculture inputs (to decrease overtime).

The benefits of this include: harnessing the inherent incentives of processors/buyers to invest in their own suppliers, as well as their existing relationships (which may extend to financial/credit relationships); addressing access to credit issues for suppliers as well as unknown/lack of demand for sustainable, certified commodities; strengthening relationships between producers and buyers, including through long term contracts that can benefit both parties.

Support NGO (or trade association) to work with smallholders to form cooperatives and apply for LED-R lines of credit (as described above) to support transition to sustainable practices. This could include the *Savory Institute* model of ranching that removes fences between properties and implements long-rotational grazing over a large area (and possibly prescribed burns or other approaches to restore grassland for cattle feed and other possible ecological benefits – less soil erosion, greater quantity of ground water, etc.). Higher yield production on less land would leave room (literally) to restore degraded land to forestry plantations on maybe 1/2 of the remaining land, of which 50-75% of costs for establishment and management for the first 5 years could be obtained through CIF (NGO/trade association could work with cooperative to apply for this financing).

This is attractive because it would achieve: economies of scale in LED-R zero-deforestation production (Savory Institute Model implemented); access to finance for the cooperative that might not be available to individual producers (depending on how LED-R financing is structured); potentially attractive to larger scale investment for **equity investors**, in which the low cost of capital for LED-R and/or forestry investments (especially through CIF) would generate higher potential returns for their investment. An additional incentive for such investors might be access to the carbon asset created through the forestry plantations.

Possible PPP with **Consumer Goods Forum and a jurisdictional government may also be considered.** This may include the Tropical Forestry Alliance, which includes the CGF and the US government to develop a "zero deforestation" standard for commodities being produced in the department/region (this may be easier if focused at the department level). This would include a bottom-up stakeholder

engagement process to develop positive lists (e.g., compliance with environmental and land-use laws, zero deforestation production) that would enable in-compliance producers to easily access finance (as developed above and/or realigned with existing state finance). Also, importantly, this would allow commodities to be stamped “zero deforestation” and bought by the CGF members. A PPP would also support long-term contracts between producers and buyers.

8 | POTENTIAL MECHANISMS FOR NATIONAL TO SUBNATIONAL BENEFIT-FOR-PERFORMANCE TRANSFER SYSTEMS FOR LOWERING DEFORESTATION

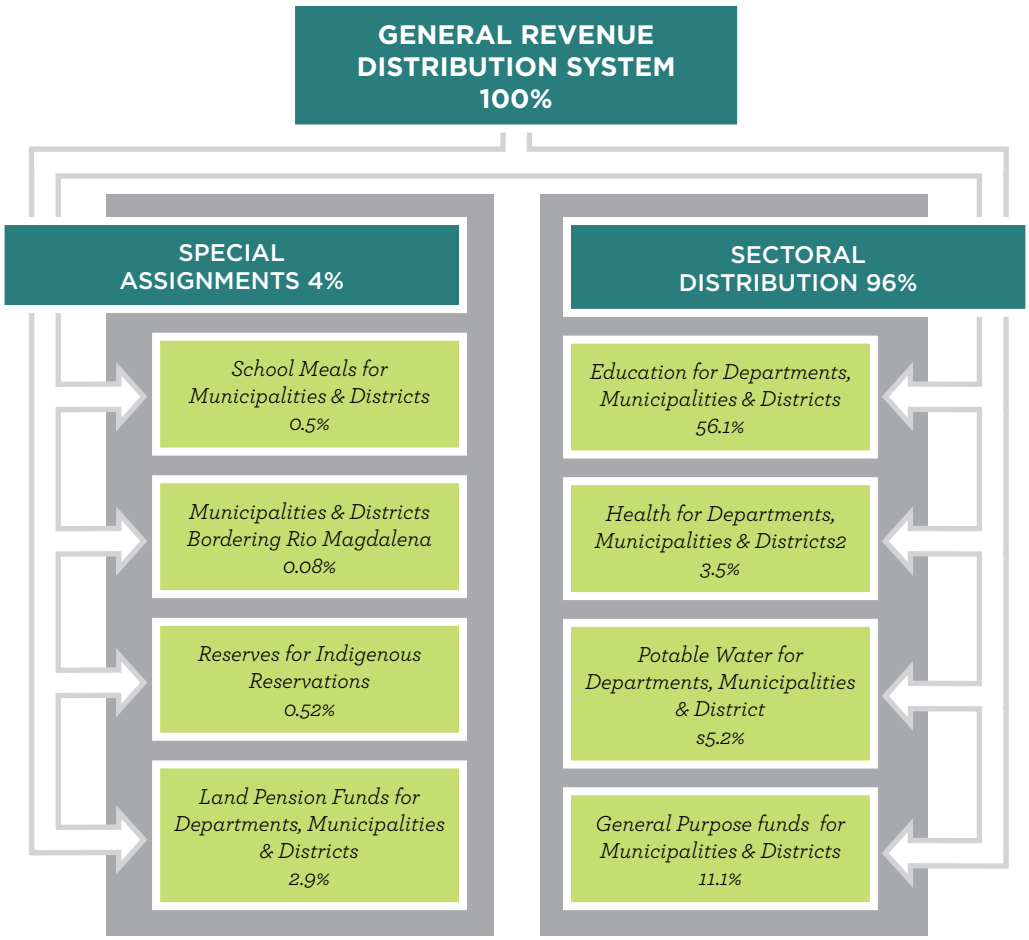

Figure 8.1 | *General Revenue Distribution System in Colombia.*
Of the total funds transferred from national government to subnational entities, 96% is classified as sectoral distribution and 4% as special assignments. There is currently no programme in Colombia for incorporating into this revenue allocation system incentives for municipal or departmental performance.

Currently, there is no transfer mechanism in Colombia to reward municipalities that decide to implement a low-emissions development model. There is also no reward for municipalities that achieve low levels of GHG emissions or those that have large percentages of their territories formalized as protected areas or indigenous lands. However, many members of civil society have expressed the importance of mechanisms for payment-for-performance in Colombia for municipality best practices[122].

The federal government is mandated by the Constitution (articles 356 and 357) to distribute funds collected through taxes to the territorial entities—departments, districts and municipalities—for financing health care services, education, drinking

122 This was expressed through interviews with members of Fundo Patrimonio Natural, WWF Colombia, Fundación Natura, FINAGRO, FEDEGAN, MADS, Fondo Acción Ambiental, and others.

water, basic sanitation, and other services (see laws 715/ 2001, 1122, and 1176/ 2007). More specifically, 96% of the funds are distributed to sectoral areas and 4% to special assignments. See Figure 8.1 for the current distribution breakdown.

As mentioned above, Colombia has expressed its intention to achieve zero percent deforestation by 2020[28]. Colombia's national government could incorporate into its distribution system a component to reward subnational entities such as departments, municipalities, and CARS that succeed in achieving GHG emissions reductions, that maintain low levels of emissions, or that slow deforestation. The transfer mechanism could be embedded in the current revenue distribution, or it could also come from a special fund created by the national government. The state of Pará in Brazil has a programme that rewards municipalities (for example, through assistance in resolving land conflicts) that achieve low levels of deforestation (below 40 km^2 per year), high levels of farm participation in the rural environmental registry (CAR), and other measures of conservation performance through the "Green Municipalities Programme" (Programa Municipios Verdes). This programme was recently reinforced through modification of the tax revenue allocation programme (for the "ICMS" tax on the commercialization of goods and services) to favor municipalities with large forest estates and low rates of deforestation.[123]

123 Pará State Law n. 7.638, of June of 2012, and Decree 775, of June of 2013, Brazil)

9 | A THEORY OF CHANGE FOR ADDRESSING AGRICULTURAL DRIVERS AND ACHIEVING LED-R AND POTENTIAL IMPACTS

Colombia is seeing an impressive shift of its major agricultural industries (palm oil, sugar, biofuel) towards sustainability concentrated in existing agricultural lands in the Llanos woodland region and the Vale del Cauca, while its remote forest frontiers remain unruly, prone to forest conversion to cattle to acquire land title, with little governance capacity. This bimodal development trajectory could diverge further as ambitious biofuel policies take root, accelerated by flows of foreign investment. The Theory of Change proposed here would strengthen the palm and sugar sectors' transition to sustainability while seeking to expand this shift to encompass the cattle sector and smallholder farmers of forest frontiers, strengthening Colombia's existing policy agenda and responding to its requests for support of its ambitious regional planning programme in the Amazon region, the "Heart of the Amazon" project. These changes are summarized below.

An integrated, national strategy for supporting Colombia's transition to low-emission rural development that results in reductions and, perhaps, the eventual end of deforestation in the Amazon region while slowing deforestation and expanding forest cover elsewhere, should seek to support and strategically link together five opportunities (Figure 9.1). These include: (a) the nation's progress in developing a jurisdictional REDD+ programme; (b) the progress of farm

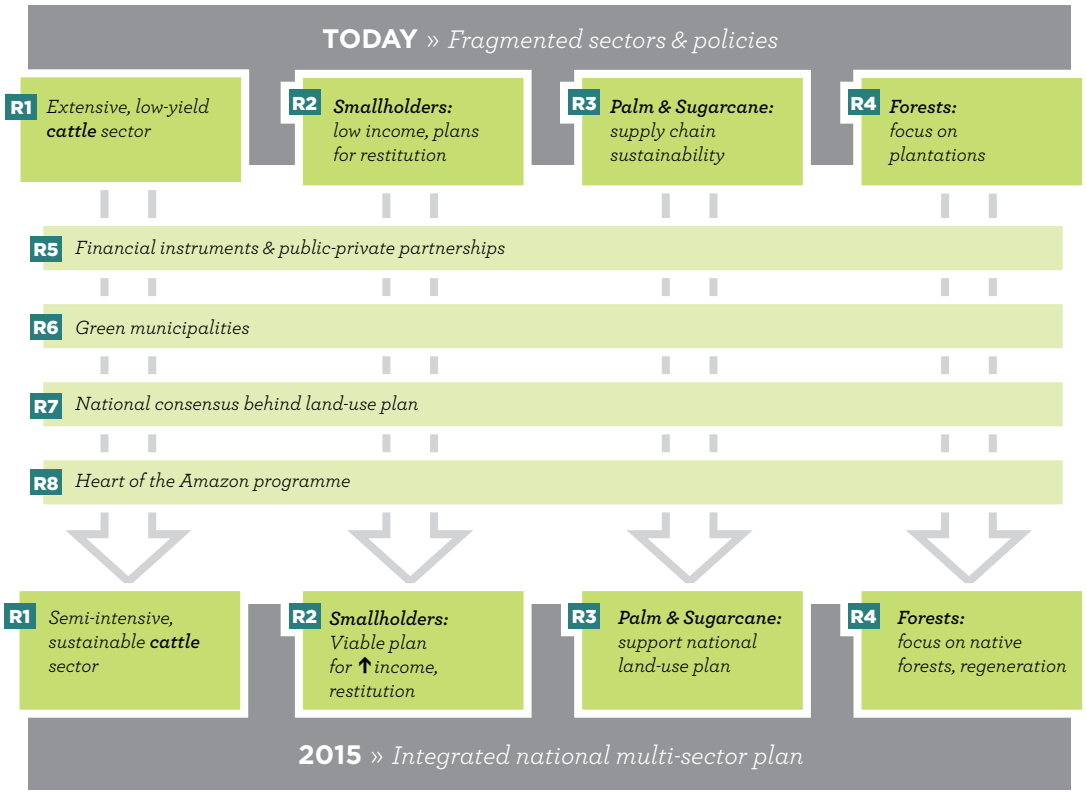

Figure 9.1 | *Theory of Change for interventions through which the UK could support the national transition to low-deforestation, poverty-alleviating development, focused on the Amazon region.*
An initial 2.5-year intervention, ending in 2015, would establish the enabling conditions and subsequent funding over an additional period (5 to 8 years) would support completion of the transition.

sectors in attracting private investment and achieving effective policies for expansion as they prepare to certify their mills and farms under international roundtable standards; (c) the commitment of the cattle sector to reduce total pastureland from 38 million to 28 million ha by 2019, while increasing production through sustainable intensification; (d) incipient programmes to effectively resettle farmers in forest regions while elevating existing smallholder settlements out of poverty; and (e) an ambitious programme to expand planted forests to reduce pressure on native forests.

This linkage could become self-reinforcing as farm sectors (that are increasingly oriented towards EU and US markets) realize greater market access, more efficient finance, and incentives for sustainably intensifying their farm systems while foregoing expansion into forests. Successful smallholder settlements, undergirded by profitable, innovative agricultural and forest product enterprises, would potentially reinforce the peace dialogue and the programmes to combat illicit crops by addressing the root cause of the conflict (inequitable land distribution and rural economic opportunities).

9.1 Potential Impacts and Co-Benefits: Greenhouse Gas Emissions, Conservation of Forests, Water and Biodiversity, and Rural Livelihoods

GHG EMISSIONS

The strategy would establish the enabling conditions for declines in deforestation by the end of 2015, with the full impact of the programme unfolding over subsequent years through 2020 and beyond dependent upon continued donor support that declines over time. The recommendations are designed to achieve redundancy—to have several processes favouring the same changes in landholder behaviour and the same positive changes in forest cover and related GHG, ecological, and livelihood impacts. This redundancy is necessary given the magnitude of the changes in the rural development model that Colombia is seeking. These estimates do not include reductions in agricultural greenhouse gas emissions (e.g. nitrous oxide from fertilizer, methane from enteric fermentation).

Table 9.1 | *Impacts of strategic recommendations on forest clearing, and greenhouse gas emissions under two alternative scenarios by 2020: (1) "business-as-usual" (BAU), and (2) "governance" (GOV). BAU assumes little to no intervention to reduce deforestation and/or increase forest cover or sustainability. GOV assumes that recommendations are implemented successfully.*

Recommendation	Forest Clearing (ha)			GHG Emissions Reductions ($MtCO_2$)			Forest Regeneration, Restoration, Management (ha)			GHG Removals ($MtCO_2$)			Net Impact GOV($MtCO_2$)
	BAU	GOV	Dif.	BAU	GOV	Dif.	BAU	GOV	Dif.	BAU	GOV	Dif.	
1. Zero Def Cattle	2,060,208[1]	767,224[2]	1,292,984	758[3]	282[3]	476	0	2,500,000[4]	2,500,000	0	58[4]	58	534
2. Settlements	217,500[5]	108,750[5]	108,750	80[6]	40[6]	40	0	320,000[4]	320,000	0	6.5[4]	6.5	46.5
3. Palm/Sugar	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Forests	---	----		---	----		0	2,820,000[4]	2,820,000	0	64.5[4]	64.5[4]	64.5
5. Finance	---	---	---	---	---		--	---	---	--	---	---	
6. Green Munic.	719,855[7]	182,593[8]	537,262	2659	67[9]	198	--	---	---	--	---	---	198
7. Nat'l Land Plan	3,603,666[10]	1,629,688[11]	1,973,978	1,116[12]	505[12]	611	--	---	---	--	---	---	611
8. Amazon Plan	2,423,774[10]	902,616[11]	1,521,158	892[6]	332[6]	560	--	---	---	--	---	---	560
Total (Maximum)			**1,973,978**			**611**			**2,820,000**			**64.5**	**675.5**

1 This represents 85% of projected future Amazon clearing for the pessimistic scenario from González et al. 2011124, Table I.1), assuming that most new clearing will take place in the Amazon and that the proportion of pasture- to cropland in the country will remain roughly the same as it is today.

2 This represents 85% of projected future Amazon clearing for the optimistic scenario from González et al. (2011)124, assuming that most new clearing will take place in the Amazon and that the proportion of pasture- to cropland in the country will remain roughly the same as it is today. Although the recommendation calls for "Zero Deforestation", in reality it is likely to be a process of incremental reduction to a "Zero" deforestation rate; as a result, net deforestation will still take place.

3 Calculated using per ha CO_2e value for the Amazon region (367.9 tCO_2e/ha), assuming that most new clearing for cattle pasture will take place in the Amazon region. (Data adapted from Yepes et al. 201142; Table I.2)

4 Estimated based on schedule of regeneration presented in Table I.3, with CO_2e absorption of 7.5 tCO_2e/ha/year.

5 Value derived from estimates provided in Table I.4.

6 Calculated using average forest carbon density (CO_2e per ha) value for Amazon region (367.9 tCO_2e/ha) (Data adapted from Yepes et al. 2011[42]; Table I.4).

7 Projection based on average annual deforestation rates calculated from 2002-2007 period (Murcia et al. 2010; Table A 5). Forest clearing projected for 2013-2020 period.

8 Projection based on reducing average annual deforestation rate for top 16 deforesting municipalities (by total area for 2002-2007) to 20% of average annual rate for 2002-2007 period and projecting for 2013-2020. The other 17 municipalities continued to deforest at 2002-2007 average annual rate from 2013-2020 (Table I.5).

9 This value is calculated using per ha CO2e value for the Amazon region (367.9 tCO_2e/ha).

10 Projection based on González et al. (2011)[124] pessimistic scenario adapted for 2020 (Table I.1).

11 Projection based on González et al. (2011)[124] optimistic scenario adapted for 2020 (Table I.1).

12 Calculated using average forest carbon density (CO_2e per ha) value for all of Colombia (309.7 tCO_2e/ha) (Data adapted from Yepes et al. 2011[42]; Table I.2)

We estimated programme effects on GHG emissions using two published scenarios[124] *(Table 9.1)* of deforestation in the Amazon and nationally through 2020, described here:

Business-as-Usual (BAU) "Pessimistic" Deforestation Scenario for 2020
The business as usual (BAU) scenario assumes that none or few of Colombia's initiatives to slow or end deforestation will be implemented, and that land-use and forest clearing will continue to 2020 according to the rate and pattern of the recent past.

- We assume that the cattle sector will continue to be responsible for the majority of new forest clearing, estimating that 85% of the clearing projected under González et al. (2011)[124] BAU scenario will be for new pastureland.
- We assume that the new restitution settlements being implemented now would contribute deforestation beyond the BAU scenario, at a rate and with associated deforestation as described in *Table I-4*.

Governance (GOV) "Optimistic" Deforestation Scenario for 2020
The "governance" (GOV) scenario assumes that several of the government's initiatives designed to slow deforestation (many of which are featured in the recommendations of this report) will be implemented, and that land-use and forest clearing through 2020 will be well below historical patterns.

Unlike in the BAU scenario, new forest clearing for cattle pastures will be incrementally reduced to zero over 7 years. Furthermore, as cattle ranching intensifies and pasturelands are taken out of production, forest regeneration will take place on a total of 2 million hectares (out of a total of 10 million hectares of current cattle pasture that the cattle sector seeks to move out of production)

Assumes that programme interventions will allow each restitution farm to regenerate forest or establish tree crops on 2 hectares.

124 González, J. J., A. A. Etter, A. H. Sarmiento, S. A. Orrego, C. Ramírez, E. Cabrera, D. Vargas, G. Galindo, M. C. García, and M. F. Ordoñez. 2011. Análisis de tendencias y patrones espaciales de deforestación en Colombia. Comité de Comunicaciones y Publicaciones del IDEAM Instituto de Hidrología, Meteorología y Estudios Ambientales-IDEAM, Bogotá D.C., Colombia.

OTHER SOCIAL AND ENVIRONMENTAL BENEFITS

One of the programme's central focuses would be on improving the production systems and incomes of smallholder farmers, including those already on the landscape, and those returning to the land following displacement by armed guerrillas. The smallholder families directly impacted by the programme (a few thousand families) would undergo income increases of an estimated 20-60%. The indirect effects of the programme could improve the livelihoods of more than a hundred thousand smallholders. Smallholder growers of palm oil and sugarcane and others would also receive benefits in the form of more equitable contracts, stronger technical support, and higher incomes, with less exposure to dangerous agrotoxins. The programme would decrease the use of fire in smallholder production systems, possibly diminishing respiratory ailments, while improving water quality and biodiversity conservation in the Amazon, Llanos, and Piedmont ecosystems. Natural forest regeneration and tree plantations in the Andes could help to regulate run-off, reducing the risk of flooding.

SYNERGY WITH OTHER DONORS

The UK programme is being developed at a moment of noteworthy convergence with other donor nations (Germany, Norway, The Netherlands, the US) around the opportunity to support Colombia's transition to low-emission, equitable, rural development. Some elements of the strategy presented here are already the focus of attention of some donors. For example, two donor's expressed interest in possibly funding pay-for-performance mechanisms such as that described under Recommendation 6 (Green Municipalities). Colombia is a priority nation for Germany's "REDD Early Mover Program". Norway has indicated to Colombia the possibility of providing up to USD 50 million for REDD+ readiness and advancing to a results-based REDD+ programme. Part of this financing could be allocated to the GEF silvopastoral production system project if it fulfills Norway' International Forest and Climate Initiative goals, and contributes towards the operationalization of payment for verified emissions reductions from deforestation in the Amazon region, in the context of a multi-donor agreement on

results-based funding, and an explicit link to national and/or jurisdictional REDD+ strategies including robust MRV. The USAID has invested in activities at the jurisdictional level (e.g. Department of Huila) and is committed (USD 60 million) to support land-use restitution and agrarian reform; USAID is also finalizing the approval of two grants focusing on biodiversity conservation and reduction of deforestation in the Department of Caquetá. The Netherlands developed a programme to support the transition of the coffee, palm, and banana sectors to sustainability, with a focus on smallholders that is complementary to the approach described here. UK's focus on financial innovation, public-private partnerships, and other mechanisms for unlocking the potential of the private sector to help drive the transition to a sustainable, low-/ zero- deforestation, low-emission rural development model would be an excellent fit with these other initiatives.

10 | RECOMMENDATIONS TO THE UK

The potential confluence of changes taking place in Colombia today to move the rural development model towards a "low-emission", productive, peaceful, poverty-alleviating trajectory is mirrored by the emerging convergence among donor nations on the importance of this moment in Colombian history. During the next 2.5 to 3 years, there is an excellent opportunity to develop a national land-use strategy that is supported by key sectors (from government, agriculture, agrarian reform, indigenous people and environmental conservation) and begin implementation. The likelihood of success of this strategy will be enhanced through a sustained, orchestrated commitment from donor nations that helps to maintain momentum across political election cycles, and that provides a long-term prospect for funding at scale that is tied to realistic performance milestones.

The recommendations presented in this report are focused on this initial design and early implementation phase (2013 through 2015) of a process that will probably take ten years (or more) to bring to full fruition. They are intended to provide a broad conceptual framework for linking together the many opportunities and initiatives in Colombia into an integrated, synergistic programme, with some detail on potential examples of specific interventions.

THE NEED FOR FURTHER ANALYSIS:

This report presents a programme of recommended interventions to support Colombia's transition to a low-emission rural development model. Each of the eight recommendations presented here should be developed more fully with the benefit of deeper analyses that provide more detail on the scale of finance that will be necessary to achieve stated goals and to investigate more thoroughly the business case for each proposed intervention. We recommend a six- to eight-month period of further analysis and investigation to provide this deeper level of analysis in support of UK's potential investment.

RECOMMENDATION 1 *Support the transition to a zero-deforestation, more productive cattle sector*

Overview I Cattle grazing lands (both planted and natural grasslands) occupy 38 million hectares in Colombia (40% of total land cover)[125], including large areas that are too hilly, sandy, rocky or wet to achieve high yields. These inefficient livestock systems are the necessary centrepiece of any strategy for expanding agricultural production while slowing and eventually ending deforestation in Colombia. Through a programme of intensification to increase yields of both beef and milk, grazing land can be made available for crop expansion while beef and milk production increase on a smaller fraction of the current area. This intensification can be achieved sustainably through improved pasture management (including the shift towards silvo-pastoral production with tighter herd rotations), better breeding, diet supplements, and pumped water supplies (versus herd access to natural water courses). FEDEGAN, Colombia's national cattle association has established a target of cutting the area of cattle production twenty-six percent by 2019 (to a total of 28 million hectares) while increasing beef and milk *production*[126]. A large-scale pilot project to foster the testing and implementation of silvopastoral production systems (grazing systems that include non-grass forage species, larger trees for shade and timber, and tighter pasture rotation) also provides an important building block for a national beef intensification programme[127] The transition to higher yields is underway in many Latin American nations, providing important lessons and motivation for FEDEGAN's goal. For example, in the Brazilian Amazon, deforestation has declined 76% (below the average for 1996-2005) while beef and soy production continued to increase *(Figure 10.1)*. This

125 Ministerio de Agricultura y Desarrollo Rural. Min. Juan Camilo Restrepo Salaza, Bogotá, 2010. Available at http://www.minagricultura.gov.co/archivos/ministro_jc_restrepo_tierras_2.pdf

126 Fedegan. Plan Estratégico de la Ganadería Colombia 2019. Bogotá, Nov. 2006.

127 The SPS currently being implemented by Fedegan (with CIPAV, TNC, and Fondo Acción) includes more than 2,000 proprieties and approximately 90,000 ha. The project has two main goals: a) improve productivity by providing technical assistance and SPS, and b) increase connectivity – in this regard, the project has USD 5 million for PES. More information available at http://www.ganaderiasostenible.co

decline in deforestation represents a reduction of CO_2 emissions of three billion tons—larger than that achieved by the EU ETS[20]. This was possible largely because of improvements in cattle yields. However, intensification is being slowed in Colombia because of lack of access to agricultural credit, to better breeds of cattle, and to knowledge of pasture and herd management. Cattle intensification is also slowed because of structural and supply-chain issues, such as the lack of adequate transportation infrastructure, undiscriminating meat processing firms, and bureaucratic obstacles to land titling. A UK programme could help to overcome these obstacles.

A 76% decline in deforestation has been achieved (below the average for 1996-2005) while beef and soy production continues to increase through successful intensification of cattle production. This decline in deforestation represents a three billion ton reduction in CO_2 emissions, approximately the size of the reduction achieved within the EU Emissions Trading Scheme[20].

extended to include deforestation hotspots in the Amazon region (western Caquetá, Putumayo, Guaviare) designed and beginning implementation. Finance and Technical support approaches for mall- and medium-scale beef and milk producers in deforestation hotspots designed and beginning implementation *(see Rec. 5)*.

OBSTACLES

There are important obstacles to FEDEGAN's plan that a carefully designed intervention could overcome.

- Cattle pasture will expand if it continues to serve as a mechanism for strengthening land claims by demonstrating "productive use"; this dynamic could increase through a peace accord if large areas of rural Colombia become safer and targets of land speculation/grabbing.
- Resettlement of displaced farmers could lead to expansion of cattle if there are no viable economic alternatives.
- Increases in cattle productivity for both beef and milk depend upon rural technical assistance and financing for high-risk producers.
- Structural and supply chain issues, such as the lack of adequate transportation infrastructure, poorly organized meat processing companies, and bureaucratic obstacles to land titling.

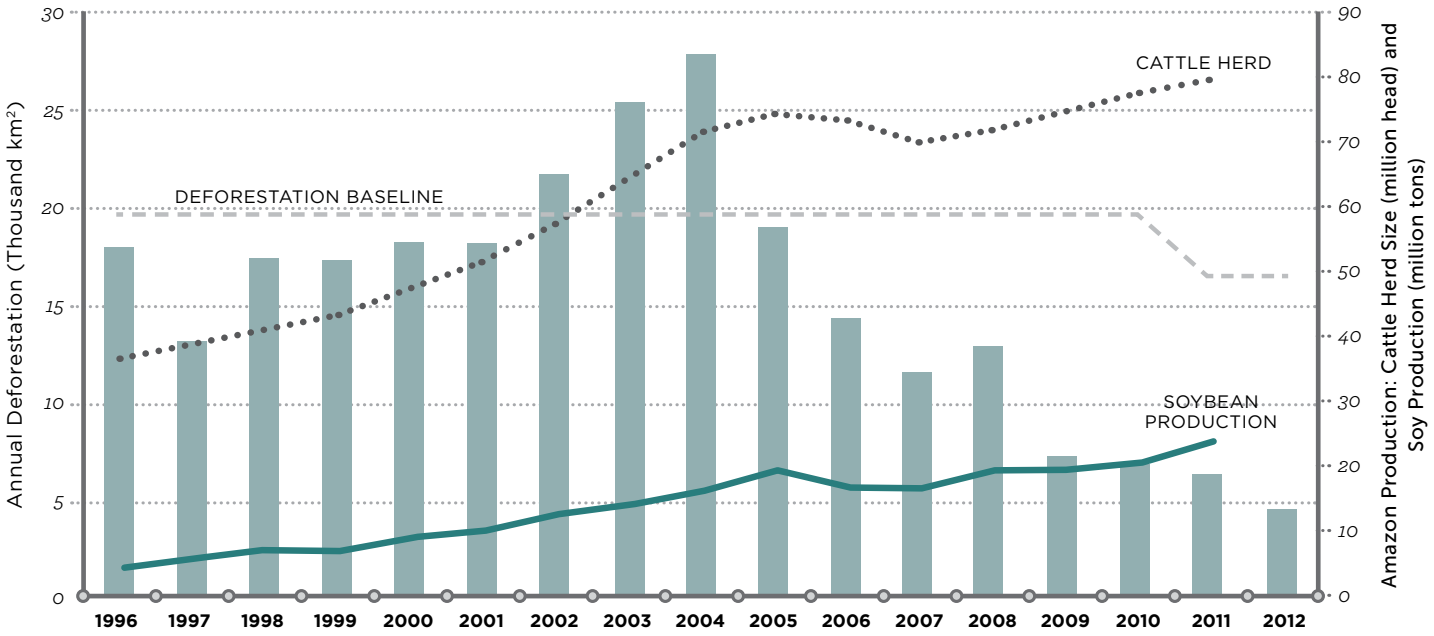

Figure 10.1 | *Brazilian Amazon. Annual deforestation, size of the cattle herd, and annual soybean production.*

DESIRED OUTCOMES BY 2015

Enabling conditions for national transition to zero deforestation cattle sector established and integrated within the national and land-use plan *(see Rec. 7)*. National zero deforestation cattle plan

STRATEGY

Goal 1 I FEDEGAN and other cattle producer organizations participate and support both national and Amazon (Heart of the Amazon) land-use strategies *(see Recs. 7 and 8)*, strengthening national spatial land-use plan.

As FEDEGAN and other cattle organizations (both beef and milk) become further engaged in the design and implementation of innovative financing and technical assistance models, and further develop their strategies to achieve their national 2019 goal, they will see the land-use strategies as aligned with their own agenda.

COST (2013-2015) I £0.3-0.5 million (participant support).

Goal 2 I Cattle sectors in deforestation hotspots beginning implementation of a comprehensive technical and financial system of support for the transition to zero deforestation, high-yield beef and milk production, and is included as part of the SPS project already being implemented by FEDEGAN and others in 5 different regions of Colombia.

SPS pilot becomes a building block of a larger, more comprehensive programme that includes improved breeding, pasture management, marketing, artificial watering systems; local organizations identified and trained for providing technical support. (Summarized in FEDEGAN's 2019 plan).

COST (2013-2015) I £3-5 million (outreach programme developed with local organizations in small number of pilot areas).

Goal 3 I Public-private partnership developed together with FINAGRO (under the supervision of MADR), designed and delivering loans to cattle producers in deforestation hotspots.

See Rec. 5 for the financial mechanism. The cost of cattle intensification can range from USD 1000-USD 8000/ha depending on the location and type of activities that are implemented.

COST (2013-2015) I £0.3-1 million (support to farmers for loan application and land legalization).

Goal 4 I Cattle production system developed and beginning implementation within 3 to 5 restitution settlements.

Cattle provide many subsistence (milk, meat, traction) and economic benefits, especially if well managed, and will be an important component of many settlements. This component would seek to develop an adaptable sustainable milk/beef intervention model for inclusion in the restitution/resettlement programme (see Rec. 3).

COST (2013-2015) I £2-6 million (support to 400-1000 farmers in 3-5 settlements for beef and/or dairy).

TOTAL COST (2013-2015) I £5.6-12.5 million.

RISKS

- Rule of law still at risk in many areas because of guerrillas, illicit crops, and illegal mining.
- Free Trade Agreements flooding Colombia with low-cost beef and milk products, undermining programme.

SUCCESS FAVOURED BY

- Links to a municipal-level system for monitoring/rewarding performance in areas reducing deforestation *(Rec. 2)*.
- Links to initiative for fostering greater efficiency and private sector engagement/investment (Rec. 5).
- Improvement in land tenure designation/clarification and law enforcement.

CO-BENEFITS

- Improved incomes and nutrition for participating farmers.
- Reduced deforestation leads to biodiversity conservation, tree cover, water and soil conservation.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** Ministry of Agriculture and Rural Development (MADR), Incoder (Rural Development Institute), URT (Unity of Land Restitution), UPRA (Agricultural Rural Planning Unit), Ministry of Environment and Sustainable

Development (MADS), departments (e.g., Caqueta, Guaviare, Putumayo), municipalities (target) FINAGRO, SENA (National Training Service), CARs (Regional Autonomous Corporations - targets), APC (Presidential Agency for International Cooperation in Colombia), National Parks Agency (if close to National Parks), and DNP (National Planning Department).

- **Producer Associations I** FEDEGAN, and local associations (e.g. Caquetá Milk and Beef Producers Association) and SAC (Colombian Association of Producers), National Association of Peasants (ANUC), and local associations of peasants in target areas.
- **Research I** Universities (e.g. Universidad Javeriana, Universidad de la Amazonia, Universidad de los Andes), CORPOICA (Colombian Agricultural Research Corporation), ICA (Colombian Agricultural Institute), CIPAV (Research Centre for Sustainable Systems of Agricultural Production), CIAT (International Centre for Tropical Agriculture), TECNIGAN (FEDEGAN'S Technical Assistance Branch), and others as appropriate.
- **Private Sector I** Friogan S.A. (meat processing branch of FEDEGAN), Nestlé, local meat processors (e.g., COFEMA, in Caquetá), and others as appropriate.
- **Civil Society I** Fondo Patrimonio Natural, Fondo Accíon Ambiental, Fundación Natura, ONF Andina, TNC, WWF-CO, and others as appropriate.
- **Others I** ASOCARs (Association of Regional Autonomous Corporations and Sustainable Development), Programme of Productive Transformation (PTP).

RECOMMENDATION 2 *Support for a nation-wide programme of sustainable farm settlements*

Overview I The concentration of land in the hands of a small minority is at the core of Colombia's rural conflict. With the prospect of peace on the horizon, it is crucial that an effective programme for resettling a significant fraction of the five to six million farmers displaced by rural conflict be designed and implemented. Those small-scale producers who are still on the land are also in need of economic alternatives, clear land titles, and basic services. Both groups of farmers are vulnerable to the illicit crop trade, to the flooding of the market with cheap farm products from the US and other nations (through free trade agreements), and to the expansion of agribusiness. Both groups of smallholders could turn to forests for their livelihoods, clearing forests for the production of subsistence crops and for the establishment of cattle pastures. Alternatively, smallholders could be supported to develop agricultural and forest-based enterprises, increasing food security both regionally and nationally while reducing pressure on remaining forests. If sustainable settlements are achieved at scale, they could provide a powerful alternative to illicit crop production systems. Colombia is developing programmes to address these challenges through its restitution programme and through programmes in support of existing smallholder settlements.

The UK and other donors could support the Colombian government in its transition to low-deforestation, high production rural development by providing support to the programme of land restitution and by building on the early lessons of the silvo-pastoral pilots and community forest management initiatives[128] to support integrated smallholder production systems that increase the capacity of smallholders and groups of farmers to engage in commercial enterprise around agricultural and forest products. One important innovation in this regard could be the establishment of regional smallholder production "clusters", each supported by a centre for technical and business outreach. This intervention links directly to the public-private partnership and finance components *(see Rec. 5)*.

DESIRED OUTCOMES BY 2015

- Incorporate restitution settlements into national land strategy *(see Rec. 7)*.
- Design effective strategies for (a) resettling farmers displaced by guerrillas (supporting the government's restitution programme) and (b) supporting existing settlements, productive alliances, "reservas campesinas", and "territorios coletivos".

128 WWF Colombia is currently implementing forest management for different products with groups in the Amazon

- Support development of sustainable community enterprises based on forest products, tree crops, and agricultural products.

OBSTACLES

There are important obstacles to sustainable settlements in Colombia.

- Large areas of rural Colombia are still with little or no governance capacity; low capacity to support the implementation of restitution settlements.
- Where land is suitable for agriculture, there are already strong claims by others.
- The infrastructure (e.g. transportation, storage, marketing facilities) that is needed for community-level enterprise is missing in many areas.
- Settlements need social/government services: schools, health, extension services, and legal representation.
- Successful settlements cannot be achieved through technology packages. Rather, individualized strategies are needed.

STRATEGY

Goal 1 I Ministry of Agriculture restitution programme leaders and representatives of displaced farmers participate in national land-use planning process to secure favourable locations and to design supporting policies for new smallholder settlements.

In the absence of a national spatial plan for reconciling competing interests among agricultural sectors, forest reserves and mining, restitution settlements run the risk of being allocated marginal land parcels where it is difficult to make a living from the land. A research effort is needed that identifies those land parcels that present the necessary combination of soils, climate, proximity to markets and services, and forest resources for these settlements to become viable places to carry out agricultural and forest-based production.

COST (2013-2015) I £0.5-0.9 million (research on settlement placement; participant support).

Goal 2 I Effective approaches for the design and implementation of successful smallholder settlements developed and vetted by relevant stakeholders and encompassing the range of settlement modalities (agrarian reform settlements, "productive alliances", "collective territories", "reservas campesinas") and that seek tailored approaches to integrate agricultural, livestock, and forest-based enterprise depending upon the local circumstances.

Particular attention needed here for developing technical and business (marketing, commercialization) support for smallholders, perhaps through centres that serve clusters of smallholder settlements and that engage local institutions (including universities, NGOs, local farm organizations).

COST (2013-2015) I £0.6-1 million (research and meetings to vet proposals).

Goal 3 I Ten pilot restitution settlements designed with effective technical/business support and finance mechanism *(see Rec. 5)*.

Exact role of UK funding would be determined through 2013-2014 pre-investment analyses. Note: Given Law n. 2 of 1959 prohibiting forest clearing in a large portion of the Amazon and the zones of illicit crops, these settlements are likely to be located outside of the Amazon.

COST (2014-2015) I £5-10 million (support for smallholder and community-based commercial enterprise; implementing agencies) (Note: since design process will probably extend through 2015, it is likely that this pool of finance will not be needed until 2016 onward).

Goal 4 I Ten existing smallholder settlements (with half in Amazon deforestation hotspots) beginning transition to sustainable, productive, economically viable systems.

This component would seek a diversity of settlement conditions and landscapes with the goal of seeding

innovation and alignment across government agencies and in different regions of Colombia, reinforcing the role of smallholder settlements/communities/alliances as sources of food security, innovation (in farm- and forest-based enterprises).

COST (2015) I £5-10 million (community enterprise investments; implementing institution support) (Note: we anticipate that, as with Goal 3, the design of this component *(Goal 4)* will probably extend into 2015 with investments scaling up after that).

TOTAL COST (2013-2015) I £11.1-21.9 million.

RISKS

- Rule of law still at risk in many areas because of on-going guerrilla activity, illicit crops, and illegal mining.
- Free Trade Agreement flooding Colombia with low-cost beef, agricultural products, possibly undermining programme.

SUCCESS FAVOURED BY

- Links to a municipal-level system for monitoring/rewarding performance in reducing deforestation *(see Rec. 6)*.
- Links to initiative for fostering greater efficiency and private sector engagement/investment *(see Rec. 5)*.
- Improvement in land tenure designation/clarification and law enforcement.

CO-BENEFITS

- Improved incomes and nutrition for farmers in pilots and, indirectly, for the broader restitution and smallholder settlement system.
- Reduced deforestation, improved biodiversity conservation, tree cover, water and soil conservation.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** MADR, URT, UPRA, INCODER, Ministry of Housing, MADS, departments and (e.g., Caqueta, Putumayo, Guaviare), municipalities (targets), CARs (targets) FINAGRO, SENA, and APC, DNP, and others as appropriate (e.g. National Parks Agency, if close to National Parks).
- **Producer Associations I** ANUC, FEDEGAN, FEDEPALMA, PROCAÑA/ASOCAÑA, FEDEBIOCOMBUSTIBLES, National Federation of Wood Industries (FEDEMADERA), SAC, and local and other associations (depending on the case/commodity).
- **Research I** Universities (e.g. Universidad Javeriana, Universidad de la Amazonia, Universidad de los Andes, Universidad Nacional), CORPOICA, ICA, and others as appropriate.
- **Others I** National Association of Peasants (ANUC), local associations of peasants in target areas.
- **Private Sector I** it will depend on the region and commodities chosen.
- **Civil Society I** INDEPAZ (Peace and Development Research Institute), Fondo Patrimonio Natural, Fondo Accíon Ambiental, Fundación Natura, ONF Andina, TNC, WWF-CO, and others as appropriate.
- **Others I** ASOCARs, PTP, AFE (Colombian Businesses Foundation Association).

RECOMMENDATION 3 *Consolidate the transition to sustainable palm and sugarcane sectors*

Overview I Palm oil and sugarcane sectors figure prominently in Colombia's ambitious renewable fuel agenda, and both have initiated a transition towards sustainable supply chains. They currently operate largely outside of forest frontier regions *(Section 3, Figure 3.2)* and are not an immediate threat to Amazon forests, although palm could become a direct driver of deforestation in the near future[129]. Industries from both commodities are exploring greater investment near the forest frontier. These sectors could become important elements in the strategy to slow deforestation while increasing agricultural production if they throw their political and economic weight behind a national land-use plan *(see Rec. 7)*. They can also provide a large number of jobs within their own operations, potentially providing economically viable alternatives to slash-and-burn agriculture

129 Oil palm currently poses a threat to the freshwater ecosystems of the Orinoco. Source WWF-CO, 2013. Also, a recent study commissioned by BID, showed that palm is highly suitable in some regions within the Amazon Biome (BID, 2012)

and illicit crops. Such alternatives will be extremely important in rural Colombia with or without a peace agreement. These sectors also have the capacity and resources to do business in the frontier even where governance capacity is low. Both sectors run the risk, however, of excluding large numbers of small-scale growers from their supply chain transitions to sustainability, since mills that depend on large numbers of small-scale producers are more costly to certify under Bonsucro or RSPO standards. The exclusion of smallholders from palm oil and sugar supply chains could potentially undermine the peace process, which is focused on peasant access to land and economic opportunities.

For palm oil and sugarcane sectors to realize their potential as proponents of a national land-use strategy, a few interventions could help consolidate and expand their commitment to sustainability while providing direct support for increasing the participation of smallholder growers as suppliers. They are already positioned to formally take on zero deforestation commitments that could be reinforced through both roundtable certification and through the requirements of the EU Renewable Energy Directive. Palm and sugarcane sectors currently view deforestation as a supply chain issue however, instead of a regional or national issue that could affect their ability to sell into some markets.

The Dutch government in partnership with Solidaridad and the Colombian government are working with large companies and smallholders to promote sustainable supplies of coffee, bananas, flowers, and palm oil. Below are some recommendations for the palm, sugar, and related biofuel industries.

DESIRED OUTCOMES BY 2015

- Palm oil and sugarcane sectors support and participate in the national land-use planning process, moving beyond supply chain focus to embrace national sustainability goal.
- Palm oil and sugarcane sectors achieve high level (25% of production) of certification under RSPO and Bonsucro that includes smallholder growers.
- Substantial number of smallholder growers of palm oil and sugarcane receiving higher incomes.

OBSTACLES

For the sugar and palm industries to make the transition to sustainable production and become supporters of a national sustainable land-use strategy, the following factors will need to be addressed (Note: the obstacles listed below should be viewed as potential intervention points, not hard limiting factors).

- Limited access to credit and high interest rates currently prohibit medium and small producers (95% of producers in Colombia) from acquiring the capital necessary to shift their practices toward sustainable production.
- Limited knowledge (among medium and small producers) of cost effective sustainable practices.
- High costs of certifying large numbers of smallholders under roundtable standards.
- Lack of governance capacity to enforce existing laws (especially in the frontier regions), no baseline ranking current production practices, and no official monitoring system to measure progress of improved production (e.g. MRV of forest cover, water quality, soil health, and labour practices).
- Infrastructure (e.g. transportation, storage, and marketing facilities) needed for community-level enterprise is missing.

STRATEGY

Goal 1 I The producers associations (FEDEPALMA, PROCAÑA/ASOCAÑA, FEDEBIOCOMBUSTIBLES, SAC, FEDEGAN, and others) engaged in a national land use dialogue that finalizes maps for go/no-go zones for each commodity and that supports national zero deforestation goal.

Dialogue with smallholder sectors reinforced by new financial instruments (see Rec. 5) and evidence of marketing advantages provokes palm oil, sugarcane and biofuel sectors to embrace national zero deforestation commitment.

COST (2013-2015) I £0.5-0.8 million (participant support, support for mapping).

Goal 2 I Autonomous smallholder groups and mills with large numbers of smallholder growers receive financial assistance to cover the costs of certification for a 2-3 year period.

Local pilot projects (e.g. PROCAÑA's concept note presented to UK)[130] establishing systems for measuring social and environmental performance and for improving performance en route to certification while receiving financial assistance to offset costs.

COST (2013-2015) I *further financial studies needed to determine actual costs.*

Goal 3 I Processors and commercial buyers (both local & international) agree to purchase a percentage of sustainable palm and sugar from Colombian producers (including a commitment to buy from small- and medium, and large producers) by 2015.

Convene buyers (international through Consumer Goods Forum; domestic through national convening), lending institutions (private and public), and farm associations to establish preferential purchasing commitments from high-performing mills and municipalities and to explore positive incentives for achieving this performance (tailored to smallholders and medium-sized farms).

COST (2013-2015) I £0.2-0.3 million (convening, analysis).

Goal 4 I Credit union providing loans with differentiated interest rate structures tailored to promote sustainable palm, sugar, and biofuel production.

Using public-private partnerships create a credit union that backs risky agricultural loans and provides differentiated interest rates and innovative long-term pay back structures. Loans and financial training given for sustainable production and new market innovation (e.g. biodegradable detergents).

COST (2013-2015) I £10-15 million (feasibility assessment, business case, and initial pilot project) (Note: design and launch of credit union could require much of the 2.5 year programme period).

TOTAL COST (2013-2015) I £10.7-16.1 million.

RISKS

- Free Trade Agreement floods Colombia with low-cost palm and sugar, undermining the programme outlined above.

SUCCESS FAVOURED BY

- Links to a municipal-level system for monitoring and rewarding performance in deforestation *(see Rec. 6)*.
- Links to initiative for fostering private sector investment and innovation in sustainable agriculture production.
- Improvement in land tenure designation/clarification and law enforcement.

CO-BENEFITS

- Improved biodiversity conservation, vegetation cover, water quality, and soil conservation.
- Improved income for smallholders.
- Improved productivity.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** MADR, UPRA, MADS, INCODER, FINAGRO, CARs, departments and municipalities (targets).
- **Producer Associations I** ANUC, ASOCAÑA/PROCAÑA, FEDEPALMA, FEDEPANELA, and FEDEBIOCOMBUSTIBLES, SAC, regional associations as appropriate.
- **Research I** CENICAÑA, Amaya, CENIPALMA, CORPOICA, Universities (e.g. Universidad Javeriana, Universidad de los Andes, Universidad Nacional) and others as appropriate.

130 Avenzza, with support of Procaña has recently developed a concept note entitled: Walking the Path towards Sustainability with Sugar Cane Growers in the Cauca River Basin– Colombia Pre-Proposal Enquiry regarding Interest – April 2013. It was presented to the UK Consulate in Cali in April, 2013.

- **Private Sector I** Bank of Colombia, large Colombian and international buyers (target list to pursue: Ardila Luelle, Grupo Manuelita, Mondelez, Colanta, Consumer Goods Forum companies).
- **Civil Society I** Fondo Accíon Ambiental, Fondo Patrimonio Natural, Fundación Natura, ONF Andina, TNC, WWF-CO, and others as appropriate.

RECOMMENDATION 4 *Expand sustainable forest management, forest regeneration, and tree plantations*

Overview I One half of the Colombian territory is covered by forests, making it one of the world's great tropical forest nations. As is the case with palm oil, sugarcane and biofuels, the nation is seeking to organize and modernize its forest sector. This is no small task. The Colombian economy consumes four million cubic meters of wood each year. Three fourths of this demand is supplied by logging natural forests and nearly half of this logging is illegal. A major piece of the plan to gain greater control over the forest sector is the establishment of tree plantations. By the end of 2014, Colombia hopes to establish one million hectares of planted forests (60% commercial plantations with exotic species; 40% with native species) to reduce exploitation pressure on natural forests and to restore degraded lands. To support this ambitious goal, USD 184 million will be made available to cover some of the costs of plantation establishment (up to 50% of costs for commercial exotics and 75% of the costs of native species plantations) through the CIF ("Forest Incentive Certificate", of MADR). So far, this programme has supported the establishment of approximately 200,000 ha of forests. CIF funds can also be used to cover the costs of natural forest management.

Colombia has an excellent opportunity to build upon its impressive planted forest agenda to develop a more comprehensive approach to forests, weaving them more deliberately into the zero deforestation cattle agenda *(Rec. 1)*, the farm settlement/restitution agenda *(Rec. 2)*, the national land-use strategy process *(Rec. 7)* and the Heart of Amazon proposal *(Rec. 8)*. Three opportunities are particularly ripe in this context. First, if the area of cattle pasture declines at the pace that is envisioned by the cattle sector (i.e. from 38 million hectares today to 28 million hectares in 2019), large areas of marginal land will become available for natural forest regeneration, which can be surprisingly cheap. Cattle pastures that have not been ploughed previously usually return to forests rapidly once they are removed from grazing if they are protected from fire. And this decline in fire risk is a natural outcome of the shift to more intensive grazing systems with more productive forage on those pastures that are not taken out of production. When livestock growers begin to manage their pastures more intensively through improved forage grasses and through the incorporation of trees by adopting "silvo-pastoral" production systems, for example, fire becomes the enemy instead of the preferred management tool for periodically knocking back woody pasture invaders[6,7]. Even if only 20% of the 10 M ha of pastures that are taken out of grazing are allowed to naturally regenerate, 10 to 15 million tons of CO_2 could be pulled out of the atmosphere each year by regenerating forests.

Second, Colombia's "competitive regional consortium" initiative, designed to support tree planting and tree-based enterprise among clusters of smallholders, could be expanded/adapted as an important element of restitution settlements. The role of UK finance could be similar to that described under *Recommendation 5*, in collaboration with FINAGRO (under guidance of MADR).

Third, National and Amazon land-use planning processes *(Recs 7 and 8)* could develop regional analyses and seek multiple-sector consensus on a spatial and economic/business plan for fostering sustainable forest management and associated enterprises (for timber and non-timber products), forest regeneration, and tree plantations. The spatial land-use plans of the national and Amazon forest strategies could recognize and, where appropriate, address the major constraints (e.g. transportation costs, processing facilities, governance capacity) to forest-based enterprise, while seizing

the major opportunities. The finance and technical outreach mechanisms for implementing the strategy on the ground could be similar to those described under *Recommendation 5*.

DESIRED OUTCOMES BY 2015

A national forest sector plan that is supported by the major rural sectors, with viable, spatially-differentiated business models for unlocking the potential of natural forest management, forest regeneration on marginal lands, and tree plantations, successfully incorporating tree-based enterprise into restitution settlements, smallholder settlements, and small-scale cattle producers.

OBSTACLES

Target rural groups (e.g. recently replaced and existing smallholder groups, Amazon region producers) are often in regions of land tenure uncertainty, with little governance capacity and precarious institutional capacity to provide technical support.

STRATEGY

Build upon Colombia's proven track record of fostering tree-based economies to embed tree- and forest-based enterprise into evolving restitution settlement model featuring clusters of producers that are supported by technical/business/finance outreach centres *(linked to Rec. 2)*. Support natural forest regeneration component within the cattle sector's zero-deforestation, intensification agenda through farm-level and regional fire prevention and control programmes. Exploit potential of timber and non-timber product enterprise in the Heart of Amazon programme.

Goal 1 I Forest sector representatives and experts participate in national land-use strategy process *(Rec 7)*, advocating larger role for forest- and tree-based enterprise and mechanisms for compensating the maintenance or restoration of forest-based ecosystem services.

COST (2013-2015) I £0.4-0.6 million (participant costs; analysis).

Goal 2 I Forest management /tree plantation pilots (12 to 20) designed and beginning implementation for three modalities, documenting costs and multiple benefits and testing finance/compensation models.

Possible pilots: (a) Amazon forest smallholder cooperative-based management for timber and non-timber products (3 to 5 pilots); (b) natural forest regeneration and fire management/control among small- and medium-scale livestock producers (3 to 5 pilots); (c) forest- and tree-base enterprise within "competitive regional clusters" that are adapted to restitution settlements (3 to 5 pilots); and (d) commercial tree plantations and species-rich forest restoration in watersheds that are crucial for Colombia's water supply (e.g. Magdalena, Valle del Cauca) designed/established to demonstrate long-term soil conservation and flood control functions to interested parties (e.g. sugar cane mills, hydropower).

COST (2013-2015) I £5-10 million (assumes 12-20 pilots at £0.4-0.5 million each).

Goal 3 I CIF expanded to support broader range of forest- and tree-based enterprise *(Goal 2)* through partnership with UK.

This partnership would be patterned on the broader financial partnership described under *Recommendation 5*, in which UK provides funds for higher risk elements of interventions in exchange for an increase in the financial commitment to CIF and greater support for loan-making in regions with low governance capacity.

COST (2013-2015) I £5-10 million (would be determined through business case analysis conducted during pre-investment phase).

TOTAL COST (2013-2015) I £10.4-20.6 million.

RISKS

- Rural Colombian society is unable to reform its use of fire.
- Low governance capacity and illegal economies (illicit crops, gold-mining, timber) undermine forest-based enterprises.

SUCCESS FAVOURED BY

- Improvement in land tenure designation/clarification and law enforcement.
- Successful peace process.

CO-BENEFITS

- Improved incomes for participating landowners.
- Stronger positive economic signal for the maintenance of natural forests against cattle pasture expansion.
- Prolonged life span of hydropower facilities from reduced sedimentation.
- Reduced impact from flooding and droughts from improved watershed management.
- Improved biodiversity conservation from the restoration of Andean forests.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** MADR, INCODER, URT, MADS, departments and municipalities, CARs (e.g. CARMAGDELENA CORPOAMAZONIA), FINAGRO, SENA, National Police, and others as appropriate (e.g. National Parks Agency depending on the area if close to National Parks).
- **Ethnic Groups I** indigenous territorial entities and associations such as National Organization of Indigenous People (ONIC) Organization of Indigenous Amazonian People (OPIAC), AICO (Organization of Indigenous Authorities of Colombia), and Afro-Colombian communities as appropriate.
- **Producer Associations I** ANUC, FEDEMADERA, National Federation of Coal Producers (FENACARBON), and regional associations as appropriate.
- **Research I** Universities (e.g. Universidad de la Amazonía, Universidad Javeriana, Universidad de los Andes, Universidad Nacional), National Corporation for Forest Research and Promotion (CONIF), CORPOICA, ICA, CIAT, Alexander Von Humboldt Institute for Research on Biological Resources (Humboldt Institute), SINCHI (Colombian Amazon Research Institute), IDEAM, and others as appropriate.
- **Private Sector I** National Business Association of Colombia (ANDI), Colombian Chamber of Construction (CAMACOL), Colombian Business Council for Sustainable Development (CECODES), Domestic and international companies in the forestry sector.
- **Civil Society I** Fondo Accíon Ambiental, Fondo Patrimonio Natural, Fundación Natura, ONF Andina, TNC, WWF-CO, and others as appropriate.
- **Others I** ASOCARs and PTP.

RECOMMENDATION 5 *Public-private partnerships for innovative finance*

Overview I The transition to low-emission rural development in Colombia is technically viable and could become financially self-sustaining. Investments in better cattle breeds, fertilizer, improved land management, tree crops, silvopastoral systems, higher yielding palm oil, sugar and other plantations, and other interventions can provide higher yields and higher profits per hectares—a key component of the transition to low-emission rural development. However, the capital necessary to make these investments is not available to most micro-, small-, and medium-sized producers. The problem cannot be simply described as lack of public finance. Colombia directs USD 8.6 billion per year to its agricultural sectors through public loans, grants, and investments. Rather, the problem is that often the people and regions that are most in need of finance can't access it. Many landholders in the Amazon and smallholders nationally do not have clear title to their land and therefore have difficulty guaranteeing their loans. Infrastructure, technical support and commercialization systems are also lacking in the Amazon region, elevating risks for loan-makers. In this Recommendation, we also present possible financial instruments that could incentivize municipal-level declines in deforestation, drawing lessons from Brazil's "green municipalities" programme. This idea is already being explored in Colombia[131].

This recommendation to the UK is for a "cross-cutting" intervention in the Colombian public finance systems to improve their effectiveness in stimulating

131 Fundacion Natura is considering the implementation of a programme called Municípios Carbonoceros, and has already engaged some municipalities interested in low emissions development models. However, at this moment Fundación Natura's programme is not linked with a transfer system from the national government to municipalities.

the transition to higher yields, lower deforestation, better soil and water management, and better labour practices on private farms. We have identified several potential interventions to mobilize finance where it is most needed, and MADR and FINAGRO have expressed interest in working with the UK in developing these instruments.

This concept is a starting point, and will require further analysis to arrive at the precise instruments that should be pursued, the level of UK investment that would be required and the impacts and benefits of each investment.

DESIRED OUTCOMES BY 2015

Finance mechanism designed and beginning implementation through public-private partnerships, with UK funds leveraging funds from the Colombian government to support:

- Sustainable cattle production, responsible beef and milk processing *(see Rec. 1)*. UK funds take on riskiest elements of the portfolio;
- Smallholder settlements *(see Rec. 2)*, investment to support their transition to low-deforestation, high-yield production;
- Certification of mills and their smallholder growers: finance mechanism to subsidize the costs incurred by mills supplied by smallholders and groups of small and medium growers of palm oil and sugarcane to certify their production systems under RSPO, Bonsucro, and other certification systems *(see Rec. 3)*; and
- Reward "green" low deforestation municipalities *(see Rec. 6)* with a portion of the National Royalty Fund money flowing through an allocation mechanism that favours those municipalities that are lowering their deforestation. Municipalities would use this finance to fund initiatives of smallholder cooperatives, farm settlements, or individual farm proposals.

OBSTACLES

Amazon region and smallholders are risky investments.

STRATEGY

Goal 1 I Matching Fund Agreement with Colombia. New "LED-R" financial products with better terms (lower interest rates) and conditions (longer repayment periods) than ordinary loans, are developed together with FINAGRO (and supervised/approved by MADR).

Some possible elements of this agreement:

- Most of the finance would target small- and medium farmers who are obliged to invest in steps towards more efficient, productive agriculture and livestock systems.
- This agreement would presumably encompass three lines of finance:
  1. finance for high risk, small-scale livestock producers in western Caquetá, Putumayo and Guaviare (all three are deforestation hotspots in the Amazon biome);
  2. finance for settlements (restitution and existing); and
  3. finance for small-and medium-scale palm and sugar growers.
- UK money would provide most or all of at-risk lending into the partnership for the first few years.

-or-

- UK and/or Colombian government provide guarantees for loans to minimize risk for commercial bank.

COST (2013-2015) I £10-15 million capital from UK; (£30-50 million capital from the Colombian Government); £0.5 million analysis and negotiation process (These amounts would be determined through pre-investment analysis).

Goal 2 I Public-Private Partnerships designed and beginning implementation. The matching fund agreement would be implemented through public-private partnerships with a commercial bank, microcredit institution, and/or credit union to offer LED-R finance products.

Conditions to leverage greater impact:

- Banco Agrario or other appropriate bank(s) and public-private partnership institution must establish branches in agricultural frontier regions.

- Design and implement training programme for loan officers on LED-R.
- UK provides a portion of the capital for physical building/infrastructure and possibly salaries for first year.

COST (2013-2015) I £2-4 million for physical buildings (2) and £1 million one year of bank salaries and staff training.

Goal 3 I Performance-based allocation of royalties to municipalities in support of a "Green Municipalities" initiative *(Rec 6)*. Negotiate agreement with National Royalty Programme (with proper legal framework) for a pilot system for allocation of funds to municipalities that are lowering their deforestation rates (and possibly other criteria). UK or other donors provide a part of the finance and fund the design process

This agreement would build upon an agreement among municipalities, prioritizing those in deforestation hotspots, to participate in this programme.

In addition to royalties, other potential performance-based benefits could be explored, including:

- Improved terms on loans that flow from UK-FINAGRO matching fund agreement *(see Goal 1)*; farmers in municipalities that are lowering their deforestation would have lower interest rates, for example.
- Allocation of national-municipal transfers (for education, asphalt, land titling).
- Tax rate adjustments to favour municipalities that are lowering their deforestation rates.

COST (2013-2015) I £2-3 million (capital from UK into this system, leveraging a larger amount from the National Royalty Programme); £0.2-0.4M to design the programme. (Note: amounts to be determined during pre-investment analysis).

TOTAL COST (2013-2015) I £14.7-22.9 million.

RISKS

- Unable to negotiate the terms of the UK-FINAGRO, UK-National Royalty Programme (NRP), or public-private partnership arrangement.
- Financial instruments are not taken up by farm sectors.
- Farmer recipients of finance do not use the funds for the stated purpose.

SUCCESS FAVOURED BY

- Technical support to smallholder cattle, settlements, and smallholder palm and sugarcane growers *(Recs 1-3)*.
- Multi-sector dialogue on national land plan *(Recommendation 6)* and Heart of Amazon initiative *(Rec 7)*.

CO-BENEFITS

- Improved incomes and nutrition for participating farmers.
- Reduced deforestation, improved biodiversity conservation, tree cover, water and soil conservation.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** MADR, MADS, departments, municipalities and CARs (targets), FINAGRO, APC, and others as appropriate.
- **Producer Associations I** ANUC, ASOCAÑA/ PROCAÑA, FEDEPALMA, FEDEPANELA, and FEDEBIOCOMBUSTIBLES, FEDEMADERAS, SAC and others as appropriate
- **Banks I** Banco Agrario, Bancolombia, Davivienda, Banco de Bogota, and BBVA and International Banks (e.g., Rabobank), and others as appropriate.
- **Others I** ASOCARs and PTP

RECOMMENDATION 6 *Design and implement a "green municipalities" programme*

Overview I One of the most effective governmental interventions in deforestation in the Brazilian Amazon was the municipal black list, created in 2008[132]. The farms located in the region's 36 top-deforesting (i.e., "black") municipalities were cut off from government agricultural loan programmes until deforestation

132 Decree n. 6.321/2007, Brazil. More information available at http://www.mma.gov.br/florestas/controle-e-prevenção-do-desmatamento/plano-de-ação-para-amazônia-ppcdam/lista-de-munic%C3%ADpios-prioritários-da-amazônia

declined. Several municipalities responded rapidly, with farmers, ranchers, and local governments organizing themselves to lower deforestation. By defining performance at the scale of the entire jurisdiction (the municipality) with a simple metric (annual deforestation compared to the historical average) and direct consequences (access to credit), the programme fostered collaboration, dialogue, and innovation that achieved declines in deforestation at a very large scale. This programme has since been adopted and modified by the state government of Pará, which has begun to allocate state-to-municipal governmental transfers to favour declines in deforestation through a programme it calls "Municipios Verdes" (Green Municipalities)[133]. Many stakeholders in Colombia believe that such an approach holds potential to slow deforestation in the Amazon region of Colombia and perhaps elsewhere in the country; work has already begun on the development of a programme of this type.

Colombia has an opportunity to test its own version of a Green Municipalities programme that leapfrogs some of the weaknesses of the Brazilian system. The main problem in Brazil has been the lack of positive incentives at the farm level in successful municipalities and the dependence upon the support of elected mayors that can disappear through election cycles. (Brazil's 76% decline in deforestation is vulnerable to a reversal precisely because it has been achieved with virtually no positive incentives to farmers and settlements that are opting for sustainable, zero-deforestation production systems.) Colombia could consider designing a programme that punishes high deforestation municipalities and rewards farmers, settlements, and governments in municipalities that are lowering deforestation.

UK and partner donors could pilot such a programme, with an initial focus on a cluster of municipalities in the Heart of Amazon region or the Amazon more broadly, where GIZ is already planning to work with municipalities and where other interventions (Rec. 1, cattle) would be focused. We recommend a second geographical focus in the Llanos agricultural frontier, to help forge a linkage between the Amazon and savannah biomes, and between a frontier with a prevalence of illegal activities and one with a consolidated, modern agricultural sector.

133 Decree n. 31.884/2011, Pará, Brazil (officially created the program). More information available at http://municipiosverdes.com.br/arquivos/decreto_de_criacao_do_pmv.pdf

DESIRED OUTCOMES BY 2015

- Pilot Municipalities (4 to 8) in each of two target regions (Amazon deforestation hotspots; Llanos) reducing deforestation through performance-based positive and negative incentives.
- Political support across several sectors for expanding the programme to the entire Amazon and, perhaps, nationally.

OBSTACLES

- Municipal governments with little institutional capacity in the Amazon region.
- Colombia's forest monitoring system is very good, but it is still not fully operationalized to support a performance-based programme such as this.

STRATEGY

Goal 1 I Amazon and Llanos target municipalities selected.

Several criteria should be used in the selection of the participating municipalities: (a) capacity and engagement of the municipal government; (b) location; (c) agricultural sectors and their level of organization; (d) remaining forests and savannahs; (e) historical rate of deforestation.

COST (2013-2014) I £0.1-0.2 million (analysis, vetting).

Goal 2 I "Green Municipalities" programme designed.

The design phase would take approximately one year, and would engage, through a series of bi-monthly workshops, the Ministry of Agriculture, the Ministry of Environment, municipal governments, key rural producer sectors (e.g. smallholders, cattle producers, timber), CARs, finance (public and private banks), and civil society organizations. The process

would be informed through analysis of Brazil's program. Departments, CARs, or the national government would have to take on the coordinating role. Result: design of the national green municipalities pilot.

COST (2013-2014) I £0.3-0.4 million (participant support, analysis).

Goal 3 I IDEAM's forest monitoring programme operationalized as authoritative source of deforestation information across all levels of government in support of green municipalities and to increase awareness of deforestation nationally.

Note from Brazil: The annual release of the Amazon deforestation estimates by Brazil's National Institute for Spatial Research (INPE) has become a widely anticipated media event that serves as a scorecard on the nation's broadly supported agenda for reducing deforestation. Colombia could achieve a similar effect through operationalization—the periodic public release of deforestation data for the Amazon region or, better still, for the entire nation—of IDEAM's forest monitoring results. This step would provide the basis for performance-driven innovation in addressing agricultural drivers of deforestation, especially if deforestation data (actual polygons of forest clearing) are made available on the internet for both historical and on-going deforestation estimates. It will be challenging to achieve this operationalization for the Llanos.

COST (2013-2015) I £2-4 million (support for IDEAM to conduct the analyses; design of web-based system for delivering data).

Goal 4 I Request for proposals from municipalities within target departments to support their efforts to organize their stakeholders and plan for the reduction of deforestation

This competitive programme would support municipalities in their planning and capacity building to develop land-use plans and to forge cross-sector agreements on the pathway to lower deforestation[134].

COST (2013-2015) I £0.9-1.2 million (six municipality grants; three in each target department).

TOTAL COST (2013-2015) I (2013-2015): £3.3-5.8 million.

RISKS

- Low levels of governance capacity among municipalities, especially in the Amazon region.
- Programme may be subject to lawsuits (especially if it uses "punishments" to municipalities").

SUCCESS FAVOURED BY

All of the other recommended interventions.
Peace process success.

CO-BENEFITS

- Substantial co-benefits, beyond GHGs, of lowering deforestation rates.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** DNP, MADR, MADS, INCODER, URT, departments and municipalities, CARS (targets), FINAGRO, NRP (National Royalty Programme), APC, National Parks Agency, and others as appropriate.
- **Ethnic Groups I** indigenous territorial entities and associations such as National Organization of Indigenous People (ONIC) Organization of Indigenous Amazonian People (OPIAC), and Afro-Colombian communities, as appropriate.
- **Producer Associations I** ANUC, ASOCAÑA/ PROCAÑA, FEDEPALMA, FEDEPANELA, and FEDEBIOCOMBUSTIBLES, FEDEMADERAS, SAC and others as appropriate.
- **Research I** Universities (e.g. Universidad de la Amazonía, Universidad Javeriana, Universidad de los Andes, Universidad Nacional), research institutes (e.g. IDEA – Institute of Environmental Studies – linked to the Universidad Nacional), CORPOICA,

134 A large portion of land-use planning is currently outdated and must be revisited and approved by law. This could represent an opportunity to include LED-R components as well as climate change adaptation. See more at: Ardila, G., G. Andrade, J. Benavides, J. Carrizosa, J. García, M. Rodríguez, G. Rudas, and J. P. Ruiz. 2013. Desarrollo económico y adaptación al cambio climático. FES, FNA, Bogotá, Colombia.

ICA, CIAT, Humboldt Institute, SINCHI, IDEAM, and others as and others as appropriate.

- **Civil Society I** Fondo Accíon Ambiental, Fondo Patrimonio Natural, Fundación Natura, INDEPPAZ, ONF Andina, TNC, WWF-CO, and others and others as appropriate.
- **Others I** ASOCARs and FMC (Colombian Federation of Municipalities), and others as appropriate.

RECOMMENDATION 7 *A national land-use strategy with deep cross-sector support*

Overview I Colombia's rural sector policies and dialogues are highly fragmented. Goals for increasing the production of crops, livestock, and biofuel are operating outside of strategies for ending deforestation or resettling hundreds of thousands of displaced farmers onto the land. The national strategy for mining is even further removed from the forests and farms agenda. As a result of this fragmentation, many programmes and policies have the potential to undermine each other. For example, even if a multi-sector agreement is reached to make the Amazon region off limits to further agricultural expansion, mining and hydrocarbon policies that open up remote regions of the Amazon to mineral exploitation could usher in waves of colonization and forest clearing. To achieve better harmonization across divergent objectives, multi-sector dialogues at different scales that develop evidence-based, spatial land-use zoning plans, infrastructure plans, and strategies for increasing frontier governance capacity are needed. This agenda is consistent with Colombia's decentralized spatial planning policy and holds great potential for diminishing conflict among rural development agendas.

Important precedents exist for achieving integrated regional development plans through multi-stakeholder processes. The "MAP" (Madre de Dios, Acre and Pando) planning process along the interoceanic highway from Brazil through Peru to the Pacific has fostered integration of policies and programmes across sectors in Acre (Brazil), Madre de Dios (Peru) and Pando (Bolivia)[10]. The BR163 "soy highway" regional planning process, in the eastern of the Brazilian Amazon, culminating in 2005, resulted in one of history's greatest pulses of tropical forest protected area and extractive reserve creation, with 24 million hectares set aside between 2004 and 2006[11,12]. This process was driven by civil society and assimilated by the federal government. Comments from a broad range of Colombian stakeholders suggests that an agreement is within reach to fully implement Law 2 of 1959 law that prohibits forest clearing in the Amazon and to identify viable pathways for increasing agricultural and mineral production with a minimum of negative impact.

DESIRED OUTCOMES BY 2015

National land strategy designed, with support across several sectors, to reconcile Colombia's goals of ending deforestation, increasing agricultural and mineral production, and resettling displaced farmers.

OBSTACLES

Although there is support across many sectors for launching such a process, a champion for leading this effort will be needed.
There is little dialogue currently with the mining sector.

STRATEGY

Goal 1 I Design and implement a regionalized, multi-sector, participatory process that would culminate in a national land strategy

Map out existing alliances and conflicts among sectors; identify points of convergence and divergence; provide support for those sectors that require further organization to "level the playing field" (e.g. some smallholders and indigenous peoples); support the regional and national convening.

Here, a request for proposals could be issued that provides support to department-level planning processes.

COST (2013-2015) I £1-2 million (analysis, vetting, capacity-building for some groups); £2-3 million (grants to 10-15 departments to support

integrated, multi-sector, spatial planning).

Goal 2 I Develop plausible 2020 scenarios for reconciling Colombia's forest, agriculture, resettlement, mining, and hydrocarbon goals that highlight the potential of current and proposed public policies and governance instruments to achieve each scenario.

Multi-stakeholder planning processes are most effective when they are supported with rigorous analyses and compelling illustrations of the full range (social, environmental, economic) of implications of rural development pathway options. This analysis must be grounded in the current status of rural development, the major policies and programmes in place or under design, and the emerging links with international markets. It should examine the implications of 3 or 4 rural development pathways for forests and savannahs, GHG emissions, job creation, economic growth (and tax revenues), agricultural output and food security, agrarian resettlement, export income, energy production and security, integration with neighbouring and regional nations, to name a few. The development of these scenarios, and the analysis to determine their implications, must be woven into the multi-sector planning dialogues.

COST (2013-2015) I £2-3 million (scenario development, integrated economic/environmental/social analysis).

Goal 3 I Develop a single, broadly shared land-use map for Colombia that reinforces the legal status of the Amazon and other regions as forest reserves that are off-limits to agricultural expansion.

COST (2013-2015) I £0.2-0.3 million. The key map layers would be developed through *Goal 2.*

TOTAL COST (2013-2015) I £5.2-8.3 million.

RISKS

- Some sectors refuse to participate.
- Legal hurdles to make such a strategy legally binding.

SUCCESS FAVOURED BY

- All of the other recommended interventions.
- Peace process success.

CO-BENEFITS

- Substantial co-benefits, beyond GHGs, of lowering deforestation rates.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** MADS, MADR, UPRA, Ministry of Mines and Energy (MinMinas), Ministry of Transportation (MinTransportes), Ministry of Interior and Justice (MIJ) DNP, INCODER, UTR, FINAGRO, ANI (National Infrastructure Agency), departments, municipalities, CARs, and National Parks Agency, and others as appropriate.
- **Ethnic Groups I** indigenous territorial entities and associations such as ONIC, OPIAC, AICO, and Afro-Colombian communities.
- **Producer Associations I** ANUC, ASOCAÑA/ PROCAÑA, FEDEPALMA, FEDEPANELA, and FEDEBIOCOMBUSTIBLES, FEDEMADERAS, ASOMINEROS (Colombian Mining Association), ACP (Colombian Petroleum Association), SAC, regional smallholder organizations, and others as appropriate.
- **Research I** Universities (e.g. Universidad de la Amazonía, Universidad Javeriana, Universidad de los Andes, Universidad Nacional) regional research institutes, Humboldt Institute, SINCHI, IDEAM, CORPOICA, CIAT, CIPAV, and others as appropriate.
- **Civil Society I** Fondo Accíon Ambiental, Fondo Patrimonio Natural, Fundación Gaia Amazonas, Fundación Natura, INDEPPAZ, ONF Andina, TNC, WWF-CO, and others as appropriate.
- **Others I** ASOCARs, FMC, National Federation of Departments.

RECOMMENDATION 8 *Complete and implement an Amazon land strategy ("Heart of the Amazon" proposal)*

Overview I Colombia's greatest challenge in reconciling its deforestation, mining, and hydrocarbon goals is the Amazon region. Governance capacity is low in

the Amazon, and even with a successful peace process, the illicit crop economy will continue to undermine efforts to govern this vast region. Mining and hydrocarbon interests are anxious to achieve permits to do prospecting and exploit resources in areas that are legally off limits to such activities. And, yet, there is a great deal of convergence across many national rural sectors around the notion that the Amazon region should be off-limits to further agricultural and livestock expansion. The cattle, palm oil, sugarcane and biofuel sectors all support the removal of deforestation from their supply chains. There is strong support for the indigenous peoples' formally recognized territories within the Amazon Biome, for management of protected areas, and for the "Heart of the Amazon" (HA) proposal to inter-connect these territories and reserves across an eleven million hectare area.

Colombia's HA proposal/programme is an appropriate centrepiece of the UK investment strategy in Colombia. It lays out an agenda of spatial planning, investments in governance capacity within subnational governments, the development of economic alternatives to forest conversion to livestock and crops, the development of programmes for improving the livelihoods of the indigenous groups whose territories lie within the Amazon biome, protected area management, among other elements. We recommend the expansion of this already-ambitious proposal to encompass the entire Amazon biome, given the large potential for an orchestrated set of investments from the UK, Germany and Norway. Most of the elements of the HA programme are addressed in *Recommendations 1-5*. The "Green Municipality" recommendation could further strengthen the HA proposal, as could the National Land-Use Strategy *(Rec 7)*. In this recommendation, we highlight those elements of the HA proposal that are not already addressed in other recommendations.

DESIRED OUTCOMES BY 2015

- Heart of the Amazon programme expanded to the entire Amazon Biome, with robust business models developed to address agricultural drivers of deforestation (increasing the value of timber- and non-timber-based incomes), effective participatory planning achieving consensus on a spatial plan and land-use strategy, a programme of support and economic alternatives for indigenous communities developed with meaningful engagement of these groups.

OBSTACLES

- Low levels of governance in the Amazon region.
- Competing interests from mining and hydrocarbon.

STRATEGY

Goal 1 I Indigenous groups of the Amazon region, together with relevant government agencies and with adequate support from partner organizations, develop programmes for improving livelihoods and managing territories, supported by analysis of current circumstances, needs assessment, and current systems for supplying basic services (health, education, water).

COST (2013-2014) I £0.5-1.0 million (convening, surveys, analysis).

Goal 2 I Governance deficiencies in the Amazon region understood and strategy for overcoming these deficiencies developed with cross-sector support.

COST (2013-2015) I £0.3-0.5 million (analysis, convening).

Goal 3 I Heart of the Amazon programme expanded to the Amazon Biome, developed and ready for implementation, with deep support from key sectors and developed on a foundation of economic, governance and sociological analyses.

COST (2013-2015) I £1-3 million (analysis, business case development, multi-sector convening).

TOTAL COST (2013-2015) I £1.8-4.5 million.

RISKS

- Competing interests (mining, illicit crops, hydrocarbons) prove too disruptive.

SUCCESS FAVOURED BY

- All of the other recommended interventions.
- Peace process success.

CO-BENEFITS

- Improvements in lives of indigenous and traditional peoples.
- Improved incomes of smallholders in Amazon region.
- Biodiversity conservation achieved by slowing/ending deforestation.
- GHG reductions.

ACTORS THAT SHOULD BE ENGAGED

- **Government I** MADR, UPRA, UTR, INCODER, MADS, MinMinas, MinTransportes, DNP, ANI, departments, municipalities, and CARs (e.g. CORPOAMAZONIA), and others as appropriate.
- **Ethnic Groups I** Indigenous territorial entities and associations including ONIC, OPIAC, AICO, and others as appropriate.
- **Producer Associations I** Producers Associations: ANUC, ASOCAÑA/ PROCAÑA, FEDEPALMA, FEDEPANELA, and FEDEBIOCOMBUSTIBLES, FEDEMADERAS, ASOMINEROS (Colombian Mining Association), ACP, SAC, regional smallholder organizations, and others as appropriate.
- **Research I** Universities (e.g. Universidad de la Amazonía, Universidad Javeriana, Universidad de los Andes, Universidad Nacional) regional research institutes, IDEAM, Humboldt Institute, SINCHI, CORPOICA, CIAT, CIPAV, and others as appropriate.
- **Civil Society I** Fondo Accíon Ambiental, Fondo Patrimonio Natural, Fundación Gaia Amazonas, Fundación Natura, INDEPPAZ, ONF Andina, TNC, WWF-CO, and others as appropriate.
- **Others I** ASOCARs, FMC, National Federation of Departments, and others as appropriate.

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GLOSSARY OF TERMS

The following abbreviations, acronyms, and terms are used in this document:

ACP	Colombian Petroleum Association
AFE	Businesses Foundations Association of Colombia
ANDI	National Business Association of Colombia
ANH	National Agency of Hydrocarbons
ANUC	National Association of Peasants
APC	Presidential Agency for International Cooperation
ASOCAÑA	Association of Producers and Mills of Sugar Cane
ASOCARs	Association of Regional Autonomous Corporations
AICO	Organization of Indigenous Authorities of Colombia
BAU	Business as Usual Scenario
BOEPD	Barrels of Oil Equivalents Per Day
Bonsucro	Bonsucro is a global multi-stakeholder non-profit organization dedicated to improving the social, environmental, and economic sustainability of sugarcane production and down- stream processing by promoting the use of a global metric standard
CAMACOL	Colombian Chamber of Construction
CECODES	Colombian Business Council for Sustainable Development
CAR	Regional Autonomous Corporation
CDA	Sustainable Development Corporation of the Northeastern Amazon
CENICAÑA	Colombian Sugar Cane Research Centre
CENIPALMA	Colombian Oil Palm Research Centre
CIAT	International Centre for Tropical Agriculture
CIF	Forest Incentive Certificate
CIPAV	Research Centre for Sustainable Systems of Agricultural Production
CONIF	National Corporation for Forest Research and Promotion
CONPES	National Economic and Social Policy Directive
COP	The Conference of the Parties is the governing body of the United Nations Framework Convention on Climate Change, representing all countries that have ratified the Convention. The Conference meets annually. COP15 was held in Copenhagen, Denmark, in 2009, COP 16 was held in Cancun, Mexico, in 2010 COP 17 was held in Durban, South Africa, in 2011, and COP 18 in Doha, Qatar 2012
CORPOICA	Colombian Agricultural Research Corporation
DANE	National Administrative Department of Statistics
DNP	National Planning Department
EU	European Union
EU ETS	European Union Emissions Trading Scheme
FCPF	Forest Carbon Partnership Facility
FAG	Colombian Agricultural Fund for Guarantees
FDI	Foreign Direct Investment
FEDEBIOCOMBUSTIBLES	Colombian Federation of Biofuel (including ethanol and biodiesel)
FEDEGAN	Colombian Federation of Cattle Ranching
FEDEMADERAS	National Federation of Wood Industries
FEDEPALMA	Colombian Federation of Palm
FENACARBON	National Federation of Coal Producers

FINAGRO	Colombian Fund for Financing the Agricultural Sector
FMC	Colombian Federation of Municipalities
FMD	Foot and Mouth Disease
FAO	Food and Agricultural Organization of the United Nations
FPIC	Free-Prior Informed Consent
FSC	Forest Stewardship Council
FTA	Free Trade Agreements
GDP	Gross Domestic Product
GHG	Greenhouse gas. This term usually refers to the greenhouse gases regulated by the Kyoto Protocol, the most important relating to agriculture and deforestation are (carbon dioxide, CO_2; methane CH_4; and nitrous oxide N_2O)
GOV	Optimistic Scenario prepared by IPAM IP for this Study call "The Governance Scenario"
ICMS	Brazilian Tax on Goods and Services
ICR	Rural Capitalization Incentive
INCODER	Institute of Rural Development (entity attached to the Colombian Ministry of Agriculture and Rural Development)
IPAM IP	Amazon Environmental Research Institute for its initials in Portuguese. As of October 2013, IPAM - IP is officially changing its name to Earth Innovation Institution
IPCC	The Intergovernmental Panel on Climate Change
GRSB	Global Roundtable for Sustainable Beef
HA	Heart of the Amazon Proposal
Ha	Hectare is a metric unit of area defined as 10,000 square meters (100m by 100m)
Humboldt Institute	Alexander Von Humboldt Institute for Research on Biological Resources
ICA	Colombian Agricultural Institute
ICR	Rural Capitalization Incentive
IDB	Inter-American Development Bank
IDEAM	Colombian Institute of Hydrology, Meteorology and Environmental Studies
INCODER	Colombian Institute of Rural Development
INDEPAZ	Peace and Development Research Institute
INPE	Brazil's National Institute for Spatial Research
LED-R	Low Emissions Rural Development
LULUCF	Land use, land-use change, and forestry, a sector covered under Articles 3.3 and 3.4 of the Kyoto Protocol; also becoming used more generally than just related to the Kyoto Protocol
MADR	Colombian Ministry of Agriculture and Rural Development
MADS	Colombian Ministry of Environment and Sustainable Development
MRV	Measurement, reporting and verification (of forest carbon emissions)
MSME	Micro, Small and Medium Enterprise
$MtCO_2$	Mega-Tonne of Carbon Dioxide
NAMA	Nationally Appropriate Mitigation Action
NDP	National Development Plan (a document that must prepared after each presidential election with the plans for the country for the next 4 years)
NRP	National Royalty Programme
ODA	Overseas Development Assistance

OIE	World Organization for Animal Health
ONIC	National Organization of Indigenous People
OPIAC	Amazonian Organization of Indigenous People
PLTC	Pact for Legal Timber in Colombia
PPP	Public Private Partnership
PROCAÑA	Association of Producers and Providers of Sugar Cane
PRONAF	Brazilian Programme to Strengthening Agricultural Families
PTP	Programme of Productive Transformation
R&D	Research and Development
REDD+	REDD refers to Reducing Emissions from Deforestation and forest Degradation in developing countries while the '+' refers to the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
RSPO	Roundtable on Sustainable Palm Oil
SENA	National Training Service
SINCHI	Colombian Amazon Scientific Research Institute
SLCDS	Sectoral Low Carbon Development Strategy
SPS	Silvopastoral Production Systems
TECNIGAN	FEDEGAN'S Technical Assistance Branch
tCO_2	Tonne of Carbon Dioxide
TIMO	Timber Investment Management Organizations
TNC	The Nature Conservancy
UNDP	United Nations Framework Convention on Climate Change, the multilateral environmental agreement to address the risk of global climate change
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
URT	Colombian Special Unity of Land Restitution (Created by the Law 1448 of 2011)
US	United States of America
USD	United States Dollar
USAID	United States Agency for International Development
VCS	Verified Carbon Standard
WWF Colombia	World Wildlife Federation of Colombia

APPENDIX A | JURISDICTIONAL REDD+ AND LOW-EMISSION RURAL DEVELOPMENT (LED-R): DEFINITIONS AND LESSONS FROM OTHER NATIONS

Definitions

JURISDICTIONAL REDD+

By "jurisdictional REDD+", we refer to programmes that are designed to incentivize reductions in deforestation and forest degradation or enhancement of carbon in new or planted forests across entire nations or subnational political jurisdictions. This is the scale at which REDD was originally conceived (e.g. Santilli et al. 2005[135]), and the scale at which alignment between public policies and institutions to achieve sustainable transitions to low-emission rural development is possible. A key element of jurisdictional REDD+ is the measurement of performance (reductions in deforestation or degradation, increases in carbon enhancement) for the entire nation or state through an emissions reference level. Jurisdictional REDD+ programmes can include projects that intervene in specific landscapes, forestry concessions, or protected areas, as long as these projects are nested within the jurisdictional framework and consistent with the broader REDD+ programme. In jurisdictional REDD+, projects are stepping stones to achieve the low-emission rural development model, instead of the focus of the programme.

MARKET TRANSFORMATION

The development of international voluntary social and environmental certification began in earnest in the 1990s with the development of the Forest Stewardship Council and other certification systems for tropical timber production[136,137,138]. During its first twenty years, FSC certification has become widely recognized as a symbol of sustainable timber and pulp production. Legal compliance, a performance criterion common to all international standards, is difficult to achieve in emerging economies and young democracies, in which weak governmental institutions are often unable to implement laws and programmes across vast forest estates. This is one of many factors that may help explain why only 3% of tropical timber production is certified under the Forest Stewardship Council standard[136,137].

Partly in response to the persistent "niche market" status of FSC and similar certification systems, a new system for developing social and environmental standards emerged that emphasizes the participation of a broader array of commodity supply-chain actors from the very beginning, a focus on performance instead of techniques or practices, attention to a small group of key performance principles, and a low bar of initial performance that becomes increasingly stringent over time[139]. Through multi-stakeholder agricultural commodity "roundtables", voluntary standards are developed with the participation of a significant share of the entire supply chain, and with a focus on "pre-competitive" certification (i.e., the exclusion of uncertified producers and processors from markets as opposed to post-competitive selection of certified products by well-informed, conscientious consumers willing to pay premiums). This emphasis on pre-competitive selection derives, in part, from the nature of the commodities themselves. Unlike timber, which is generally sold directly in the market place as a single-component commodity, soy, palm oil, and sugar are usually one ingredient among many in retail products. This makes it more difficult to develop a workable consumer labeling approach. The commodity roundtables of greatest relevance to Colombia are Bonsucro (for sugar cane sugar and ethanol) and the RSPO for palm oil.

LOW-EMISSION RURAL DEVELOPMENT

"Low-emission rural development" (LED-R) refers to a rural development model in which increases in production, rural incomes, and job opportunities are achieved while reducing GHG emissions. In tropical forest nations, LED-R may achieve emissions reductions through a REDD+ programme, through supply-chain transitions to sustainability that are reinforced by market transformation, and through domestic policy

135 Santilli, M. P., P. Moutinho, S. Schwartzman, D. C. Nepstad, L. Curran, and C. A. Nobre. 2005. Tropical Deforestation and the Kyoto Protocol: an editorial essay. Climatic Change 71:267-276.

136 Cashore, B., F. Gale, E. Meidinger, and D. Newsom. 2006. Confronting Sustainability: Forest Certification in Developing and Transitioning Countries. Yale School of Forestry & Environmental Studies, New Haven, CT.

137 Forest Stewardship Council. 2012. Facts and Figures. http://ic.fsc.org/index.htm.

138 Conroy, M. E. 2007. Branded! How the 'Certification Revolution' is Transforming Global Corporations New Society Publishers.

139 Steering Committee of the State-of-Knowledge Assessment of Standards and Certification. 2012. Toward sustainability: The roles and limitations of certification. RESOLVE, Inc., Washington, DC.

alignment and innovation. We use LED-R within this report as the presumed goal of Colombian society for its rural economy (although it is not necessarily referred to in Colombia with the term "LED-R".)

Lessons from REDD+, Market Transformation, and LED-R:

THE NEED FOR RE-FRAMING REDD+ TO FOCUS ON RURAL DEVELOPMENT THAT ENGAGES A BROAD RANGE OF CONSTITUENCIES

REDD+ became formal in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations by COP 13 in Bali, in 2007[140], and had greatly elevated expectations among tropical forest nations of near-term, large-scale flows of revenues into their countries[20,141]. It now appears that a unified global mechanism for channeling finance at scale to participating tropical nations who are reducing emissions from deforestation will not be forthcoming until 2020 or beyond. This loss of political support is also a reflection of the failure in many nations to move their REDD+ initiatives beyond their status as a mechanism for capturing a complex, uncertain source of new international funding. Few REDD+ programmes today have succeeded in aligning agricultural, forestry, environmental and infra-structure policies and institutions, nor have they garnered support across the principal rural constituencies (farm sectors, smallholders, indigenous and traditional peoples) that they are designed to influence. In this light, it is important that REDD+ be reframed as the policy framework for supporting the broader transition to LED-R.

IMPORTANCE OF FOCUS ON JURISDICTION-WIDE MECHANISMS AND PROCESSES: MOVING BEYOND ISOLATED REDD+ PROJECTS AND FARM-BY-FARM CERTIFICATION

There are important examples of how jurisdiction-wide "benefit-for-performance" systems can achieve results at scale. Deforestation in the Brazilian Amazon declined in part because of the restrictions on access to agricultural loans placed on farmers located in *municipalities* with high deforestation rates[142]. The State of Pará, in the eastern Amazon, has built upon this experience to align transfers from the state to *municipality* governments in a way that favors those *municipalities* that are reducing their deforestation. Similarly, foot-and-mouth disease (FMD) eradication programmes have been successful in many nations by restricting market access for entire zones or states following an outbreak of the disease[143,144]. Both of these programmes foster peer-to-peer enforcement among neighboring landholders to achieve the target (reductions in deforestation and in FMD, respectively)[20], making these programmes less dependent upon governmental law enforcement systems.

Achieving changes in rural development models across entire jurisdictions is a messy process that must engage multiple levels of government, institutions that are often underfunded or with little capacity, powerful elites with vested interests in business-as-usual agricultural frontier expansion[145], and in the case of Colombia and many other nations, rural militia and illicit crops. For this reason, most of the activity in REDD+ in recent years has focused on projects that are, by design, largely independent of public policies and government institutions, and therefore do little to foster the policy alignment and institutional innovation that is ultimately needed to achieve the transition to LED-R[20,141,145,146]. Similarly, commodity roundtables have been developed to operate independently of governments and public policy. In the cases of both REDD+ projects and farm-by-farm certification under roundtables, the costs of participation can become prohibitively high, while the potential for addressing deforestation at scale remains low.

140 Estaban & Gioandomenico, The History of RED Policy. Carbon Planet, Dec. 4, 2009, Carbon Planet. Available at http://unfccc.int/files/methods_science/redd/submissions/application/pdf/redd_20091216_carbon_planet_the_history_of_redd_carbon_planet.pdf

141 Agrawal, A., D. Nepstad, and A. Chhatre. 2011. Reducing Emissions from Deforestation and Forest Degradation. Pages 373-396 in A. Gadgil and D. M. Liverman, editors. Annual Review of Environment and Resources, Vol 36.

142 Assunção, J., C. Gandour, R. Rocha, and R. Rocha. 2013. Does Credit Affect Deforestation? Evidence from a Rural Credit Policy in the Brazilian Amazon. Climate Policy Institute, www.climatepolicyinitiative.org.

143 OIE and FAO. 2012. The global foot and mouth disease control strategy. OIE, FAO, http://www.oie.int/doc/ged/D11786.PDF.

144 OIE. 2012. Foot and mouth disease Article 8.5.in World Organisation for Animal Health, editor. Terrestrial Animal Health Code OIE, http://www.oie.int/eng/A_FMD2012/docs/en_chapitre_1.8.5.pdf.

145 Brockhaus, M. and A. Angelsen. 2012. Seeing REDD+ through 4Is: A political economy framework Page 456 in A. Angelsen, M. Brockhaus, W. D. Sunderlin, and L. V. Verchot, editors. Analysing REDD+: Challenges and Choices. Center for International Forestry Research, Indonesia.

146 Electrical Power Research Institute (EPRI). 2012. Overview of Subnational Programs to Reduce Emissions from Deforestation and Degradation (REDD) as part of the Governors' Climate and Forest Task Force Electric Power Research Institute, EPRI, Palo Alto, CA (Written by D. Nepstad, W. Boyd, J. O. Niles, A. Azevedo, T. Bezerra, C. Stickler, B. Smid, R. M. Vidal, and K. Schwalbe).

A LACK OF MULTI-SECTOR ALIGNMENT ACROSS POLICIES AND PROGRAMMES

REDD+ has not yet succeeded in aligning policies and programmes across environment, agriculture, forestry, energy, transportation infra-structure and mining sectors[20,147], perhaps because of the common view of REDD+ as a complicated new international finance mechanism. This alignment is particularly important now that the scale of near-term finance for REDD+ has been significantly reduced.

LACK OF EFFECTIVE ENGAGEMENT OF FARM SECTORS, FINANCE SECTORS, AND PRIVATE INVESTORS IN REDD+; LACK OF A BRIDGE BETWEEN VOLUNTARY "MARKET TRANSFORMATION" PROCESSES (E.G. COMMODITY ROUNDTABLES) AND REDD+

International negotiations of REDD+ and UN-affiliated processes (e.g. FCPF, UN-REDD, and bilateral programmes have made important progress in defining guidelines for measurement, reporting and verification of forest carbon emissions (MRV) and social and environmental safeguards. Little progress has been made, however, in effectively engaging the farm sectors that are driving forest conversion to crops and livestock, nor the logging industry that is degrading tropical forests. Similarly, REDD+ has generally achieved little success in creating links to domestic finance for agriculture, livestock, and forestry sectors, even though these programmes are often far greater in scale of financial flows than REDD+ interim finance. As a result, farm sectors have generally turned their backs on the REDD+ deforestation agenda.

In contrast, commodity roundtables have been effective at engaging significant numbers of supply chain actors, including farm sector organizations, in the development and implementation of international social and environmental performance standards. However, these processes, through their focus on "pre-competitive" selection (vs. post-competitive consumer choice), and the insistence among many commodity buyers that they will not pay performance premiums, have left many farm sectors unable to cover the costs of compliance[20]. There is potential, therefore, for a virtuous cycle between jurisdictional REDD+ and the transition of farm sectors to sustainability and compliance with roundtable standards.

147 Nepstad, D. C., P. Moutinho, W. Boyd, A. Azevedo, T. Bezerra, B. Smid, M. C. C. Stabile, C. Stickler, and O. Stella. 2012. Re-framing REDD+: Unlocking jurisdictional REDD+ as a policy framework for low-emission rural development: research results and recommendations for governments. IPAM-IP, San Francisco.

APPENDIX B | GHG EMISSION INVENTORY

Table B.1 | *GHG Emissions inventory (2000-2004) by sector*[41].

	2000		2004		Change (2000-2004)	
Sector	**CO_2e (Mt)**	**% of total contribution**	**CO_2e (Mt)**	**% of total contribution**	**CO_2e (Mt)**	**% of total contribution**
Energy	**66.5**	**37**	**66**	**37**	**-0.5**	**No change**
Fossil fuel combustion	57.3	32	56.2	31	-1.1	-1
Fugitive emissions	7.5	4	9.2	5	+1.7	+1
Biomass burning	0.7	0.4	0.6	0.3	-0.1	-0.01
Industrial processes	**7**	**4**	**9**	**5**	**+2**	**+1**
Non-metallic mineral production	3.3	2	3.5	2	+0.2	No change
Chemical production	0.5	0.3	0.6	0.3	+0.1	No change
Metal production	2.6	1.5	3.8	2	+1.2	+0.5
SF6 emissions	7.2	0.4	7.2	0.4	0	No change
ODS substitutes	2.5	0.1	5.7	0.3	+3.2	+0.2
Agriculture	**65.2**	**37**	**68.6**	**38**	**+3.4**	**+1**
Enteric fermentation	30.9	17	33.3	19	+2.4	+2
Manure management	1.1	0.6	1.2	0.7	+0.1	+0.1
Rice cultivation	1.3	0.7	1.4	0.8	+0.1	+0.1
Agricultural soil management	31.7	19	32.6	18	+0.9	-1
Prescribed burning (grasslands)	0.06	0.03	0.06	0.03	0	No change
Burning agricultural wastes	0.07	0.04	0.09	0.05	+0.02	+0.01
Land Use, Land-Use Change and Forestry	**30.2**	**17**	**26**	**14**	**-4.2**	**-3**
Changes in forest and other woody biomass	6.4	4	2.1	1	-4.3	-3
Conversion of forests & woodlands	16.3	9	16.6	9	+0.3	No change
Abandonment of cultivated lands	-0.2	-0.1	-0.1	0.1	+0.1	+0.2
Emissions and absorption of soil CO_2	7.3	4	7.3	4	0	No change
Waste	**9.3**	**5**	**10.3**	**6**	**+1**	**+1**
Deposition of solid waste (in the ground)	8.2	5	9	5	+0.8	No change
Treatment of water waste	0.4	0.2	0.5	0.2	+0.1	No change
Human water waste management	0.7	0.4	--	--	N/A	N/A
TOTAL	**177.6**	**100**	**180**	**100**	**+2.4**	**(N/A)**

Table B.2 | *GHG Emissions from agricultural activities (2000-2004) by source*[41].

	2000		2004		Change (2000-2004)	
Source	**CO_2e (Mt)**	**% of total contribution**	**CO_2e (Mt)**	**% of total contribution**	**CO_2e (Mt)**	**Change % of total contribution**
TOTAL AGRICULTURE	**65.2**		**68.6**		**+3.4**	
Enteric fermentation	**30.9**	**48**	**33.3**	**48.5**	**+2.4**	**+1**
Dairy cattle	1.2	2	0.9	1	-0.3	-1
Non-dairy cattle	27.8	43	30.3	44	+2.5	+2
Buffalo	0.2	0.3	0.2	0.3	0	No change
Sheep	0.3	0.4	0.3	0.4	0	No change
Goats	0.4	0.6	0.4	0.6	0	No change
Camelids/llamas	0	0	0	0	0	No change
Horses	0.9	1.4	1	1.4	+0.1	No change
Mules/donkeys	0.2	0.2	0.1	0.2	-0.1	No change
Pigs	0.1	0.1	0.1	0.1	0	No change
Poultry	0	0	0	0	0	No change
Manure management	**1.1**	**2**	**1.2**	**1.7**	**+0.1**	**-0.3**
Dairy cattle	0.03	0	0.02	0	0	No change
Non-dairy cattle	0.5	0.7	0.5	0.7	0	No change
Buffalo	0	0	0	0	0	No change
Sheep	0	0	0	0	0	No change
Goats	0.02	0	0.02	0	0	No change
Camelids/llamas	0	0	0	0	0	No change
Horses	0.1	0.2	0.1	0.2	0	No change
Mules/donkeys	0.02	0	0.02	0	0	No change
Pigs	0.1	0.1	0.1	0.1	0	No change
Poultry	0.1	0.2	0.2	0.2	+0.1	No change
Anaerobic	0	0	0	0	0	No change
Liquid	0	0	0	0	0	No change
Solid storage	0.2	0.4	0.2	0.4	0	No change
Rice cultivation	**1.3**	**2**	**1.4**	**2**	**+0.1**	**No change**
Irrigated	0.8	1	0.7	1	-0.1	No change
Dry	0.5	1	0.6	1	+0.1	No change
Deep water	0	0	0	0	0	No change
Agricultural soil management	**31.7**	**49**	**32.6**	**48**	**+0.9**	**-1**
Prescribed burning (grasslands)	**0.1**	**0.1**	**0.1**	**0.1**	**0**	**No change**
Burning agricultural wastes	**0.1**	**0.1**	**0.1**	**0.1**	**0**	**No change**
TOTAL AGRICULTURE	**65.2**		**68.6**		**+3.4**	

APPENDIX C | MAPS

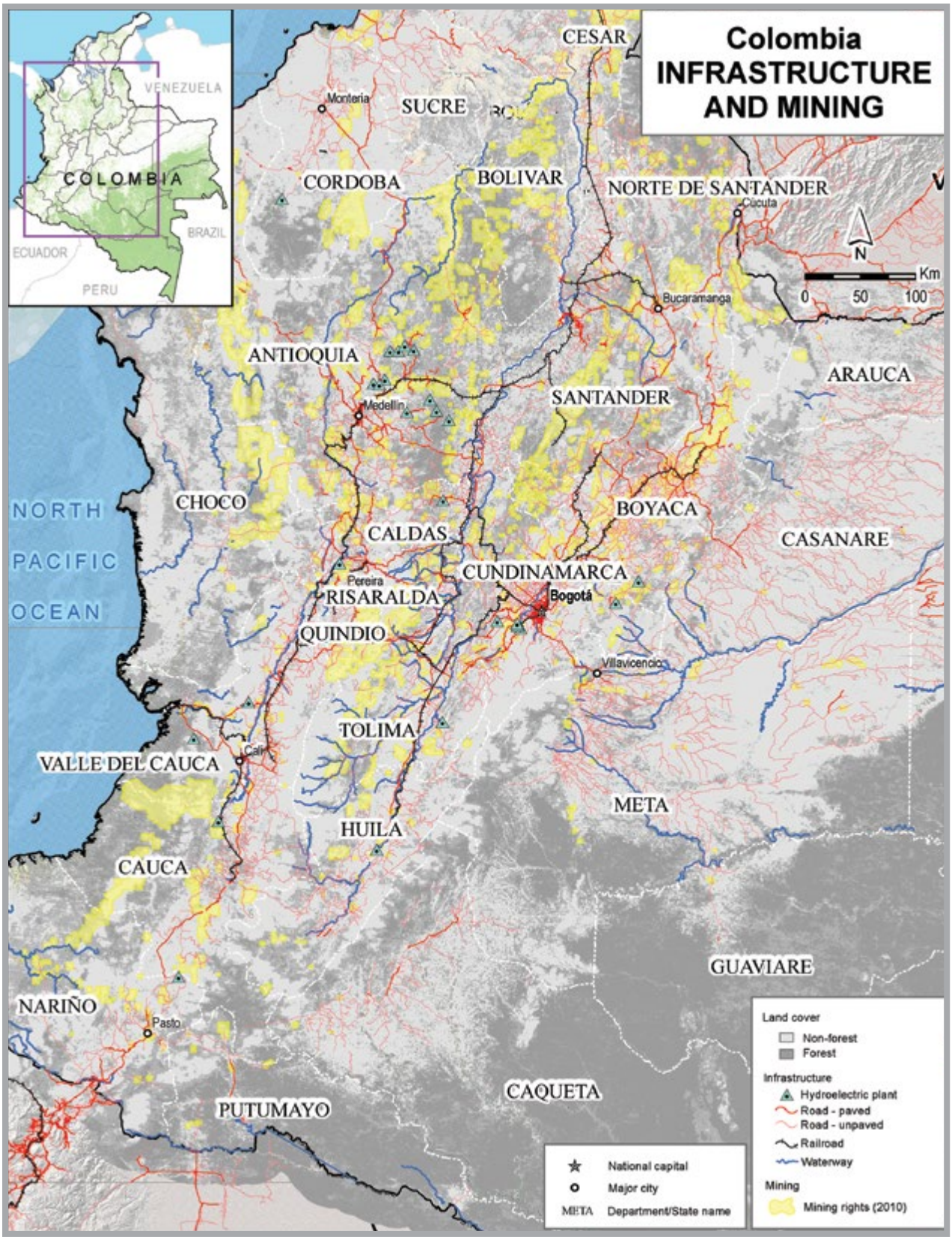

Figure C.1 | *Major transportation and energy infrastructure investments and mining permits in Colombia.*

Source: Dimiceli et al 2011[148] *(land cover 2010; Vector Map Level 1 – VMAP1 (road, railroads); OpenStreetMap (waterways); Insitituto Colombiano de Geologia y Mineria 2010 (mining rights).*

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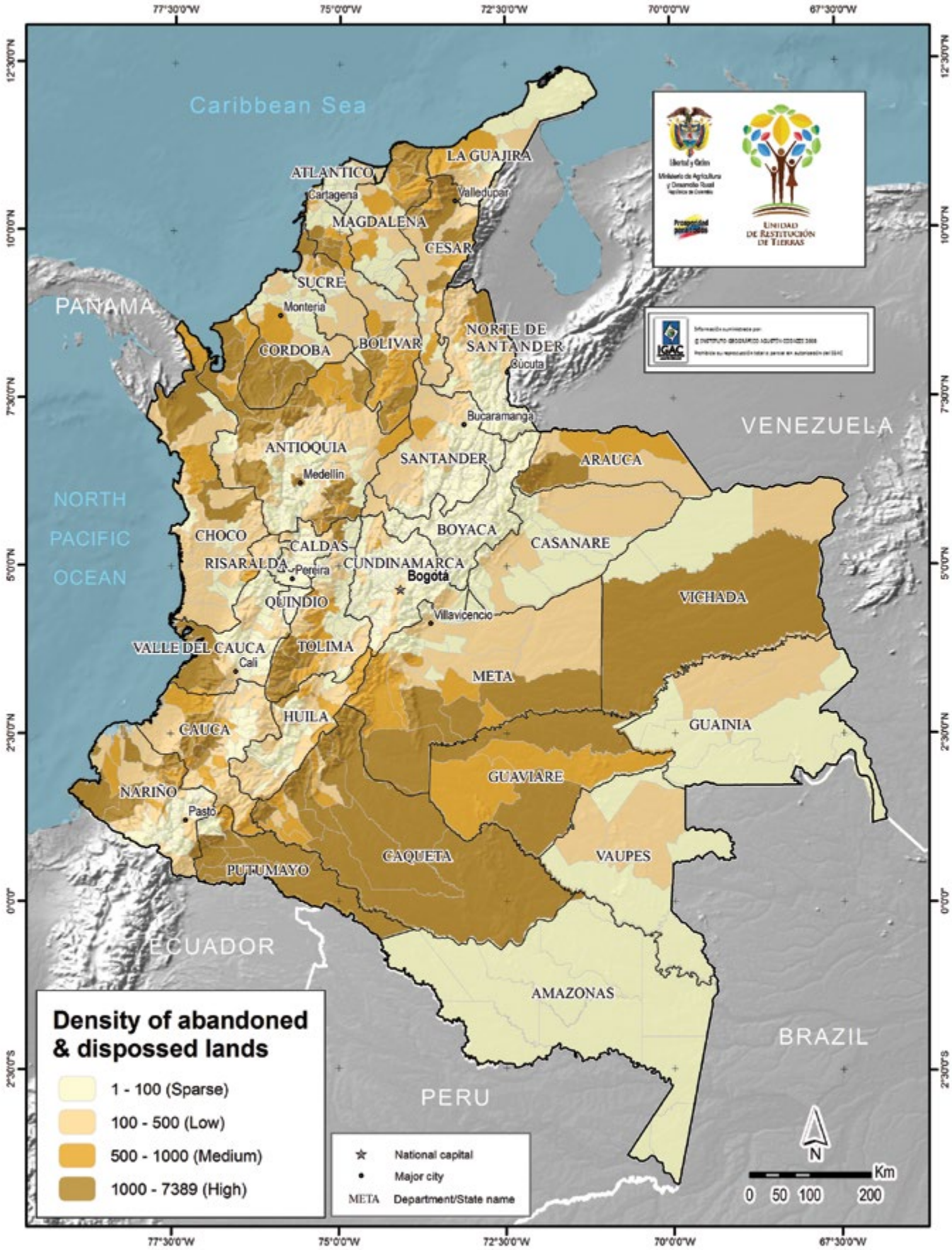

Figure C.2 | *The density of lands abandoned or divested throughout Colombia that would be likely targets for restitution.*

APPENDIX D | POLICY TABLE

Table D.1 | *Public Policies in Colombia*
Highlights of the main laws and policies affecting land-use change in Colombia, and their current and potential contribution to low emissions rural development (LED-R)

SYMBOLS

Positive incentives Negative incentives

	Status	Current Contribution to LED-R	Right, Responsibility, Goal	Effects on Land-Use	Mechanism	Potential Contribution to LED-R	Suggested Changes
Laws							
Constitution (1) (High level Directive)	In effect	Low	Recognize collective property and promotes land-distribution	Incentivize occupation and development		●	Prioritize degraded and consolidation areas
Forest Reserves (Law 2, 1959)	In effect	Medium	Protect large tracks of forests throughout Colombia	Limit property rights		●	Effective implementation and land-use planning
Land Acquisition (Law 160, 1994)	In effect	Medium	Distribute land based on its development	Acquisition of property rights		◑	Prioritize degraded and consolidation areas
Territorial Planning (Law 388, 1997)	In effect	Low	Municipalities develop territorial plans (use of land)	Define land use at the local level	&	●	Coordination (≠ levels) and landscape approach
Territorial Planning (Law 1454, 2011)	In effect	Medium	Natl. gov. and departments develop guidance for territorial plans	Guide land-use planning - regional level	N/A	●	Implementation and Coordination
Land Restitution (Law 1448, 2011)	In effect	Medium	Incentivize reoccupation of displaced communities	Reestablish-ment of prop-erty rights		●	Prioritize degraded and consolidation areas
National Environmental System (99/ 1993)	In effect	Medium	Determine environmental authorities of national gov., CARs, and municipalities	Limit land rights (e.g. requires environmental permits)		◑	Effective implementation and include incentives
Law for Rural Development (proposed)	Planned	High	Coordinate land-use planning and distribution, protected areas, and UAFs	Regulate land distribution, use and tenure	&	◑	Coordination (≠ levels) and prioritize degraded and consolidation areas
Mining Code (Law 685, 2001)	Partial (may be revoked)	Low	Regulate mining operations; all mineral resources belongs to the State	Mining rights affect land use and limit property rights	&	◑	Minimize environmental and social impacts
Mining Code (Law 1382, 2010)	Partial (suspended)	Medium	Regulate mining operations, all mineral resources belongs to the State	Mining rights affect land use and limit property rights	&	◑	Minimize environmental and social impacts, and respect no go zones

	Status	Current Contribution to LED-R	Right, Responsibility, Goal	Effects on Land-Use	Mechanism	Potential Contribution to LED-R	Suggested Changes
Biofuel Mandate (Laws 639, 2001 and 939, 2004, CONPES 3150/2008 - others)	In effect	Medium	Mandates biofuel use, tax incentives and others for palm and sugar plantation and processing	Incentivize land-use for biofuel related crops		◑	Coordination (across sectors) and prioritize degraded and consolidation areas
Forestry (Decree 1791, 1996)	In effect	Low	Define the use of forests and license for timber in planted and natural forests	Define rights and limitations regarding land-use		◑	Coordination (across sectors), implementation and minimize env. impacts
CIF (Law 139, 1994 and Decree 900, 1997)	In effect	Medium	Created the Forest Incentive Certificate to support the planting of forests	Incentives for forest plantations		◑	Increase the programme and define areas of prioritization
Policies							
National Plan for Forestry Development (2000)	In effect	Low	Multi-sector plan to promote sustainable forest management	Incentivize sustainable land-use in forested areas		◑	Coordination (across sectors) and effective implementation
National Adaptation Plan	In effect	High	Determine risk areas and plans for land-use	Limit land-use rights in risk areas		◑	Coordination ≠ levels and across sectors and effective implementation
National REDD+ Strategy	Planned	High	Define actions and priority areas for conservation and restoration	Limit property rights and increase conservation areas		●	Coordination ≠ levels and across sectors and effective implementation
Multi-Sectoral Low Carbon Strategy	Planned	N/A	Define strategies for different sectors including agriculture and mining	n.a	N/A	●	Coordination ≠ levels and across sectors, transparency and effective implementation
National Development Plan 2010-2014 (Law 1450, 2011)	In effect	Medium	Plan growth for the main economic sectors	Diverse (e.g. increase in mining can limit land rights, and ag. incentives can promote crop expansion)		◑	Coordination ≠ levels and across sectors and effective implementation

APPENDIX E | FORESTRY POLICIES

Despite efforts promoting legal and sustainable forest management, illegal logging still accounts for approximately 42% of logging activities in Colombia[52]. The wood consumption in Colombia is approximately 4 million cubic meters, of which only 25% is supplied by commercial plantations and imports, and 75% from natural forests[74]. MADR seeks to promote the use of wood from plantations as an alternative to reduce pressure on natural forests[74]. However, to achieve its goals, Colombia must overcome obstacles such as weak institutional capacity for control, monitoring, and enforcement, insufficient budget allocations, lack of engagement of local communities, and armed conflicts in forest production areas.

Forestry activities are mainly regulated by Decree 1791 of 1996 (e.g., forest uses and activities, and requirements for pursuing logging in both natural forests and forest plantations). However, its implementation has been inefficient based on the problems described above and considering the lack of forest inventory, zoning, monitoring, and incentives for forest management.

In an attempt to improve forest management, in 2000, the government approved a National Plan for Forestry Development (PNDF) with the following ambitious goals:

1 | characterize and value the supply of goods and services provided by forest ecosystems;

2 | generate competitive forest goods and services that strengthen the forest sector and the national economy;

3 | position the forest products and services sector in domestic and international supply chains to promoting competitiveness;

4 | incorporate, conserve and manage forest ecosystems for the provision of environmental goods and services;

5 | develop processes in which the population involved in the forestry sector can equally participate in the preservation, protection, conservation, use and management of forest ecosystems to build a sustainable society;

6 | strengthen Colombia's participation, bargaining, and marketing power in international discussions about preservation, conservation, sustainable use and management of forest ecosystems and biodiversity;

7 | build a culture of sustainable use and management of forest ecosystems and biodiversity, that encourages positive change between humankind and the environment; and

8 | provide technical, financial, economic and institutional capacity to the sector that allows for continuous and sustainable development.

Nonetheless, only 33% of goals were achieved from 2001 to 2004[149]. The main difficulties were: a) lack of integration between the policy and instruments for its implementation; b) deficient communication strategy with the public and private sector, academia, and other stakeholders; c) low degree of implementation of different programmes; d) lack of a permanent team; and e) lack of an institution directly responsible for implementing the plan.

Forest Incentive Certificate - CIF

On the other hand, the Forest Incentive Certificate, CIF (Law 139, 1994 and Decree 900, 1997) administered by MADR, (Law 1377, 2010) has been effective in promoting commercial reforestation in Colombia. As the government of Colombia states "CIF is the recognition by the government to the positive externalities of reforestation efforts, and consists of a cash payment to cover the costs to plant forests with protective-productive objectives in lands suitable for forests" (CONPES 3724). CIF covers: a) 75% of the costs to plant native species and 50% for non-native species, and b) from the second to the fifth year it covers 50% of the costs of maintenance, and c) 75% of the maintenance of natural forest inside of the management plan during the first five years (Law 139, 1994)[150].

From 1996 until 2011, 173,950 hectares of forest were established with economic incentives generated by the CIF (CONPES 3724). The plan is to achieve 600,000 ha of commercially planted forests by 2014 according

149 Information provided by WWF-CO as part of the collaboration on this project, March, 2013.

150 There is however a requirement of more than 1,000 trees per ha, and for plantations with lower density, not less than 50 trees per ha, the amount will be calculated proportionally.

to MADR's Plan of Action for Commercial Reforestation[41] and 400,000 hectares of native forest plantation, totaling 1 million ha reforested[151]. To achieve this ambitious goal, in 2012 the government increased the resources allocated to the CIF by 700% relative to the average of the last three years[152]. Below is the investment plan established by MADR to achieve its 2014 targets[74].

Table E.1 | *Amount of investment estimated by MADR to achieve its goals of 1 million ha reforested by 2014. Source MADR, Plan, 2011. Conversion using average exchange rate of USD 1 to COP 1,800*

Estimated Budget Allocated for Reforestation	
Year	**Amount (USD)**
2011	8,500,000
2012	45,628,889
2013	75,851,111
2014	108,628,889
Total	**238,608,889**

Competitive Regional Consortiums

Competitive Regional Consortiums (part of the PNDF, 2000) are aimed to promote private sector initiatives linked with smallholders who want to reforest areas. The purpose of these agreements is to improve productivity and competitiveness of the forest products in cluster regions, and strengthen the national production and the consolidation and expansion towards external markets. The projects are intended to produce different products based on different species, by region, participant skills, and taking into account the domestic market. The projects are the first steps in consolidating the production of wood supply chains in Colombia. MADR seems very supportive of the initiative[74], however, at this time we were not able to find indicators describing the initiative results.

Pact for Legal Timber in Colombia

An important step towards the reduction of illegal timber was the signing of the "Pact for Legal Timber in Colombia" in 2009 (PLTC, 2009)[153]. The agreement is a voluntary commitment signed by a multi-sector group that included members of the government, private industry, and civil society. The goal is to ensure that the wood harvested, transported, processed, marketed, and used in Colombia comes exclusively from legal sources. However, further policy reform that makes the marketing of illegal wood economically unattractive could greatly improve the success of the agreement. As President Santos stated, the value of illegal timber being brought to market is about USD 60 million per year at a cost of USD 194 per cubic meter, while legal timber is nearly double the cost at about USD 333 per cubic meter[154]. MADR also has plans to promote the implementation of this Pact[74], but more direct actions have yet to be undertaken.

New proposed Laws

A proposed law for forest plantations is being considered in Congress, and among other things it suggests that Finagro should offer credit lines to cover up to 50% of the costs of forest plantations[67]. MADS is also considering the proposal of a law to address forest management (but it has not been circulated[155]). It is important that these proposed laws take into account climate change mitigation and adaptation factors, transparency and effectiveness. This would allow greater participation of small and medium producers[156]. Also, it would be very helpful to have a territorial plan that clearly identifies priority areas for conservation, reforestation, and forest plantations at the national level.

151 Ministry of Agriculture, Press Release n. 324, Nov, 15th, 2011. Bogotá, Colombia. Available at: http://www.minagricultura.gov.co/archivos/_bol_324_2011_minagricultura_radica_proyecto_de_ley__para_reglamentar_la_actividad_reforestadora_en_el_pais.pdf (last accessed in May 11, 2013)

152 José Luis Ordóñez Jimenez, El Futuro del CIF. Revista M&M – El Mueble y la Madera. Number 76. June-August 2012.

153 The pact was signed by the representatives of the following groups: European Union Delegation to Colombia and Ecuador, Minister of Environment, Housing and Territorial Development, National Federation of Wood Industry, (FEDEMADERAS), World Wildlife Fund (WWF), Colombia, CARDER (CAR from Risaralda), CRC (CAR from Quindio), Cortolima (CAR of Tolima), Corponor (CAR of the Northeast Frontier), FEDEGAN, Federation of Municipalities, Federation of Coal Producers (FEDECARBON), Federation of Transport Industry (COLFECAR) and others. – Source: Forests Project Publication FLEGT / Colombia (CARDER-EU) – Available at http://elijamaderalegal.blogspot.com/p/pacto-intersectorial-por-la-madera.html

154 Presidential Communication, Aug. 31st, 2011. Available at: http://wsp.presidencia.gov.co/Prensa/2011/Agosto/Paginas/20110831_05.aspx

155 WWF-CO 2013 Personal Communication

156 According to information provided by WWF Colombia (as part of the collaboration for this report), as of now, the overall costs associated with the legal and technical requirements are too high for the local communities).

APPENDIX F | LED-R AND REDD+ INITIATIVES IN COLOMBIA

F.1 Domestic - Ministry of Environment – The Heart of the Amazon Initiative[157]

For several decades Colombia has been constructing an extensive system of protected areas and indigenous reservations in the Amazon, which, according to the National government, have proved effective in slowing deforestation. The development of the "Governance for Conservation and Sustainability at the Heart of the Colombian Amazon" is an integral part of this commitment, designed to conserve and sustainably manage more than 11 million hectares with the Chiribiquete National Park at the core of the conservation area. If successful, the project will significantly lower CO_2 emissions, preserve a biological corridor between the Andes and the Amazon, promote sustainable development, and improve the livelihoods of local communities and indigenous peoples in the region[158].

The Colombian Ministry of Environment has been actively seeking international support for the Chiribiquete "Heart of the Amazon" project, which focuses on three intervention strategies as well as a component of environmental and social monitoring and evaluation. The Chiribiquete National Park is surrounded by a buffer zone and a larger land-use planning zone that would inter-connect indigenous lands and other protected areas that encompass a large portion of the Colombian Amazon forest region.

IMPROVED GOVERNANCE

Land-use planning and zoning: Six million hectares of the Amazon Forest Reserve Area remain without land-use planning designations, mostly in the departments of Caquetá and Guaviare[159]. Zoning is essential to determine possible uses and tenure in different areas, resolve conflicts between national priorities, such as conservation of biodiversity and oil exploration; and give the State legitimacy in controlling deforestation. It is also needed to provide legal certainty to farmers, settlers, indigenous communities and the private sector. The land-use planning process includes the extension of Chiribiquete's National Park. The Ministry of Environment has commissioned SINCHI's Amazon Research Institute to develop land-use zoning within the Amazon Forest Reserve that delimits environmental management units and protected areas. Also, given the potential conflict between forest conservation and oil and gas exploration, the National Parks of Colombia reached agreements with the ANH (National Agency of Hydrocarbons) to allow expansion of the park in areas that had been reserved for oil exploration. At a finer scale, land-use planning includes issuing land titles to peasant and settler families on land that is zoned for production, giving legal certainty to farmers and the private sector. Initially, resources from the Gordon and Betty Moore Foundation are available to support planning and management actions in the park's most vulnerable areas.

Institutional strengthening: Many hotspots of deforestation in Colombia, such as the Chiribiquete's Land-Use Planning Area, are places where government has historically been absent. Improving the institutional presence of the State, particularly with environmental law enforcement, is a goal of the present government. Under the umbrella of the *National Territorial Consolidation Policy*, the government is re-entering areas where the absence of the State is generating threats to national security. These areas are called *Consolidation Zones* and one such area includes the municipalities of San Vicente del Caguán and Cartagena del Chairá (Caquetá) and Macarena (Meta) in the western and northern Chiribiquete Land-Use Planning Area. This will allow international cooperation to be guided by the degree of government control in the region. Bearing this in mind, a special emphasis is placed on institutional strengthening during the first four years of this project, so that the field phases that involve distribution of incentives are on much more solid footing once they begin. The strengthening of indigenous territory governance is another core portion of this action.

157 The Ministry of Environment is leading the initiative Heart of the Amazon and its position has evolved in the past months. For example, there are some plans to extend it to the entire Amazon Biome, and to allow more flexibility for the Colombian Government to decide where to direct its funds, and to extend its activities to areas including the Departments of Vaupes, Putumayo, and Guainía on the border with Brazil. However, these ideas are not expressed in an official document yet. The proposal that was analyzed here was provided by MADS. MADS has another proposal submitted to the Global Environmental Facility (but this is not a public document yet)

158 Ministerio de Ambiente y Desarollo Sostenible, Republica de Colombia, - Governance for Conservation and Sustainability of the Heart of the Colombian Amazon – Proposal for Funding, May 2012

159 Fundación Alisios. 2011. Transformaciones en la Amazonia colombiana. Fundación Alisos, Bogotá, Colombia. (prepared by Wightman, Wendy Arenas et al).

SECTORAL ACCORDS FOR SUSTAINABILITY

Interagency public policy agreements: This process seeks policy coherence across the government, where the 2020 zero deforestation target for the Amazon, indicated by Colombia at the UN Climate Summit in Copenhagen in 2009 and again in Cancun in 2010, is internalized across agencies and local authorities. Although the Ministry of Environment has been historically at a disadvantage during interagency policy discussions, this project could boost its leadership to secure key agreements, particularly with the Agricultural, Energy and Mining and Transportation ministries. In addition, it is key to have policy coherence between environmental incentives, farming subsidies and credit policies for farmers. If achieved, purchasing agreements of sustainable Amazonian products by large public sector buyers like the Ministries of Health and Defense can also have a great positive impact. Regional governments, regional environmental authorities and municipalities need to be brought to the table for these agreements.

Public-private sectoral agreements: The livestock and dairy industries, agricultural financing institutions, the timber, food, oil and mining industries are among the most important sectors with which to reach agreement in order to steer private decision-making towards the zero deforestation goal. Specifically, in the areas of Caquetá and Macarena (Meta) where livestock production is well-articulated with the national market, and where cattle ranching is responsible for significant deforestation in the Chiribiquete Land-Use Planning Area, it is essential to reach agreements with the livestock sector through the national guild FEDEGAN, municipal committees, and companies such as Nestlé which play an important role as the main purchasers of milk in the region.

Private sector agreements can help producers to overcome financial barriers to transition to sustainable agricultural practices (e.g., silvopastoral) and market barriers of Amazonian fruits (e.g., arazá). Private sector agreements support can materialize through loans, and or agreements that ensure demands for sustainable products. (e.g., agreement with juice bottling companies in Colombia for the purchase arazá, or with Nestlé for acquiring milk free of deforestation).

INCENTIVES FOR CONSERVATION, RESTORATION AND SUSTAINABLE USE

Incentives for forest conservation: In alignment with the National REDD+ Strategy, these must be adequately designed to prevent deforestation in areas at risk, and reward long-standing conservation in forest areas not at risk, including indigenous reservations. Two REDD+ early implementation projects in the region will provide key inputs for the implementation phase of the incentives.

Restoration of degraded lands: Areas that guarantee connectivity between protected areas; along rivers that connect the Chiribiquete Land-Use Planning Area with the Andes, and in the Amazon Piedmont, emerge as likely priorities for restoration incentives and activities, via spontaneous or assisted restoration. Estimates from the Ministry of Environment and National Parks of Colombia indicate a wide range of costs for assisted restoration from USD 3,694 to USD 8,639 per ha. For spontaneous restoration (i.e. assisted natural forest regeneration), the cost estimates are for fencing, around USD 1,108 per ha. This activity is aligned with the *National Plan for Ecosystem Restoration, Recovery and Rehabilitation*.

Cattle ranching conversion: As the leading driver of deforestation, it is crucial to change the regional model of cattle ranching through intensification, achieved by rotation of grazing fields, stabling and fodder planting, silvopastoral systems and the setting aside of areas for natural restoration. There are significant experiences in promoting silvopastoral models in Caquetá, Meta and Guaviare, which include two GEF/World Bank projects that are expected to continue into a next phase with support from the ICF. Data from SINCHI indicate that silvopastoral systems in the Amazon can cost USD 7,061/ha over 9 years before breakeven is reached at year 9, but can become highly profitable at year 20, when wood can be harvested. Traditional cattle ranching can cost USD 1,352/ha and generally breaks even as early as year 3, although profit margins are low, with an IRR of 5%. In Caquetá, CIPAV joined forces with Nestlé to pilot silvopastoral systems for milk production, with significant success at full costs of USD 2,440 to USD 4,651 per ha for establishment of the system[160]. These experiences have great potential for replication and expansion given the adequate incentives such as loan guarantees, technical assistance and purchasing agreements.

Amazonian production systems: It is important to promote agricultural and extractive production models that are environmentally compatible with the conditions of the Amazon, both to provide food security for local communities and indigenous peoples and as a strategy for poverty reduction and economic integration of the region. This project will build on already established experiences and work to resolve

160 Tafur, O. et al. 2011. Leche ambientalmente sostenible – LAS. Fundación CIPAV

bottlenecks in these systems before rolling out an incentive programme that disseminates successful production arrangements. Certification of sustainable products will be a strategy to encourage behavior change. The REDD+ early implementation project funded by the Netherlands includes the establishment of this type of system.

MONITORING AND EVALUATION

IDEAM produces deforestation estimates at a coarse scale nationwide, and at a fine scale for hotspots of deforestation and REDD projects[161]. Using this system, IDEAM can estimate with a relatively low degree of uncertainty (10%), the annual CO_2 emissions caused by deforestation. Regarding monitoring of biodiversity and social indicators, the SINCHI Amazon Research Institute has developed a set of indicators that can be applied to the project area. The environmental, social and economic impact of cattle ranching conversion, Amazonian production systems, restoration and conservation will be monitored according to protocols validated in previous projects. This will include indicators about poverty reduction. The active participation of communities will be sought in the monitoring component of the project.

Project Management

The Ministry of Environment is the lead agency for the project, while Fondo Patrimonio Natural is the funding administrator. Institutional arrangements and responsibilities for the project will be further refined during the strategy development phase via an interagency steering committee, which will include relevant local and regional partners. In addition to National Parks of Colombia and the regional governments of Caquetá, Meta, Guaviare, Vaupés and Amazonas, three autonomous regional corporations (CARs) have jurisdiction in the area, as well as 14 municipalities.

The Colombian government is seeking donor contributions of USD 133.8 million: USD 33.8 million for a sinking fund and USD 100 million for the endowment fund. Additionally, they propose a 1:1 cost-sharing ratio for the sinking funds and an annual match of the returns of the endowment fund. This proposal is the result of an interagency effort led by MADS with the participation of National Parks of Colombia, IDEAM, the Amazon Institute of Scientific Research SINCHI, Patrimonio Natural Fund and The Nature Conservancy.

F.2 Domestic – Ministry of Agriculture – Strategy for International Cooperation 2013 to 2015

In December 2012, the Colombian Ministry of Agriculture defined six strategic areas with a number of priority issues possibly requiring international support (Estrategia de Cooperación Internacional del Sector Agropecuario 2013-2015)[162].

Land-Use: A comprehensive land policy aims to manage the ownership and use of rural land, seeking efficient and coordinated actions of all institutions related to the rural sector around the protection of wetlands, moors, management areas, and protected areas against misappropriation and illegal occupation. Likewise, **this policy is designed to ensure closure of the expansion of the agricultural frontier, clean and secure the rights of land ownership and recovery of degraded lands.** This policy also aims to fairly redistribute land to citizens that were expelled for reasons of armed conflict, and to comply with social and ecological functions of rural property. There should be a focus on efficient and sustainable production, taking into account the biophysical, climatic, and environmental potential of both the territory and communities that inhabit it.

Rural Development: This policy is a portion of the proposed *Bill of Lands and Rural Development*, which conceptualized sector development from a territorial approach, where actors responsible for the sector work together in a comprehensive, coordinated and articulated manner. Programmes and rural development projects will be planned and implemented within targeted areas through **public-private partnerships in order to promote economic, social and environmental development of rural areas to contribute to rural poverty reduction,** strengthening the capacity to generate income, improving the living conditions of the rural population, and increasing competitiveness and productivity.

161 IDEAM. 2011. Memoria técnica de la cuantificación de la deforestación histórica nacional – escalas gruesa y fina. (Cabrera E., Vargas D. M., Galindo G. García, M.C., Ordoñez, M.F. - autores) Instituto de Hidrología, Meteorología, y Estudios Ambientales-IDEAM-, Bogotá D.C., Colombia.

162 Estrategia de Cooperación Internacional del Sector Agropecuario 2013-2015. Bogotá, December 2012. Prepared by MADR et al)

Productivity: Support all services that are responsible for delivering agricultural products from the farm to the final consumer (traceability, storage, transportation, etc.). Strengthen productive diversity and specializations aimed at different markets. Provide technical support to producers of high quality products in order to improve their productive capacities and business practices. **Promote and strengthen certification processes for small and medium producers.** Modernize physical infrastructure including collection/wholesale centres in developing regions and transportation infrastructure. Develop a set of tools and financial incentives to support agricultural production. Strengthen associations of small producers with suitable schemes according to the productive activity. Model instruments and incentive experiences of countries where agriculture is subsidized.

Innovation, Science and Technology: Research activities will be linked to the productive sector through agro-oriented processes to achieve practical results that are replicable and scalable to help improve competitiveness and profitability. Guidelines will be developed to promote health and safety in the agricultural sector. Alternative sources of energy for agriculture will be promoted through policies, strategies, financing, scientific research, and innovation **including second and third generation biomass utilization and biofuel production.** Environmentally sustainable activities will be promoted including clean technologies for utilization of organic solid waste. Adjustments to agricultural activities will be implemented to help adapt to changing climatic conditions in different regions of the country. Promote partnerships with private enterprise and implementation of quality control system for agricultural genetics. Develop rules for recognizing payment of environmental services associated with productive systems. Implement measures to minimize energy costs and reduce emissions. Promote water footprint and carbon footprint methodologies for agricultural production.

Agricultural Risk Management: Identify and monitor risk through generation, collection, and analysis of information needed for timely and appropriate decision making. Promote a culture of communication and dissemination of institutional information needed for the producer to make decisions that will lower his risks.

Institutional Strengthening: Improve communication, coordination and planning in order to integrate and complement the resources and institutional efforts between different sectors involved in policy development. Assist entities to adapt to new objectives, goals, and tasks required for implementing public policies in the national context. Strengthen the coordination, relationship, and management between the national, regional and local institutions.

F.3 International Cooperation in the Amazon Region

Amazonas, Caquetá, Guainía, Guaviare, Putumayo and Vaupés hosted 310 projects funded by USD 91,007,524 in international support during the period of 2008 – 2012 (as of September 5, 2012)[163]. Projects related to peace and regional development were the most widely funded (USD 24,879,660) followed by human rights (USD 18,206,016), social development (USD 16,941,878), infrastructure (USD 12,285,317), environment (USD 10,572,637) and alternative development (USD 7,874,542). Caquetá and Putumayo were the focus of most of the international cooperation, each hosting 33% of the total project funding. The project locations and themes are summarized in the following tables.

163 Fuente Sistema de Información de Ayuda Oficial al Desarrollo – SIAOD de la Agencia Presidencial de Cooperación Internacional de Colombia APC-Colombia.

Table F.1 | *Total amount of funds tracked by the Presidential Agency for International Cooperation (APC) to the Amazon Region from the period of 2008 to 08/2012. By type of Activity Supported. Source: APC, March 2013.*

Department	Cooperation (USD)	No. Projects
Peace and Regional Development	24,879,660	9
Human Rights	18,206,016	124
Social Development	16,941,878	75
Infrastructure	12,285,317	6
Environment	10,572,637	10
Alternative Development	7,874,542	66
Science and Technology	103,055	1
Business Development	50,052	6
Democracy	41,789	4
Justice	35,842	6
Reintegration	13,484	2
Modernization	3,252	1
Total	**91,007,524**	**310**

Table F.2 | *Total amount of funds tracked by the Presidential Agency for International Cooperation (APC) to the Amazon Region from the period of 2008 to 08/2012. Departments located within the Amazon Region. Source: APC, March 2013.*

Department	Cooperation (USD)	No. Projects
Caquetá	29,705,172	57
Putumayo	29,661,476	159
Guaviare	15,766,626	40
Amazonas	13,487,651	33
Vaupes	1,895,516	11
Guiana	491,083	10
Total	**91,007,524**	**310**

The EU was the largest contributor to the Amazon region giving USD 30,586,532 to projects in peace and development, the environment and human rights. The United States gave the second largest amount at USD 24,796,784 contributing to projects in infrastructure, alternative development, and social development. The major sources of funding are summarized in the table below.

Table F.3 | *Total amount of funds tracked by the Presidential Agency for International Cooperation (APC) to the Amazon Region from the period of 2008 to 08/2012. Organized by International Source of Funds. Source: APC, March 2013.*

Department	Cooperation (USD)	No. Projects
European Union	30,586,532	21
United States	24,796,784	131
Netherlands	14,443,561	6
World Food Programme	10,523,069	11
Finland	2,290,548	2
Canada	2,120,624	3
UNHCR	2,062,684	104
Germany	957,110	3
UNICEF	713,596	11
World Bank	666,666	2
Development Bank of Latin America	494,446	1
Japan	456,793	5
European Union Humanitarian Aid	389,396	1
Inter-American Development Bank	317,050	2
Spain	94,400	2
Organization of American States	90,872	2
UNESCO	3,393	3
Total	**91,007,524**	**310**

Many of the funded projects in the areas of peace and regional development, human rights, social development, infrastructure, environment, and alternative development have strong synergies with the UK goals. Some funded projects that directly relate to UK goals are highlighted in the table below. It should be noted that while all of these projects had international support, many also had funding from the Colombian government.

Table F.4 | *Relevant initiatives selected by the authors to highlight activities that may have synergy with the interests of the UK government.*

The authors selected these projects from the total of 310 activities tracked by the Presidential Agency for International Cooperation (APC) for the Amazon Region during the period of 2008 to 08/2012. Source: APC, March 2013.

Project Description	International Funder	International Cooperation (USD)	National Funding (USD)	Date	Dept.
Develop guide for best practice palm oil production	USA	27,800	8,300	7/2/10	Caquetá and others
Strengthen cattle production of 34 families	USA	60,743	65,928	6/30/10	Caquetá
Establish 150 ha of sugar cane for 75 different smallholders	USA	211,574	707,737	10/20/10	Caquetá
Support for integrating agricultural production with national markets	USA	130,002	0	5/14/10	Putumayo
Support for pepper production	USA	20,000	0	5/14/10	Putumayo
Support socioeconomic reestablishment of displaced families	USA	374,868	681,629	5/12/10	Putumayo
Development of silvo-pastoral systems for 300 small producers	USA	259,091	694,137	2/28/10	Putumayo
Technical assistance for 44 families to sustainably utilize native forests	USA	4,787	34,756	12/23/09	Putumayo
Establish 450 ha of cacao for 150 families	USA	200,002	1,696,525	12/31/09	Putumayo
Strengthen food production systems to provide local autonomy	USA	810,254	2,424,261	12/31/09	Putumayo
Technical assistance for bean growers and processors	USA	233,836	233,837	4/30/10	Putumayo
Establish 60 ha of new brown sugar for 30 families	USA	53,269	187,193	12/31/09	Putumayo
Improve conditions for 182 smallholder coffee producers	USA	237,775	785,273	12/31/09	Putumayo
Establish 200 ha of Palm Chontaduro (Palm Heart) for 100 smallholders	USA	385,884	583,551	7/25/10	Putumayo
Pave 21 km of highway and construct 6 bridges	USA	5,661,599	5,661,599	12/31/09	Putumayo
Strengthening and modernization of 309 smallholder farms	USA	607,190	479,267	12/31/09	Putumayo
Establish sustainable cattle ranching and restore soil fertility	Germany	679,680	355,200	1/1/08	Putumayo
Support environmental governance to prevent deforestation	EU	4,418,554	0	3/1/13	Vaupes, Meta, Amazonas
Implement REDD projects	Netherlands	1,931,530	0	4/1/11	Amazonas

The table above highlights international programmes partnering with the Colombian government to directly address forest and land-use issues in Colombia. There are many additional projects that have less direct effects through strengthening government programmes throughout the region. The United States focused significant funding in Putumayo, likely as an extension of anti-illicit crop efforts in that department.

A few conclusions can be drawn from this data. Overall, the number of projects currently being funded and implemented is insufficient to enact a broad transition to LED-R within the agricultural sector. However analyzing these activities and their results can provide critical guidance as financial support for LED-R in Colombia is scaled up.

APPENDIX G | STAKEHOLDERS

Table G.1 | *Stakeholder Table*

SYMBOLS

Cattle | Palm Oil | Mining and Oil | **N/A** Non applicable

General Agriculture | Sugar Cane | Forestry

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	**Stakeholder**	**Commodities**	**Effects on Land-Use**	**Functions**	**Potential Contribution to LED-R**	**Changes that would support LED-R**
Domestic Government	National Planning Department		**High**	Head of the National System for Climate Change	**High**	• Engage different sectors around LED-R consensus
	Ministry of Agriculture and Rural Development (MADR)		**Medium**	Coordinates policies and infrastructure for agriculture, and social services in rural areas (e.g. education, health)	**High**	• Adopt LED-R as part of its mission and agenda • Coordination with Ministry of Environment to align agendas
	Colombian Institute for Rural Development (INCODER)		**High**	Executes policies of rural development created by MADR, including access to land	**High**	• Incorporate LED-R in the process of land-rendering and restitution
	CORPOICA		**Medium**	Generates agricultural scientific knowledge through research, innovation, technology transfer and training	**High**	• Increase understanding and promote agricultural practices that support LED-R
	ICA		**Low**	Research and control of sanitation and diseases for health and food safety	**Medium**	• Disseminate agricultural practices that are in alignment with LED-R
	Ministry of Environment and Sustainable Development (MADS)	+	**High**	Responsible for managing the environment and renewable natural resources. Promotes and regulates environmental planning, and environmental policy Also, is the Executive Secretary of the National Climate Change System.	**High**	• Coordination with MADR, Ministry of Mines and Energy, and Transportation to align agendas around SLCDS and REDD+
	Institute of Hydrology, Meteorology and Environmental Studies (IDEAM)		**Low**	Monitors and quantifies forest cover, land use change and deforestation at the national and regional levels; identifies drivers of deforestation; elaborates national GHG information to the UNFCCC	**Medium**	• Improve monitoring capacity of GHG emissions through higher resolution imagery • Increase capacity to monitor emissions from agricultural practices
	National Environmental License Authority		**High**	Grants licenses, permits and environmental procedures under MADS, in accordance with environmental laws and regulations	**High**	• Increase institutional capacity

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	Stakeholder	Commodities	Effects on Land-Use	Functions	Potential Contribution to LED-R	Changes that would support LED-R
Domestic Government	Ministry of Mines and Energy		**Medium**	Responsible for the energy and mining policy, including establishing a coherent territorial zoning of extractive activities and taking measures to limit carbon emissions within the sector	**High**	• Integrate environmental issues and zoning in the decision making process and mitigate direct and indirect GHG emissions • Be included in the REDD+ strategy process • Use Environmental Compensation funds to support LED-R and REDD+ activities • Integrate NAMAs priority mitigation actions within the sector to all relevant mining, energy, oil, and gas projects
	Ministry of Transport		**Medium/High**	Promotes, approves and oversees important infrastructure projects including those in the Amazon region and the Llanos Orientales	**High**	Ibid and in addition: • Integrate the different infrastructure projects to a more comprehensive regional development strategy, integrating LED-R criteria
	Ministry of Interior		**Low**	Coordinate actions with ethnic communities, including legal mandate of consultation with these communities in projects that may affect them	**High**	• Simplify the protocol for getting prior informed consent from indigenous and African-Colombian communities to reduce the time and costs of consultation
	Regional Autonomous Corporations (CARs)		**High**	Manages natural resource at the local level, including monitoring deforestation, and the environmental aspect of territorial zoning plans; enforces environmental laws and issues environmental licenses	**High**	• Increase technical and monitoring capacity for LED-R to improve decision-making process of license and enforcement
	CAR - Corpoamazonía		**High**	Ibid (but for the territory under its responsibility)	**High**	Ibid
	CAR - Sustainable Development Corporation of North East Amazon (known as CDA)		**High**	Ibid (but for the territory under its responsibility)	**High**	Ibid

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	**Stakeholder**	**Commodities**	**Effects on Land-Use**	**Functions**	**Potential Contribution to LED-R**	**Changes that would support LED-R**
Domestic Government	Departmental Governments		**Low**	Implement national, regional and sectorial environmental policies (e.g. SLCDS); provide finance and technical support to CARs, municipalities and other public organizations; promote, co-finance and execute infrastructure projects including watershed restoration and roads	**Medium**	• Increase technical, monitoring capacity for LED-R to improve decision-making process ensuring the implementation of SLCDS and additional LED-R policies at the departmental level
	Municipal Mayors (Secretaries of Environment and Agriculture)		**High**	Enact and adjust laws and taxes to control, and conserve the ecologic patrimony within the municipality; have access to funds from the national budget and also general royalty funds; implement national, regional and sectorial environmental policies (e.g. SLCDS); enact and implement territorial land-use zoning	**High**	• More finance resources and technical expertise to prepare more holistic land-use zoning and planning in their jurisdictions and implement them on the ground • Capacity building in REDD, LED-R, and to implement rural extension services
International Community	World Bank (FCPF)		**Low**	FCPF has been an important financial support mechanism for the development of the REDD National strategy; its implementation will also be financed by this organization	**High**	• Simplify the due diligence process; currently Colombia has not received money from FCPF because it has not complied with all the due diligence criteria required by the bank
	World Bank (GEF)		**High**	The Global Environmental Facility is supporting the Silvopastoral Productive System Pilot Project and the Palm Oil Biodiversity Corridors	**High**	• Align its efforts with other international supporters to ensure balance and collaboration while avoiding duplicated efforts
	United Nations Development Programme (UNDP)		**Low**	Co-financing and coordinating the SLCDS	**High**	• It should also support and engage subnational governments to ensure their efforts are aligned with the SLCDS
	European Union		**Low**	Supports several initiatives in the Amazon region, including strengthening: (1) local governance, (2) protected areas and indigenous territories, (3) systems for sustainable timber and non-timber products, and (4) REDD+ demonstrations	**High**	• Align its efforts with other international supporters to ensure balance and collaboration while avoiding duplicated efforts

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	Stakeholder	Commodities	Effects on Land-Use	Functions	Potential Contribution to LED-R	Changes that would support LED-R
International Community	Netherlands Embassy		**Low**	Supporting SINCHI´s research on drivers of deforestation in the Amazon region and also two REDD+ projects in collaboration with Patrimonio Natural, near Chiribiquete's National Park in the Amazon region. Supporting the platform for sustainable agricultural commodities	**Medium**	Ibid
	USAID		**Medium**	Implementing BIOREDD project with focus in the Atlantic and Pacific regions, and ICAA (Initiative for Conservation in the Andean Amazon) in the Amazon Basin; strengthening government and civil society capacity on (1) landscape management, (2) natural resource governance, (3) economic incentives for conservation and (4) understanding environmental issues and possible solutions	**Medium**	Ibid
	Norwegian Government		**Low**	Recently, Norway has indicated to Colombia the intent of providing up to USD 50 million for REDD+ readiness and advancing to a results-based REDD+ programme	**High**	Ibid
Indigenous and Afro-Colombian communities	Indigenous Populations (Communal Lands – Reserves)		**Low**	Rights over large tracts of land in the Amazon region; low deforestation rates, but do selective logging; plant illegal crops, and mining (in certain regions)	**High**	• Need economic alternatives to change from selective logging or illicit crop cultivation to other activities and support to strengthen governance
	National Organization of Indigenous People (ONIC) Organization of Indigenous Amazonian People (OPIAC) Organization of Indigenous Authorities of Colombia – (AICO)		**Low**	They have the right to free prior and informed consent on policy and guidelines, considering their self-governance rights; actively participate in the development of mitigation and adaptation measures, including REDD+	**High**	• Simplify the protocol for getting prior informed consent from indigenous communities
	Permanent Bureau Consultation with Indigenous people (Decree 1397/96)		**Low**	Active in policy decisions at the national level, and in harmonizing national policies with indigenous rights; any LED-R initiative in their territory requires prior informed consent according to the national legislation	**High**	• Ensure long-term funds to support the initiative, and ensure capacity building (including on managing funds from REDD+)

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	**Stakeholder**	**Commodities**	**Effects on Land-Use**	**Functions**	**Potential Contribution to LED-R**	**Changes that would support LED-R**
Indigenous and Afro-Colombian communities	Mesa Regional Amazónica (Decreto 3012/05)		**Low**	Main indigenous organization in the Amazon region; actively engaged in the development of the REDD+ strategy; holds right to prior informed consent	**High**	• Simplify the protocol for getting prior informed consent from indigenous communities
	Afro-Colombian Communities (Consejos Comunitários de Comunidades Negras)		**Medium**	Possess large areas of natural forest; are committed to sustainable use of land, but many internal and external factors affect their ability to protect their forest, including armed conflicts	**High**	• Need economic alternatives to change from selective logging or illicit crop cultivation to other activities • Need support to strengthen governance and government presence in the region
Civil Society	Amazonas 2030	**N/A**	**N/A**	Alliance between civil society, private sector and media with Netherlands financial support; promotes sustainability and welfare in the Amazon	**N/A**	• Coordinate efforts with NGOS and government to strengthen the results of its activities and avoid duplicating efforts or creating confusion for local communities and government.
	Fundación Gaia Amazonas	**N/A**	**N/A**	Promotes indigenous people's autonomy, environmental governance, and articulation with the national government	**N/A**	Ibid
	Fundación Patrimonio Natural	**N/A**	**N/A**	Promotes governance in the Amazon region to conserve forest ecosystems, and mitigate climate change; focused on protected areas	**N/A**	Ibid
	Research Institute SINCHI (close ties with the Ministry of Environment)	**N/A**	**N/A**	Performs research on the Amazon region ecosystems, biodiversity, economy and social groups; working with IDEAM to identify drivers of deforestation in the Amazon	**N/A**	Ibid
	Research Institute of Biologic Resources Alexander von Humboldt	**N/A**	**N/A**	Focused on conservation, sustainable land-use, and biodiversity in Colombia; evaluating the co-benefits of the REDD strategy.	**N/A**	Ibid
	ECOVERSA	**N/A**	**N/A**	Prepares environmental impact legislation evaluation and cost-benefit analysis; working on the SLCDS	**N/A**	Ibid
	Fondo para Acción Ambiental y Niñez	**N/A**	**N/A**	Funds and channels funds for environmental and childhood projects; designed and implemented by civil society organizations	**N/A**	Ibid

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	Stakeholder	Commodities	Effects on Land-Use	Functions	Potential Contribution to LED-R	Changes that would support LED-R
Civil Society	INDEPAZ	N/A	N/A	Works in regions where the social situation is difficult and illegal crops are cultivated, including Caquetá and Putumayo in the Amazon	N/A	Ibid
	WWF	N/A	N/A	Conducts analyses on threats and strategies for the Amazon biome; works at different scales on policy, capacity building and communication	N/A	Ibid
	Office National des Forets (ONF) Andina	N/A	N/A	Preparing PDD (Project Design Document) for Patrimonio Natural REDD projects in the Amazon region; leading the National REDD roundtable with other NGOs	N/A	Ibid
	Fondo Patrimonio Natural	N/A	N/A	Fund that invests in the conservation of natural areas in Colombia and environmental services	N/A	Ibid
	CONIF (National Corporation for Forest Research and Promotion)		N/A	Scientific and technical activities aimed at recovery, conservation, protection, management, and use of forest resources	N/A	Ibid
Academia	Universidad Nacional (Forestry Dept.)		N/A	Studies different forest ecosystems and carbon stocks in different regions	N/A	• Coordinate with other Academic Institutions, NGOs and government agencies to strengthen the results of its work and avoid duplicated efforts
	IDEA - Institute of Environmental Studies (Universidad Nacional)	N/A	N/A	Prepares economic valuation, assessments, and impacts of environmental services and agricultural activities	N/A	Ibid
	Universidad Distrital (Dept of Environmental and Natural Resources)	N/A	N/A	Studies different forest ecosystems as well as carbon stocks and biomass in different regions	N/A	Ibid
	Universidad Javeriana	N/A	N/A	Studies different land-use changes and modeling, and can help with analysis of projections of deforestation and agricultural expansion	N/A	Ibid
	Universidad de Los Andes	N/A	N/A	Studies different environmental policies to facilitate a consensus around LED-R	N/A	Ibid
	Universidad de la Amazonia	N/A	N/A	University located in Florencia; they may be able to help assess carbon stocks and biomass in different regions on the ground	N/A	Ibid

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	**Stakeholder**	**Commodities**	**Effects on Land-Use**	**Functions**	**Potential Contribution to LED-R**	**Changes that would support LED-R**
Private Sector	Ecopetrol		**High**	State owned oil & gas company	**High**	• Adopt practices that minimize environmental impact, absorb externalities, and coordinate with different sectors (e.g. MADS and MADR)
	El Ingenio Risaralda		**High**	Sugar mill & ethanol producer	**High**	• Adopt practices that minimize social and environmental impact and promote these practices as examples in the sector
	Ingenio Providencia		**High**	Sugar mill & ethanol producer	**High**	Ibid
	Incauca		**High**	Sugar mill & ethanol producer	**High**	Ibid
	Sapuga		**High**	Palm oil company	**High**	Ibid
	Extractora del Sur de Casanare		**High**	One of the largest palm mills	**High**	Ibid
	Mayagüez SA		**High**	One of the largest sugar mills	**Medium**	Ibid
	Ardila Luelle, Incauca SA, Postbon Beverage		**High**	Largest beverage company and conglomerate in Colombia	**High**	Ibid
	Grupo Manuelita SA		**High**	One of the largest Sugar and Palm Mills in Colombia	**High**	Ibid
	Alpina Productos Alimenticios		**High**	Major supermarket chain and large milk buyer	**High**	• Commitment to buy from producers that adopt better social and environmental practices (e.g. free of deforestation and child/ slave labor)
	Colanta		**High**	Colombian grocer and a significant buyer of both beef and milk	**High**	Ibid
	Grupo Éxito		**High**	Large Colombian grocer and one of the largest buyers of domestic beef	**High**	Ibid
	Mondelez		**High**	Large buyer of both Palm and Sugar. (Kraft Foods)	**High**	Ibid
	Nestlé		**Medium**	International company and large milk buyer. Currently buys milk from smallholders in the Amazon region; Nestle is one of the only large companies working within the Amazon region in Colombia	**High**	Ibid

Relevant Stakeholders Affecting Commodities Supply Chain in Colombia						
Entity	Stakeholder	Commodities	Effects on Land-Use	Functions	Potential Contribution to LED-R	Changes that would support LED-R
Farm Associations	FEDEBIO-COMBUSTIBLES		**High**	Colombian federation for producers of biofuels including the palm and sugar sectors	**High**	• Coordination with national government and industry to promote better social and environmental practices that reduce the carbon footprint and support zero deforestation
Farm Associations	ASOCAÑA		**High**	Colombian Association of Sugar Mills	**High**	Ibid
Farm Associations	FEDEGAN		**High**	Cattle Federation. They plan to reduce the area of cattle in the country and increase efficiency and productivity through intensification and silvopastoral productive systems	**High**	Ibid
Farm Associations	PROCAÑA		**High**	Association of Sugar Cane Mills	**High**	Ibid
Farm Associations	FEDEPALMA		**High**	Colombian Association of Palm Producers	**High**	Ibid
Farm Associations	SAC		**High**	Colombian Association of Producers; it represents all (or almost all) other federations, including the ones listed above	**High**	Ibid
Farm Associations	FEDEPANELA		**High**	Federation of Producers of Panela, an important part of the Colombian diet; the sector lacks sophistication and sometimes is associated with deforestation	**High**	Ibid
Farm Associations	FEDECAFE		**Medium**	Federation of Coffee Producers, Coffee is the largest agricultural commodity produced in Colombia	**Medium**	Ibid
U.K. companies	British Petroleum-Equión		**High**	Could be a good partner in the implementation of LED-R initiatives in its area of influence	**High**	• Adopt practices that minimize environmental impact, absorb externalities, and coordinate with different sectors (e.g. MADS and MADR)
U.K. companies	Emerald Energy		**High**	With oil fields in Caquetá and Putumayo, the company is present within the Amazon region and could be a strategic partner for a LED-R strategy in those departments	**High**	Ibid

APPENDIX H | FINANCING FOR AGRICULTURE

Table H.1 | *Financing available for agricultural production*

Financial Instrument	Description	Budget 2013 USD millions
FINAGRO Lines of Credit	Loans for working capital and investments	3,660[164]
Rural Capitalization Incentive – ICR	Subsidizes a percentage of investment projects undertaken to improve competitiveness (if financed through FINAGRO)	145[165]
Special Line of Credit – LEC	Low interest rate, longer-term loans for projects that improve competitiveness of the agriculture sector	13
Technical assistance and related courses	Subsidizes the costs of expenses to hire technical assistance	81
Irrigation-related programmes	Subsidizes the costs of irrigation projects	36
Agricultural Fund for Guarantees – FAG	Backs working capital and investment loans financed with FINAGRO rediscounted funds	18[166]
National Agricultural Recovery Programme (PRAN)	Refinances overdue debts for small-, medium- and large scale producers	*
Insurance of Agricultural Incentive (ISA)	Subsidy to help producers pay for insurance	*
Forestry Incentive Certificate – CIF	Covers part of the investment costs for establishing and maintaining commercial forest plantations	56
National Royalty Fund	Regional Development Fund, Reg, Compensation Fund, and Science, Technology and Innovation Funds (together, 50% of total royalties) are most likely to be used for agricultural projects (max. amount)	≤2,400[167] (2012)
Commercial suppliers and trade finance	Finance includes input suppliers, sellers of machinery and equipment, and purchasers of agricultural commodities	1,222[168]
ODA	Total ODA; ODA for agriculture, forestry and fisheries	750; 110[169] (2011)

*Not available.

164 FINAGRO statistics on its website, accessed March 20, 2013: https://www.finagro.com.co/sites/default/files/field-collection/estadisticas/files/otorgados_por_linea_.pdf

165 Information on the size of the ICR, LEC, Tech Assistance, Irrigation-related programs, and CIF was obtained from a Ministry of Agriculture and Rural Development (MADR) document that details the programs, opening dates, and budgets (via an interview at MAG in March, 2013).

166 Amount paid on losses in 2012. At the end of 2012, the value guaranteed by FAG reached USD 1,667 million.

167 *Distribución* SGR 2013-2014 - *resumen departamental* on *Sistema General de Regalias'* website, accessed March 20, 2013: https://sgr.dnp.gov.co/LinkClick.aspx?fileticket=ybG3SPotZP4=&tabid=76.

168 In the time frame of this assessment, we have been unable to uncover the current terms and scope of commercial trade finance, but based on historic data (*Colombia Rural Finance: Access Issues, Challenges and Opportunities.* World Bank, November 2003 (Report No. 27269-CO), such finance is approximately one third of the FINAGRO lending portfolio (USD 3.67 billion in 2013).

169 *ODA by sector – bilateral commitments by donor and recipient (Geo Book)*, OECD statistics on its website, accessed March 20, 2013: http://stats.oecd.org/Index.aspx?DataSetCode=DACSECTOR.

APPENDIX I | TABLES SUPPORTING ANALYSIS OF BAU AND GOVERNANCE SCENARIOS IN COLOMBIA

Table I.1 | *Future deforestation by 2020 within Colombia under two scenarios was derived from González et al (2011)[124].*

The initial forest extent, for year 2010, was extracted from a separate study by Cabrera et al (2011)[43] which classified land cover in the five major regions of the country (Amazon, Andes, Orinoquia, Pacific and Caribbean).

	Projected Deforestation to 2020 (ha)				
		BAU 2020 (Pessimistic scenario)		GOV 2020 (Optimistic scenario)	
Region	Forest cover 2010 (ha)	Mean annual deforestation rate (%/year)	Total deforestation 2010-2020 (ha)	Mean annual deforestation rate (%/year)	Total deforestation 2010-2020 (ha)
Amazon	39,697,218	0.0063	2,423,774	0.0023	902,616
Inside the Amazon			**2,423,774**		**902,616**
Andes	10,716,141	0.0065	674,394	0.0054	563,325
Orinoquia	2,076,807	0.0061	122,899	0.0042	85,420
Pacific	4,924,656	0.0043	207,272	0.0011	53,874
Caribbean	1,606,983	0.0137	205,742	0.0056	87,518
Outside the Amazon			**1,210,306**		**790,137**
National	**59,021,805**	**0.0063**	**3,603,666**	**0.0028**	**1,629,688**

Table I.2 | *Average forest carbon density by major region in Colombia, estimated from Table 1 in Yepes et al. 2011.*

Region	Average tCO_2e per ha
Andes	272.1
Caribe	347.9
Pacific	298.7
Amazon	367.9
Orinoquia	176.5
Average	**309.7**

Table I.3 | *Forest regeneration, restoration and/or plantation from 2014 to 2020 by intervention, with estimated carbon absorption (at rate of 7.5 tCO_2e/ha/year).*

	Cattle Sector			Family Farm Settlements	
Year	Forest Regeneration or Tree Crops (ha)	Carbon absorbed ($MtCO_2e$)	Number of families	Forest Regeneration or Tree Crops (ha)	Carbon absorbed ($MtCO_2e$)
2014	100,000	0.75	5000	10,000	0.075
2015	200,000	1.5	10,000	20,000	0.15
2016	400,000	3	20,000	40,000	0.3
2017	1,000,000	7.5	40,000	80,000	0.6
2018	1,500,000	11.25	80,000	160,000	1.2
2019	2,000,000	15	120,000	240,000	1.8
2020	2,500,000	18.75	160,000	320,000	2.4
Total		**57.75**	**435,000**		**6.52**

Table I.4 | *Estimates of number of families resettled and annual forest clearing rate from 2013-2020 assuming no measures are taken to slow forest clearing on family farm settlements.*

Year	Number of families	Forest clearing (0.5 ha/y/family)
2014	5000	2500
2015	10,000	5000
2016	20,000	10,000
2017	40,000	20,000
2018	80,000	40,000
2019	120,000	60,000
2020	160,000	80,000
Total	**435,000**	**217,500**

Table I.5 | *Deforestation by municipality in Caquetá, Guaviare, and Putumayo from 2002-2007, with projected deforestation from 2013-2020 under two alternative scenarios.*

Municipality	Departament	Deforestation 2002-2007 (ha)	Mean annual deforestation rate (ha/year)	Projected Deforestation to 2020 (ha)	
				BAU 2020	GOV 2020
Colón	Putumayo	120	24	192	192
Sibundoy	Putumayo	128	26	204	204
Morelia	Caquetá	352	70	563	563
San Francisco	Putumayo	460	92	735	735
Albania	Caquetá	561	112	898	898
Santiago	Putumayo	736	147	1,177	1,177
Curillo	Caquetá	1,054	211	1,686	1,686
San Miguel	Putumayo	1,219	244	1,951	1,951
Milán	Caquetá	1,822	364	2,914	2,914
Mocoa	Putumayo	2,028	406	3,244	3,244
Belén de Los Andaquíes	Caquetá	2,033	407	3,253	3,253
San José del Fragua	Caquetá	2,215	443	3,544	3,544
Solita	Caquetá	2,749	550	4,399	4,399
Valparaíso	Caquetá	3,311	662	5,297	5,297
El Paujil	Caquetá	3,348	670	5,357	5,357
Valle del Guamuez	Putumayo	3,869	774	6,190	6,190
El Doncello	Caquetá	4,171	834	6,674	6,674
Villagarzón	Putumayo	5,999	1,200	9,598	1,920
Puerto Caicedo	Putumayo	7,379	1,476	11,806	2,361
Florencia	Caquetá	9,751	1,950	15,602	3,120
Orito	Putumayo	12,066	2,413	19,306	3,861
La Montañita	Caquetá	14,472	2,894	23,156	4,631
Puerto Rico	Caquetá	14,913	2,983	23,861	4,772
Puerto Asís	Putumayo	16,021	3,204	25,633	5,127
Miraflores	Guaviare	21,858	4,372	34,972	6,994
Leguízamo	Putumayo	23,040	4,608	36,864	7,373
Solano	Caquetá	24,495	4,899	39,192	7,838
Calamar	Guaviare	30,380	6,076	48,608	9,722
El Retorno	Guaviare	32,463	6,493	51,941	10,388
Puerto Guzmán	Putumayo	35,986	7,197	57,578	11,516
San José del Guaviare	Guaviare	46,824	9,365	74,919	14,984
Cartagena del Chairá	Caquetá	51,177	10,235	81,884	16,377
San Vicente del Caguán	Caquetá	72,911	14,582	116,657	23,331
TOTAL		**449,909**		**719,855**	**182,593**

Source of deforestation data: Murcia, G.U.G.; Huertas, M.C; Rodríguez, J.M; Castellanos, H.O. 2010. Cambios multitemporales de los bosques y otras coberturas de la Amazonia colombiana, a escala 1:100.000, en el periodo 2002 al 2007. Instituto Amazónico de Investigaciones Científicas SINCHI. Bogotá, D.F